LiDAR Mapping Report: AL_17COUNTY_2020_B20

LiDAR Collection, Processing, and QA/QC

140G0220F0084: AL_17County_2020_B20

QL2 LiDAR

Prepared For:

US Geological Survey

Prepared By:

Digital Aerial Solutions, LLC

4027 Crescent Park Drive

Riverview, FL

33578

Phone: (813) 628-0788

Contract: G16P00044 Contractor: Digital Aerial Solutions

Task Order: 140220F0084: AL_17County_2020_B20

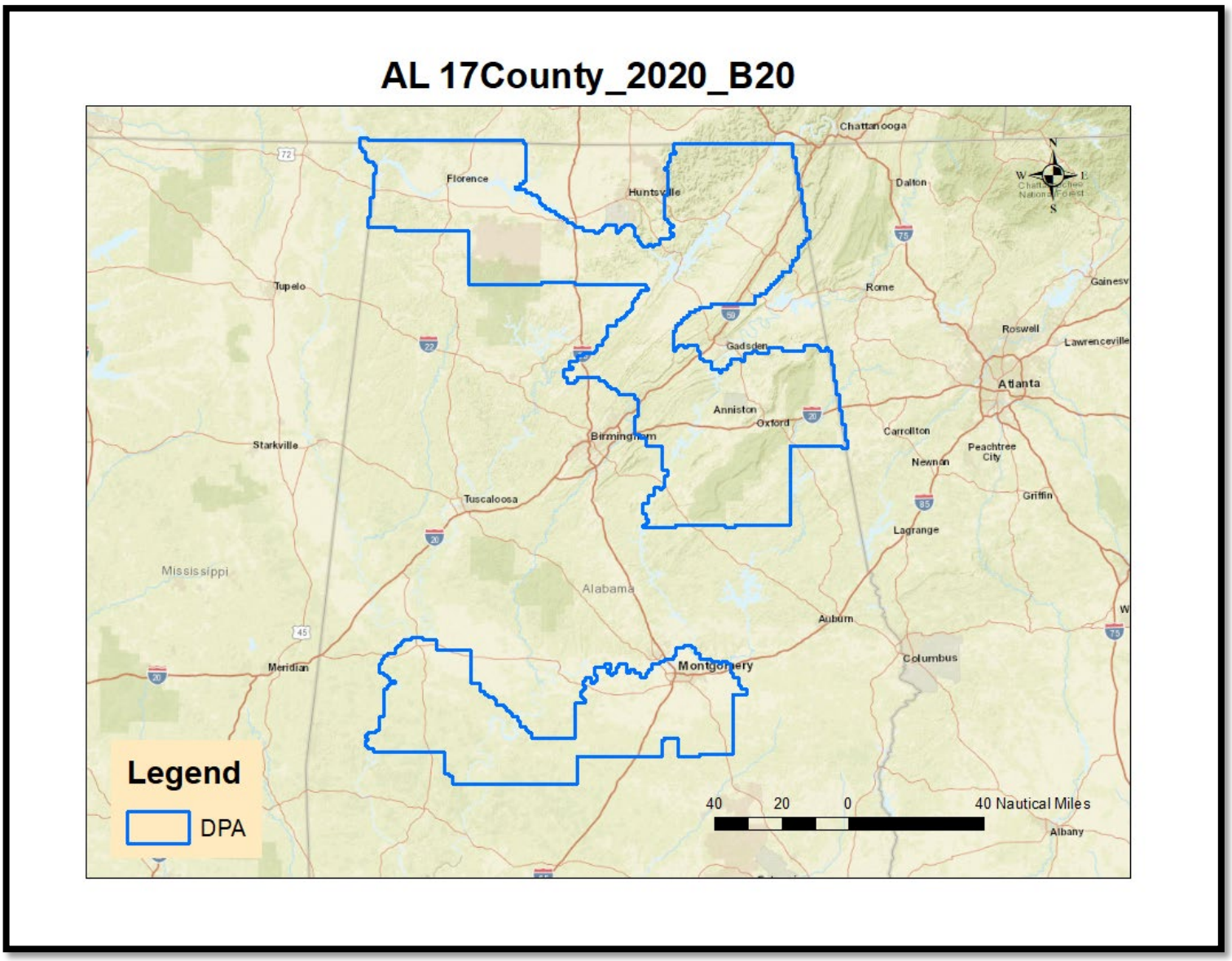


Figure 1 Define Project Area (DPA)

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1 Data Acquisition and Processing

1.1 Introduction

Digital Aerial Solutions, LLC (DAS) was tasked with planning, acquiring, processing and deriving elevation products for Light Detection and Ranging (LiDAR) for the 140G0220F0084: AL_17County_2020_B20. The task order required Spring 2020/Fall 2020 leaf-off LiDAR survey to be collected at an aggregate nominal pulse spacing (ANPS) < 0.71 meters (QL2) including overlap, with up to 2 discrete returns per pulse along with intensity values of each return. Aerial LiDAR was collected over approximately 13,146 square miles in the state of Alabama using the Leica Terrain Mapper and Reigl sensors as shown in Figure 1's Defined Project Area (DPA).

LiDAR dataset were post process to generate elevation point cloud swaths for each flight lines. Deliverables include tiled point cloud classified by land cover type, breaklines to support hydro-flattening of digital elevations models (DEM), intensity image and bare-earth DEM. Swath separation raster and Maximum Surface Height Raster (MSHR) are also delivered as ancillary data.

The point cloud deliverables are stored in the LAS Version 1.4-point data record format 6. The tiling scheme for the tiled deliverables is a **1,500 x 1,500 meters** grid. Tile naming convection is based on the US National Grid (USNG) format. All deliverables were generated in compliance with the U.S Geological Survey National Geospatial Program Guidelines and Base Specifications, Version 2.1. The spatial reference of the data is as follows;

Horizontal Spatial Reference

– Coordinates: UTM, Zone 16 North Meters (to 2 decimal places)

– Datum: North American Datum 1983 (2011), Meters (to 2 decimal places)

Vertical Spatial Reference

All datasets are available with orthometric elevation; point cloud datasets are also available with ellipsoid heights.

– Datum: North American Vertical Datum of 1988 (GEOID18)

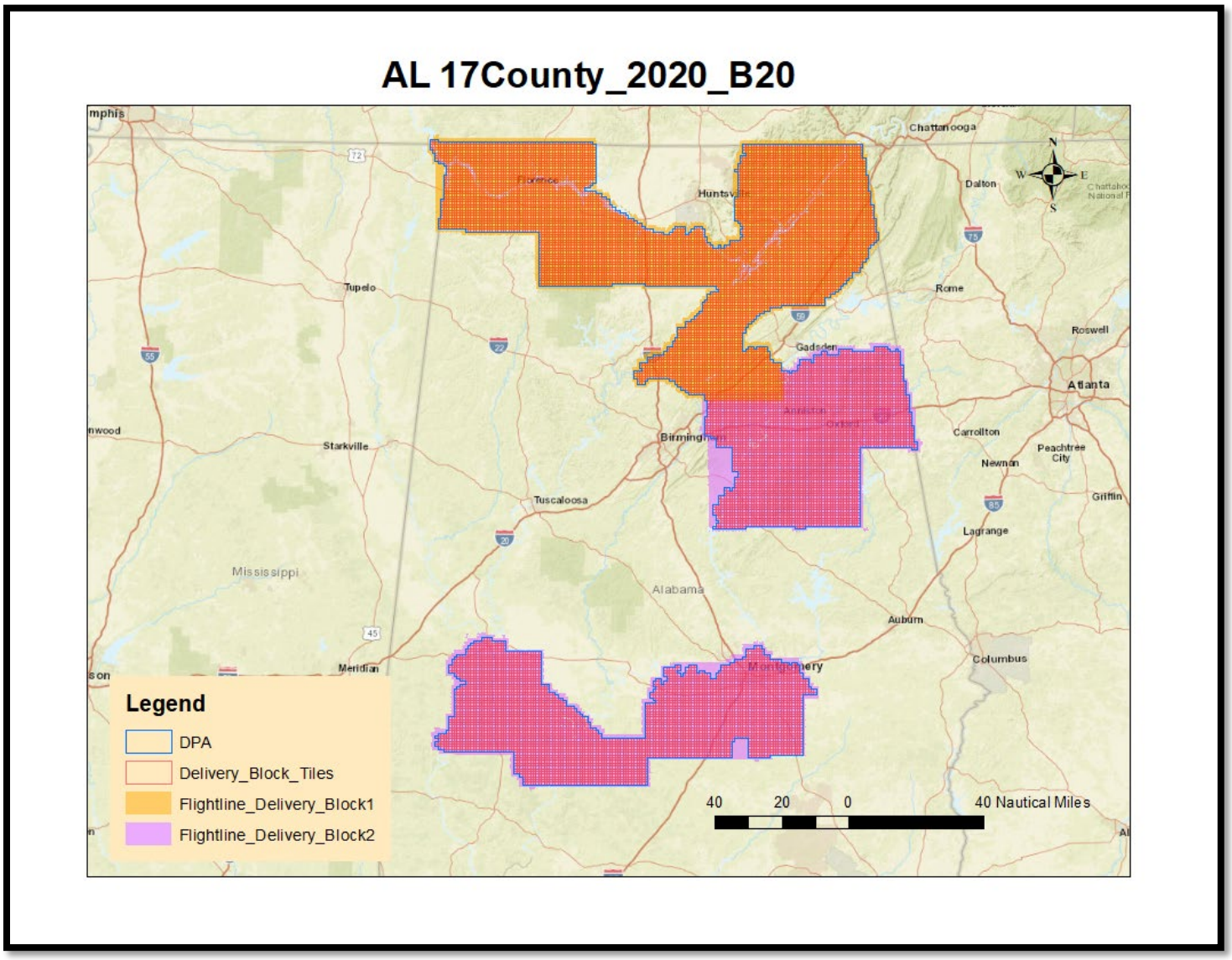


Figure 2 Al_17County_2020_B20 Flightlines

1.2 Mission Acquisition

Mission acquisition for 140G0220F0084: AL_17County_2020_B20 survey was done using KANB as base airports. A Riegl VQ-1560i was used for data collection. All acquisition was completed in 17 missions between December 10, 2020 and January 17, 2021.There was a total of 144 flightlines covering the entire Delivery Block 2 AOI, approximately 6704.86 square miles, in the State of Alabama. All mission flight logs can be found in Appendix A.

1.3 Acquisition Parameters

Acquisition parameters are designed to meet the project task order requirements. The sensor configuration and the flight plan characteristics are selected based on a number of project specific criteria. These include data accuracy, land cover types within the project area and the required nominal pulse spacing. Aggregate Nominal Pulse Density (ANPD) for QL2 is no less than 2ppm. Table 1 summarizes the project parameters for AL 17County 2020 B20.

Parameter (QL2)	Reigl (VQ-1560i)
Flying Height Above Ground Level:	7,546 feet
Nominal Sidelap:	20%
Nominal Speed Over Ground:	180 Knots
Field of View:	58.5°
Laser Rate:	2x 500 kHz
Scan Rate:	2x 161 lps
Average Point Spacing:	1.28 meters

Table 1 Flight Parameters

1.4 Mission Conditions

The acquisition mission for **140G0220F0084: AL 17County_2020_B20** survey was conducted under optimal collection conditions.

2 ABGNSS-inertial Processing

2.1 Airborne GPS/IMU

Aircraft	Sensor	GPS Lever Arm (m)	IMU Lever Arm (m)
C208B-704MD	Reigl (VQ-1560i)	X: 0.056, Y: 0.060, Z: -1.292	X: 0.000, Y:0.000, Z: 0.000

Table 2 Aircraft and Lever Arms

2.2 Smooth Best Estimate of Trajectory (SBET)

POSPac MM 8.6 software was used to compute inertial solution file (SBET) for each mission using Trimble's PP-RTX Technology. The resulting solution was checked to ensure a centimeter level accuracy for horizontal and vertical positions respectively. The software utilizes data from a dedicated global network of tracking stations to compute corrections to satellite orbit and clock information as well as atmospheric delay models. POSPac uses this data to post-process the GNSS-Inertial Trajectory. POSPac generated graphical results were reviewed to ensure that the IMU data was healthy. Graphical results for all lifts can be found in Appendix C.

2.3 Point Cloud Creation

Raw LiDAR sensor ranging data and the final solution sensor trajectory (*sbet), from POSPAC MM 8.6 were processed to produce LiDAR point cloud swath for each flight line in LAS version 1.4 file format. Quality control of the swath point cloud was performed to validate proper functioning of the sensor system, full coverage of the project area and point density of the LiDAR data. Swath point clouds were assigned unique file source identification. The data was found to be complete and consistent with the sensor calibration parameters.

2.4 Geometric Calibration

Geometric calibration for the point cloud was done using LiDAR Suite proprietary software. LiDAR products are finally generated in the Product Generation step as LAS swaths (LAS 1.4). Vertical (Z) shift (determined from QA step with control) is also applied during the product generation. The full point cloud is tiled into a manageable size for further processing. The final geometrically calibrated swath point clouds were compared to the bare-earth profile survey data. The data fit the profile surveys within the vertical accuracy tolerance specified for the project. Full documentation of the vertical accuracy checks maybe found in section 3.2

For **140G0220F0084: AL 17County_2020_B20** QL2 LiDAR project, the control lines listed below were used in data adjustment.

Point ID	Easting	Northing	Ortho Height
1_GS0040	576064.317	3856966.626	420.728
1_GS0055	584875.61	3822285.011	188.336
1_GS0103	551784.983	3761755.985	228.644
2_GS0166	630360.5	3721721.769	287.305
2_GS0190	581522.077	3717475.943	168.524
2_GS0218	588676.306	3672884.704	249.436
2_GS0241	616977.886	3674188.066	293.302
2_GS0265	528120.064	3814834.87	189.734
2_GS0270	512367.128	3811836.098	214.906
2_GS0287	477452.511	3834468.095	182.522
3_GS0341	475860.042	3809883.435	200.599
3_GS0344	467790.905	3799263.42	289.134
3_GS0354	440298.394	3833494.607	147.142
3_GS0358	514202.211	3750159.419	165.794
3_GS0365	562920.838	3717922.168	157.045
3_GS0381	579561.917	3569536.256	65.914
3_GS0389	582069.474	3542514.198	139.744
3_GS0415	523849.85	3570875.027	66.461
3_GS0433	522128.771	3542982.663	83.133
3_GS0441	532532.497	3554539.743	66.133
4_GS0494	446831.793	3554289.764	40.213
4_GS0506	445674.628	3540055.99	54.42
4_GS0530	425106.74	3572263.988	42.3
1_GS0004	564849.048	3784686.904	299.446
1_GS0011	562921.151	3799261.033	187.514
1_GS0018	547574.296	3808684.849	311.769
1_GS0025	567582.785	3817736.426	374.304
1_GS0033	574495.242	3836957.737	187.404
1_GS0047	594068.253	3852360.369	190.332
1_GS0052	594185.36	3832740.203	182.01
1_GS0066	603401.802	3793171.35	213.225
1_GS0074	600742.126	3812325.137	386.117
1_GS0080	586885.194	3799208.106	335.628
1_GS0088	544397.629	3780798.333	256.965
1_GS0094	530668.74	3805240.318	181.08
1_GS0110	529710.539	3755410.853	134.671
1_GS0116	538881.495	3744171.808	190.539
1_GS0125	550051.761	3736462.581	210.672
1_GS0132	562292.245	3735135.231	194.297
1_GS0138	565842.737	3747366.658	180.889
2_GS0147	600337.664	3746315.304	164.321
2_GS0154	614301.444	3743905.023	213.64

2_GS0158	631847.054	3725213.877	303.634
2_GS0177	592765.592	3718638.753	173.305
2_GS0184	587262.209	3730360.744	150.776
2_GS0197	575266.656	3700230.621	183.052
2_GS0204	574611.759	3687340.36	157.266
2_GS0212	564977.16	3672949.3	175.154
2_GS0226	595896.923	3705710.978	179.833
2_GS0233	598955.178	3687352.011	321.18
2_GS0249	614151.604	3693291.006	342.37
2_GS0255	612810.568	3719501.638	190.328
2_GS0261	538979.978	3814711.629	367.798
2_GS0273	508883.837	3808225.132	189.468
2_GS0280	501104.72	3824444.943	180.626
2_GS0282	501111.769	3824507.041	180.989
2_GS0289	471616.665	3838233.026	174.867
2_GS0295	462878.758	3845878.027	178.773
2_GS0297	465035.587	3852549.327	186.713
3_GS0302	472722.338	3853734.744	191.504
3_GS0312	451793.679	3868564.459	226.377
3_GS0318	438149.969	3849910.112	128.818
3_GS0324	421593.118	3843606.458	138.682
3_GS0330	421620.597	3837787.039	151.717
3_GS0339	480657.891	3811251.164	198.96
3_GS0350	459015.578	3815924.588	197.413
3_GS0367	569909.184	3583769.932	65.207
3_GS0376	588521.617	3577835.578	75.097
3_GS0385	588375.12	3550087.131	138.573
3_GS0395	556652.229	3553511.626	90.462
3_GS0399	555026.973	3562191.284	83.606
3_GS0407	550035.128	3572751.861	55.992
3_GS0408	542429.982	3570322.375	66.782
3_GS0413	527601.084	3570092.914	48.635
3_GS0421	518931.409	3564942.272	118.088
3_GS0422	514791.715	3557488.784	91.332
3_GS0426	518186.467	3546086.135	89.071
3_GS0430	508187.656	3539509.825	63.475
3_GS0445	544148.975	3566923.141	84.244
4_GS0453	487770.74	3539092.921	67.471
4_GS0462	468116.139	3538226.193	43.581
4_GS0475	465714.644	3550806.317	42.093
4_GS0483	443386.632	3585823.469	74.986
4_GS0518	412385.119	3550426.109	48.617
4_GS0540	415868.229	3583550.57	70.502

Table 4 Ground Control Points

3. Geometric Quality

3.1 Point Cloud

Geometric calibration quality control validates that the positional accuracy requirements of the project are met, and includes relative accuracy assessments for intra-swath (within) and inter-swath (between) accuracy, along with absolute accuracy assessments against project ground control.

Figure 3 below, shows the swath-to-swath calibration assessment depicted by an intensity ortho created by using all returns, and colored by elevation difference between the swaths. The source deltas are an image type used for visualizing the elevation mismatch between overlapping swaths of LAS data. The granularity is controlled by the interval's selection. The interval size specifies the Z threshold at which the color bands apply. The interval used to create the difference elevation image is 0.040m. Colors shown as green indicates swath separation <0.040m, yellow indicates separation > 0.040m and <0.080m, red indicates separation >0.080m. All red areas depicted in the image have been reviewed and represent locations of high vegetation.

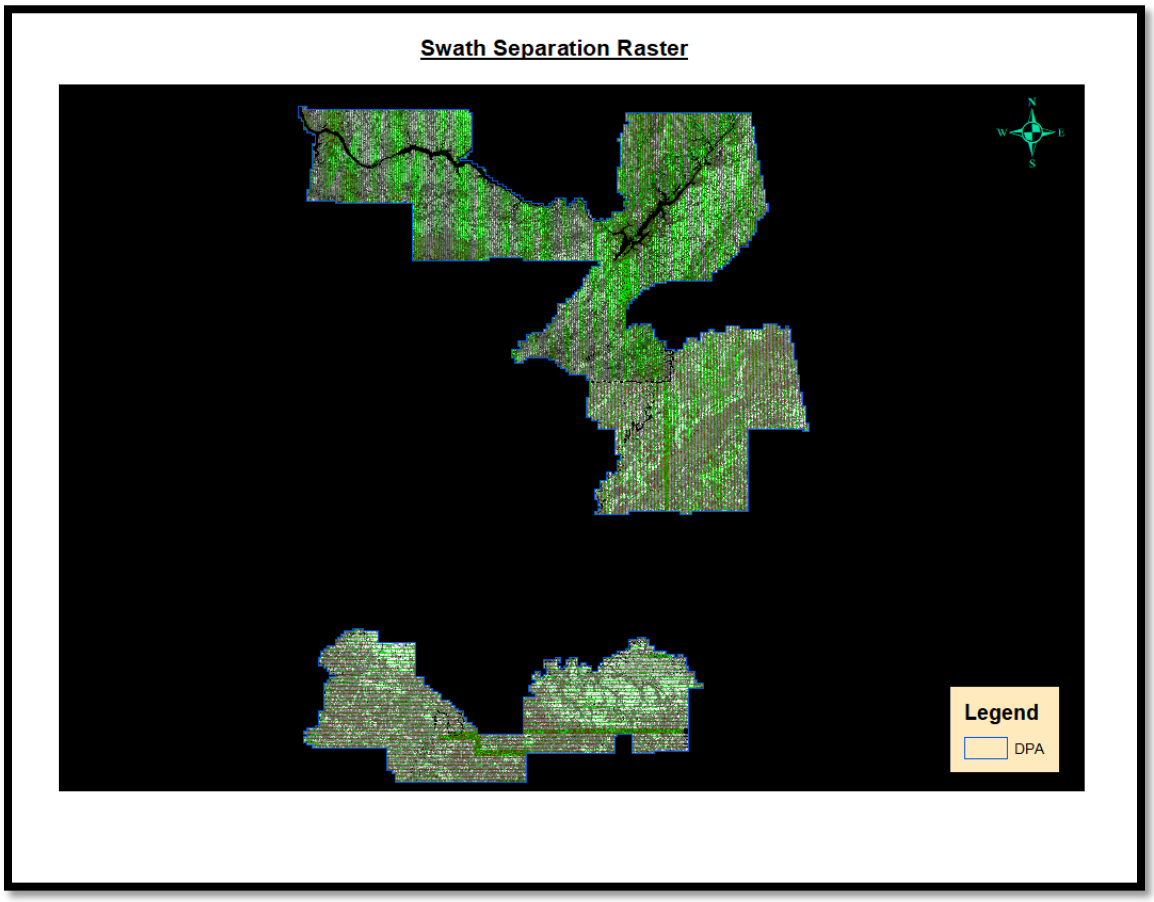


Figure 3 Swath Separation Raster

3.2 Accuracy Assessment

This data set was produced to meet ASPRS "Positional Accuracy Standards for Digital Geospatial Data" (2014) for a 36.0 (cm) RMSEx / RMSEy Horizontal Accuracy Class which equates to Positional Horizontal Accuracy =+/- 71.0 cm at a 95%

The absolute vertical accuracy of the point cloud data is assessed against ground check point data. For the **140G0220F0084: AL 17County_2020_B20** project, ground check point data were surveyed using VRS- GPS techniques.

Local TIN models of the elevation points are built around each ground check points. The tin model elevation is sampled at the horizontal position of the ground check point. The TIN model elevation and ground check point survey elevation values were used to calculate the Non-vegetated Vertical Accuracy (NVA) of the swath point clouds. Calculations were produced to meet ASPRS "Positional Accuracy Standards for Digital Geospatial Data" (2014).

The tiled point cloud products were reviewed for full coverage of the AOI and proper classification. As part of the QC process, TINs are built in the Terramodeler software for each tile using the ground class and the hydro-flattening breaklines. The TINs are reviewed for non-ground features, and edited where necessary to remove any remaining non-ground features. Points were also reviewed for absolute elevation, and points falling below the selected orthometric elevation for water were removed from the ground class.

Tested Accuracy	RMSEz	NVA	VVA
Classified LiDAR	0.051	256	185
Digital Elevation Model	0.051	256	185

Table 5 Tested $RMSE_Z$ of NVA, NVA and VVA of LiDAR Point Cloud and Digital Elevation Model

Total #	# NVA	# VVA
441	256	185

Table 6 Number of Survey Points used to calculate accuracy of data.

4. Production

4.1 Point Cloud Classification

Georeferenced information was applied to the swath point cloud LAS files. Geometrically calibrated swath point cloud was cut into **1,500-meter x 1,500-meter** LAS 1.4 format tiles for point cloud classification. Tiled point cloud data was processed in Terrasolid's TerraScan software to assign initial classification values. The TerraScan software provides a number of automated routines to algorithmically detect and assign points to their appropriate classes. Points left unclassified by the algorithmic routine remain as Class 1– Processed, but unclassified. Automated classification routines assigned points to one of the following classes:

Class 1 – Processed, but unclassified

Class 2 – Bare-earth ground

Class 7 – Low Noise (low, manually identified, if necessary)

Class 9 — Water

Class 17 — Bridge Decks

Class 18 – High Noise (high, manually identified, if necessary)

Class 20 — Ignored Ground (Breakline Proximity)

Class 21 – Snow (if present and identifiable)

Class 22- Temporal exclusion (typically non-favored data in intertidal, use as necessary)

Automated classification results were reviewed for each tiled point cloud, and manual edits were made where necessary to correct for misclassified points.

4.2 Breakline Collection

Class 2 lidar was used to create a bare earth surface model. The surface model was then used to heads-up digitize 2D breaklines of Inland Streams and Rivers with a 100-foot nominal width and Inland Ponds and Lakes of 2 acres or greater surface area. Elevation values were assigned to all Inland streams and rivers using NV5 Geospatial's proprietary software.

All ground (ASPRS Class 2) lidar data inside of the collected inland breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 1 meter was also used around each hydro flattened feature. These points were moved from ground (ASPRS Class 2) to Ignored Ground (ASPRS Class 20). The breakline files were then translated to Esri file geodatabase format using Esri conversion tools.

Breaklines are reviewed against lidar intensity imagery to verify completeness of capture. All breaklines are then compared to TINs (triangular irregular networks) created from ground only points prior to water classification. The horizontal placement of breaklines is compared to terrain features and the breakline elevations are compared to lidar elevations to ensure all breaklines match the lidar within acceptable tolerances. Some deviation is expected between breakline and lidar elevations due to monotonicity, connectivity, and flattening rules that are enforced on the breaklines. Once completeness, horizontal placement, and vertical variance is reviewed, all breaklines are reviewed for topological consistency and data integrity using a combination of Esri Data Reviewer tools and proprietary tools.

4.3 DEM Generation

Class 2 lidar in conjunction with the hydro breaklines were used to create a 1-meter Raster DEM. Using automated scripting routines within proprietary software, a GeoTIFF file was created for each tile. Each surface is reviewed using Global Mapper to check for any surface anomalies or incorrect elevations found within the surface.

Appendix A. Flight Logs

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 Counties LIDAR		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator	
			A				Schoone	
Date/Julian:	12/10/2020	Disk Drive		Sensor			Pilot	
Hobbs End	15029.2			1560ii_4040			Baumgarten	
Hobbs ST	15023.1	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	6.1		180					C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	1	1	15:37	15:43	184°	8110	138		28	1.0		
	2	2	15:45		4°	8117	137		29	1.0		sensor not firing to record mode
	2	2	15:50	15:56	4°	8134	132		27	1.0		working again
	3	3	15:59	16:16	184°	7930	134		30	1.0		
	4	4	16:19	16:37	4°	7930	140		29	1.0		
	5	5	16:40	16:57	184°	7900	141		30	1.0		
	6	6	17:00	17:17	4°	7923	140		31	1.0		
	7	7	17:20	17:38	184°	7927	142		29	1.0		
	8	8	17:41	17:58	4°	7910	140		27	1.0		
	9	9	18:00	18:18	184°	7927	141		28	1.0		
	10	10	18:20	18:38	4°	7930	140		28	1.0		
	11	11	18:40	18:57	184°	7817	145		26	1.0		
	12	12	19:00	19:17	4°	7930	140		27	1.0		
	13	13	19:19	19:36	184°	7943	146		26	1.0		
	14	14	19:39	19:56	4°	7950	142		25	1.0		
	67	67	20:06	20:19	94°	7940	150		25	1.0		xtie

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 7 Counties LIDAR	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A				Schoone
Date/Julian:	12/11/2020	Disk Drive	Sensor			Pilot
Hobbs End	10534.3		1560ii_4040			Baumgarten
Hobbs ST	10529.2	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	5.1		180					C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time: Begin:	UTC time: End:	Direction	GPS Altitude	Speed	Available MM Space	S/Vs	Position Acc. AVG PDOP	Position Acc. AVG HDOP	Comments and Conditions:
	15	15	15:11	15:30	184°	7894	130		29	1.0		
	16	16	15:32	15:48	4°	7959	136		29	1.0		
	17	17	15:50	16:08	184°	7969	160		31	1.0		
	18	18	16:11	16:26	4°	7969	160		31	1.0		
	19	19	16:28	16:46	184°	7955	130		30	1.0		
	20	20	16:48	17:03	4°	7980	140		28	1.0		
	21	21	17:05	17:23	184°	7907	140		27	1.0		
	22	22	17:25	17:40	4°	7920	162		27	1.0		
	23	23	17:42	18:00	184°	7943	151		28	1.0		*look for clouds on South End* Q forming
	24	24	18:02	18:19	4°	7980	160		30	1.0		*look for clouds on South End* Q forming
	xtie	xtie	18:30	18:35	90°	8158	156		25	1.0		unplanned xtie - moving East
	37	37	18:50	19:13	4°	8071	161		24	1.0		
	38	38	19:15	19:34	184°	8084	173		26	1.0		ok for clouds* layer forming - Aborting after this l
	xtie	xtie	19:36	19:39	270°	" "	170			" "		unplanned

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL Counties		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator	
			A				Schoone	
Date/Julian:	12/13/2020	Disk Drive		Sensor			Pilot	
Hobbs End	10537.5			1560ii_4040			Baumgarten	
Hobbs ST	10534.3	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	3.2		180					C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	66	66	19:03	19:05	185°	8452	127		24	1.0		
	65	65	19:07	19:12	5°	8452	130		22	1.0		
	64	64	19:17	19:25	185°	8435	146		24	1.0		
	63	63	19:28	19:36	5°	8430	125		21	1.0		
	62	62	19:42	19:56	185°	8415	133		23	1.0		
	61	61	19:59	20:11	5°	8435	153		22	1.0		
	60	60	20:13	20:27	185°	8412	130		22	1.0		
	59	59	20:30	20:42	5°	8383	163		22	1.0		
	58	58	20:44	20:59	185°	8340	125		24	1.0		
	57	57	21:01	21:13	5°	8278	132		25	1.0		
	56	56	21:15	21:29	185°	8245	137		25	1.0		Clouds forming and dropping -> RTB
	xtie	xtie	21:31	21:36	90°	7500	150		27	1.0		unplanned

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 Counties LiDAR	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		B				Schoone
Date/Julian:	12/18/2020	Disk Drive	Sensor			Pilot
Hobbs End	15045.4		1560ii_4040			Baumgarten

Hobbs ST	15041.9	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	3.5		180						C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	55	55	18:54	19:09	4°	8210						
	54	54	19:11	19:23	184°	8176						
	53	53	19:26	19:42	4°	8176						
	52	52	19:43	19:54	184°	8176						
	51	51	19:57	20:09	4°	8176						
	50	50	20:12	20:24	184°	8179						
	49	49	20:35	20:58	4°	8200						
	48	48	21:00	21:22	184°	8212						
	47	47	21:25	21:48	4°	8200						
	xtie	xtie	21:49		90°	8340						unplanned

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County LiDAR		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator	
			A			30.29	Schoone	
Date/Julian:	12/19/2020	Disk Drive		Sensor			Pilot	
Hobbs End	15050.4			1560ii_4040			Baumgarten	
Hobbs ST	15045.4	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	5		180						C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	46	46			185°	8200	131		31	1.0		ser and ount were not engaging - Full Restart in A
	46	46	15:44	16:09	185°	8166	131		31	1.0		
	45	45	16:11	16:33	5°	8127	153		30	1.0		
	44	44	16:36	17:01	185°	8138	127		26	1.0		
	43	43	17:03	17:24	5°	8120	150		28	1.0		
	42	42	17:27	17:51	185°	8162	130		29	1.0		
	41	41	17:54	Abort	5°	8114	133		25	1.0		traffic - refly
	41	41	17:57	18:17	5°	8127	156		25	1.0		reflight good
	40	40	18:19	18:42	185°	8114	140		25	1.0		
	39	39	18:46	19:06	5°	8211	135		24	1.0		
	68	68	19:23	19:35	94°	8110	144		25	1.0		*planned xtie*

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County LiDAR		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator	
			A				Schoone	
Date/Julian:	12/21/2020	Disk Drive	Sensor				Pilot	
Hobbs End	15055		1560ii_4040				Baumgarten	
Hobbs ST	15050.4	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.6		180					C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	143	143	20:15	20:40	278°	7684	120		24	1.0		
	142	142	20:43	21:06	93°	7667	154		24	1.0		
	141	141	21:09	21:39	274°	7661	131		25	1.0		
	140	140	21:41	22:04	93°	7658	151		27	1.0		
	139	139	22:07	22:35	274°	7661	125		29	1.0		
	138	138	22:38	23:00	93°	7671	145		26	1.0		
	144	144	23:27	23:27	0°	7651	126		30	1.0		planned xtie

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County LiDAR		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator	
			A				Schoone	
Date/Julian:	12/22/2020	Disk Drive		Sensor			Pilot	
Hobbs End	15061			1560ii_4040			Baumgarten	
Hobbs ST	15055	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	6		180					C208B_N704MD	Anniston (KANB)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	137	137	15:30	16:00	275°	7660	142		32	1.0		last 2 miles not flown - Had to breakoff. Refly 0-5
	136	136	16:04	16:22	93°	7713	151		31	1.0		
	135	135	16:25	16:48	275°	7707	140		28	1.0		
	134	134	16:50	17:08	93°	7694	130		26	1.0		
	133	133	17:10	17:32	274°	7690	160		29	1.0		
	132	132	17:34	17:51	93°	7768	140		29	1.0		
	131	131	17:54	18:15	274°	7710	132		25	1.0		
	130	130	18:18	18:35	93°	7700	142		26	1.0		
	129	129	18:37	18:58	274°	7897	135		26	1.0		
	128	128	19:00	19:18	93°	7688	169		25	1.0		
	127	127	19:20	19:41	274°	7684	135		23	1.0		
	xtile	xtile	19:43	19:49	180°	7670	151		24	1.0		unplanned Fuel. RTB

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	8	16	102.44	Schoone
Date/Julian:	12/27/2020	Disk Drive	Sensor			Pilot
Hobbs End	15066.6		1560ii_4040			Simonds

Hobbs ST	15061.4	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	5.2		160						C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	28	28	17:10	17:30	184°	8015	141		27	0.9		SKC Smoth air
	29	29	17:34	17:51	4°	8009	170		24	1.0		
	30	30	1:75	18:16	184°	8009	139		25	0.9		
	31	31	18:19	18:39	4°	8015	171		24	0.9		
	32	32	18:41	19:02	184°	7956	139		23	0.9		
	33	33	19:06	19:23	4°	7913	177		22	1.0		
	34	34	19:27	19:49	184°	8041	140		21	1.1		
	35	35	19:52	20:10	4°	8051	176		23	1.0		to 7500 to center around 25 miles from N. End (2
	36	36	20:13	20:35	184°	8061	138		23	1.0		
	cross	cross	20:39	20:45			150		25	1.0		
	24	4	20:49	21:06	4°	7973	169		25	0.9		RFT Line
	25	184	21:09	21:30	184°	7979	124		26	0.9		

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	11	13	102.68	Schoone
Date/Julian:	12/28/2020	Disk Drive	Sensor			Pilot
Hobbs End	15069.1		1560ii_4040			Simonds

Hobbs ST	15066.6	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	2.5								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	112	112	16:05	16:07	94°	7651	179		32	0.9		
	113	113	16:09	16:12	274°	7648	138		32	0.9		
	114	114	16:15	16:18	94°	7664	179		31	0.9		
	115	115	16:23	16:28	274°	7654	134		31	0.9		
	116	116	16:31	16:38	94°	7648	179		30	0.9		
	cross	cross	16:46	16:48	360°		157		30	0.9		
	110	110	17:14	17:18	274°	7576	142		26	1.0		Abort - Clouds

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County LiDAR	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	7		101.93	Schoone
Date/Julian:	1/2/2021	Disk Drive	Sensor			Pilot
Hobbs End	15075.5		1560ii_4040			Simonds

Hobbs ST	15071.5	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	26	26	15:44	16:04	184°	7963	141		28	1.0		SKC
	27	27	16:07	16:23	4°	7959	170		29	1.0		
	cross	cross	16:27	16:29	270°		131		30	0.9		
	117	117	17:15	17:26	93°	7651	191		25	0.9		OVC 10k Cue 0-10 Fee
	137	137	17:39	18:10	275°	7661	124		25	1.0		
	93	93	18:15	18:21	274°	7576	127		24	1.0		Light turbulence clouds abort
	97	97	18:31	18:35	274°	7589	126		24	1.0		Abort
												RTB

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	7	12	102.24	Schoone
Date/Julian:	1/3/2021	Disk Drive	Sensor			Pilot
Hobbs End	15080.4		1560ii_4040			Simonds

Hobbs ST	15075.5	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.9								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	117	117	17:36	17:42	274°	7651	122		24	1.0		0-10 East End
	118	118	17:50	18:10	274°	7641	122		24	1.0		Drop 300' For Traffic
	119	119	18:13	18:26	94°	7661	192		22	1.0		
	120	120	18:30	18:51	274°	7651	125		22	1.0		
	121	121	19:02	19:17	93°	7641	192		22	1.0		
	122	122	19:20	19:43	274°	7628	129		24	1.0		
	123	123	19:45	20:00	93°	7628	190		23	1.0		
	124	124	20:03	20:27	274°	7651	124		23	1.0		
	125	125	20:30	20:46	93°	7664	190		26	1.0		
	126	126	20:49	21:13	274°	7681	128		27	0.9		
	cross	cross	21:18	21:23	360°		148		29	0.9		

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	8	14	102.24	Schoone
Date/Julian:	1/4/2021	Disk Drive	Sensor			Pilot
Hobbs End	15084.4		1560ii_4040			Simonds

Hobbs ST	15080.4	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	111	111	15:59	16:17	165°	7582	161		31	0.9		High thick Cirrus
	110	110	16:24	16:37	93°	7576	188		31	0.8		
	109	109	16:40	16:58	273°	7592	132		27	1.0		
	108	108	17:01	17:14	93°	7589	184		27	0.9		
	107	107	17:17	17:36	273°	7589	130		28	0.8		

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	7	12	102.10	Schoone
Date/Julian:	1/5/2021	Disk Drive	Sensor			Pilot
Hobbs End	15089.2		1560ii_4040			Simonds

Hobbs ST	15084.4	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.8								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	69	69	19:20	19:22	273°	7585	145		25	0.9		from multiple fires on west end of project. Nothi
	70	70	19:27	19:32	93°	7592	164		24	1.0		
	71	71	19:42	19:47	273°	7592	45		25	1.0		
	72	72	19:51	19:56	93°	7592	167		26	0.9		
	73	73	20:03	20:14	273°	7579	154		27	0.9		
	74	74	20:18	20:28	93°	7579	165		28	0.9		
	75	75	20:31	20:43	273°	7576	145		28	0.9		
	76	76	20:46	20:56	93°	7576	162		26	1.0		
	77	77	21:01	21:12	273°	7605	145		27	0.9		
	78	78	21:15	21:26	93°	7579	170		28	0.9		
	79	79	21:29	21:41	273°	7579	146		31	0.8		
	80	80	21:44	21:54	93°	7595	167		29	0.9		
	81	81	21:58	22:09	273°	7595	149		29	1.0		
	82	82	22:12	22:23	93°	7595	173		32	0.9		
	83	83	22:26	22:39	273°	7595	137		32	0.9		
	cross	cross	22:45	22:54	360°		148		33	0.9		

Digital Aerial Solutions Flight Log

Project/Flight Plan:	AL 17 County	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A	3		102.44	Schoone
Date/Julian:	1/6/2021	Disk Drive	Sensor			Pilot
Hobbs End	15094.2		1560ii_4040			Simonds

Hobbs ST	15089.2	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	5								C208B_N704MD	Birmingham (KBHM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
	84	84	16:02	16:13	93°	7595	167		29	0.9		OVC 25k
	85	85	16:18	16:32	273°	7598	153		30	0.9		
	86	86	16:35	16:47	93°	7585	162		27	1.0		
	87	87	16:51	17:05	273°	7582	146		26	0.9		
	88	88	17:08	17:22	93°	7602	158		24	1.0		
	89	89	17:25	17:41	273°	7598	147		25	1.0		
	90	90	17:44	17:59	93°	7589	164		24	1.0		
	91	91	18:02	18:19	273°	7595	155		23	1.0		
	92	92	18:22	18:38	93°	7566	164		24	0.9		
	93	93	18:47	19:04	273°	7566	154		23	1.0		
	94	94	19:07	19:24	93°	7585	166		23	1.1		
	cross	cross	19:34	19:39	360°		164		24	1.0		

Digital Aerial Solutions Flight Log

Project/Flight Plan:	2021 AL 17CO		Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
			A				Gary Tao
Date/Julian:	1/16/2021	Disk Drive		Sensor			Pilot
Hobbs End	15109.5			1560ii_4040			Alex Sessions
Hobbs ST	15104.9	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.6	7,600						C208B_N704MD	Montgomery (KMGM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
			16:25	16:29								Opening S-turn
	106	106	16:33	16:51	270°	7600	139		24	1.1		clear
	105	105	16:55	17:13	90°	7600	145		25	1.0		clear
	104	104	17:15	17:33	270°	7600	143		23	1.1		clear
	103	103	17:36	17:54	90°	7600	145		24	0.9		clear
	102	102	17:57	18:15	270°	7550	145		22	1.1		clear
	101	101	18:26	18:45	90°	7550	149		23	1.1		clear
	100	100	18:48	19:10	270°	7579	149		24	1.0		clear
	99	99	19:13	19:34	90°	7600	143		27	0.9		clear
	98	98	19:38	20:00	270°	7600	145		29	0.9		clear
	xtie	180	20:11	20:18			149					xtie
			20:18	20:22								Closeout S-turn

Digital Aerial Solutions Flight Log

Project/Flight Plan:	BHM Phase one/LiDA Test	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A				Gary Tao
Date/Julian:	1/17/2021	Disk Drive	Sensor			Pilot
Hobbs End	15113.9		1560ii_4040			Alex Sessions

Hobbs ST	15109.5	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.4	2,755							C208B_N704MD	Montgomery (KMGM)

∠	Flight Line	Mission Line	UTC time: Begin:	UTC time: End:	Direction	GPS Altitude	Speed	Available MM Space	S/Vs	Position Acc. AVG PDOP	Position Acc. AVG HDOP	Comments and Conditions:
			18:57	19:00								Opening S-turn
	2	2	19:02	19:04	340°	2750	130		25	0.9		Phaseone Dropped 14 exps
	1	1	19:07	19:09	160°	2760	113		25	0.9		" Dropped 9 exps
	2R	2R	19:11	19:12	340°	2750	110		25	1.0		" Dropped 2 exps
			19:12	19:13								Closeout S-turn

Digital Aerial Solutions Flight Log

Project/Flight Plan:	2021 AL 17CO LiDAR	Lift	Temp °C Before	Temp °C After	Pressure (kPa)	Sensor Operator
		A				Gary Tao
Date/Julian:	1/17/2021	Disk Drive	Sensor			Pilot
Hobbs End	15113.9		1560ii_4040			Alex Sessions

Hobbs ST	15109.5	TARGET MSL	Target AIRSPD	Base Name	PID	Base Name	PID	Base Height	Aircraft	Airport Identifcation:
Flight Time	4.4	7,600	145					C208B_N704MD		Montgomery (KMGM)

∠	Flight Line	Mission Line	UTC time:		Direction	GPS Altitude	Speed	Available	S/Vs	Position Acc.		Comments and Conditions:
			Begin:	End:				MM Space		AVG PDOP	AVG HDOP	
			18:55	18:57								Opening S-turn
	95	95	16:59	17:22	270°	7600	139		24	1.0		clear
	96	96	17:25	17:46	90°	7600	145		22	1.1		clear
	97	97	17:50	18:13	270°	7600	141		22	1.2		clear
			18:21	18:25	360°							
			18:26	18:29								Closeout S-turn
												andby mode to swich projects, ie, stopeped reaqui
												Proceeding onto BHM Test

Appendix B. Vertical Accuracy Calculations

Project Information

Prepared By: DAS
Project Name: AL 17County_2020_B20
Sensor Info: Leica TM
Required Nominal Pulse Spacing: 0.72
Vendor Name: Digital Aerial Solutions, LLC
Units: Meters
Percent of Extent Tolerance: Extents Not Checked
Date of Aquisition: Start: 12/9/2020 Finish: 2/22/2021

Metadata Information

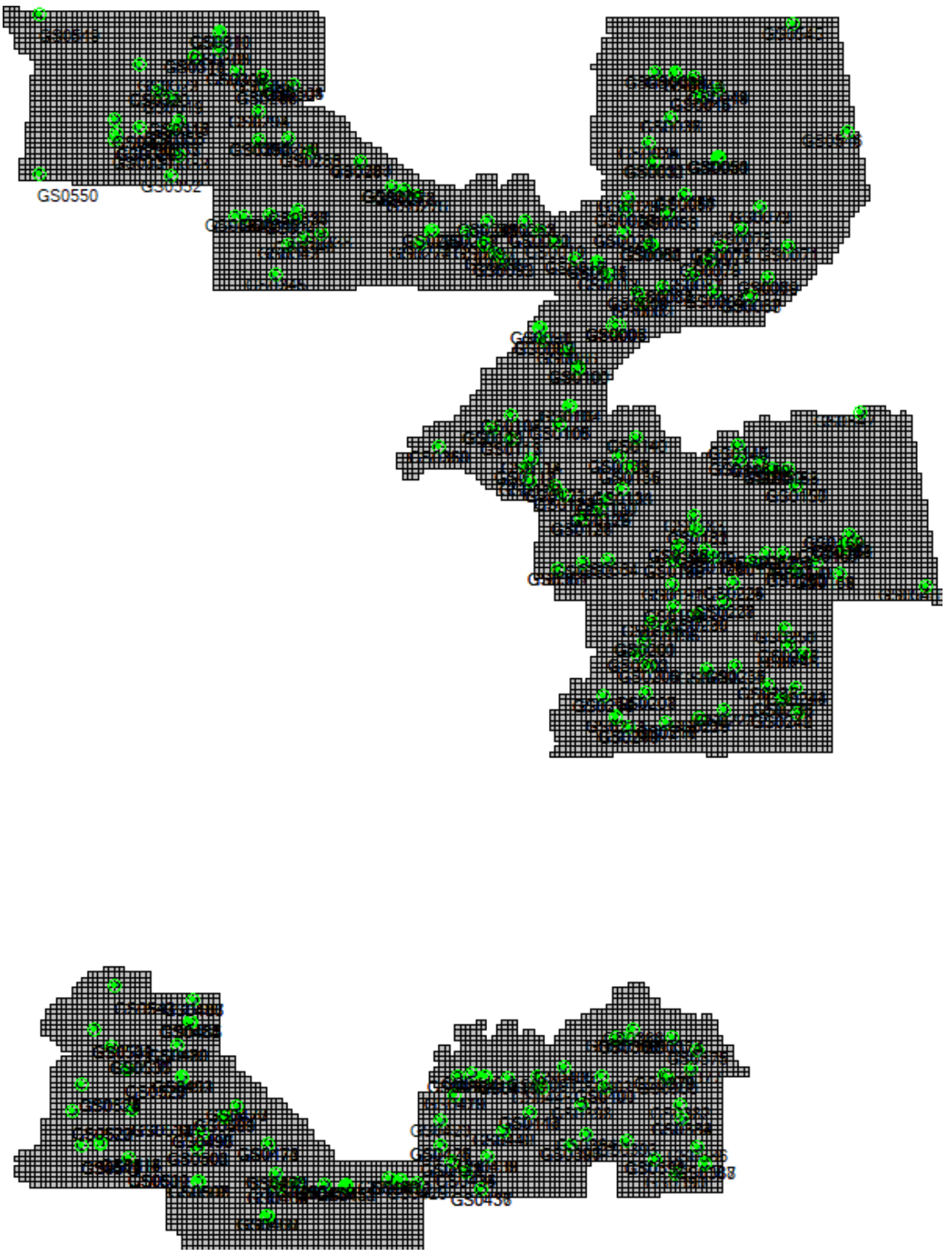
Tile Index:
- Filename: AL_Index_DAS_DPA_Final.shp
- Number of Polys: 0

Intensity:
- Tile Index Attribute: Not Specified
- Data Filename: Not Specified

DEM:
- Tile Index Attribute: Tile_ID
- Data Filename: DEM

LAS:
- Tile Index Attribute: Tile_ID
- Data Filename: LAS

Tiled-Data Area



LiDAR Accuracy Assessment Summary

LC Type	# Points	NVA	VVA	RMSE Z
LAS		95% Confidence	95 Percentile	
Bare Earth	121	0.083		0.042
High Vegetation	92		0.092	0.054
Low Vegetation	43		0.136	0.080
Medium Vegetation	50		0.115	0.060
Urban Terrain	135	0.079		0.040
NVA Total:	256	0.081		0.041
VVA Total:	185		0.123	0.062
Total:	441			0.051
DEM		95% Confidence	95 Percentile	
Bare Earth	121	0.089		0.045
High Vegetation	92		0.106	0.058
Low Vegetation	43		0.179	0.091
Medium Vegetation	50		0.134	0.064
Urban Terrain	135	0.086		0.044
NVA Total:	256	0.087		0.044
VVA Total:	185		0.134	0.068
Total:	441			0.051
			Units:	Meters

Coordinates and Offsets of Analyzed Locations

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
1)	☑	**GS0005**					
			564894.028	3784684.609	299.361	299.343	299.341
					Bare Earth	-0.018	-0.02
2)	☑	**GS0006**					
			564895.977	3784710.055	299.38	299.337	299.345
					Bare Earth	-0.043	-0.035
3)	☑	**GS0015**					
			559700.855	3802798.488	189.076	189.077	189.072
					Bare Earth	0.001	-0.004
4)	☑	**GS0023**					
			567155.362	3811694.051	194.336	194.321	194.311
					Bare Earth	-0.015	-0.025
5)	☑	**GS0024**					
			567138.382	3811717.586	195.043	194.995	194.997
					Bare Earth	-0.048	-0.047
6)	☑	**GS0027**					
			567628.364	3817705.166	374.281	374.291	374.28
					Bare Earth	0.01	-0.001
7)	☑	**GS0036**					
			580473.726	3844273.596	227.078	227.003	227.005
					Bare Earth	-0.075	-0.073

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
8)	☑	**GS0041**					
			576094.579	3856978.523	421.772	421.786	421.789
					Bare Earth	0.014	0.017
9)	☑	**GS0045**					
			589108.888	3850622.5	191.295	191.325	191.333
					Bare Earth	0.03	0.038
10)	☑	**GS0057**					
			584867.007	3822243.15	188.197	188.118	188.117
					Bare Earth	-0.079	-0.08
11)	☑	**GS0059**					
			579915.534	3816899.853	202.15	202.178	202.18
					Bare Earth	0.028	0.03
12)	☑	**GS0061**					
			575070.262	3807795.867	184.264	184.231	184.223
					Bare Earth	-0.033	-0.041
13)	☑	**GS0064**					
			593026.21	3794386.717	348.917	348.893	348.882
					Bare Earth	-0.024	-0.035
14)	☑	**GS0073**					
			606367.815	3818544.701	399.246	399.208	399.218
					Bare Earth	-0.038	-0.028

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
15)	GS0077					
		595067.856	3807506.76	358.614	358.555	358.568
				Bare Earth	-0.059	-0.046
16)	GS0086					
		551249.929	3778031.624	267.21	267.249	267.252
				Bare Earth	0.039	0.042
17)	GS0093					
		532751.665	3803364.248	182.273	182.271	182.269
				Bare Earth	-0.002	-0.004
18)	GS0098					
		527551.73	3808185.621	179.635	179.66	179.66
				Bare Earth	0.025	0.025
19)	GS0104					
		551796.464	3761790.359	228.584	228.608	228.617
				Bare Earth	0.024	0.033
20)	GS0106					
		548728.1	3756607.351	261.681	261.711	261.71
				Bare Earth	0.03	0.029
21)	GS0107					
		534788.787	3759119.444	158.218	158.253	158.253
				Bare Earth	0.035	0.035

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
22)	**GS0108**					
		534783.359	3759091.321	157.901	157.932	157.924
				Bare Earth	0.031	0.023
23)	**GS0111**					
		529734.883	3755439.426	135.287	135.304	135.308
				Bare Earth	0.017	0.021
24)	**GS0119**					
		540580.797	3740415.223	322.502	322.483	322.492
				Bare Earth	-0.019	-0.01
25)	**GS0120**					
		540550.011	3740418.072	321.891	321.876	321.879
				Bare Earth	-0.015	-0.012
26)	**GS0122**					
		547478.517	3738872.571	225.785	225.909	225.91
				Bare Earth	0.124	0.125
27)	**GS0131**					
		562304.157	3735172.948	194.211	194.258	194.244
				Bare Earth	0.047	0.033
28)	**GS0134**					
		566840.082	3738122.569	187.147	187.179	187.199
				Bare Earth	0.032	0.052

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
29)	**GS0139**					
		565848.448	3747338.466	181.398	181.484	181.49
				Bare Earth	0.086	0.092
30)	**GS0148**					
		600333.953	3746285.233	164.208	164.211	164.221
				Bare Earth	0.003	0.013
31)	**GS0150**					
		606057.739	3745906.424	177.189	177.213	177.216
				Bare Earth	0.024	0.027
32)	**GS0155**					
		614331.137	3743916.874	214.124	214.126	214.13
				Bare Earth	0.002	0.006
33)	**GS0157**					
		616393.572	3738896.61	257.851	257.835	257.843
				Bare Earth	-0.016	-0.008
34)	**GS0163**					
		634042.734	3723066.547	317.48	317.435	317.464
				Bare Earth	-0.045	-0.016
35)	**GS0164**					
		634135.661	3723066.306	316.18	316.156	316.143
				Bare Earth	-0.024	-0.037

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
36)	**GS0171**					
		622424.302	3717012.081	306.75	306.783	306.767
				Bare Earth	0.033	0.017
37)	**GS0178**					
		592725.645	3718647.109	173.421	173.44	173.459
				Bare Earth	0.019	0.038
38)	**GS0181**					
		588034.962	3726491.017	182.119	182.23	182.233
				Bare Earth	0.111	0.114
39)	**GS0189**					
		581544.597	3717489.367	168.082	168.077	168.081
				Bare Earth	-0.005	-0.001
40)	**GS0199**					
		575293.456	3700228.233	183.714	183.73	183.715
				Bare Earth	0.016	0.001
41)	**GS0203**					
		571248.636	3690429.372	138.938	138.938	138.933
				Bare Earth	0	-0.005
42)	**GS0207**					
		573471.505	3679866.157	167.647	167.65	167.643
				Bare Earth	0.003	-0.004

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
43)	GS0208					
		573441.54	3679864.314	167.566	167.612	167.62
				Bare Earth	0.046	0.054
44)	GS0213					
		564983.803	3672921.876	173.01	173.102	173.035
				Bare Earth	0.092	0.025
45)	GS0215					
		561628.127	3678963.145	146.83	146.83	146.858
				Bare Earth	0	0.028
46)	GS0217					
		579324.455	3671243.577	258.904	258.907	258.929
				Bare Earth	0.003	0.025
47)	GS0219					
		588647.585	3672873.317	251.021	251.058	251.044
				Bare Earth	0.037	0.023
48)	GS0220					
		588622.044	3672860.864	252.49	252.609	252.556
				Bare Earth	0.119	0.066
49)	GS0225					
		598686.401	3711028.833	187.381	187.416	187.392
				Bare Earth	0.035	0.011

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
50)	**GS0230**					
		588293.774	3702070.295	175.511	175.604	175.592
				Bare Earth	0.093	0.081
51)	**GS0242**					
		616947.267	3674204.657	292.399	292.392	292.423
				Bare Earth	-0.007	0.024
52)	**GS0248**					
		614178.972	3693299.601	342.076	342.032	342.027
				Bare Earth	-0.044	-0.049
53)	**GS0251**					
		613338.494	3698408.56	300.856	300.874	300.854
				Bare Earth	0.018	-0.002
54)	**GS0253**					
		616643.711	3714818.381	215.74	215.772	215.787
				Bare Earth	0.032	0.047
55)	**GS0274**					
		508882.457	3808194.706	189.825	189.841	189.842
				Bare Earth	0.016	0.017
56)	**GS0277**					
		504470.484	3823736.501	174.816	174.822	174.825
				Bare Earth	0.006	0.009

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
57)	☑	**GS0278**					
			504450.073	3823668.434	174.316	174.351	174.35
					Bare Earth	0.035	0.034
58)	☑	**GS0284**					
			491940.52	3831673.075	187.676	187.709	187.707
					Bare Earth	0.033	0.031
59)	☑	**GS0286**					
			477483.379	3834477.004	182.787	182.799	182.795
					Bare Earth	0.012	0.008
60)	☑	**GS0298**					
			465066.361	3852571.524	186.671	186.684	186.685
					Bare Earth	0.013	0.014
61)	☑	**GS0304**					
			472711.391	3853796.392	192.745	192.842	192.833
					Bare Earth	0.097	0.088
62)	☑	**GS0307**					
			456464.978	3857708.105	202.327	202.266	202.282
					Bare Earth	-0.061	-0.045
63)	☑	**GS0311**					
			451774.843	3868591.549	226.764	226.719	226.715
					Bare Earth	-0.045	-0.049

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
64)	GS0314					
		444441.494	3861463.592	207.987	207.911	207.91
				Bare Earth	-0.076	-0.077
65)	GS0320					
		434448.273	3851919.015	180.208	180.273	180.279
				Bare Earth	0.065	0.071
66)	GS0326					
		421564.224	3843615.604	138.838	138.877	138.877
				Bare Earth	0.039	0.039
67)	GS0327					
		422324.614	3839749.878	142.996	143.057	143.035
				Bare Earth	0.061	0.039
68)	GS0331					
		421599.884	3837818.438	150.87	150.885	150.875
				Bare Earth	0.015	0.005
69)	GS0342					
		471236.002	3808134.954	308.176	308.109	308.152
				Bare Earth	-0.067	-0.024
70)	GS0351					
		456137.971	3816108.726	198.477	198.423	198.393
				Bare Earth	-0.054	-0.084

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
71)	**GS0355**					
		438886.646	3841079.437	153.571	153.429	153.425
				Bare Earth	-0.142	-0.146
72)	**GS0356**					
		438934.77	3841071.574	153.82	153.698	153.704
				Bare Earth	-0.122	-0.116
73)	**GS0362**					
		548398.185	3715128.149	215.02	215.068	215.061
				Bare Earth	0.048	0.041
74)	**GS0369**					
		568420.688	3581399.849	72.476	72.425	72.434
				Bare Earth	-0.051	-0.042
75)	**GS0378**					
		578829.553	3570782.415	65.146	65.173	65.175
				Bare Earth	0.027	0.029
76)	**GS0380**					
		579591.844	3569542.373	65.904	65.91	65.894
				Bare Earth	0.006	-0.01
77)	**GS0387**					
		590689.682	3545340.508	142.928	142.97	142.928
				Bare Earth	0.042	0

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
78)	**GS0390**					
		582060.004	3542537.516	138.649	138.738	138.708
				Bare Earth	0.089	0.059
79)	**GS0392**					
		576115.377	3546486.038	137.632	137.639	137.66
				Bare Earth	0.007	0.028
80)	**GS0396**					
		552012.769	3550647.628	99.467	99.446	99.445
				Bare Earth	-0.021	-0.022
81)	**GS0397**					
		551982.508	3550651.992	100.385	100.4	100.393
				Bare Earth	0.015	0.008
82)	**GS0401**					
		561727.325	3567151.684	76.218	76.185	76.196
				Bare Earth	-0.033	-0.022
83)	**GS0409**					
		542406.593	3570314.007	66.707	66.707	66.7
				Bare Earth	0	-0.007
84)	**GS0416**					
		523806.538	3570879.57	66.497	66.522	66.505
				Bare Earth	0.025	0.008

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
85)	**GS0417**					
		519917.899	3570030.948	130.707	130.697	130.702
				Bare Earth	-0.01	-0.004
86)	**GS0418**					
		519940.604	3570049.106	128.881	128.898	128.865
				Bare Earth	0.017	-0.016
87)	**GS0424**					
		514776.713	3550584.733	62.262	62.264	62.288
				Bare Earth	0.002	0.026
88)	**GS0425**					
		514767.869	3550630.322	61.644	61.676	61.689
				Bare Earth	0.032	0.045
89)	**GS0427**					
		518197.027	3546042.536	89.003	89.037	89.019
				Bare Earth	0.034	0.016
90)	**GS0436**					
		526301.056	3537844.871	94.342	94.305	94.355
				Bare Earth	-0.037	0.013
91)	**GS0438**					
		528170.759	3547300.927	99.5	99.517	99.514
				Bare Earth	0.017	0.014

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
92)	GS0442					
		532570.981	3554568.898	66.634	66.622	66.628
				Bare Earth	-0.012	-0.006
93)	GS0443					
		540339.501	3559795.818	62.953	62.927	62.979
				Bare Earth	-0.026	0.026
94)	GS0451					
		487767.226	3539067.586	66.968	66.972	66.979
				Bare Earth	0.004	0.011
95)	GS0452					
		487739.816	3539078.727	66.568	66.655	66.651
				Bare Earth	0.087	0.083
96)	GS0457					
		481571.597	3539495.739	92.962	93.001	92.997
				Bare Earth	0.039	0.035
97)	GS0466					
		465365.075	3530350.862	82.816	82.798	82.815
				Bare Earth	-0.018	-0.001
98)	GS0467					
		465379.107	3530378.799	81.472	81.431	81.45
				Bare Earth	-0.041	-0.022

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
99)	☑	**GS0469**					
			468047.038	3542481.868	48.655	48.656	48.661
					Bare Earth	0.001	0.006
100)	☑	**GS0471**					
			468048.266	3542417.392	51.799	51.807	51.842
					Bare Earth	0.008	0.043
101)	☑	**GS0479**					
			439703.727	3579071.478	73.639	73.569	73.571
					Bare Earth	-0.07	-0.068
102)	☑	**GS0485**					
			443436.629	3585831.934	72.651	72.654	72.614
					Bare Earth	0.003	-0.037
103)	☑	**GS0495**					
			446824.295	3554258.202	39.817	39.864	39.86
					Bare Earth	0.047	0.043
104)	☑	**GS0498**					
			446801.654	3554176.864	39.929	39.991	39.975
					Bare Earth	0.062	0.046
105)	☑	**GS0499**					
			452995.903	3558802.763	49.851	49.88	49.884
					Bare Earth	0.029	0.033

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
106)	**GS0503**					
		445636.251	3549478.592	41.557	41.59	41.586
				Bare Earth	0.033	0.029
107)	**GS0507**					
		445648.964	3540022.567	54.275	54.305	54.299
				Bare Earth	0.03	0.024
108)	**GS0508**					
		445676.863	3540000.398	54.133	54.179	54.183
				Bare Earth	0.046	0.05
109)	**GS0511**					
		425894.58	3546861.243	60.635	60.69	60.704
				Bare Earth	0.055	0.069
110)	**GS0517**					
		412349.955	3550428.843	47.343	47.302	47.319
				Bare Earth	-0.041	-0.024
111)	**GS0521**					
		409676.248	3560298.465	43.7	43.684	43.713
				Bare Earth	-0.016	0.013
112)	**GS0522**					
		409714.574	3560274.546	44.853	44.891	44.872
				Bare Earth	0.038	0.019

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
113)	☑	**GS0523**					
			409715.107	3560242.207	44.78	44.816	44.783
					Bare Earth	0.036	0.003
114)	☑	**GS0525**					
			412190.138	3568035.276	58.447	58.455	58.415
					Bare Earth	0.008	-0.032
115)	☑	**GS0526**					
			412210.418	3568001.142	56.893	56.901	56.884
					Bare Earth	0.008	-0.009
116)	☑	**GS0529**					
			425148.23	3572251.38	42.721	42.708	42.712
					Bare Earth	-0.013	-0.009
117)	☑	**GS0532**					
			426784.553	3560951.903	83.318	83.31	83.338
					Bare Earth	-0.008	0.02
118)	☑	**GS0533**					
			426810.283	3560963.936	84.07	84.056	84.093
					Bare Earth	-0.014	0.023
119)	☑	**GS0537**					
			420799.02	3578921.009	28.965	28.956	28.979
					Bare Earth	-0.009	0.014

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
120)	☑	GS0538					
			415856.276	3583587.045	71.409	71.395	71.414
					Bare Earth	-0.014	0.005
121)	☑	GS0541					
			415892.295	3583535.812	70.663	70.643	70.671
					Bare Earth	-0.02	0.008
122)	☑	GS0003					
			572515.025	3791462.374	313.314	313.344	313.331
					Urban Terrain	0.03	0.017
123)	☑	GS0007					
			564897.1	3784754.958	299.406	299.349	299.35
					Urban Terrain	-0.057	-0.056
124)	☑	GS0013					
			562943.058	3799215.189	184.421	184.433	184.433
					Urban Terrain	0.012	0.012
125)	☑	GS0017					
			553284.944	3803977.41	312.537	312.51	312.524
					Urban Terrain	-0.027	-0.013
126)	☑	GS0020					
			543040.154	3811825.55	324.554	324.581	324.578
					Urban Terrain	0.027	0.024

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
127) ☑	**GS0021**					
		543039.372	3811798.031	323.679	323.712	323.694
				Urban Terrain	0.033	0.015
128) ☑	**GS0026**					
		567609.541	3817722.492	374.509	374.503	374.495
				Urban Terrain	-0.006	-0.014
129) ☑	**GS0032**					
		575960.23	3831452.328	195.551	195.573	195.572
				Urban Terrain	0.022	0.021
130) ☑	**GS0035**					
		574416.658	3836968.861	188.566	188.57	188.545
				Urban Terrain	0.004	-0.021
131) ☑	**GS0038**					
		581953.745	3856987.93	511.612	511.61	511.613
				Urban Terrain	-0.002	0.001
132) ☑	**GS0039**					
		581986.025	3857007.367	511.872	511.869	511.862
				Urban Terrain	-0.003	-0.01
133) ☑	**GS0042**					
		581982.523	3856875.785	512.34	512.315	512.323
				Urban Terrain	-0.025	-0.017

Coordinates and Offsets of Analyzed Locations (Continued)

	ID					
		Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
134)	GS0043					
		587487.676	3856072.812	512.668	512.57	512.567
				Urban Terrain	-0.098	-0.101
135)	GS0046					
		589072.805	3850633.161	190.813	190.793	190.796
				Urban Terrain	-0.02	-0.017
136)	GS0050					
		594313.19	3832828.395	186.225	186.198	186.201
				Urban Terrain	-0.027	-0.024
137)	GS0051					
		594324.626	3832856.704	186.156	186.114	186.111
				Urban Terrain	-0.042	-0.045
138)	GS0054					
		594199.635	3832760.661	182.199	182.211	182.225
				Urban Terrain	0.012	0.026
139)	GS0056					
		584866.463	3822312.577	188.726	188.657	188.66
				Urban Terrain	-0.069	-0.067
140)	GS0062					
		575048.629	3807778.985	183.56	183.486	183.495
				Urban Terrain	-0.074	-0.065

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
141)	☑	**GS0068**					
			603439.186	3793153.707	213.617	213.632	213.635
					Urban Terrain	0.015	0.018
142)	☑	**GS0070**					
			608483.336	3798409.637	231.776	231.775	231.785
					Urban Terrain	-0.001	0.009
143)	☑	**GS0076**					
			595048.988	3807478.051	358.291	358.207	358.249
					Urban Terrain	-0.084	-0.042
144)	☑	**GS0079**					
			591726.478	3803315.012	357.854	357.792	357.8
					Urban Terrain	-0.062	-0.054
145)	☑	**GS0081**					
			586931.649	3799216.111	336.245	336.176	336.186
					Urban Terrain	-0.069	-0.059
146)	☑	**GS0089**					
			544430.111	3780801.756	256.101	256.065	256.082
					Urban Terrain	-0.036	-0.019
147)	☑	**GS0095**					
			530643.284	3805219.545	182.34	182.305	182.311
					Urban Terrain	-0.035	-0.029

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
148)	☑	**GS0096**					
			530611.463	3805209.693	182.967	182.968	182.961
					Urban Terrain	0.001	-0.006
149)	☑	**GS0097**					
			527588.922	3808128.619	183.008	182.981	182.992
					Urban Terrain	-0.027	-0.016
150)	☑	**GS0101**					
			554387.019	3772801.733	238.305	238.351	238.344
					Urban Terrain	0.046	0.039
151)	☑	**GS0113**					
			534943.753	3752394.801	168.038	168.003	168.019
					Urban Terrain	-0.035	-0.019
152)	☑	**GS0114**					
			540805.085	3746746.127	183.118	183.121	183.112
					Urban Terrain	0.003	-0.006
153)	☑	**GS0115**					
			540824.275	3746771.509	183.478	183.455	183.47
					Urban Terrain	-0.023	-0.008
154)	☑	**GS0117**					
			538864.176	3744203.435	190.387	190.436	190.445
					Urban Terrain	0.049	0.058

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
155)	☑	**GS0126**					
			555205.045	3729443.099	215.853	215.807	215.821
					Urban Terrain	-0.046	-0.032
156)	☑	**GS0127**					
			555220.772	3729468.293	215.143	215.108	215.114
					Urban Terrain	-0.035	-0.029
157)	☑	**GS0128**					
			560373.215	3731856.968	215.784	215.763	215.797
					Urban Terrain	-0.021	0.013
158)	☑	**GS0136**					
			568906.359	3744315.062	173.329	173.404	173.416
					Urban Terrain	0.075	0.087
159)	☑	**GS0141**					
			571019.804	3752931.996	193.135	193.174	193.152
					Urban Terrain	0.039	0.017
160)	☑	**GS0144**					
			600032.223	3750812.455	183.06	183.062	183.055
					Urban Terrain	0.002	-0.005
161)	☑	**GS0145**					
			600018.402	3750841.054	183.57	183.566	183.559
					Urban Terrain	-0.004	-0.011

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
162)	☑	**GS0152**					
			609983.928	3744095.474	192.563	192.571	192.572
					Urban Terrain	0.008	0.009
163)	☑	**GS0159**					
			631815.699	3725203.843	303.977	303.961	303.953
					Urban Terrain	-0.016	-0.024
164)	☑	**GS0160**					
			631799.117	3725229.422	304.438	304.442	304.43
					Urban Terrain	0.004	-0.008
165)	☑	**GS0167**					
			630394.226	3721765.403	286.199	286.203	286.19
					Urban Terrain	0.004	-0.009
166)	☑	**GS0168**					
			629070.874	3714060.609	251.784	251.79	251.794
					Urban Terrain	0.006	0.01
167)	☑	**GS0169**					
			629063.91	3714032.998	251.581	251.584	251.581
					Urban Terrain	0.003	0
168)	☑	**GS0175**					
			603887.466	3717657.164	199.468	199.451	199.446
					Urban Terrain	-0.017	-0.022

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
169)	☑	**GS0180**					
			590405.483	3720817.195	189.583	189.644	189.585
					Urban Terrain	0.061	0.002
170)	☑	**GS0182**					
			588054.755	3726463.996	182.435	182.459	182.471
					Urban Terrain	0.024	0.036
171)	☑	**GS0186**					
			583095.401	3721764.777	157.341	157.296	157.345
					Urban Terrain	-0.045	0.004
172)	☑	**GS0187**					
			583103.682	3721716.549	157.038	157.04	157.039
					Urban Terrain	0.002	0.001
173)	☑	**GS0191**					
			581062.898	3710739.198	175.132	175.14	175.116
					Urban Terrain	0.008	-0.016
174)	☑	**GS0194**					
			581758.13	3704434.027	176.057	176.037	176.038
					Urban Terrain	-0.02	-0.019
175)	☑	**GS0196**					
			580396.795	3698894.679	176.814	176.762	176.788
					Urban Terrain	-0.052	-0.026

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
176)	☑	**GS0201**					
			573088.996	3694784.686	175.051	175.058	175.027
					Urban Terrain	0.007	-0.024
177)	☑	**GS0205**					
			574603.264	3687366.739	157.553	157.565	157.568
					Urban Terrain	0.012	0.015
178)	☑	**GS0210**					
			568673.859	3670033.122	172.763	172.845	172.826
					Urban Terrain	0.082	0.063
179)	☑	**GS0221**					
			595906.591	3674874.38	290.742	290.701	290.705
					Urban Terrain	-0.041	-0.037
180)	☑	**GS0227**					
			595934.038	3705720.393	179.373	179.382	179.368
					Urban Terrain	0.009	-0.005
181)	☑	**GS0228**					
			595872.812	3705713.505	180.586	180.639	180.586
					Urban Terrain	0.053	0
182)	☑	**GS0231**					
			591018.109	3686725.499	293.886	293.823	293.828
					Urban Terrain	-0.063	-0.058

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
183)	☑	**GS0232**					
			590998.427	3686705.678	292.777	292.8	292.738
					Urban Terrain	0.023	-0.039
184)	☑	**GS0234**					
			598980.743	3687341.949	321.463	321.47	321.445
					Urban Terrain	0.007	-0.018
185)	☑	**GS0236**					
			608423.958	3682270.121	343.139	343.147	343.128
					Urban Terrain	0.008	-0.011
186)	☑	**GS0237**					
			608398.449	3682305.924	343.204	343.206	343.188
					Urban Terrain	0.002	-0.016
187)	☑	**GS0239**					
			612656.687	3677928.867	337.589	337.552	337.565
					Urban Terrain	-0.037	-0.024
188)	☑	**GS0243**					
			616420.417	3681168.032	327.809	327.827	327.823
					Urban Terrain	0.018	0.014
189)	☑	**GS0244**					
			616389.751	3681163.043	327.703	327.683	327.701
					Urban Terrain	-0.02	-0.002

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
190)	☑	**GS0246**					
			618818.962	3691144.628	317.481	317.511	317.474
					Urban Terrain	0.03	-0.007
191)	☑	**GS0252**					
			616652.73	3714800.821	216.929	216.904	216.914
					Urban Terrain	-0.025	-0.015
192)	☑	**GS0256**					
			612832.667	3719526.456	190.23	190.291	190.25
					Urban Terrain	0.061	0.02
193)	☑	**GS0257**					
			607889.915	3719745.044	201.411	201.45	201.442
					Urban Terrain	0.039	0.031
194)	☑	**GS0263**					
			538956.141	3814709.635	367.522	367.463	367.462
					Urban Terrain	-0.059	-0.06
195)	☑	**GS0266**					
			528095.771	3814815.793	190.102	190.072	190.07
					Urban Terrain	-0.03	-0.032
196)	☑	**GS0268**					
			522616.233	3811659.428	185.972	185.979	185.976
					Urban Terrain	0.007	0.004

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
197)	☑	**GS0276**					
			508343.886	3821623.405	186.508	186.503	186.494
					Urban Terrain	-0.005	-0.014
198)	☑	**GS0281**					
			501117.97	3824474.988	180.927	180.884	180.876
					Urban Terrain	-0.043	-0.051
199)	☑	**GS0290**					
			471618.394	3838265.913	174.774	174.795	174.793
					Urban Terrain	0.021	0.019
200)	☑	**GS0292**					
			462959.712	3837800.766	171.818	171.804	171.801
					Urban Terrain	-0.014	-0.017
201)	☑	**GS0294**					
			462877.542	3845845.337	178.815	178.808	178.807
					Urban Terrain	-0.007	-0.008
202)	☑	**GS0296**					
			465031.103	3852580.619	187.648	187.615	187.63
					Urban Terrain	-0.033	-0.018
203)	☑	**GS0299**					
			464224.394	3856281.219	195.066	195.096	195.084
					Urban Terrain	0.03	0.018

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
204)	☑	**GS0303**					
			472703.116	3853766.443	191.676	191.734	191.731
					Urban Terrain	0.058	0.055
205)	☑	**GS0306**					
			456488.873	3857719.842	203.128	203.007	203.018
					Urban Terrain	-0.121	-0.11
206)	☑	**GS0309**					
			451500.513	3863529.356	222.67	222.602	222.595
					Urban Terrain	-0.068	-0.075
207)	☑	**GS0313**					
			444415.111	3861457.228	207.824	207.754	207.748
					Urban Terrain	-0.07	-0.076
208)	☑	**GS0317**					
			440182.04	3843413.471	160.853	160.74	160.737
					Urban Terrain	-0.113	-0.116
209)	☑	**GS0321**					
			434432.973	3851947.848	179.832	179.914	179.887
					Urban Terrain	0.082	0.055
210)	☑	**GS0323**					
			428804.656	3859435.53	173.643	173.628	173.643
					Urban Terrain	-0.015	0

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
211) ☑	**GS0329**					
		422355.208	3839800.599	141.999	142.07	142.054
				Urban Terrain	0.071	0.055
212) ☑	**GS0332**					
		428965.499	3841321.213	154.045	154.072	154.073
				Urban Terrain	0.027	0.028
213) ☑	**GS0333**					
		428966.796	3841351.912	153.563	153.62	153.615
				Urban Terrain	0.057	0.052
214) ☑	**GS0337**					
		473946.165	3817837.33	198.975	199.002	198.994
				Urban Terrain	0.027	0.019
215) ☑	**GS0345**					
		467796.14	3799291.898	289.235	289.239	289.257
				Urban Terrain	0.004	0.022
216) ☑	**GS0346**					
		473162.036	3815409.093	195.891	195.933	195.937
				Urban Terrain	0.042	0.046
217) ☑	**GS0347**					
		466244.445	3816334.948	196.457	196.434	196.438
				Urban Terrain	-0.023	-0.019

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
218) ☑	**GS0374**					
		581057.373	3581381.51	66.221	66.191	66.174
				Urban Terrain	-0.03	-0.047
219) ☑	**GS0384**					
		583710.208	3557910.787	83.972	84.003	83.98
				Urban Terrain	0.031	0.008
220) ☑	**GS0386**					
		588411.134	3550089.946	138.373	138.399	138.392
				Urban Terrain	0.026	0.019
221) ☑	**GS0393**					
		568280.752	3551922.282	97.991	97.939	97.96
				Urban Terrain	-0.052	-0.031
222) ☑	**GS0402**					
		560848.377	3570053.832	67.373	67.309	67.333
				Urban Terrain	-0.064	-0.04
223) ☑	**GS0405**					
		550017.529	3572730.126	56.092	56.069	56.067
				Urban Terrain	-0.023	-0.025
224) ☑	**GS0410**					
		534067.321	3569708.022	84.104	84.134	84.111
				Urban Terrain	0.03	0.007

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
225) ☑	**GS0411**					
		534035.075	3569707.577	84.174	84.164	84.148
				Urban Terrain	-0.01	-0.026
226) ☑	**GS0420**					
		518955.141	3564979.438	117.79	117.829	117.807
				Urban Terrain	0.039	0.017
227) ☑	**GS0423**					
		514798.821	3557517.356	91.299	91.23	91.233
				Urban Terrain	-0.069	-0.066
228) ☑	**GS0428**					
		518159.359	3546104.356	89.338	89.28	89.321
				Urban Terrain	-0.058	-0.017
229) ☑	**GS0431**					
		503405.914	3540802.222	88.795	88.807	88.796
				Urban Terrain	0.012	0.001
230) ☑	**GS0434**					
		522139.948	3542960.416	83.51	83.489	83.469
				Urban Terrain	-0.021	-0.041
231) ☑	**GS0435**					
		522134.882	3543015.117	82.759	82.747	82.745
				Urban Terrain	-0.012	-0.014

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
232)	**GS0444**					
		540367.736	3559759.135	64.14	64.085	64.095
				Urban Terrain	-0.055	-0.045
233)	**GS0446**					
		544172.544	3566902.944	84.077	84.05	84.049
				Urban Terrain	-0.027	-0.028
234)	**GS0449**					
		499922.753	3541151.744	76.174	76.13	76.157
				Urban Terrain	-0.044	-0.017
235)	**GS0456**					
		481597.451	3539485.635	93.136	93.157	93.138
				Urban Terrain	0.021	0.002
236)	**GS0460**					
		473721.651	3539812.357	51.786	51.787	51.782
				Urban Terrain	0.001	-0.004
237)	**GS0461**					
		473693.698	3539789.05	51.991	51.999	51.994
				Urban Terrain	0.008	0.003
238)	**GS0473**					
		465664.493	3550804.048	41.934	41.91	41.904
				Urban Terrain	-0.024	-0.03

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
239)	**GS0477**					
		456654.628	3561823.171	61.263	61.236	61.223
				Urban Terrain	-0.027	-0.04
240)	**GS0478**					
		456629.868	3561808.939	60.928	60.92	60.91
				Urban Terrain	-0.008	-0.018
241)	**GS0480**					
		439687.618	3579108.021	74.085	74.075	74.05
				Urban Terrain	-0.01	-0.035
242)	**GS0484**					
		443358.65	3585833.127	75.557	75.48	75.473
				Urban Terrain	-0.077	-0.084
243)	**GS0501**					
		453006.564	3558742.494	49.647	49.642	49.633
				Urban Terrain	-0.005	-0.014
244)	**GS0505**					
		445695.563	3540088.305	54.141	54.122	54.114
				Urban Terrain	-0.019	-0.027
245)	**GS0515**					
		417798.575	3551191.538	45.784	45.777	45.776
				Urban Terrain	-0.007	-0.008

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
246) ☑	**GS0519**					
		412416.648	3550421.597	49.112	49.09	49.093
				Urban Terrain	-0.022	-0.019
247) ☑	**GS0534**					
		426810.963	3560936.476	84.752	84.721	84.72
				Urban Terrain	-0.031	-0.032
248) ☑	**GS0536**					
		420819.648	3578894.351	29.377	29.349	29.356
				Urban Terrain	-0.028	-0.021
249) ☑	**GS0539**					
		415830.586	3583589.018	70.267	70.186	70.164
				Urban Terrain	-0.081	-0.103
250) ☑	**GS0543**					
		421793.151	3596115.439	47.943	47.94	47.931
				Urban Terrain	-0.003	-0.012
251) ☑	**GS0545**					
		615396.784	3871051.163	202.753	202.738	202.741
				Urban Terrain	-0.015	-0.012
252) ☑	**GS0546**					
		631267.318	3840268.295	267.677	267.646	267.644
				Urban Terrain	-0.031	-0.033

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
253) ☑	**GS0547**					
		634962.714	3760127.898	223.797	223.755	223.775
				Urban Terrain	-0.042	-0.022
254) ☑	**GS0548**					
		653542.938	3710490.649	307.507	307.507	307.498
				Urban Terrain	0	-0.01
255) ☑	**GS0549**					
		400437.459	3873865.109	220.655	220.462	220.46
				Urban Terrain	-0.193	-0.195
256) ☑	**GS0550**					
		400197.313	3828214.588	221.179	221.131	221.12
				Urban Terrain	-0.048	-0.059
257) ☑	**GS0002**					
		572502.329	3791433.996	313.072	313.127	313.089
				High Vegetation	0.055	0.017
258) ☑	**GS0008**					
		564857.866	3784728.695	298.834	298.784	298.799
				High Vegetation	-0.05	-0.035
259) ☑	**GS0010**					
		571236.896	3793967.561	316.265	316.287	316.281
				High Vegetation	0.022	0.016

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
260) ☑	**GS0012**					
		562916.594	3799203.516	184.594	184.618	184.621
				High Vegetation	0.024	0.027
261) ☑	**GS0014**					
		559720.523	3802784.522	189.013	189.013	189.015
				High Vegetation	0	0.002
262) ☑	**GS0016**					
		553286.331	3803947.235	311.825	311.871	311.863
				High Vegetation	0.046	0.038
263) ☑	**GS0029**					
		568639.172	3821408.298	372.828	372.812	372.806
				High Vegetation	-0.016	-0.022
264) ☑	**GS0031**					
		575956.419	3831487.574	196.996	197.065	197.07
				High Vegetation	0.069	0.074
265) ☑	**GS0034**					
		574449.141	3836959.817	187.56	187.561	187.57
				High Vegetation	0.001	0.01
266) ☑	**GS0044**					
		587537.75	3856058.478	513.202	513.132	513.131
				High Vegetation	-0.07	-0.071

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
267) ☑	**GS0048**					
		594034.628	3852354.139	189.882	189.885	189.878
				High Vegetation	0.003	-0.004
268) ☑	**GS0058**					
		579879.741	3816893.445	202.857	202.918	202.926
				High Vegetation	0.061	0.069
269) ☑	**GS0060**					
		575049.234	3807817.085	184.44	184.452	184.423
				High Vegetation	0.012	-0.017
270) ☑	**GS0072**					
		606387.042	3818585.62	401.216	401.177	401.174
				High Vegetation	-0.039	-0.042
271) ☑	**GS0075**					
		600750.856	3812364.94	386.676	386.699	386.699
				High Vegetation	0.023	0.023
272) ☑	**GS0085**					
		551263.835	3778065.749	267.182	267.192	267.198
				High Vegetation	0.01	0.016
273) ☑	**GS0087**					
		544421.386	3780763.163	256.815	256.873	256.877
				High Vegetation	0.058	0.062

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
274)	☑	**GS0092**					
			532737.261	3803389.091	183.01	183.11	183.086
					High Vegetation	0.1	0.076
275)	☑	**GS0100**					
			554405.182	3772776.254	239.139	239.329	239.336
					High Vegetation	0.19	0.197
276)	☑	**GS0105**					
			548699.58	3756620.18	261.976	262.079	262.078
					High Vegetation	0.103	0.102
277)	☑	**GS0109**					
			529703.877	3755381.223	133.888	133.954	133.945
					High Vegetation	0.066	0.057
278)	☑	**GS0112**					
			534971.813	3752385.31	167.657	167.677	167.681
					High Vegetation	0.02	0.024
279)	☑	**GS0129**					
			560373.298	3731829.128	216.877	216.863	216.87
					High Vegetation	-0.014	-0.007
280)	☑	**GS0130**					
			562277.282	3735180.732	194.422	194.448	194.449
					High Vegetation	0.026	0.027

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
281) ☑	**GS0133**					
		566849.899	3738097.527	185.396	185.555	185.532
				High Vegetation	0.159	0.136
282) ☑	**GS0140**					
		571003.856	3752907.631	192.935	193.026	193.001
				High Vegetation	0.091	0.066
283) ☑	**GS0153**					
		614296.404	3743933.29	213.656	213.682	213.682
				High Vegetation	0.026	0.026
284) ☑	**GS0156**					
		616410.476	3738866.343	257.802	257.867	257.803
				High Vegetation	0.065	0.001
285) ☑	**GS0161**					
		634099.171	3723079.483	316.354	316.338	316.325
				High Vegetation	-0.016	-0.029
286) ☑	**GS0162**					
		634069.507	3723087.469	316.305	316.29	316.29
				High Vegetation	-0.015	-0.015
287) ☑	**GS0165**					
		630360.787	3721750.254	287.553	287.66	287.655
				High Vegetation	0.107	0.102

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
288)	**GS0170**					
		622412.693	3717035.796	307.348	307.336	307.326
				High Vegetation	-0.012	-0.022
289)	**GS0183**					
		587292.292	3730351.777	151.101	151.101	151.141
				High Vegetation	0	0.04
290)	**GS0192**					
		581080.668	3710709.737	174.424	174.427	174.412
				High Vegetation	0.003	-0.012
291)	**GS0195**					
		580405.542	3698859.025	178.174	178.19	178.194
				High Vegetation	0.016	0.02
292)	**GS0198**					
		575274.798	3700259.848	183.951	183.918	183.943
				High Vegetation	-0.033	-0.008
293)	**GS0200**					
		573096.321	3694813.261	176.906	176.893	176.927
				High Vegetation	-0.013	0.021
294)	**GS0202**					
		571246.574	3690464.587	138.207	138.218	138.23
				High Vegetation	0.011	0.023

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
295) ☑	**GS0206**					
		574568.192	3687363.166	155.557	155.603	155.639
				High Vegetation	0.046	0.082
296) ☑	**GS0214**					
		561622.348	3678991.57	145.968	145.951	145.998
				High Vegetation	-0.017	0.03
297) ☑	**GS0216**					
		579328.52	3671276.111	260.054	260.155	260.146
				High Vegetation	0.101	0.092
298) ☑	**GS0235**					
		599005.299	3687323.144	321.449	321.48	321.485
				High Vegetation	0.031	0.036
299) ☑	**GS0238**					
		612724.398	3677926.761	336.676	336.674	336.712
				High Vegetation	-0.002	0.036
300) ☑	**GS0240**					
		617005.477	3674197.115	293.971	293.971	294.039
				High Vegetation	0	0.068
301) ☑	**GS0262**					
		539008.93	3814717.009	367.456	367.456	367.444
				High Vegetation	0	-0.012

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
302) ☑	**GS0291**					
		462959.14	3837833.974	171.626	171.674	171.672
				High Vegetation	0.048	0.046
303) ☑	**GS0301**					
		472731.67	3853765.233	192.234	192.33	192.326
				High Vegetation	0.096	0.092
304) ☑	**GS0305**					
		456508.196	3857743.33	203.767	203.736	203.702
				High Vegetation	-0.031	-0.066
305) ☑	**GS0316**					
		440213.14	3843421.005	160.539	160.428	160.42
				High Vegetation	-0.111	-0.119
306) ☑	**GS0319**					
		438181.465	3849905.971	128.99	128.908	128.92
				High Vegetation	-0.082	-0.071
307) ☑	**GS0322**					
		428771.849	3859441.788	172.737	172.77	172.758
				High Vegetation	0.033	0.021
308) ☑	**GS0340**					
		475828.561	3809888.546	200.649	200.743	200.739
				High Vegetation	0.094	0.09

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
309)	☑	**GS0343**					
			471248.24	3808108.965	306.835	306.871	306.88
					High Vegetation	0.036	0.045
310)	☑	**GS0366**					
			569905.872	3583739.015	65.585	65.621	65.614
					High Vegetation	0.036	0.029
311)	☑	**GS0368**					
			568399.37	3581377.341	72.849	72.839	72.845
					High Vegetation	-0.01	-0.004
312)	☑	**GS0373**					
			581049.295	3581410.641	66.604	66.589	66.568
					High Vegetation	-0.015	-0.036
313)	☑	**GS0375**					
			588488.573	3577821.009	77.776	77.782	77.806
					High Vegetation	0.006	0.03
314)	☑	**GS0379**					
			578820.686	3570806.548	65.064	65.074	65.084
					High Vegetation	0.01	0.02
315)	☑	**GS0382**					
			583225.66	3562253.778	84.547	84.568	84.578
					High Vegetation	0.021	0.031

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
316)	☑	**GS0383**					
			583688.089	3557939.627	83.754	83.717	83.76
					High Vegetation	-0.037	0.006
317)	☑	**GS0388**					
			590704.044	3545364.616	143.805	143.832	143.806
					High Vegetation	0.027	0.001
318)	☑	**GS0391**					
			576075.005	3546481.954	137.726	137.832	137.806
					High Vegetation	0.106	0.08
319)	☑	**GS0394**					
			556635.795	3553484.687	90.338	90.326	90.341
					High Vegetation	-0.012	0.003
320)	☑	**GS0400**					
			561734.626	3567122.173	76.611	76.575	76.578
					High Vegetation	-0.036	-0.033
321)	☑	**GS0406**					
			550001.386	3572754.302	55.987	55.992	55.973
					High Vegetation	0.005	-0.014
322)	☑	**GS0429**					
			508223.66	3539547.022	63.635	63.633	63.617
					High Vegetation	-0.002	-0.018

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
323)	☑	**GS0432**					
			503433.928	3540782.301	87.44	87.493	87.485
					High Vegetation	0.053	0.045
324)	☑	**GS0437**					
			526266.158	3537846.134	95.172	95.201	95.195
					High Vegetation	0.029	0.023
325)	☑	**GS0439**					
			528170.626	3547274.52	99.994	99.983	99.993
					High Vegetation	-0.011	-0.001
326)	☑	**GS0450**					
			499942.222	3541163.204	76.374	76.404	76.418
					High Vegetation	0.03	0.044
327)	☑	**GS0454**					
			487789.147	3539125.573	66.997	66.996	67.029
					High Vegetation	-0.001	0.032
328)	☑	**GS0455**					
			481636.235	3539478.938	93.079	93.085	93.128
					High Vegetation	0.006	0.049
329)	☑	**GS0464**					
			468121.829	3538299.802	43.377	43.414	43.436
					High Vegetation	0.037	0.059

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
330)	☑	**GS0465**					
			468155.134	3538300.766	43.217	43.317	43.307
					High Vegetation	0.1	0.09
331)	☑	**GS0472**					
			465677.463	3550782.129	41.746	41.831	41.815
					High Vegetation	0.085	0.069
332)	☑	**GS0474**					
			465638.739	3550793.607	41.857	41.738	41.827
					High Vegetation	-0.119	-0.03
333)	☑	**GS0476**					
			456656.89	3561792.963	59.352	59.42	59.395
					High Vegetation	0.068	0.043
334)	☑	**GS0481**					
			439717.661	3579050.751	73.145	73.186	73.159
					High Vegetation	0.041	0.014
335)	☑	**GS0482**					
			443407.076	3585841.472	74.2	74.285	74.231
					High Vegetation	0.085	0.031
336)	☑	**GS0488**					
			444219.458	3592032.6	62.366	62.359	62.354
					High Vegetation	-0.007	-0.012

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
337)	☑	**GS0493**					
			441133.87	3569978.198	50.497	50.529	50.536
					High Vegetation	0.032	0.039
338)	☑	**GS0500**					
			452996.013	3558772.357	49.451	49.518	49.484
					High Vegetation	0.067	0.033
339)	☑	**GS0502**					
			445644.81	3549448.938	41.105	41.184	41.157
					High Vegetation	0.079	0.052
340)	☑	**GS0504**					
			445630.947	3549504.288	41.806	41.887	41.882
					High Vegetation	0.081	0.076
341)	☑	**GS0513**					
			417804.757	3551167.168	45.676	45.743	45.716
					High Vegetation	0.067	0.04
342)	☑	**GS0514**					
			417834.443	3551172.094	46.889	46.858	46.874
					High Vegetation	-0.031	-0.015
343)	☑	**GS0520**					
			409684.692	3560262.52	44.629	44.703	44.718
					High Vegetation	0.074	0.089

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
344)	☑	**GS0524**					
			412220.856	3568037.864	57.439	57.473	57.424
					High Vegetation	0.034	-0.015
345)	☑	**GS0527**					
			425148.526	3572285.584	41.959	41.986	42.011
					High Vegetation	0.027	0.052
346)	☑	**GS0531**					
			426773.38	3560926.734	83.735	83.82	83.806
					High Vegetation	0.085	0.071
347)	☑	**GS0535**					
			420850.133	3578913.615	29.694	29.729	29.734
					High Vegetation	0.035	0.04
348)	☑	**GS0542**					
			421764.193	3596097.183	48.078	48.078	48.107
					High Vegetation	0	0.029
349)	☑	**GS0037**					
			580448.89	3844300.334	227.201	227.263	227.276
					Low Vegetation	0.062	0.075
350)	☑	**GS0053**					
			594178.781	3832716.424	182.159	182.129	182.155
					Low Vegetation	-0.03	-0.004

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
351)	**GS0123**					
		549999.223	3736482.465	211.652	211.781	211.784
				Low Vegetation	0.129	0.132
352)	**GS0124**					
		550025.574	3736480.056	211.476	211.61	211.612
				Low Vegetation	0.134	0.136
353)	**GS0137**					
		565832.204	3747385.845	180.48	180.609	180.62
				Low Vegetation	0.129	0.14
354)	**GS0146**					
		600365.354	3746326.512	164.859	164.826	164.881
				Low Vegetation	-0.033	0.022
355)	**GS0179**					
		590412.68	3720846.57	188.59	188.601	188.62
				Low Vegetation	0.011	0.03
356)	**GS0188**					
		581579.858	3717479.267	169.462	169.47	169.522
				Low Vegetation	0.008	0.06
357)	**GS0193**					
		581766.268	3704400.793	175.694	175.696	175.729
				Low Vegetation	0.002	0.035

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
358)	☑	**GS0222**					
			595882.593	3674883.648	290.687	290.76	290.737
					Low Vegetation	0.073	0.05
359)	☑	**GS0224**					
			598715.112	3711039.456	187.639	187.656	187.673
					Low Vegetation	0.017	0.033
360)	☑	**GS0229**					
			588326.648	3702089.42	174.821	174.906	174.906
					Low Vegetation	0.085	0.085
361)	☑	**GS0245**					
			618800.383	3691136.045	318.033	318.123	318.128
					Low Vegetation	0.09	0.095
362)	☑	**GS0247**					
			614206.758	3693309.354	341.893	341.876	341.871
					Low Vegetation	-0.017	-0.022
363)	☑	**GS0264**					
			528149.14	3814833.485	188.945	188.917	188.925
					Low Vegetation	-0.028	-0.02
364)	☑	**GS0267**					
			522628.585	3811686.724	185.621	185.655	185.661
					Low Vegetation	0.034	0.04

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
365)	☑	**GS0269**					
			512399.167	3811823.601	215.078	215.141	215.127
					Low Vegetation	0.063	0.049
366)	☑	**GS0271**					
			512336.264	3811839.465	214.029	214.104	214.093
					Low Vegetation	0.075	0.064
367)	☑	**GS0275**					
			508318.804	3821644.996	186.106	186.197	186.175
					Low Vegetation	0.091	0.069
368)	☑	**GS0288**					
			471585.686	3838249.888	175.393	175.627	175.592
					Low Vegetation	0.234	0.199
369)	☑	**GS0300**					
			464194.206	3856268.095	194.465	194.559	194.536
					Low Vegetation	0.094	0.071
370)	☑	**GS0308**					
			451531.518	3863530.779	222.611	222.577	222.582
					Low Vegetation	-0.034	-0.029
371)	☑	**GS0310**					
			451754.253	3868612.584	227.333	227.292	227.307
					Low Vegetation	-0.041	-0.026

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
372)	☑	**GS0328**					
			422331.605	3839779.576	142.148	142.207	142.213
					Low Vegetation	0.059	0.065
373)	☑	**GS0336**					
			473963.116	3817809.007	198.808	198.945	198.944
					Low Vegetation	0.137	0.135
374)	☑	**GS0348**					
			466260.42	3816369.053	195.815	195.891	195.895
					Low Vegetation	0.076	0.08
375)	☑	**GS0349**					
			459046.326	3815946.874	196.163	196.307	196.293
					Low Vegetation	0.144	0.13
376)	☑	**GS0352**					
			437945.137	3827448.785	207.919	207.878	207.88
					Low Vegetation	-0.041	-0.039
377)	☑	**GS0353**					
			440271.139	3833473.506	147.291	147.192	147.198
					Low Vegetation	-0.099	-0.093
378)	☑	**GS0363**					
			555787.545	3717147.48	176.496	176.535	176.54
					Low Vegetation	0.039	0.044

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
379)	☑	**GS0364**					
			562897.246	3717889.984	157.301	157.357	157.334
					Low Vegetation	0.056	0.033
380)	☑	**GS0398**					
			555004.467	3562142.891	83.168	83.347	83.291
					Low Vegetation	0.179	0.123
381)	☑	**GS0412**					
			527567.366	3570092.034	48.551	48.598	48.573
					Low Vegetation	0.047	0.022
382)	☑	**GS0414**					
			527636.223	3570095.668	48.512	48.638	48.599
					Low Vegetation	0.126	0.087
383)	☑	**GS0440**					
			532562.646	3554547.323	66.917	66.978	66.97
					Low Vegetation	0.061	0.053
384)	☑	**GS0458**					
			481543.328	3539499.639	93.338	93.433	93.396
					Low Vegetation	0.095	0.058
385)	☑	**GS0468**					
			465389.629	3530404.522	80.032	80.062	80.088
					Low Vegetation	0.03	0.055

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
386) ☑	**GS0487**					
		444231.828	3592090.751	59.784	59.781	59.814
				Low Vegetation	-0.003	0.03
387) ☑	**GS0491**					
		441134.653	3569942.65	50.02	50.058	50.07
				Low Vegetation	0.038	0.05
388) ☑	**GS0492**					
		441155.719	3569959.282	50.064	50.11	50.134
				Low Vegetation	0.046	0.07
389) ☑	**GS0496**					
		446818.896	3554231.138	40.097	40.139	40.137
				Low Vegetation	0.042	0.04
390) ☑	**GS0497**					
		446817.106	3554199.601	39.651	39.842	39.77
				Low Vegetation	0.191	0.119
391) ☑	**GS0528**					
		425176.157	3572252.734	42.852	42.984	42.956
				Low Vegetation	0.132	0.104
392) ☑	**GS0009**					
		571248.758	3793997.937	316.358	316.334	316.347
				Medium Vegetation	-0.024	-0.011

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
393)	**GS0019**					
		547557.746	3808644.778	313.213	313.268	313.238
				Medium Vegetation	0.055	0.025
394)	**GS0022**					
		543057.274	3811785.528	322.692	322.78	322.789
				Medium Vegetation	0.088	0.097
395)	**GS0028**					
		568662.112	3821419.574	372.161	372.139	372.158
				Medium Vegetation	-0.022	-0.003
396)	**GS0049**					
		594036.587	3852326.327	190.135	190.135	190.134
				Medium Vegetation	0	-0.001
397)	**GS0065**					
		593010.059	3794366.942	349.139	349.162	349.118
				Medium Vegetation	0.023	-0.021
398)	**GS0067**					
		603428.804	3793196.305	214.864	214.894	214.907
				Medium Vegetation	0.03	0.043
399)	**GS0069**					
		608500.177	3798442.642	230.998	231.041	231.063
				Medium Vegetation	0.043	0.065

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
400)	☑	**GS0071**					
			614204.644	3807557.633	273.66	273.685	273.699
					Medium Vegetation	0.025	0.039
401)	☑	**GS0078**					
			591700.509	3803292.901	357.734	357.711	357.711
					Medium Vegetation	-0.023	-0.023
402)	☑	**GS0082**					
			586992.071	3799235.258	336.116	336.132	336.125
					Medium Vegetation	0.016	0.009
403)	☑	**GS0083**					
			578401.57	3795801.048	323.616	323.681	323.701
					Medium Vegetation	0.065	0.085
404)	☑	**GS0084**					
			578428.035	3795776.672	324.534	324.568	324.553
					Medium Vegetation	0.034	0.019
405)	☑	**GS0090**					
			543292.192	3784063.932	253.863	253.861	253.853
					Medium Vegetation	-0.002	-0.01
406)	☑	**GS0091**					
			543268.006	3784092.05	253.168	253.194	253.168
					Medium Vegetation	0.026	0

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
407)	☑	**GS0102**					
			551768.649	3761724.946	228.024	228.035	228.072
					Medium Vegetation	0.011	0.048
408)	☑	**GS0118**					
			538837.446	3744177.725	190.822	190.879	190.891
					Medium Vegetation	0.057	0.069
409)	☑	**GS0121**					
			547482.091	3738844.774	226.099	226.234	226.214
					Medium Vegetation	0.135	0.115
410)	☑	**GS0135**					
			568910.369	3744344.299	172.609	172.71	172.724
					Medium Vegetation	0.101	0.115
411)	☑	**GS0149**					
			606028.598	3745909.888	176.078	176.079	176.117
					Medium Vegetation	0.001	0.039
412)	☑	**GS0151**					
			609953.631	3744105.09	192.354	192.406	192.403
					Medium Vegetation	0.052	0.049
413)	☑	**GS0174**					
			603875.273	3717684.061	201.148	201.213	201.175
					Medium Vegetation	0.065	0.027

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
414)	☑	**GS0176**					
			592743.572	3718657.414	173.479	173.486	173.47
					Medium Vegetation	0.007	-0.009
415)	☑	**GS0185**					
			583085.711	3721737.729	155.683	155.749	155.743
					Medium Vegetation	0.066	0.06
416)	☑	**GS0209**					
			568664.281	3670061.769	172.397	172.516	172.481
					Medium Vegetation	0.119	0.084
417)	☑	**GS0211**					
			564990.416	3672980.124	175.009	175.031	175.037
					Medium Vegetation	0.022	0.028
418)	☑	**GS0250**					
			613307.729	3698412.939	301.739	301.704	301.696
					Medium Vegetation	-0.035	-0.043
419)	☑	**GS0254**					
			612804.583	3719530.59	190.552	190.596	190.595
					Medium Vegetation	0.044	0.043
420)	☑	**GS0258**					
			607855.558	3719776.208	201.942	202.008	202.003
					Medium Vegetation	0.066	0.06

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
421)	☑	**GS0272**					
			508866.338	3808248.949	188.885	188.908	188.916
					Medium Vegetation	0.023	0.031
422)	☑	**GS0279**					
			501076.523	3824483.436	180.932	180.915	180.91
					Medium Vegetation	-0.017	-0.022
423)	☑	**GS0283**					
			491915.887	3831692.743	187.571	187.636	187.645
					Medium Vegetation	0.065	0.074
424)	☑	**GS0285**					
			477514.426	3834479.548	182.433	182.467	182.467
					Medium Vegetation	0.034	0.034
425)	☑	**GS0293**					
			462897.421	3845823.357	178.673	178.766	178.77
					Medium Vegetation	0.093	0.097
426)	☑	**GS0325**					
			421562.137	3843588.804	138.381	138.412	138.436
					Medium Vegetation	0.031	0.055
427)	☑	**GS0338**					
			480628.993	3811245.47	197.847	197.866	197.906
					Medium Vegetation	0.019	0.059

Coordinates and Offsets of Analyzed Locations (Continued)

		ID					
			Survey X	Survey Y	Z1	Z DEM	Z LAS
					LC Type	ΔZ DEM	ΔZ LAS
428)	☑	**GS0359**					
			514212.291	3750185.79	165.431	165.423	165.41
					Medium Vegetation	-0.008	-0.021
429)	☑	**GS0360**					
			514240.718	3750170.342	165.83	165.819	165.822
					Medium Vegetation	-0.011	-0.008
430)	☑	**GS0361**					
			548373.349	3715109.069	215.444	215.476	215.434
					Medium Vegetation	0.032	-0.01
431)	☑	**GS0370**					
			565081.442	3581481.685	82.41	82.41	82.371
					Medium Vegetation	0	-0.039
432)	☑	**GS0377**					
			586503.593	3572540.262	92.094	92.144	92.158
					Medium Vegetation	0.05	0.064
433)	☑	**GS0419**					
			518952.914	3564951.184	117.469	117.479	117.488
					Medium Vegetation	0.01	0.019
434)	☑	**GS0459**					
			473716.587	3539784.983	51.386	51.443	51.436
					Medium Vegetation	0.057	0.05

Coordinates and Offsets of Analyzed Locations (Continued)

	ID	Survey X	Survey Y	Z1	Z DEM	Z LAS
				LC Type	ΔZ DEM	ΔZ LAS
435) ☑	**GS0463**					
		468114.755	3538269.361	43.463	43.51	43.528
				Medium Vegetation	0.047	0.065
436) ☑	**GS0470**					
		468047.105	3542445.385	50.358	50.317	50.36
				Medium Vegetation	-0.041	0.002
437) ☑	**GS0486**					
		444217.968	3592063.267	61.416	61.432	61.426
				Medium Vegetation	0.016	0.01
438) ☑	**GS0509**					
		425910.026	3546842.526	60.283	60.541	60.47
				Medium Vegetation	0.258	0.187
439) ☑	**GS0510**					
		425873.341	3546826.807	60.213	60.281	60.294
				Medium Vegetation	0.068	0.081
440) ☑	**GS0512**					
		425926.63	3546857.221	60.802	60.936	60.914
				Medium Vegetation	0.134	0.112
441) ☑	**GS0516**					
		412316.914	3550433.471	45.673	45.689	45.72
				Medium Vegetation	0.016	0.047

LAS

Nonvegetated Vertical Accuracy

LandCover Type: Bare Earth, Urban Terrain

Minimum DZ: -0.195

Maximum DZ: 0.125

Mean DZ: -0.004

Mean Magnitude DZ: 0.175

Number Observations: 256

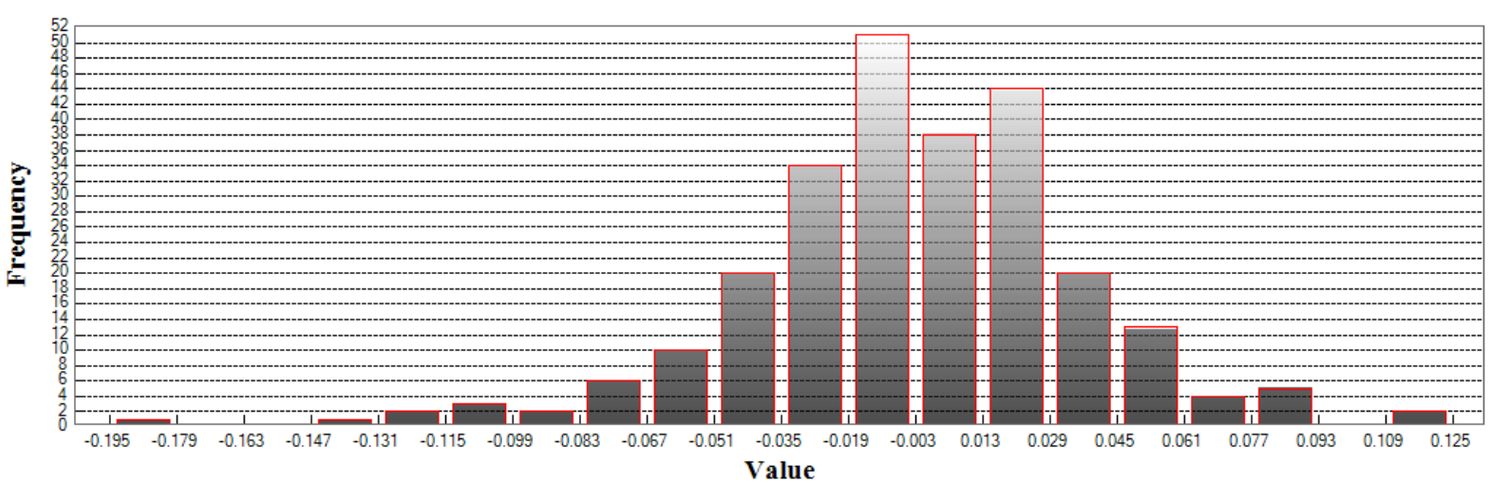
Standard Deviation DZ: 0.041

RMSE Z: 0.041

95% Confidence Level Z: 0.081

Units: Meters

Histogram



Min: -0.195

Max: 0.125

Number Of Bins: 20

Bin Interval: 0.016

LAS (Continued)

Vegetated Vertical Accuracy

LandCover Type: High Vegetation

Minimum DZ: -0.119

Maximum DZ: 0.197

Mean DZ: 0.026

Mean Magnitude DZ: 0.205

Number Observations: 92

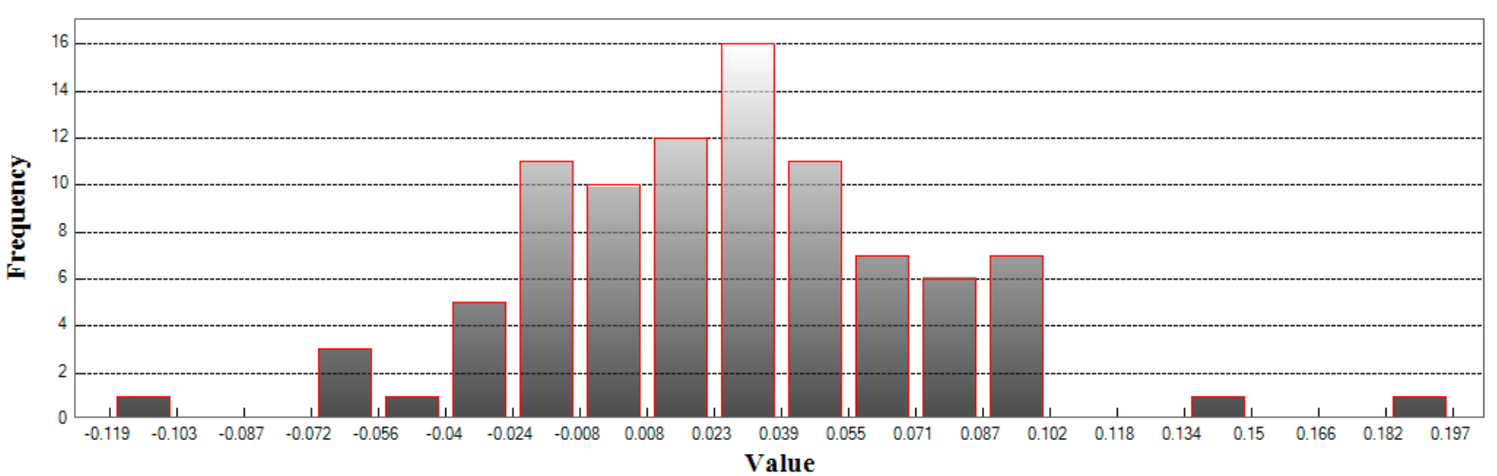
Standard Deviation DZ: 0.047

RMSE Z: 0.054

95th Percentile: 0.092

Units: Meters

Histogram



Min: -0.119

Max: 0.197

Number Of Bins: 20

Bin Interval: 0.016

LAS (Continued)

Vegetated Vertical Accuracy

LandCover Type: Low Vegetation

Minimum DZ: -0.093

Maximum DZ: 0.199

Mean DZ: 0.057

Mean Magnitude DZ: 0.26

Number Observations: 43

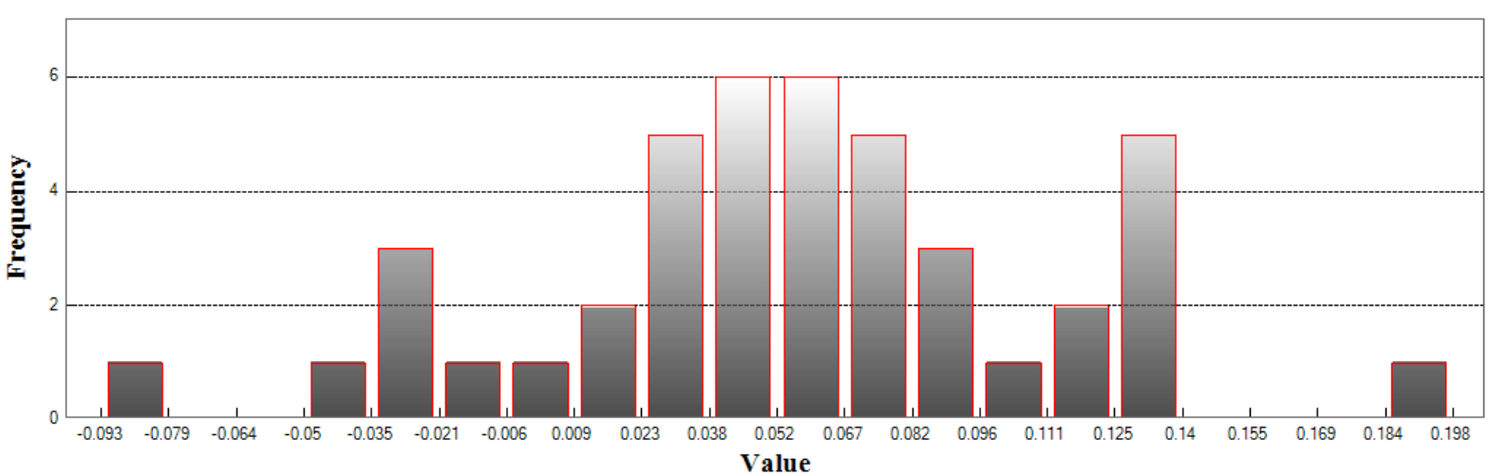
Standard Deviation DZ: 0.056

RMSE Z: 0.08

95th Percentile: 0.136

Units: Meters

Histogram



Min: -0.093

Max: 0.199

Number Of Bins: 20

Bin Interval: 0.015

LAS (Continued)

Vegetated Vertical Accuracy

LandCover Type: Medium Vegetation

Minimum DZ: -0.043

Maximum DZ: 0.187

Mean DZ: 0.038

Mean Magnitude DZ: 0.216

Number Observations: 50

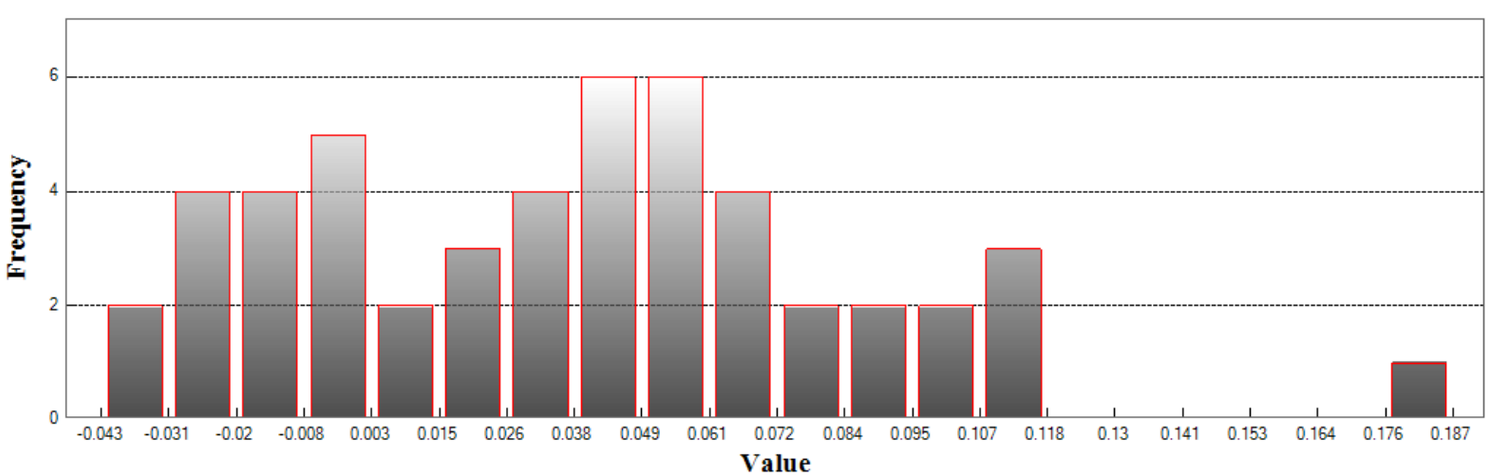
Standard Deviation DZ: 0.046

RMSE Z: 0.06

95th Percentile: 0.115

Units: Meters

Histogram



Min: -0.043

Max: 0.187

Number Of Bins: 20

Bin Interval: 0.011

DEM

Nonvegetated Vertical Accuracy

LandCover Type: Bare Earth, Urban Terrain

Minimum DZ: -0.193

Maximum DZ: 0.124

Mean DZ: -0.003

Mean Magnitude DZ: 0.183

Number Observations: 256

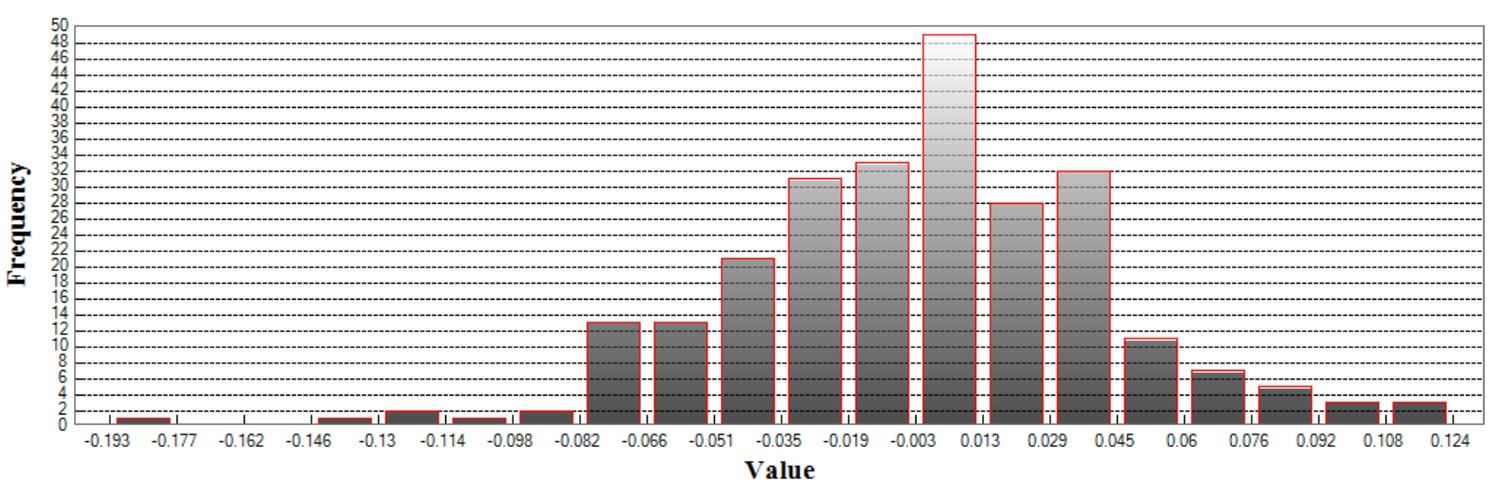
Standard Deviation DZ: 0.045

RMSE Z: 0.044

95% Confidence Level Z: 0.087

Units: Meters

Histogram



Min: -0.193

Max: 0.124

Number Of Bins: 20

Bin Interval: 0.016

DEM (Continued)

Vegetated Vertical Accuracy

LandCover Type: High Vegetation

Minimum DZ: -0.119

Maximum DZ: 0.19

Mean DZ: 0.026

Mean Magnitude DZ: 0.208

Number Observations: 92

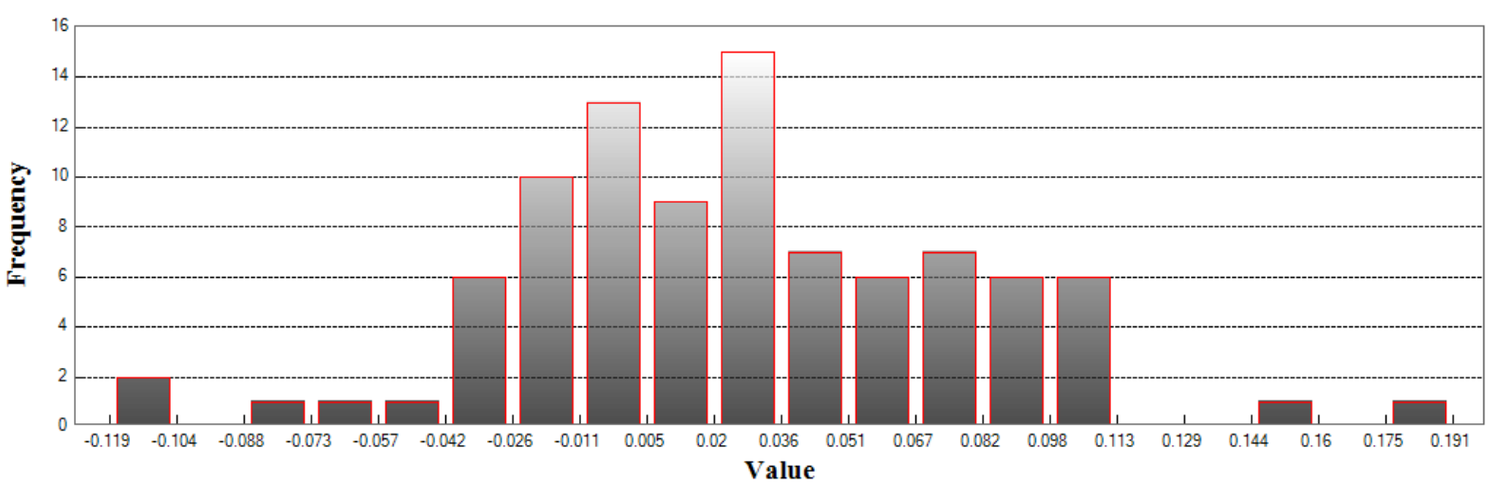
Standard Deviation DZ: 0.052

RMSE Z: 0.058

95th Percentile: 0.106

Units: Meters

Histogram



Min: -0.119

Max: 0.19

Number Of Bins: 20

Bin Interval: 0.015

DEM (Continued)

Vegetated Vertical Accuracy

LandCover Type: Low Vegetation

Minimum DZ: -0.099

Maximum DZ: 0.234

Mean DZ: 0.058

Mean Magnitude DZ: 0.271

Number Observations: 43

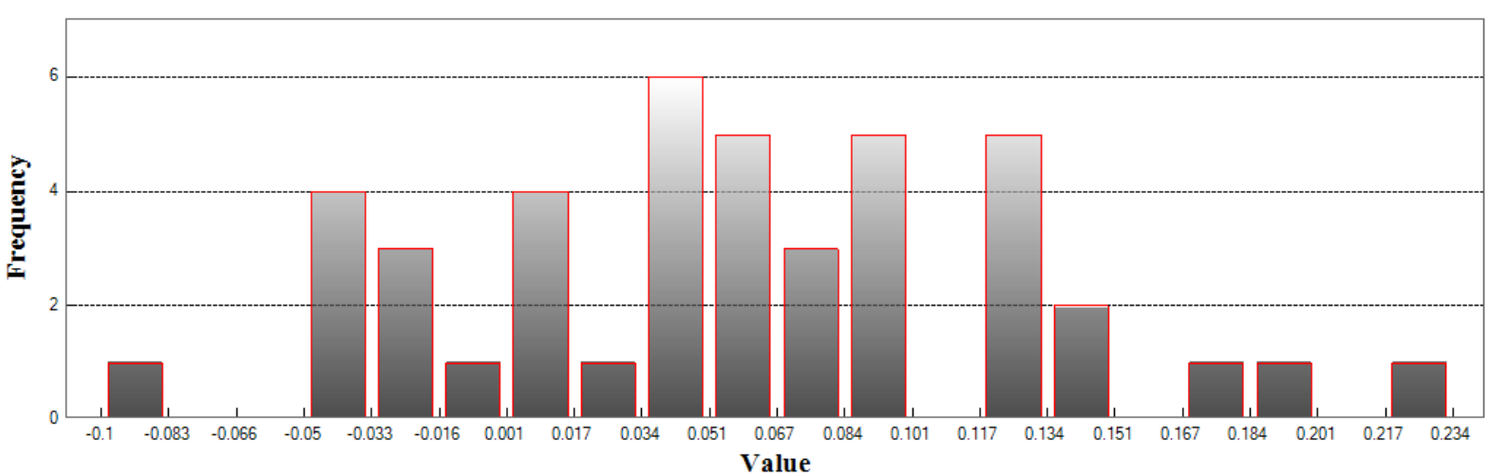
Standard Deviation DZ: 0.07

RMSE Z: 0.091

95th Percentile: 0.179

Units: Meters

Histogram



Min: -0.099

Max: 0.234

Number Of Bins: 20

Bin Interval: 0.017

DEM (Continued)

Vegetated Vertical Accuracy

LandCover Type: Medium Vegetation

Minimum DZ: -0.041

Maximum DZ: 0.258

Mean DZ: 0.038

Mean Magnitude DZ: 0.214

Number Observations: 50

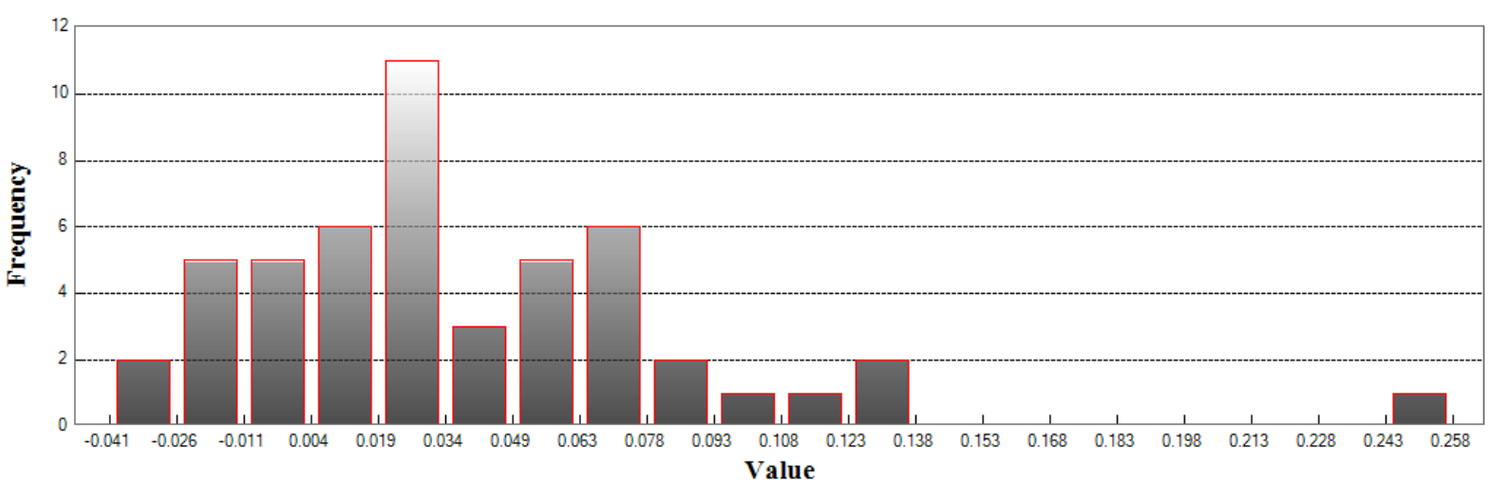
Standard Deviation DZ: 0.052

RMSE Z: 0.064

95th Percentile: 0.134

Units: Meters

Histogram



Min: -0.041

Max: 0.258

Number Of Bins: 20

Bin Interval: 0.015

Appendix C. POSPac

General Information

Mission Information

Project name	01022021A_4040
Processing date	2022-01-05 15:21:05
Mission date	2021-01-02 15:06:23
Mission duration	03:50:15.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210102_150604_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0020.21g	GLONASS Broadcast Ephemeris
Ephm0020.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01022021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210102_150604_INS-GPS_1.raw		
Last raw data file	210102_150604_INS-GPS_1.raw		
Start GPS week	2138		
Start time	572764.796 (1/2/2021 3:06:04 PM)		
End time	586580.233 (1/2/2021 6:56:20 PM)		
Start of fine alignment	573115.064 (1/2/2021 3:11:55 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

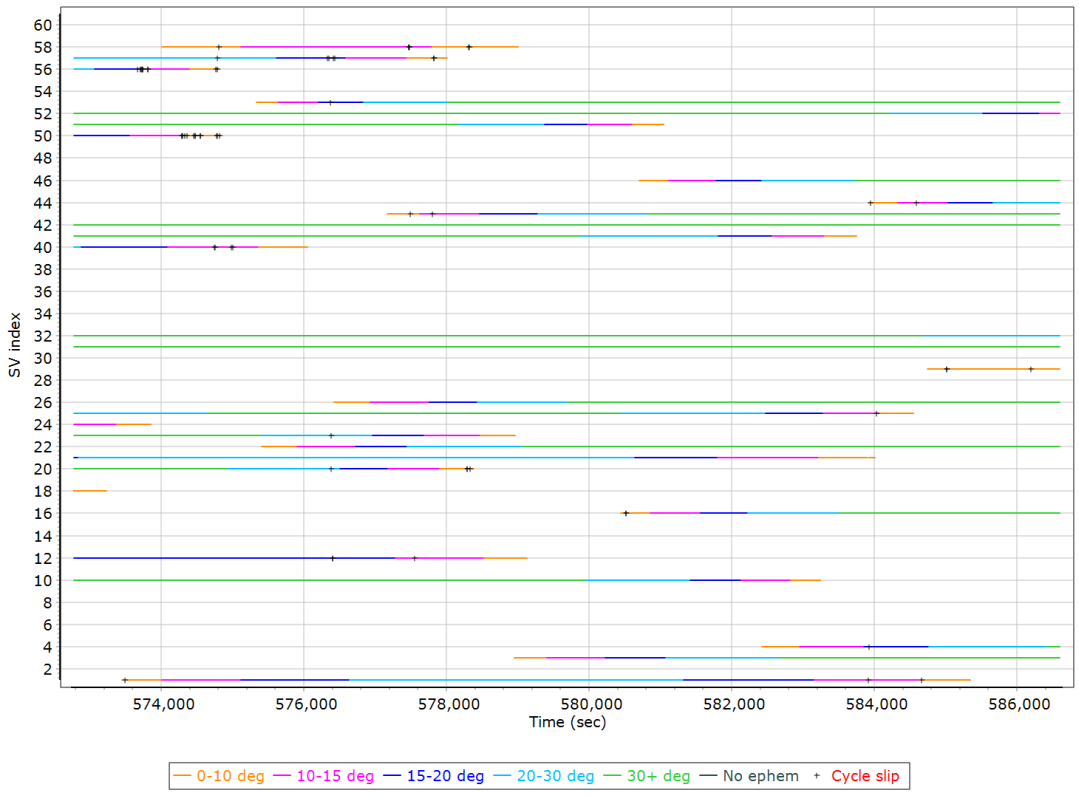
Rover Data QC

Raw IMU Import QC Summary

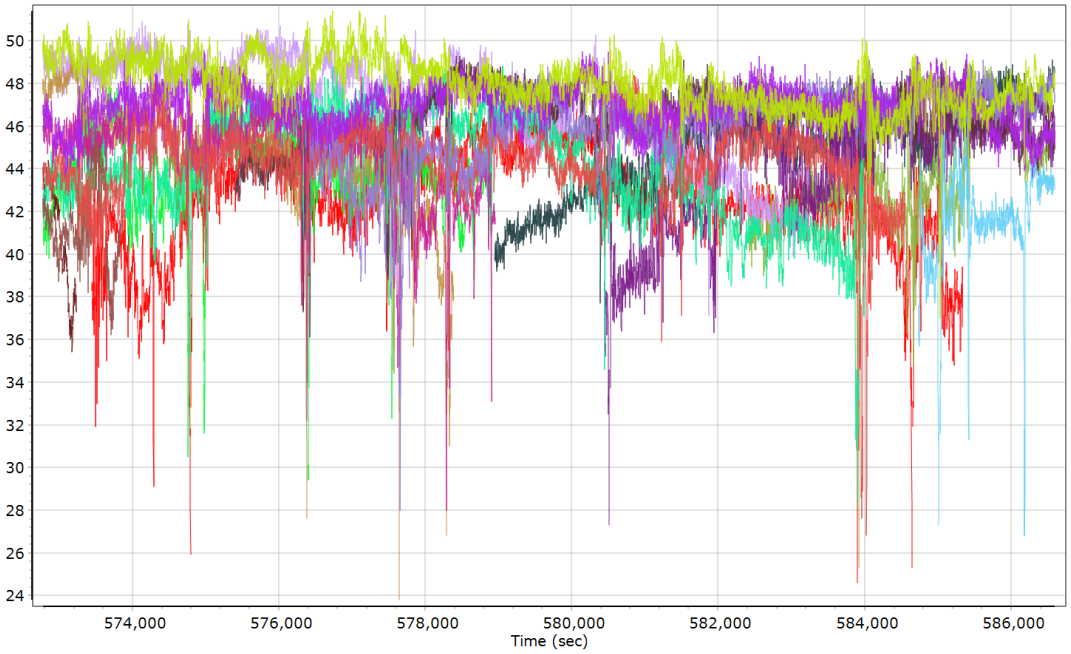
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01022021A_4040.log
IMU Records Processed	2762604
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

GPS/GLONASS L1 Satellite Lock/Elevation

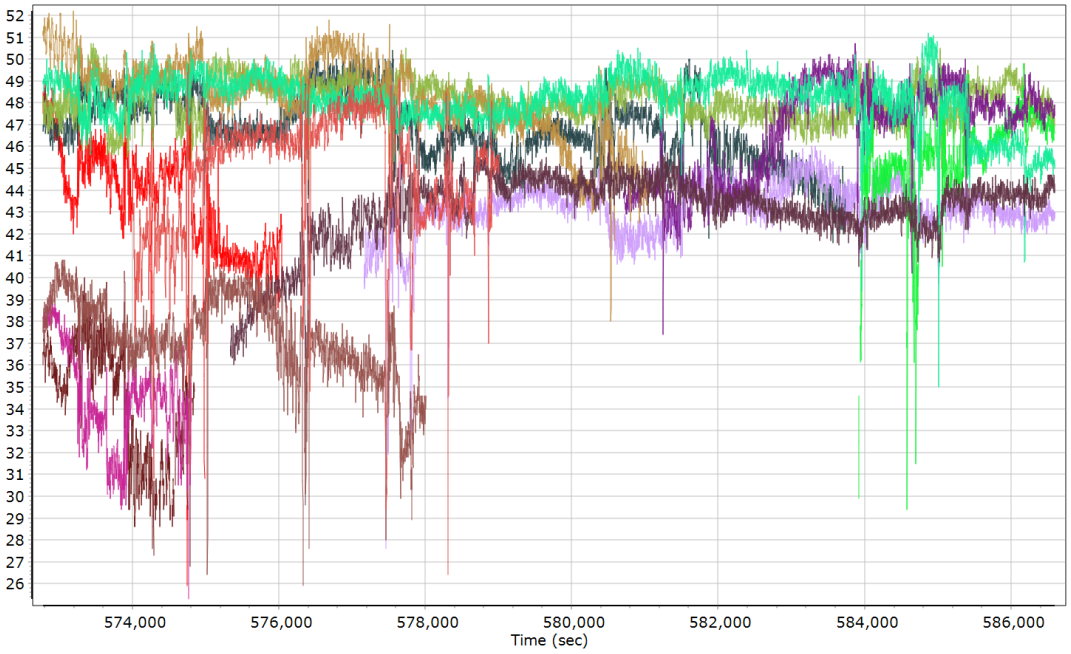


GPS L1 SNR



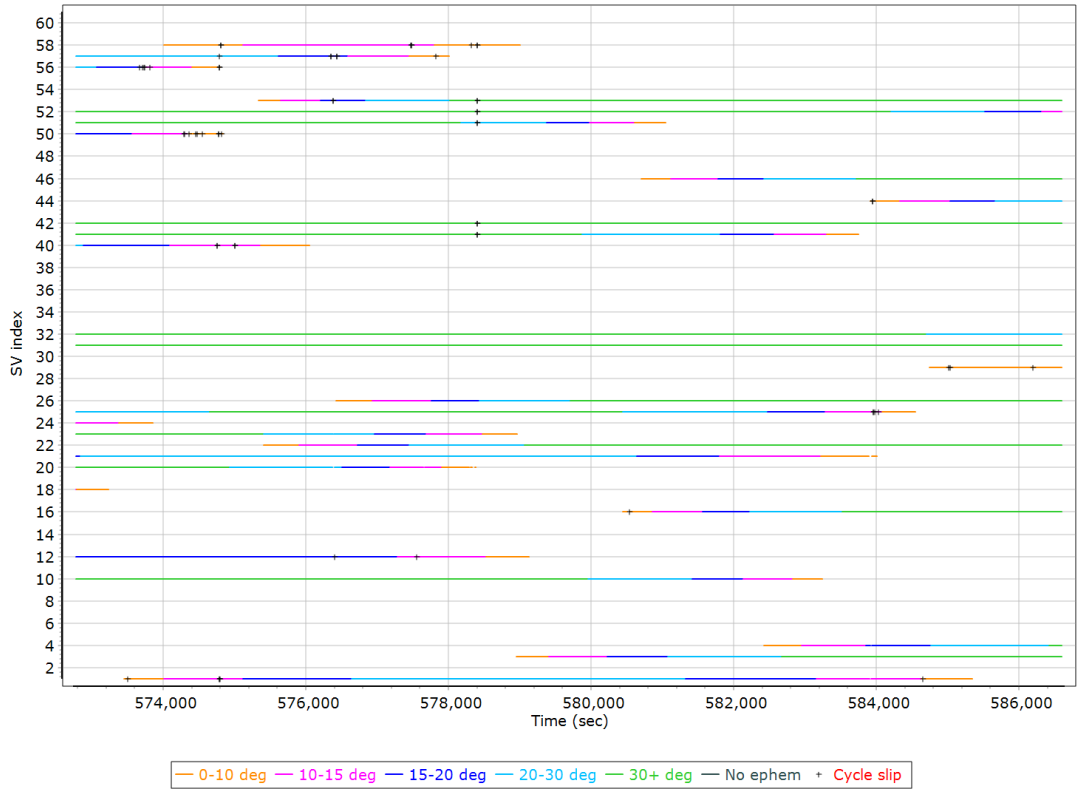
GPS PRN 01 L1 SNR (dB/Hz) GPS PRN 03 L1 SNR (dB/Hz) GPS PRN 04 L1 SNR (dB/Hz) GPS PRN 10 L1 SNR (dB/Hz)
GPS PRN 12 L1 SNR (dB/Hz) GPS PRN 16 L1 SNR (dB/Hz) GPS PRN 18 L1 SNR (dB/Hz) GPS PRN 20 L1 SNR (dB/Hz)
GPS PRN 21 L1 SNR (dB/Hz) GPS PRN 22 L1 SNR (dB/Hz) GPS PRN 23 L1 SNR (dB/Hz) GPS PRN 24 L1 SNR (dB/Hz)
GPS PRN 25 L1 SNR (dB/Hz) GPS PRN 26 L1 SNR (dB/Hz) GPS PRN 29 L1 SNR (dB/Hz) GPS PRN 31 L1 SNR (dB/Hz)
GPS PRN 32 L1 SNR (dB/Hz)

GLONASS L1 SNR

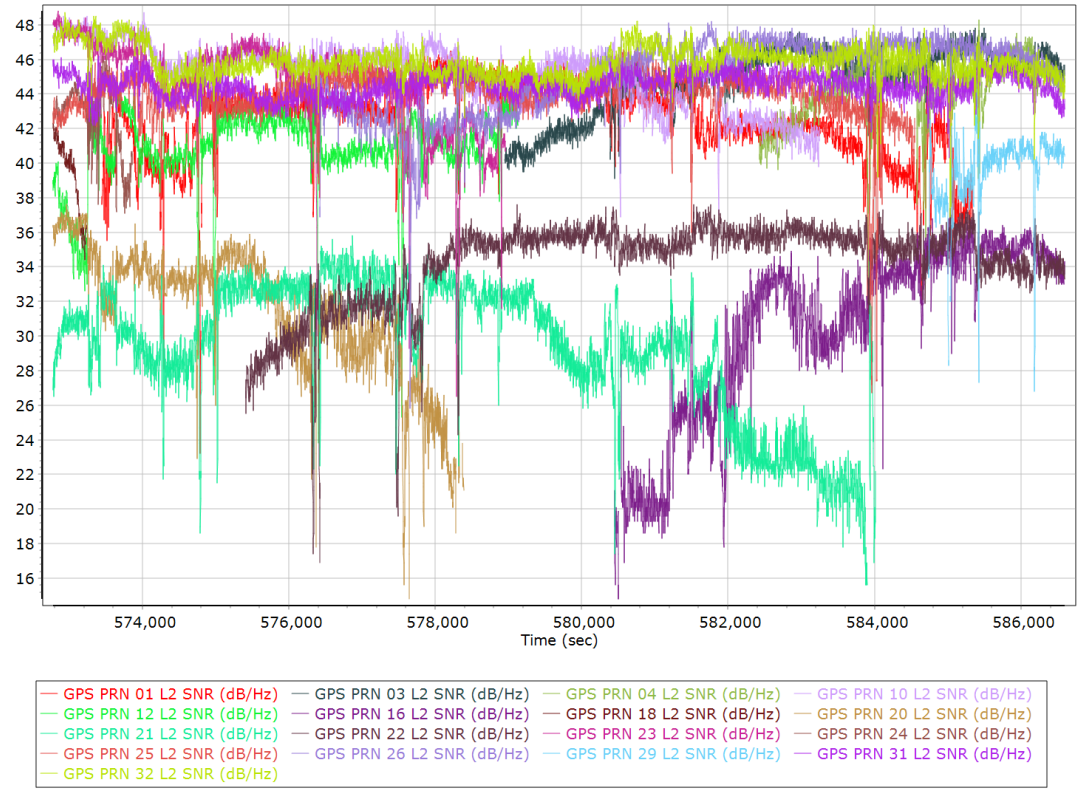


GLONASS 03 L1 SNR (dB/Hz) GLONASS 04 L1 SNR (dB/Hz) GLONASS 05 L1 SNR (dB/Hz)
GLONASS 06 L1 SNR (dB/Hz) GLONASS 07 L1 SNR (dB/Hz) GLONASS 09 L1 SNR (dB/Hz)
GLONASS 13 L1 SNR (dB/Hz) GLONASS 14 L1 SNR (dB/Hz) GLONASS 15 L1 SNR (dB/Hz)
GLONASS 16 L1 SNR (dB/Hz) GLONASS 19 L1 SNR (dB/Hz) GLONASS 20 L1 SNR (dB/Hz)
GLONASS 21 L1 SNR (dB/Hz)

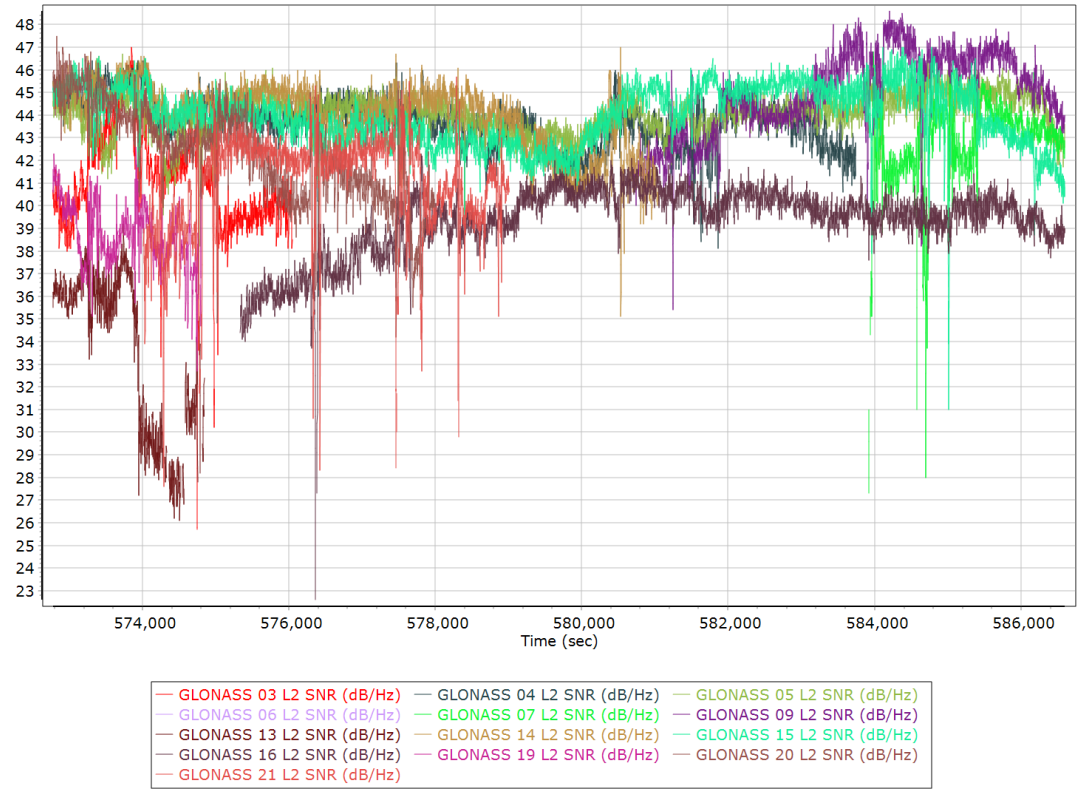
GPS/GLONASS L2 Satellite Lock/Elevation



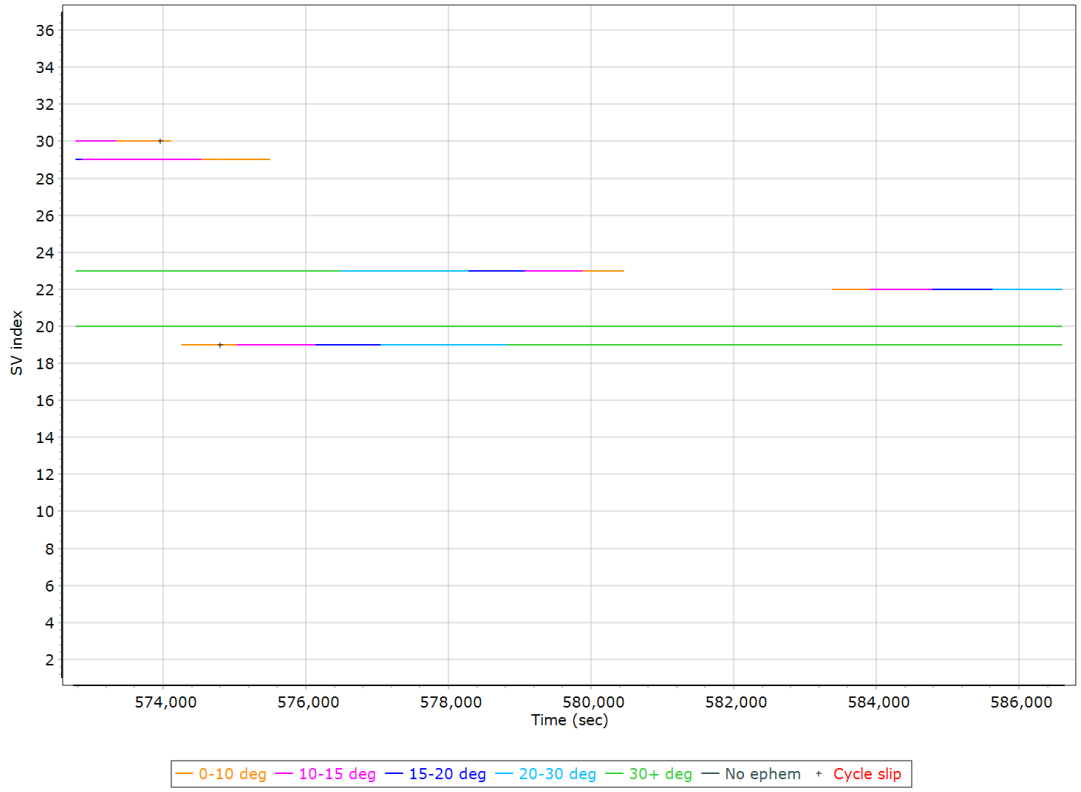
GPS L2 SNR



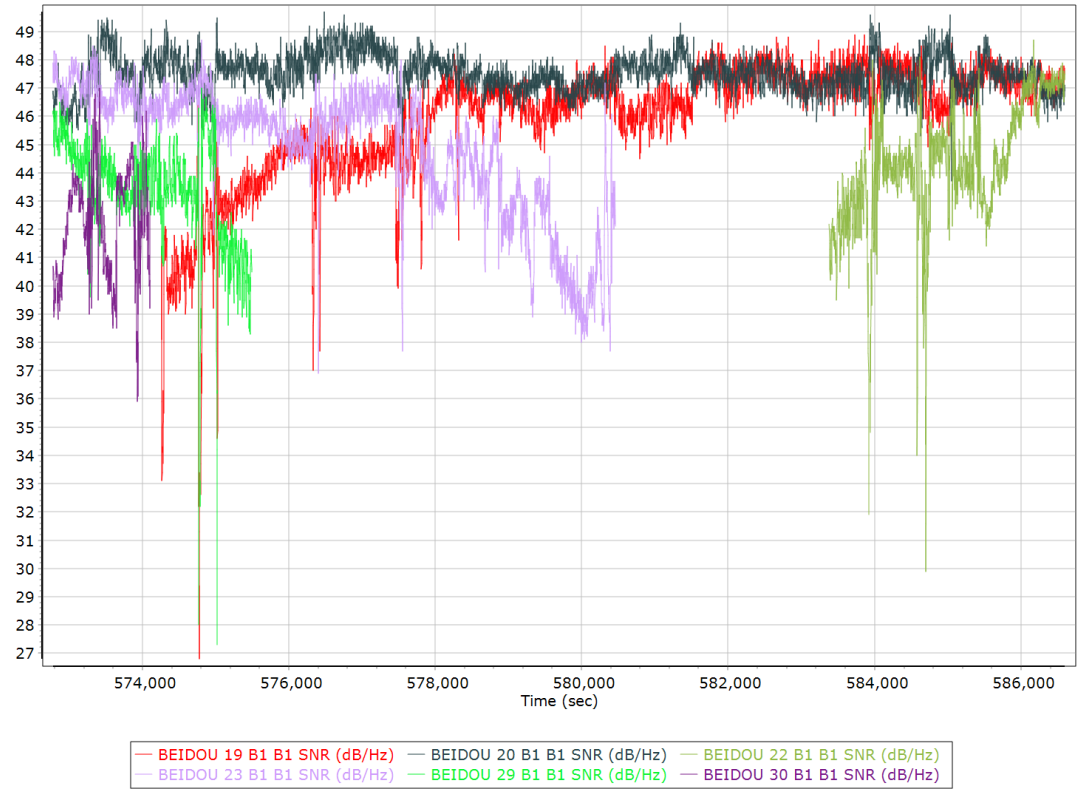
GLONASS L2 SNR



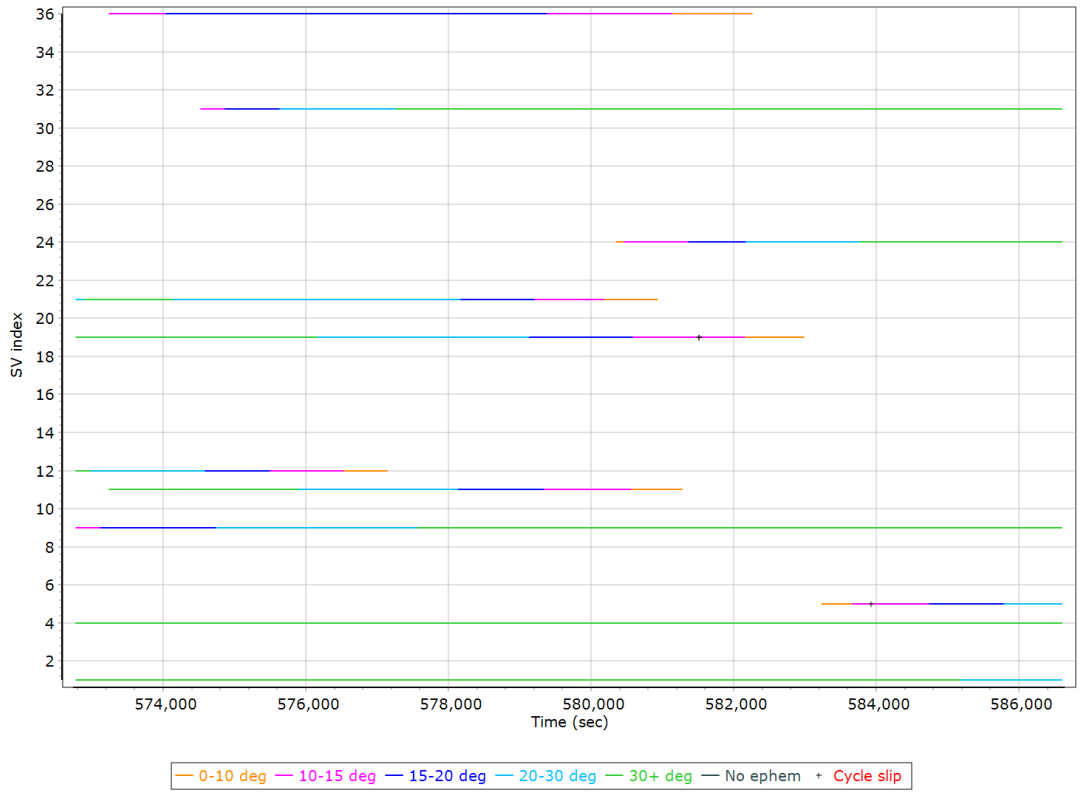
BEIDOU Satellite Lock/Elevation



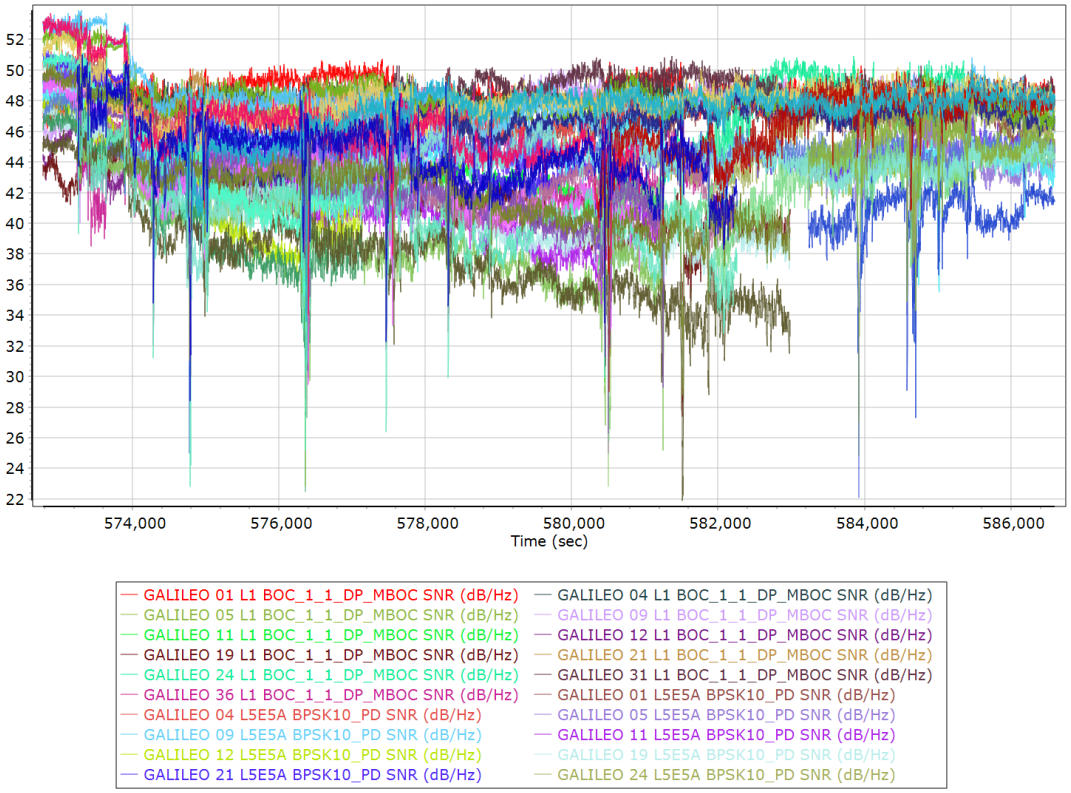
BEIDOU SNR



GALILEO Satellite Lock/Elevation

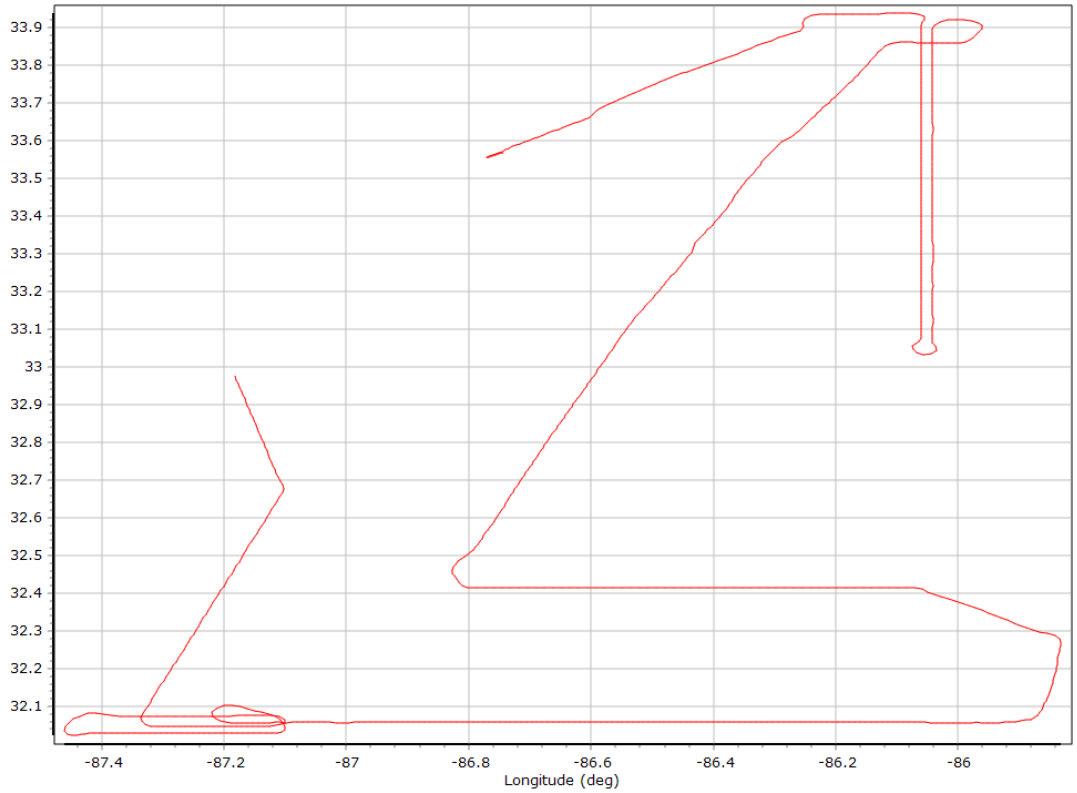


GALILEO SNR

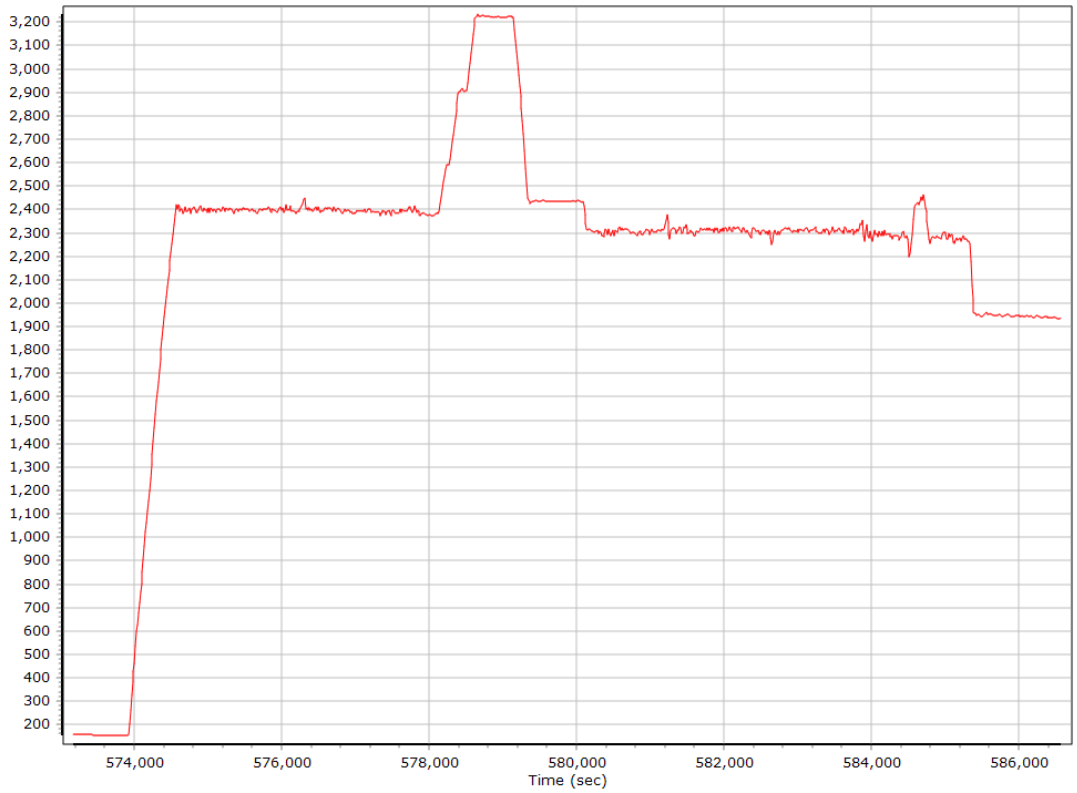

52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
574,000
576,000
578,000
580,000
582,000
584,000
586,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 11 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 36 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 11 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

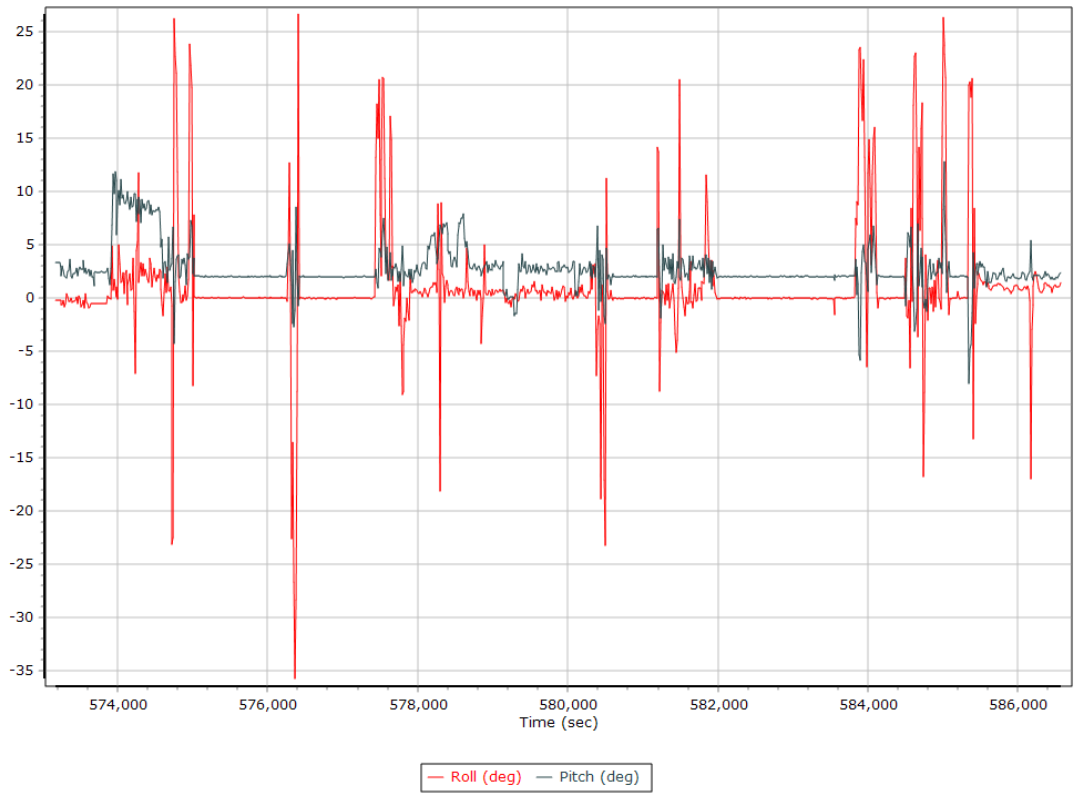
Top View



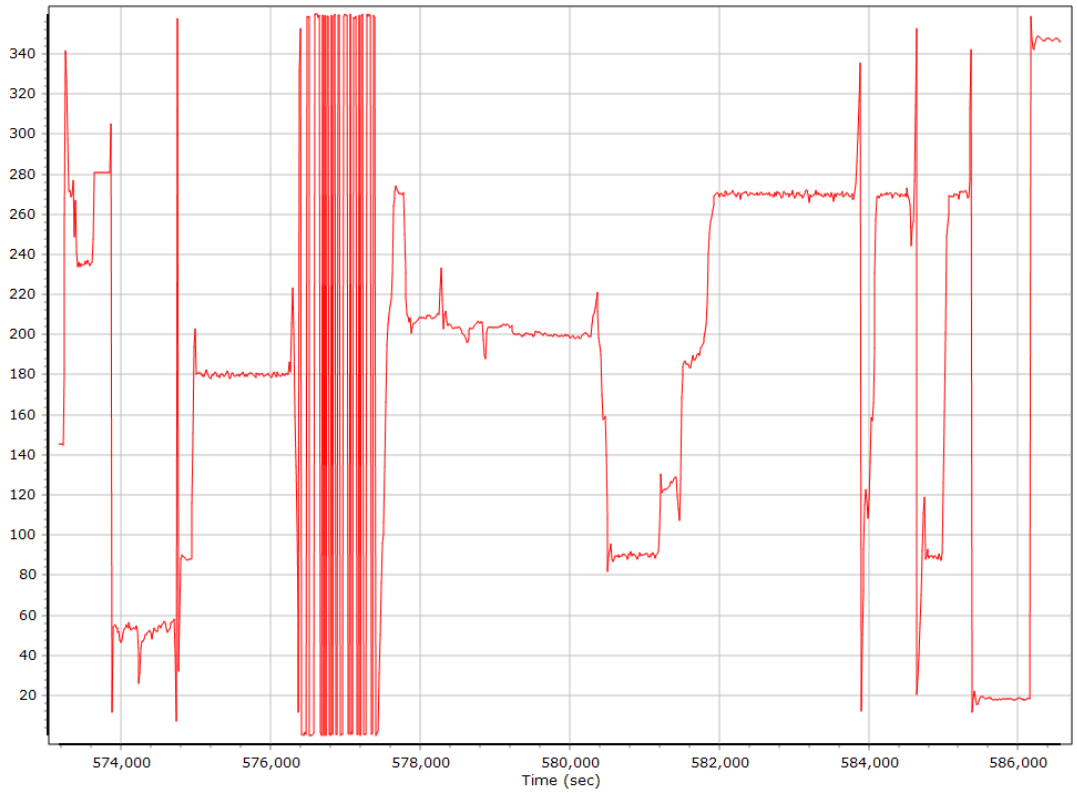
Altitude



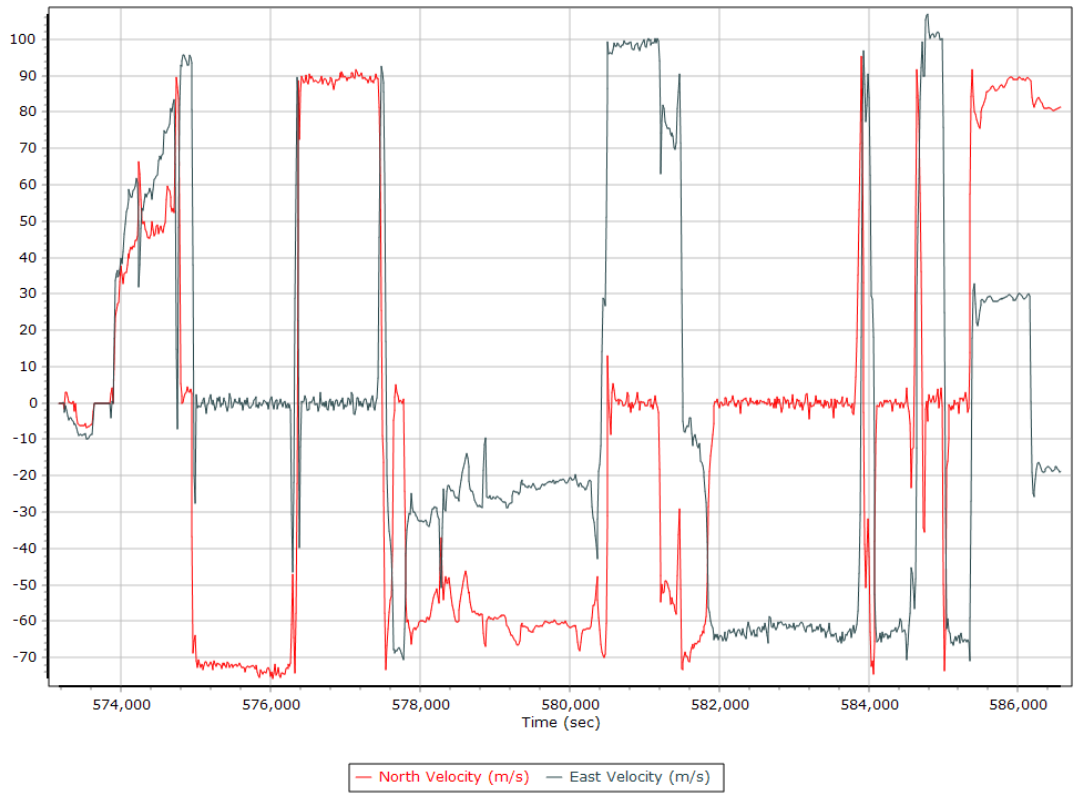
Roll/Pitch



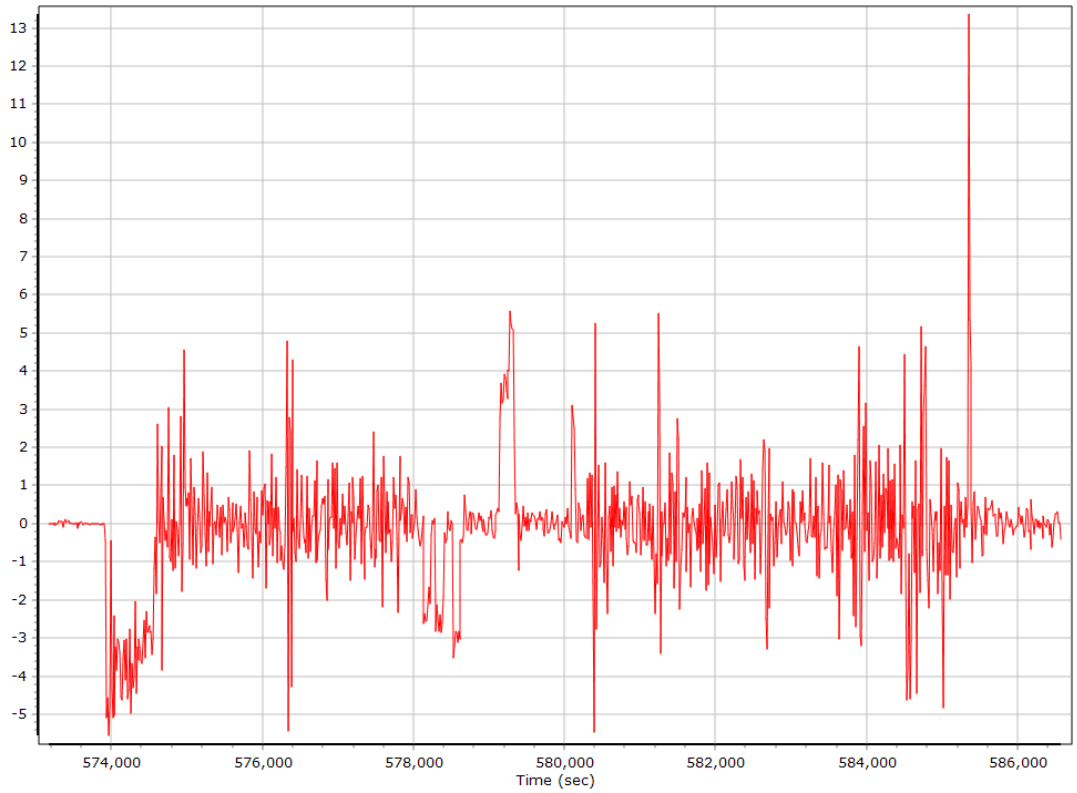
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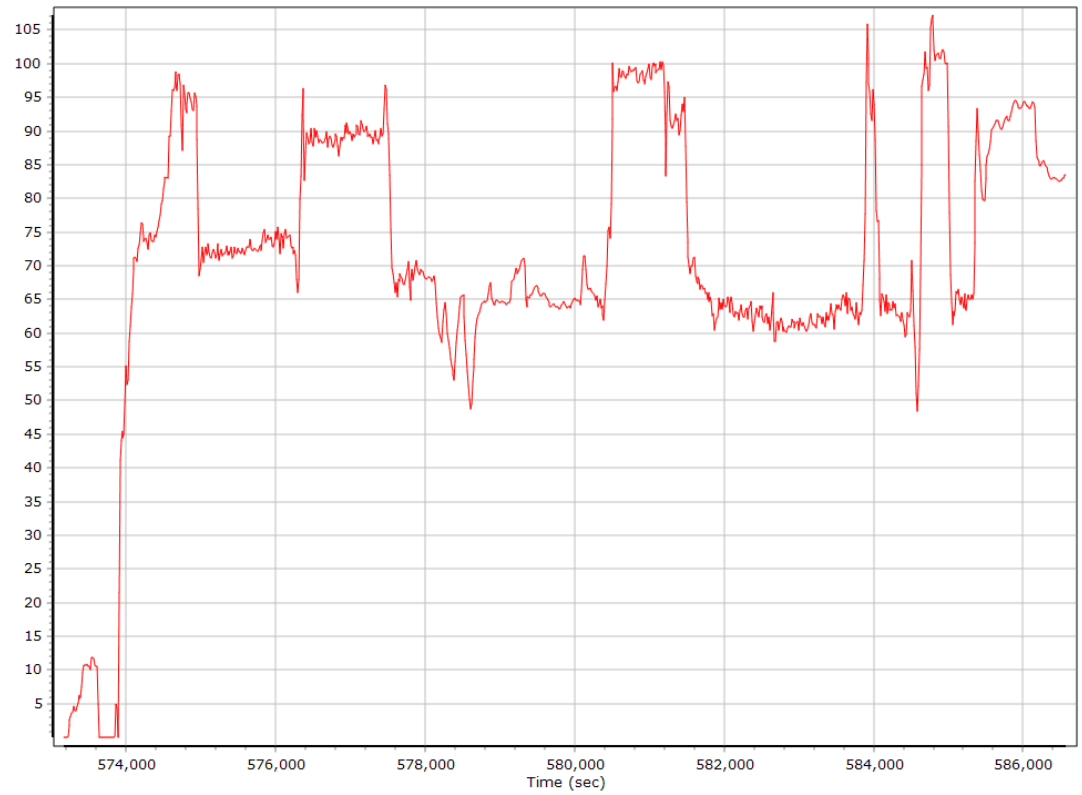
North/East Velocity



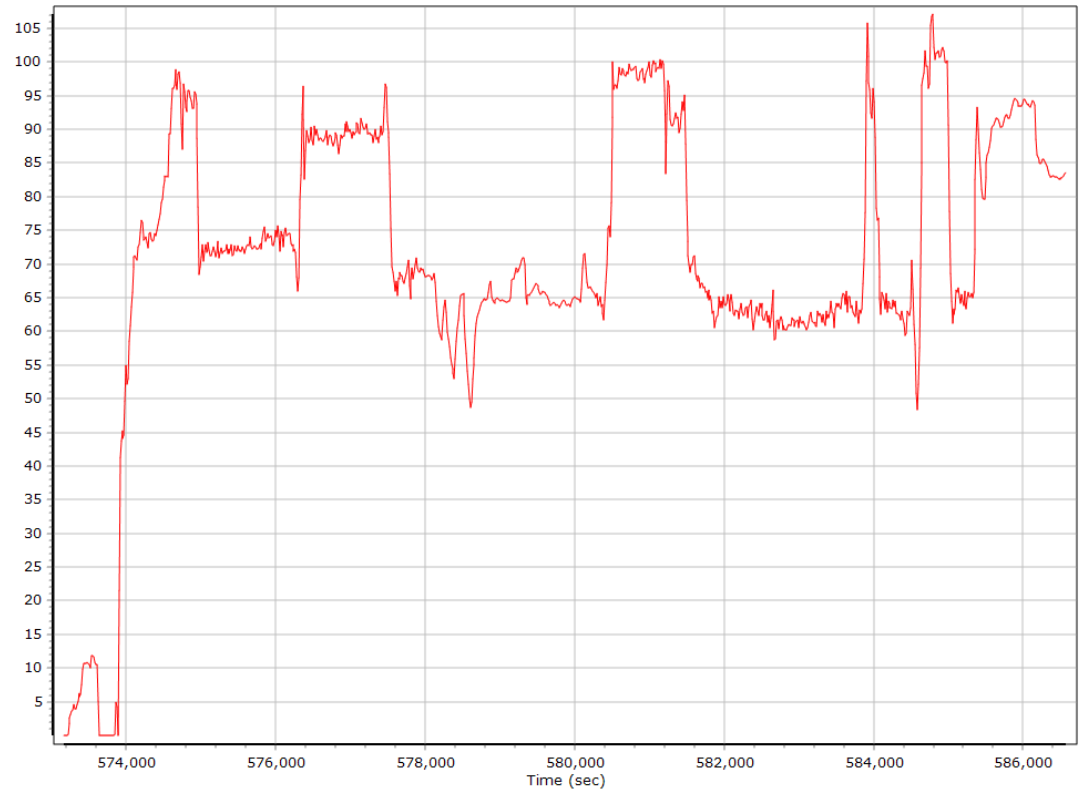
Down Velocity



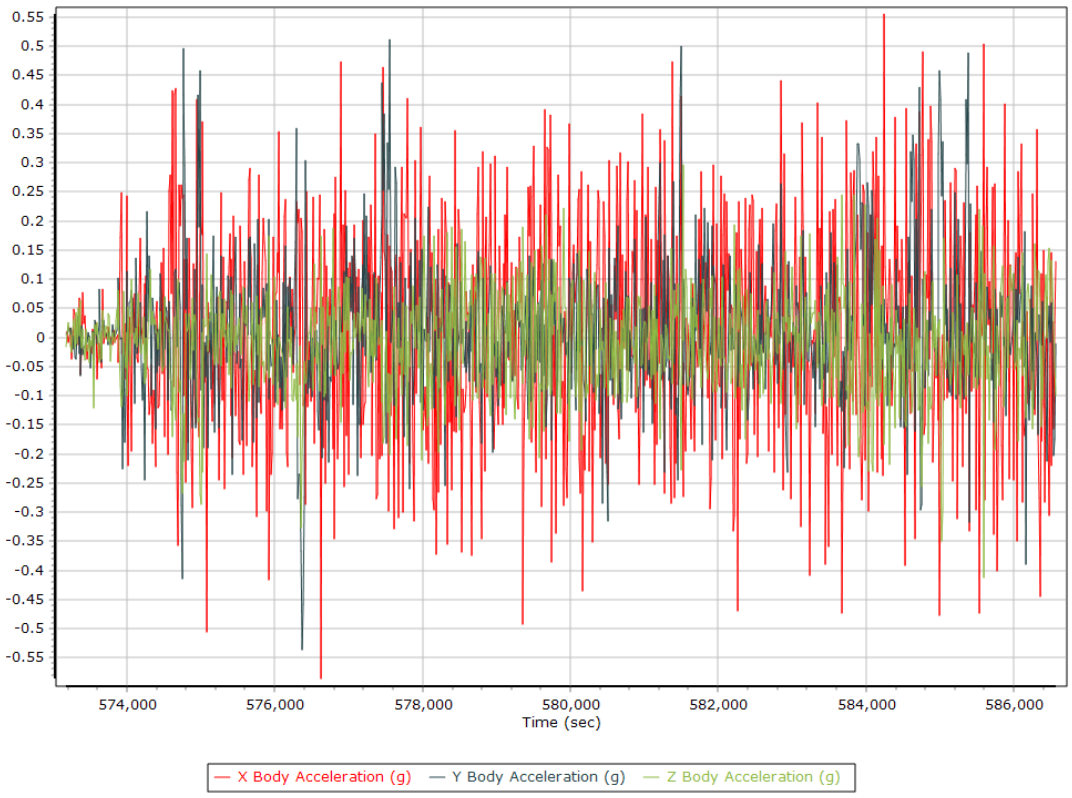
Total Speed



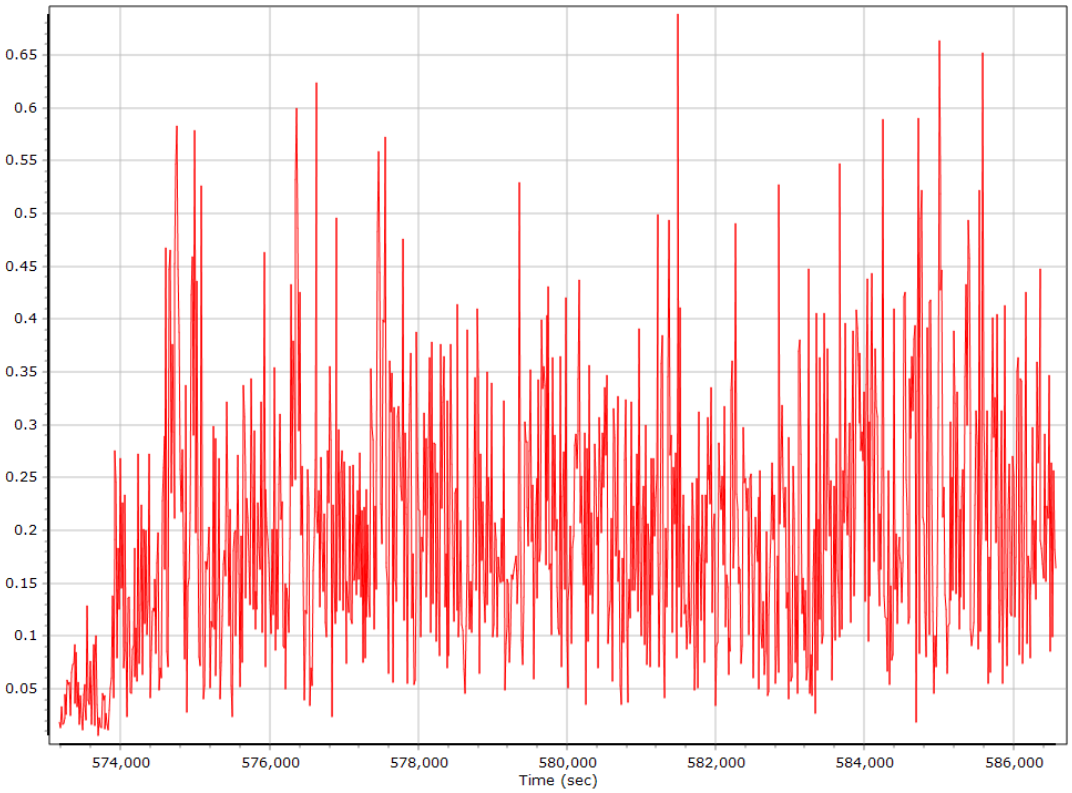
Ground Speed



Body Acceleration



Total Body Acceleration

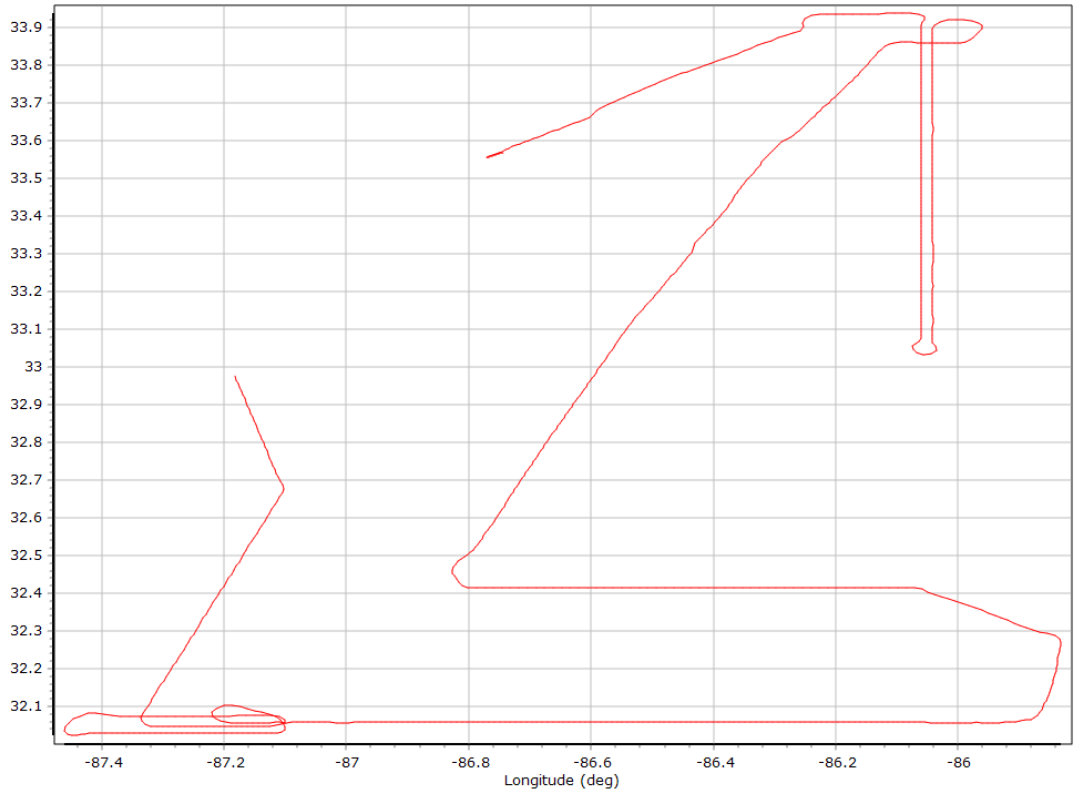


Body Angular Rate

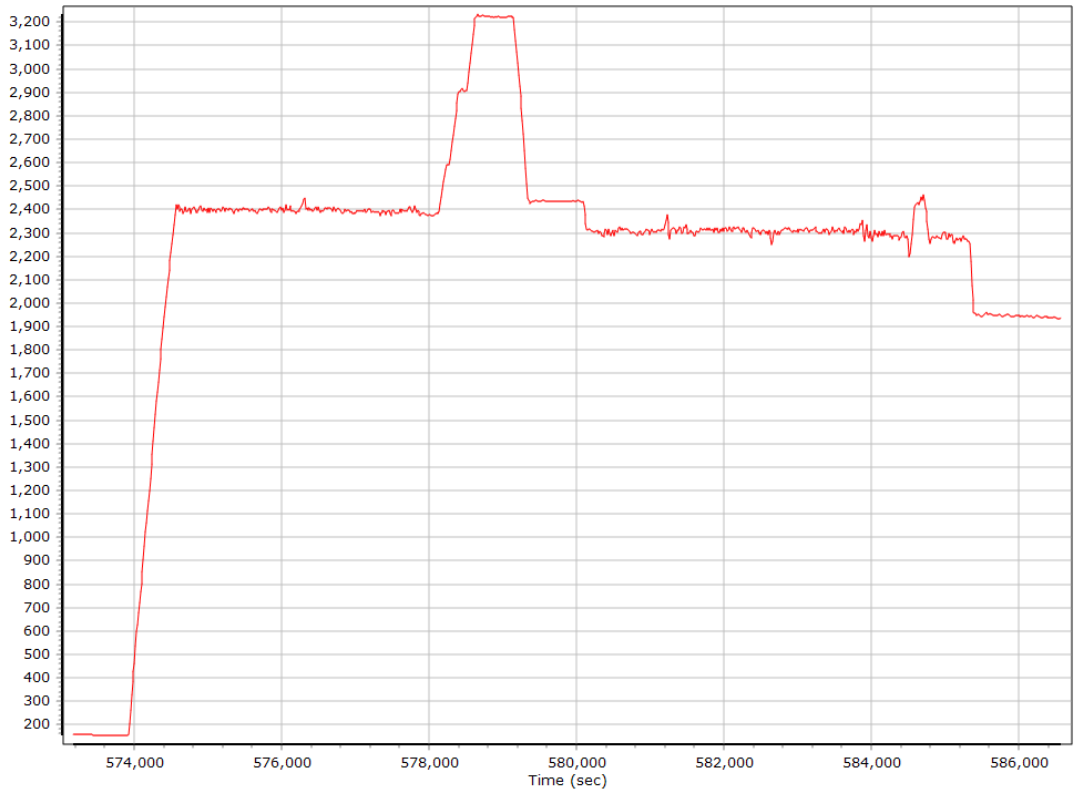


Forward Processed Trajectory Information

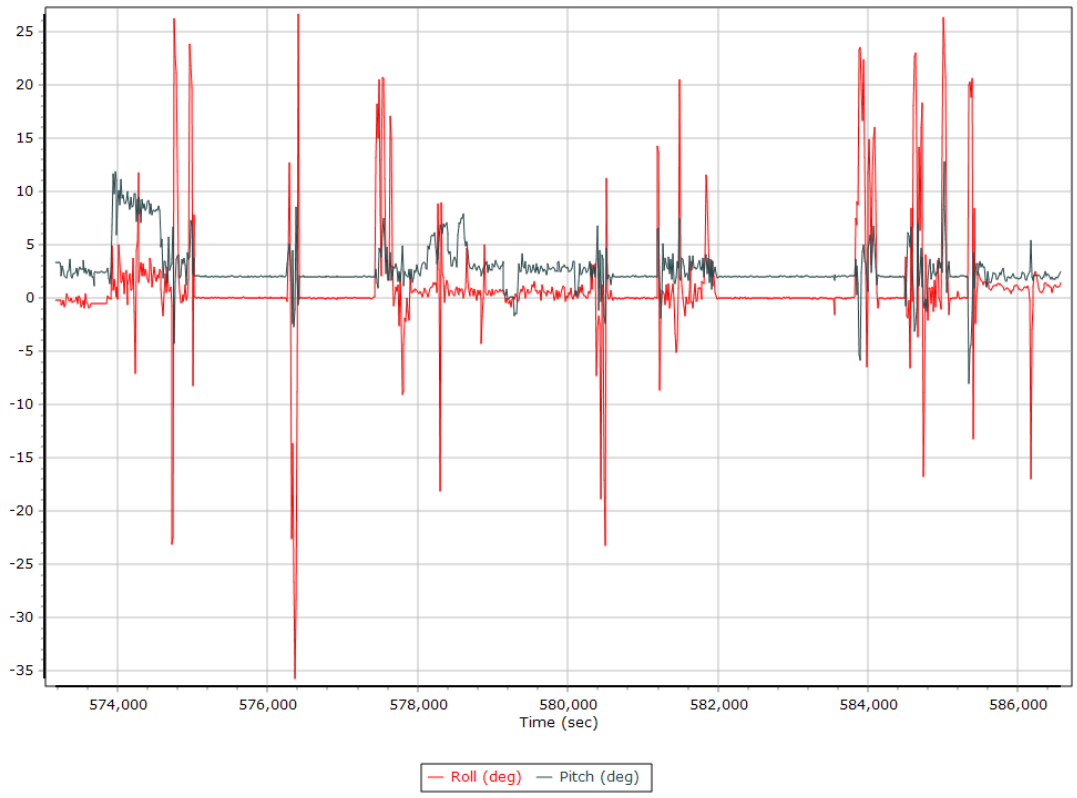
Top View



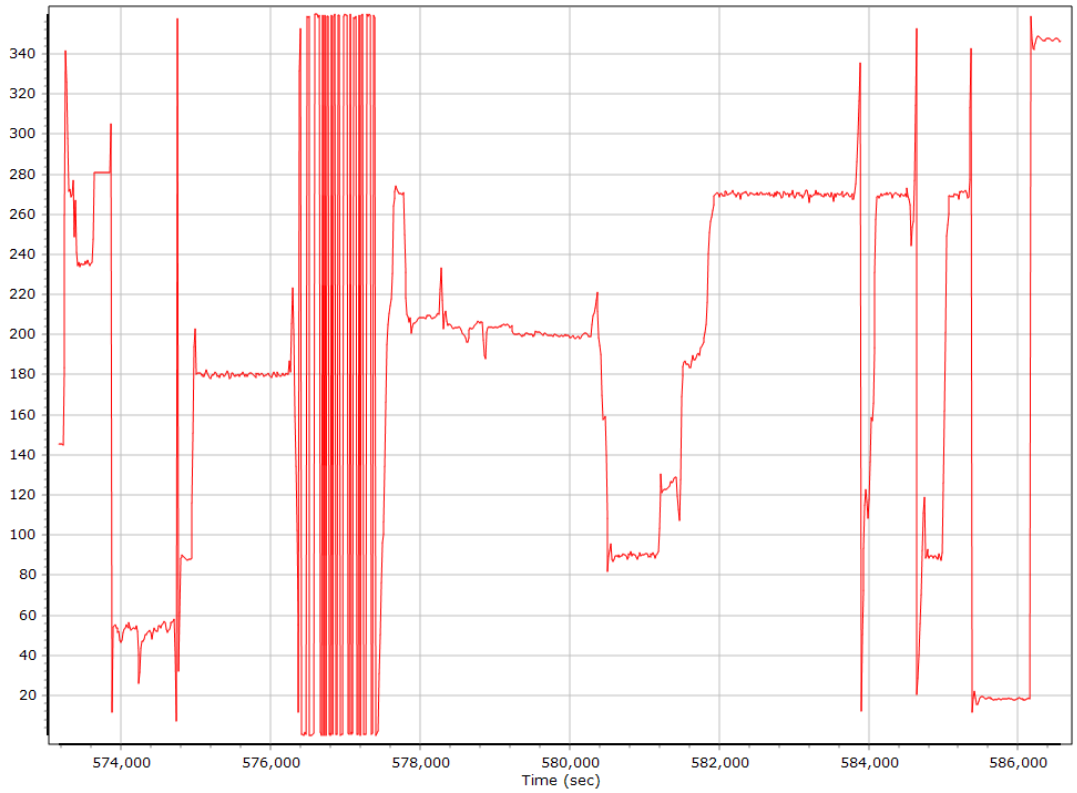
Altitude



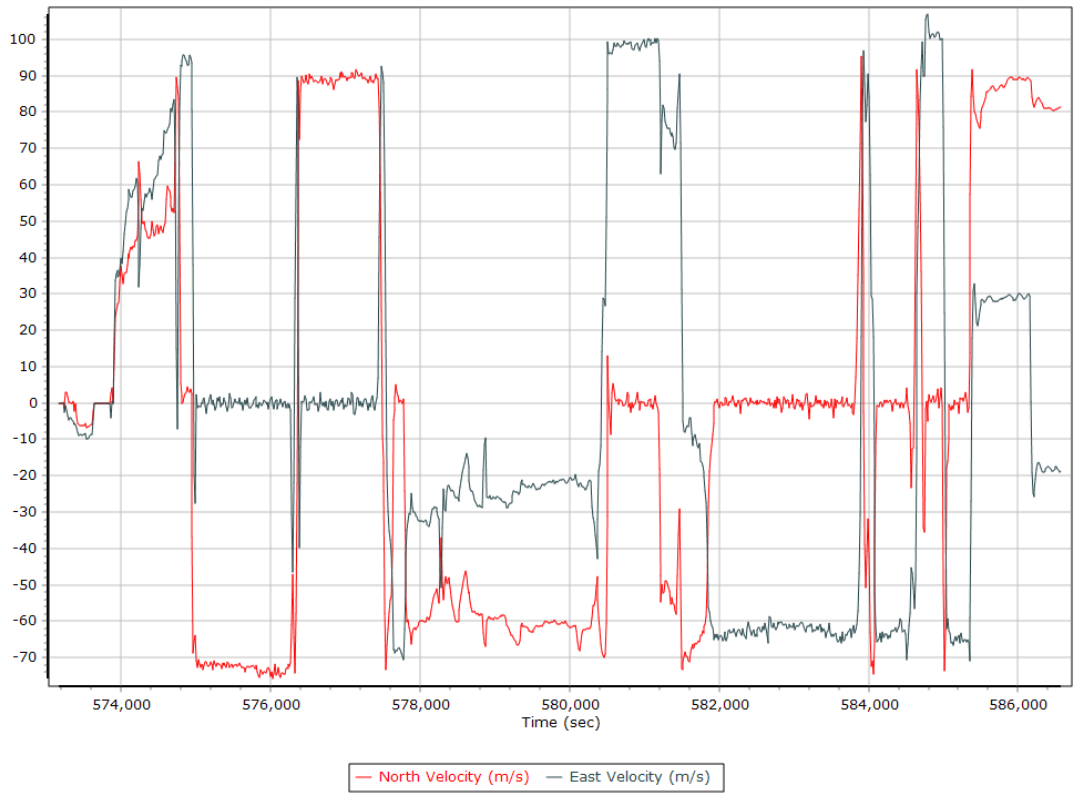
Roll/Pitch



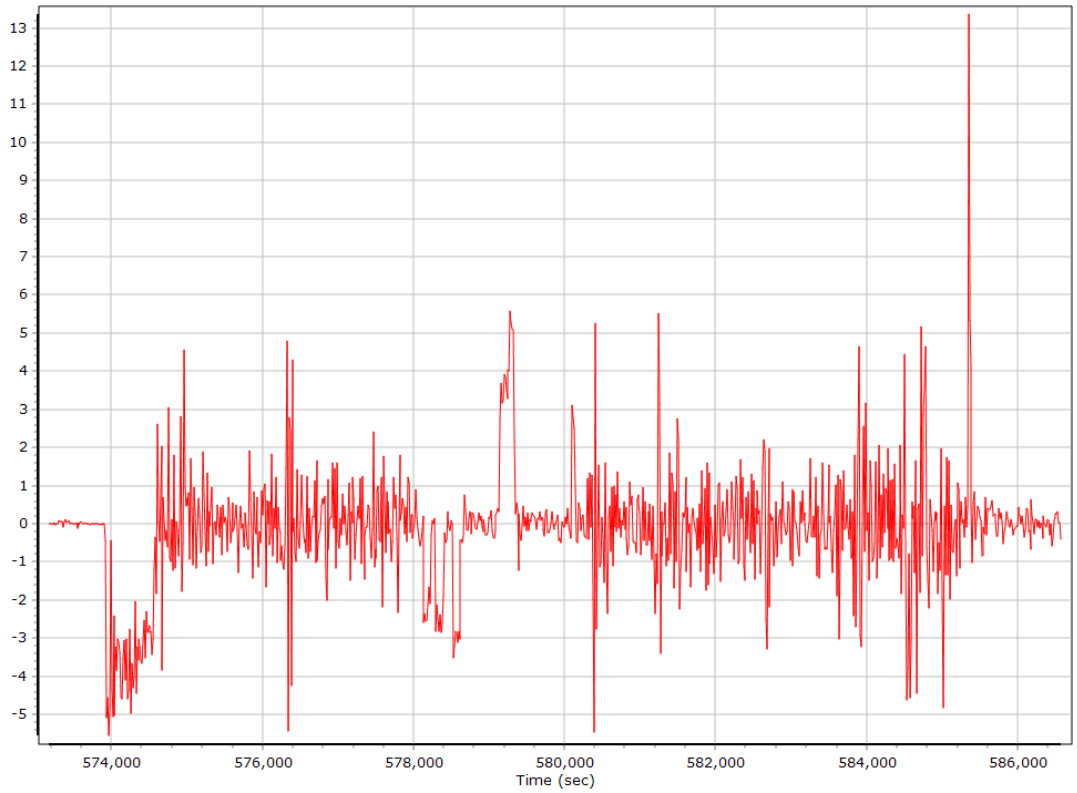
Heading



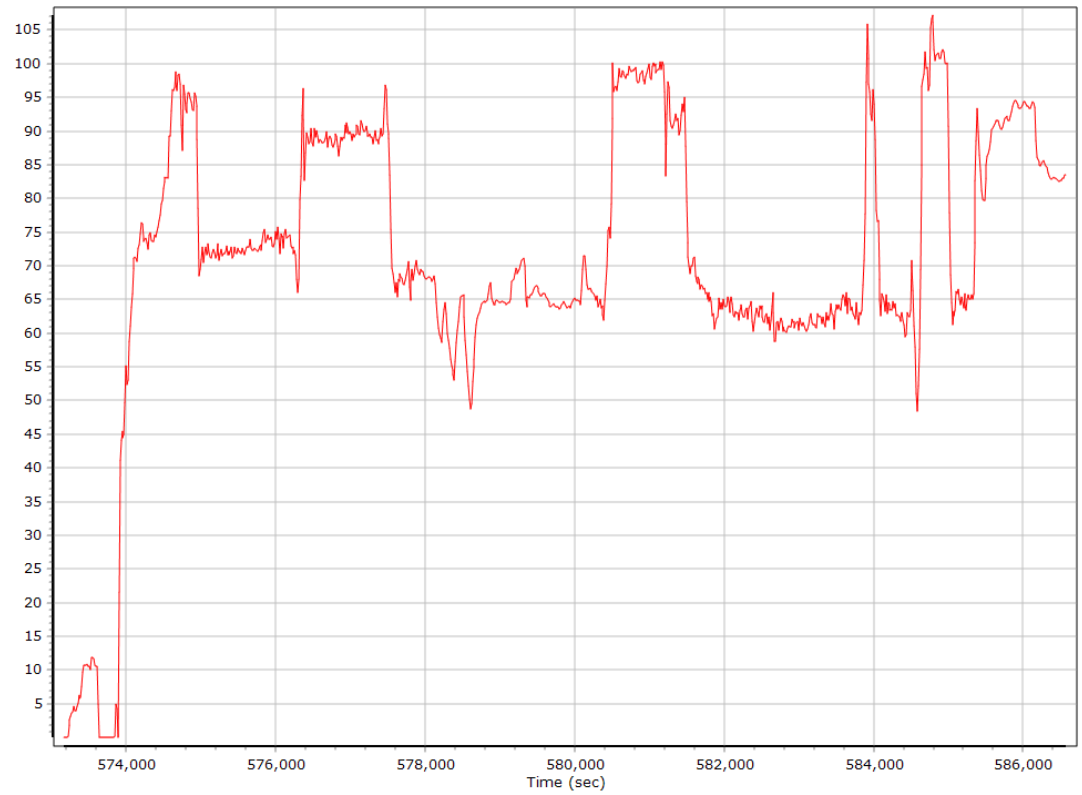
North/East Velocity



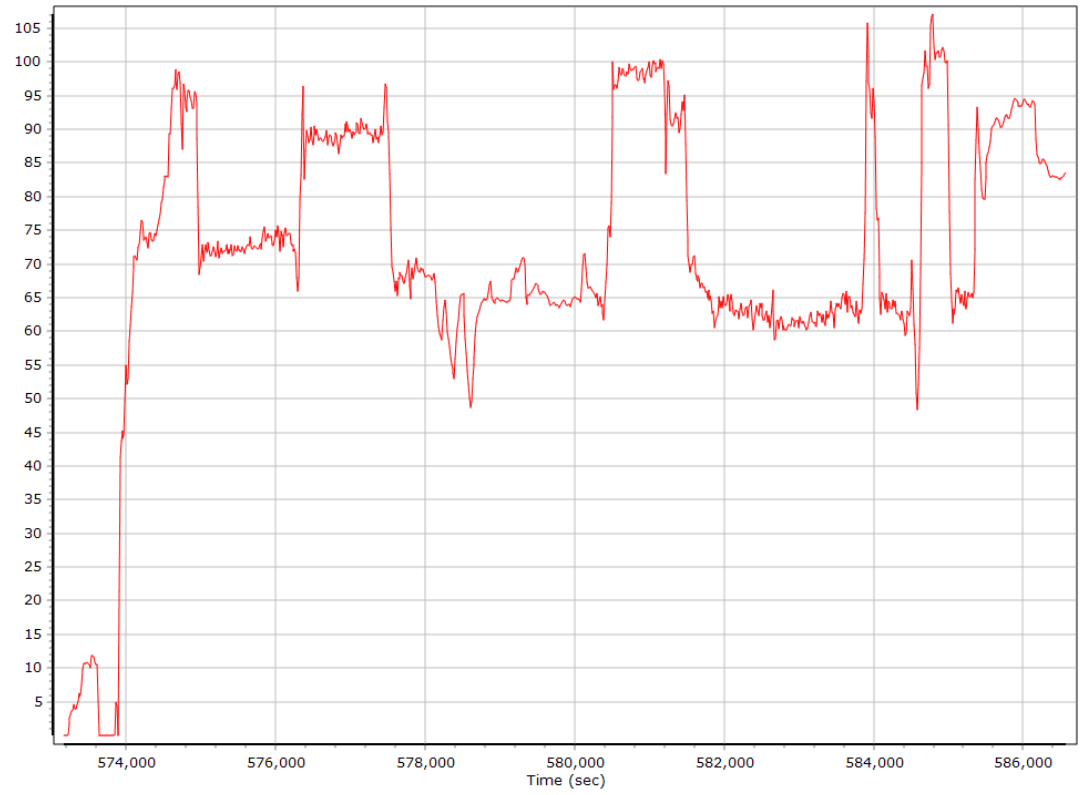
Down Velocity



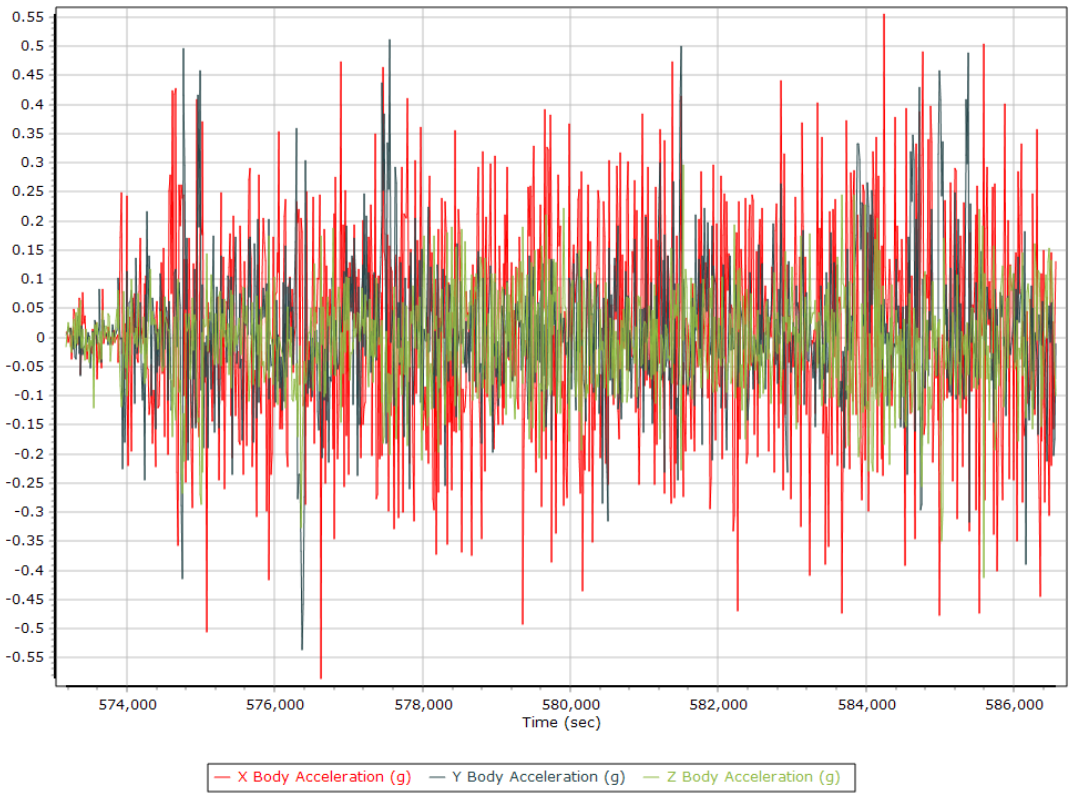
Total Speed



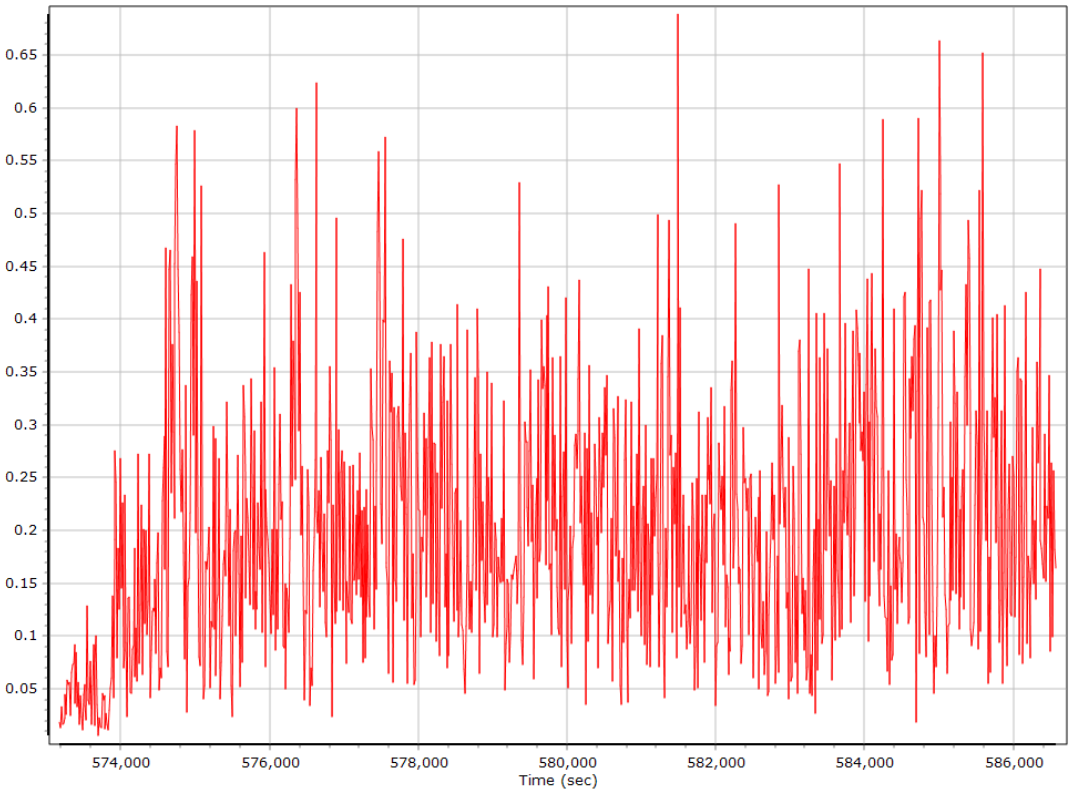
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

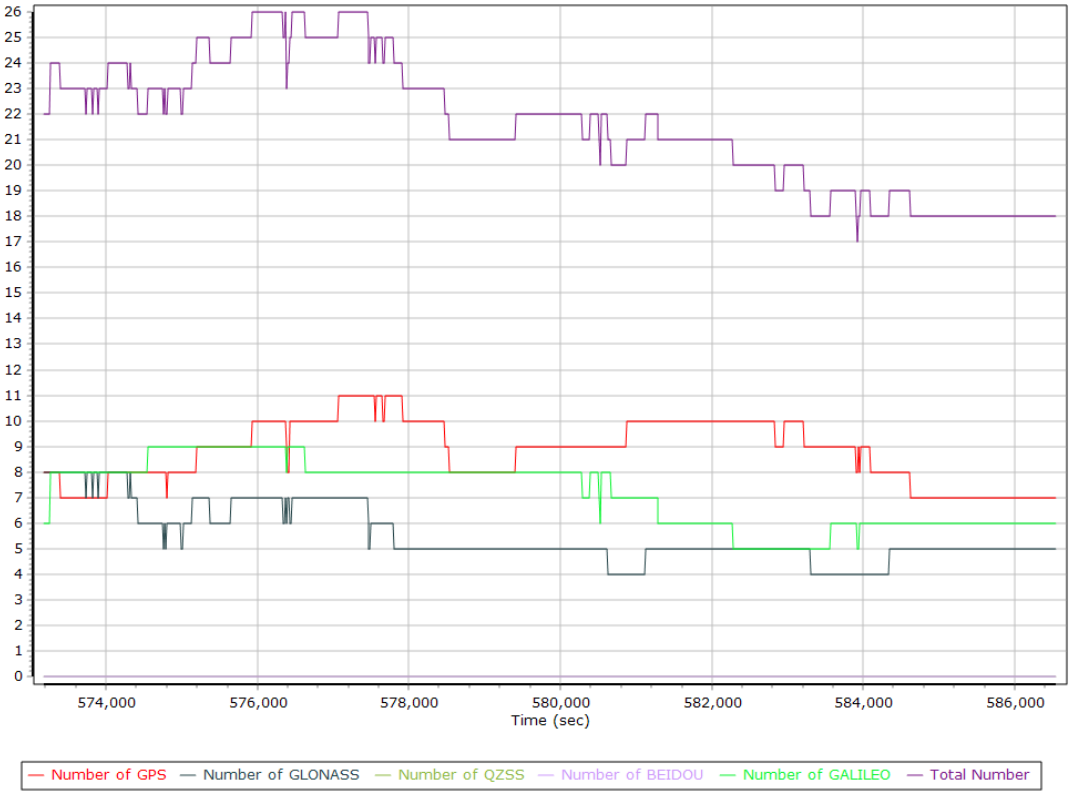


GNSS QC

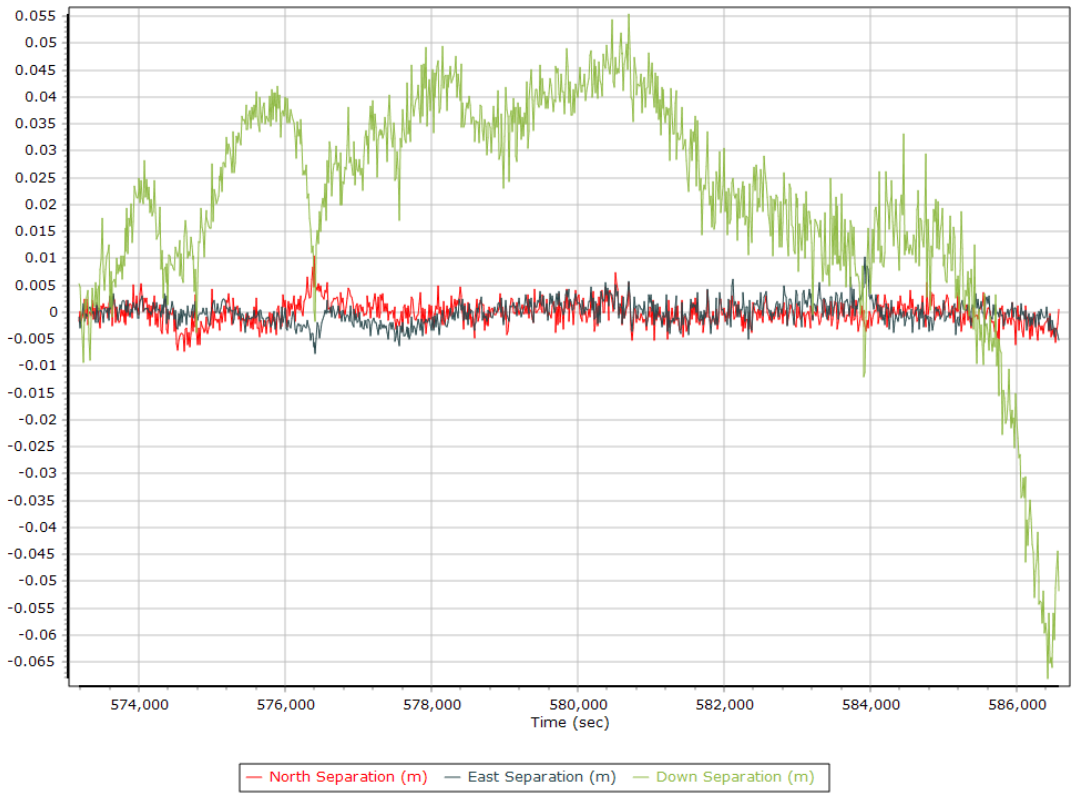
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	7	11	9
Number of GLONASS SV	0	8	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	9	7
Total number of SV	16	26	22
PDOP	0.99	1.49	1.18
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	13762.00	0.00	0.00
Percentage	100.00	0.00	0.00

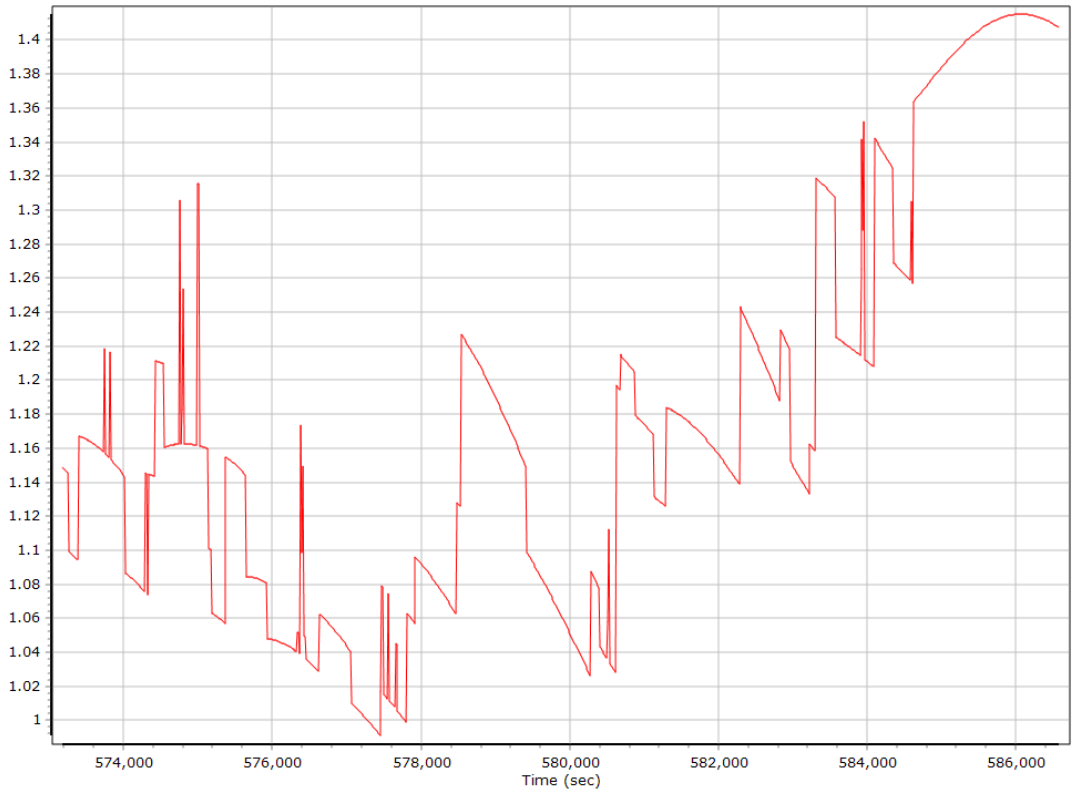
Num SVs in solution



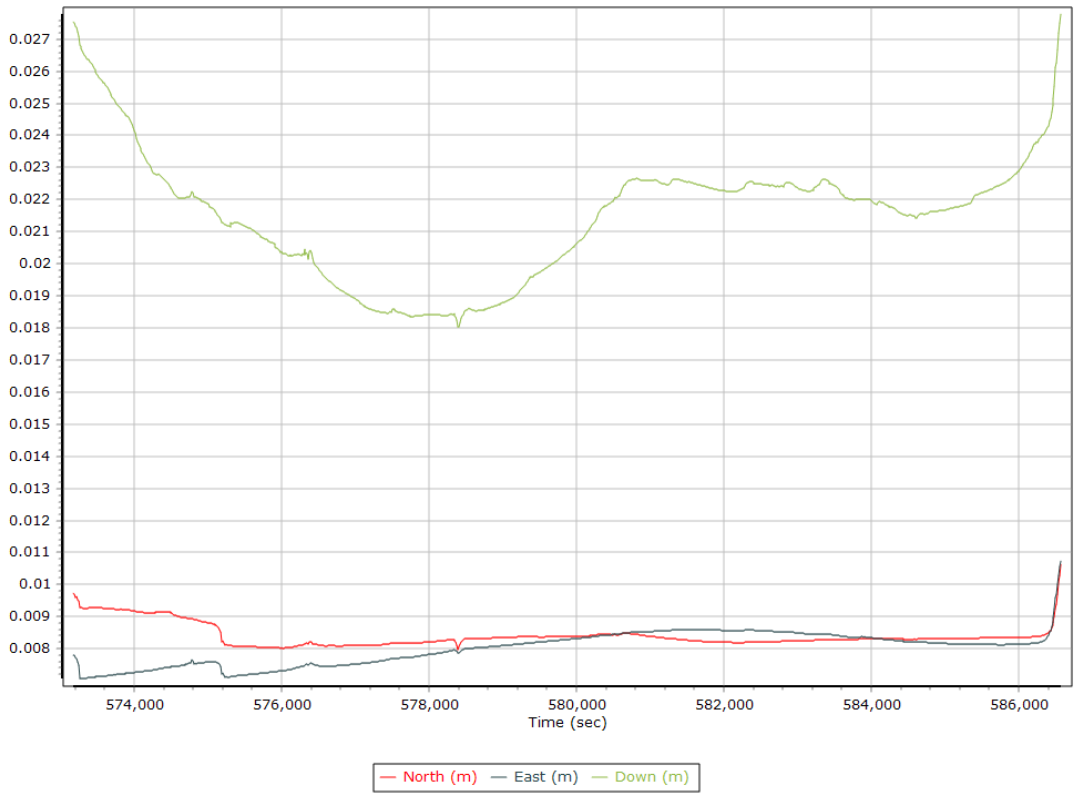
Forward/Reverse Separation



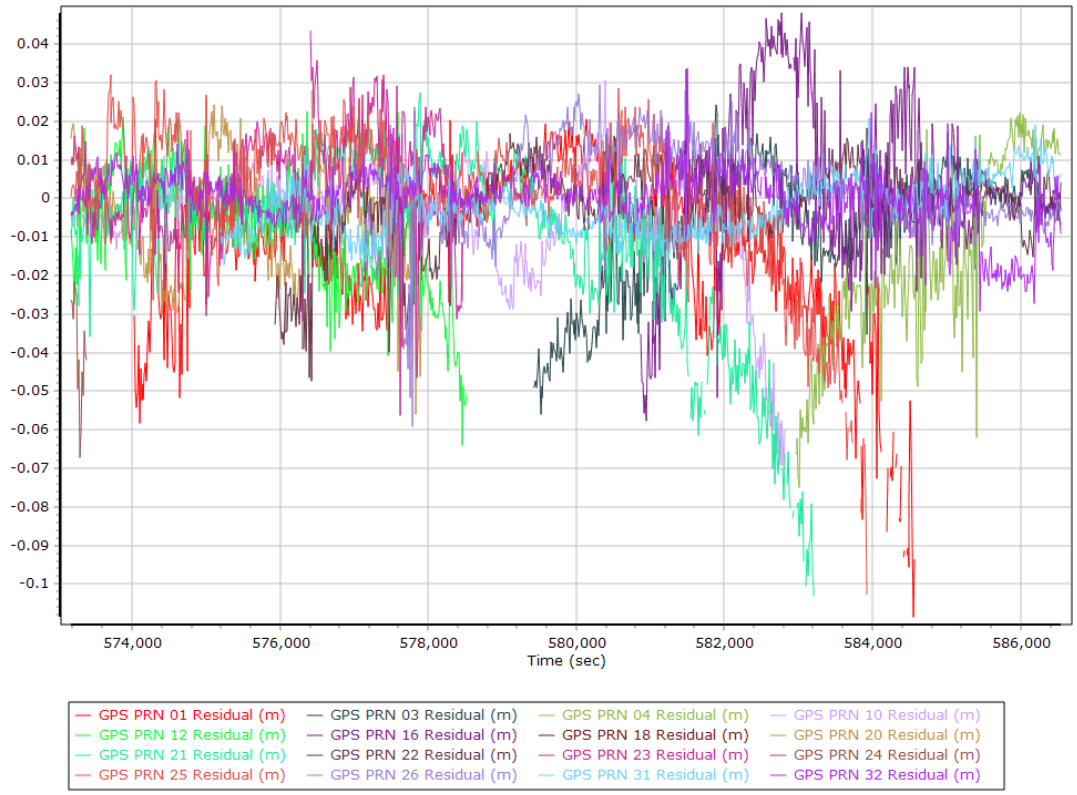
PDOP



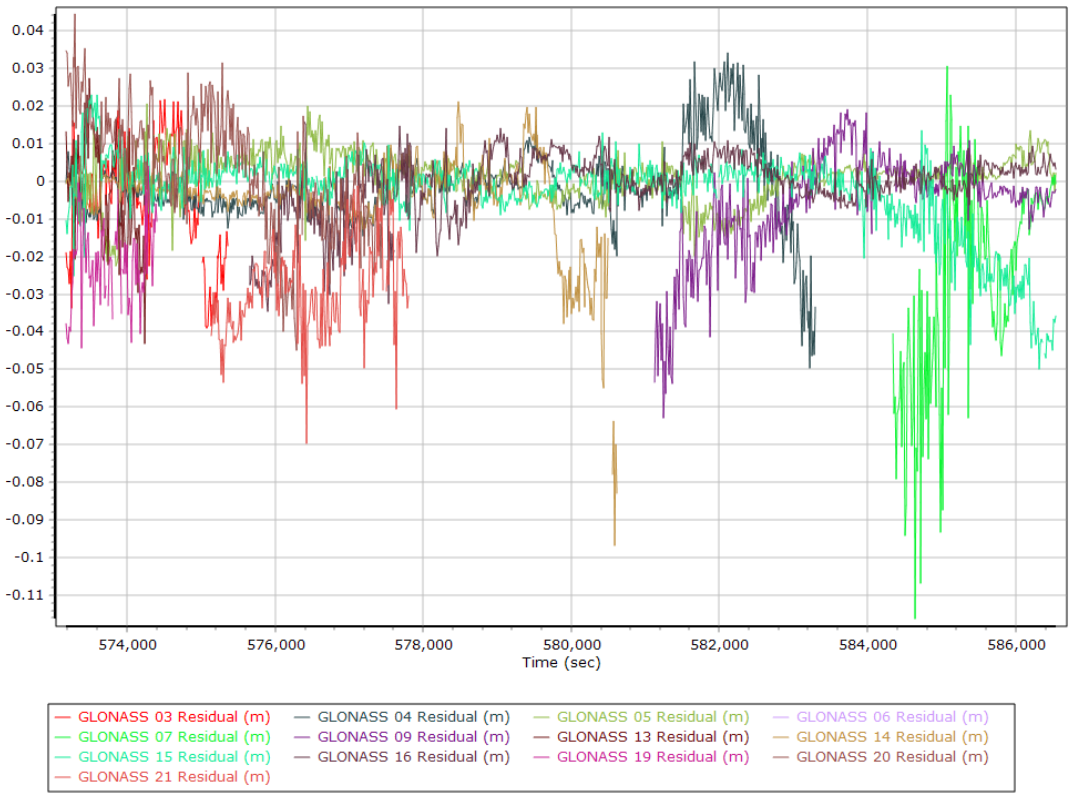
Estimated Position Accuracy



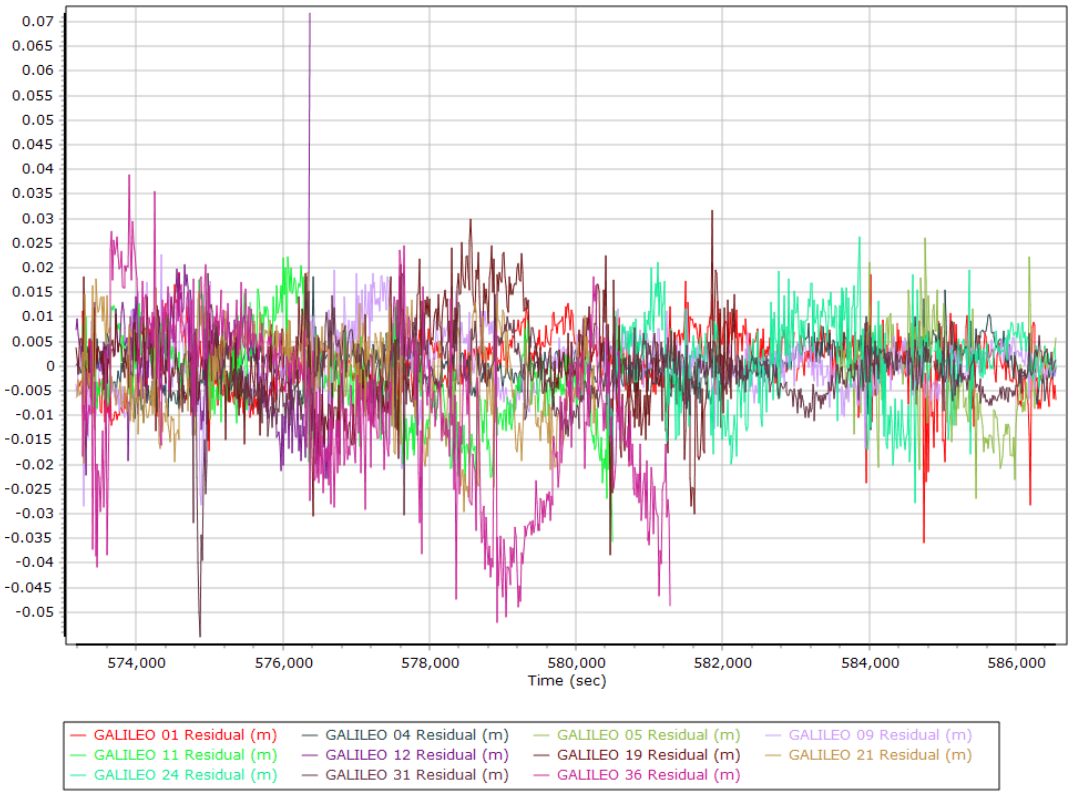
GPS Residuals



GLONASS Residuals



GALILEO Residuals



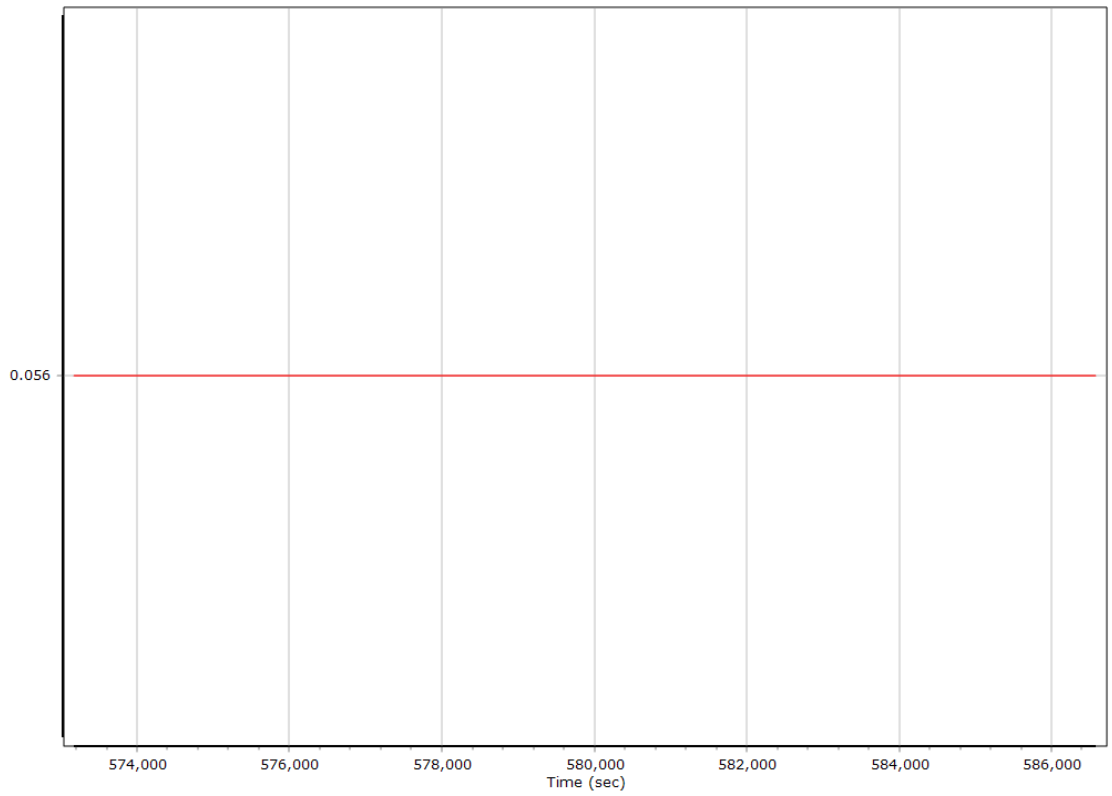
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	572765.000 (1/2/2021 3:06:05 PM)		
Processing end time	586580.000 (1/2/2021 6:56:20 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

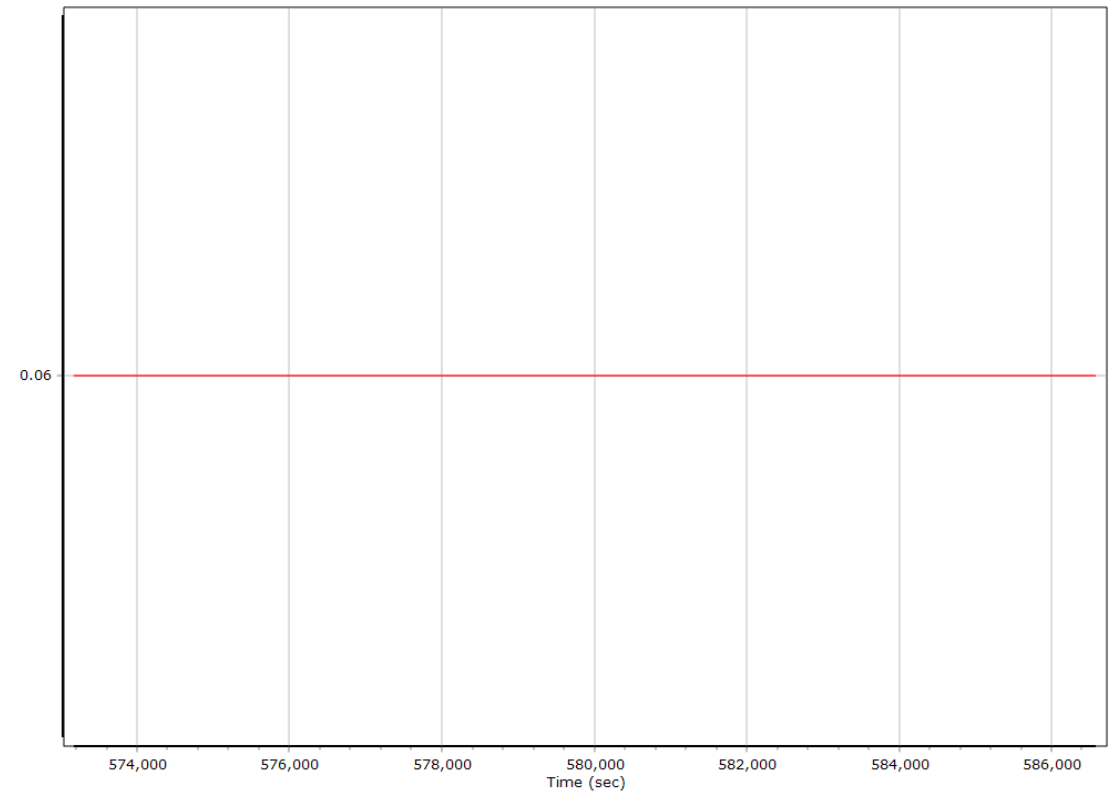
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

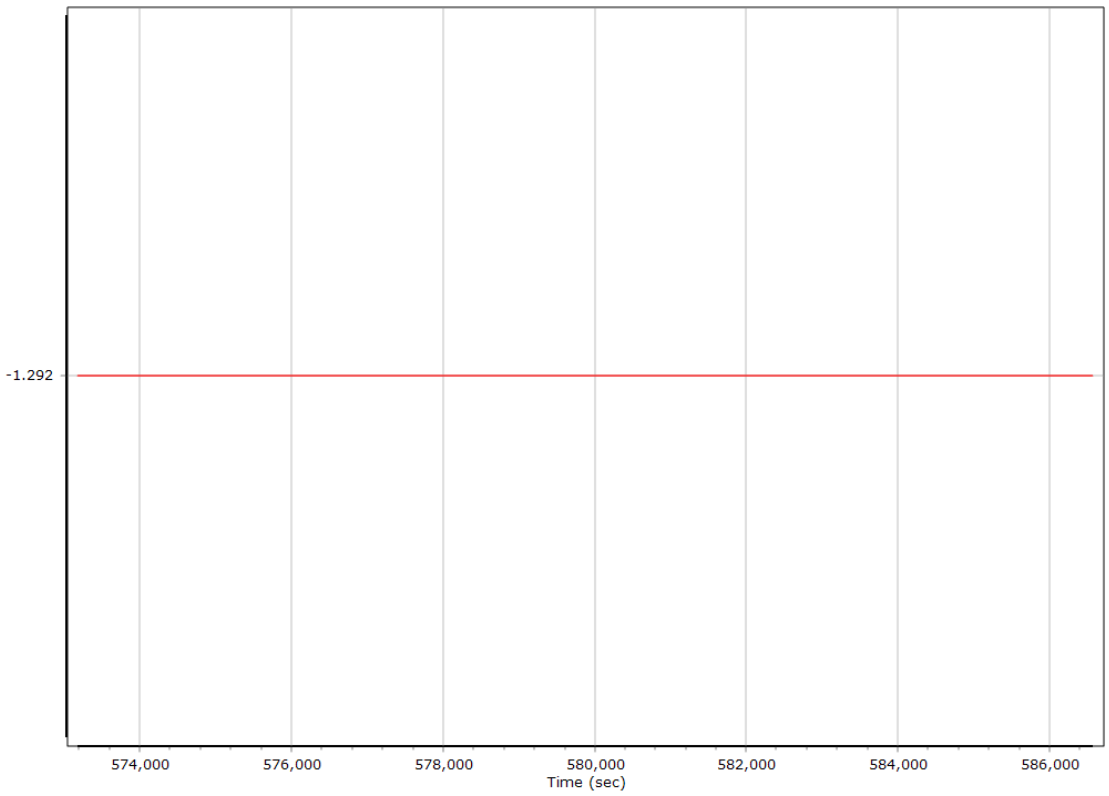
X Reference-Primary GNSS Lever Arm (m)



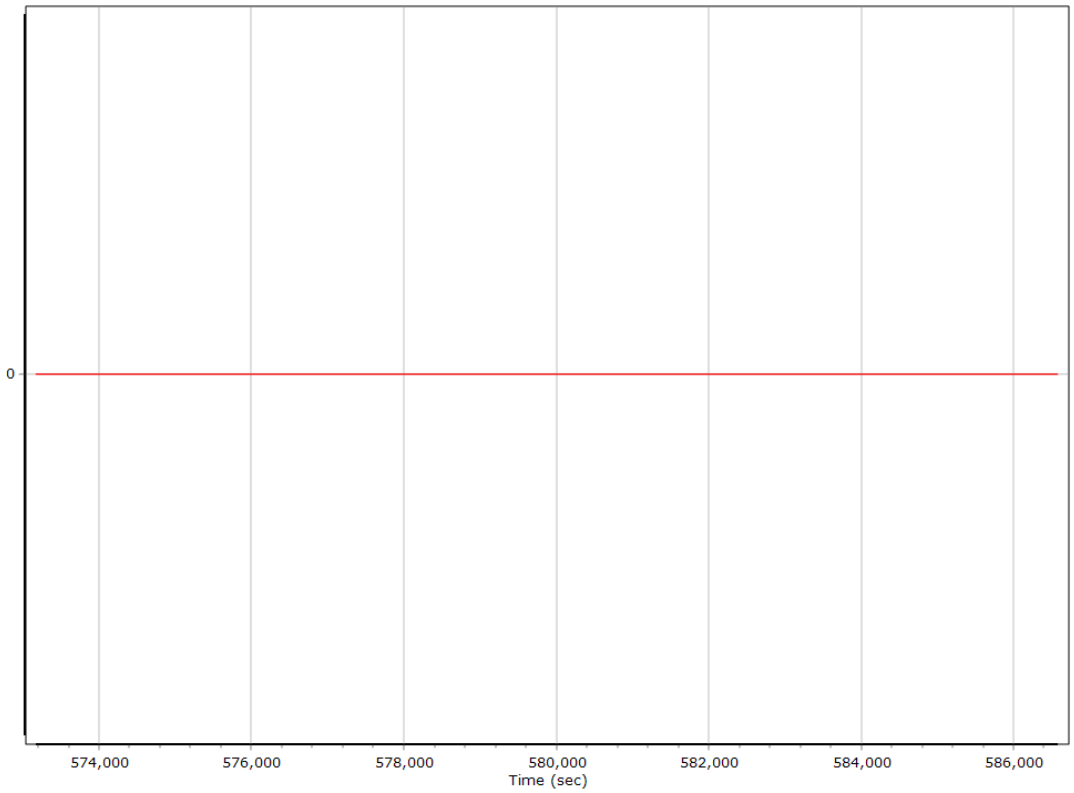
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



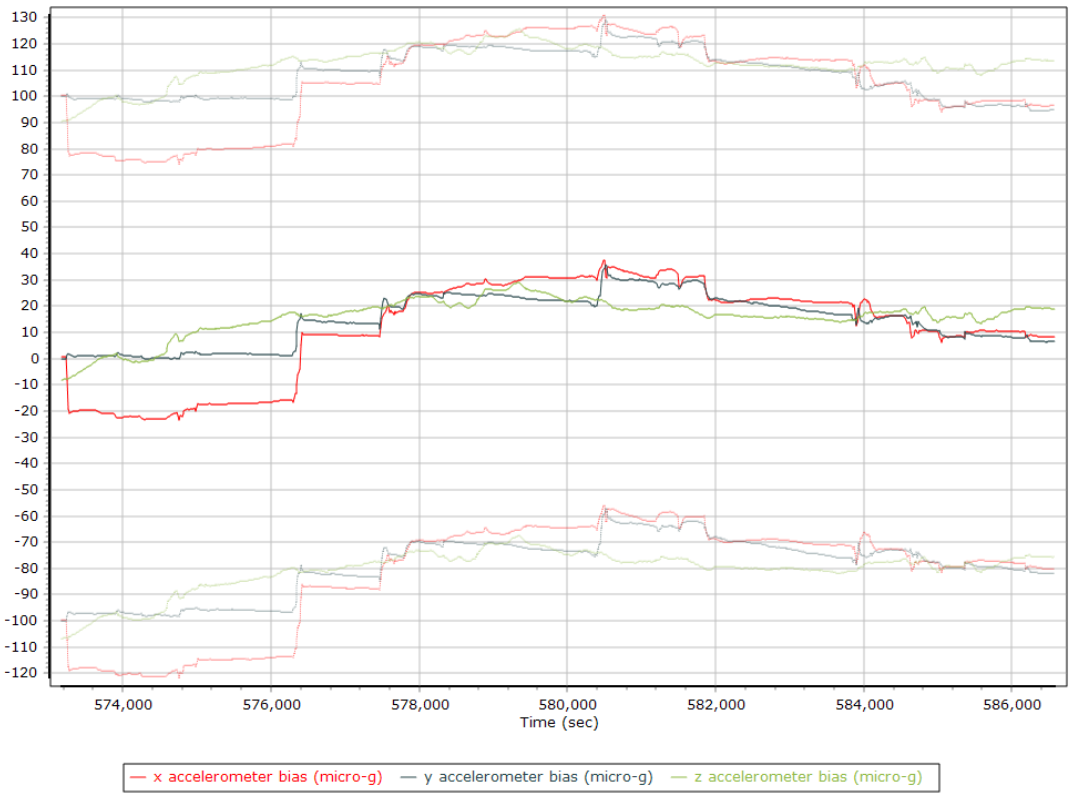
Reference-Primary GNSS Lever Arm Figure of Merit



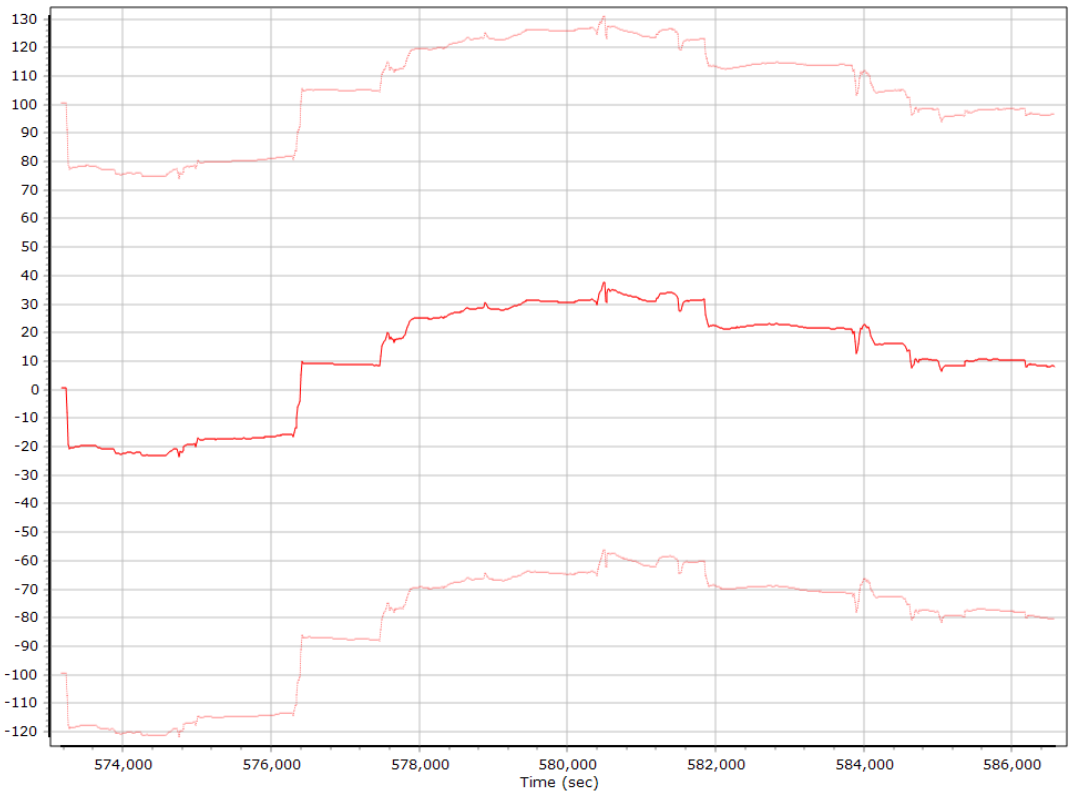
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

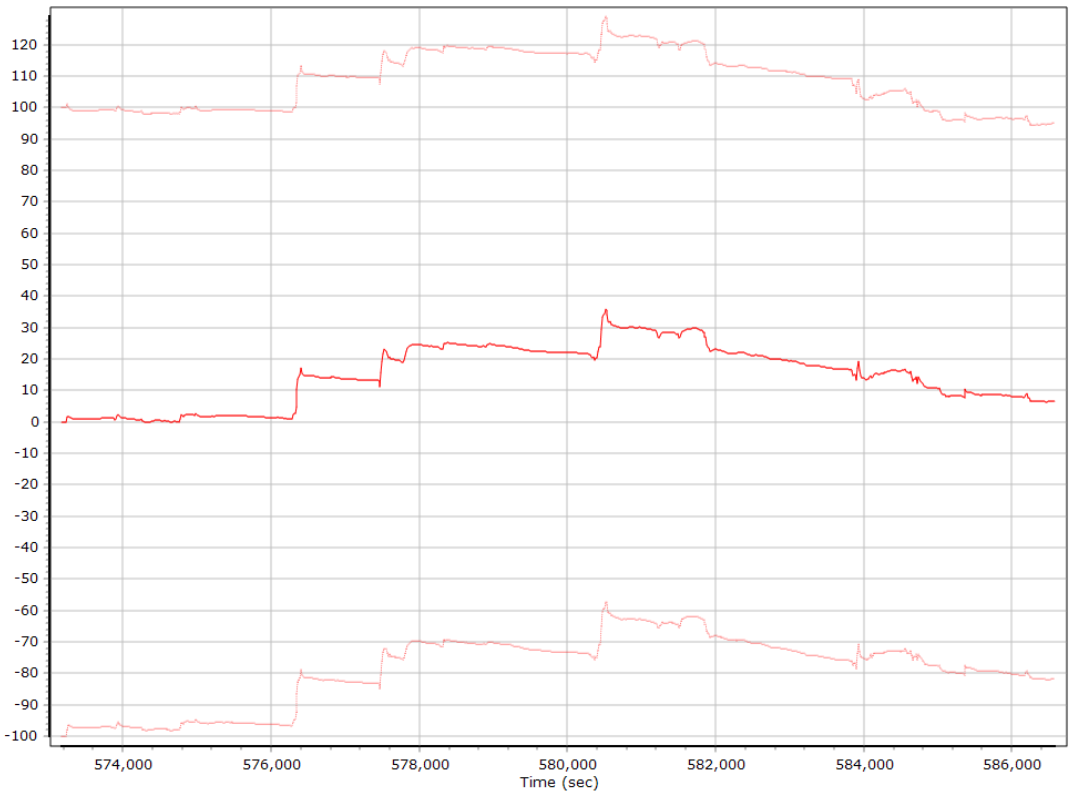
Accelerometer Bias (micro-g)



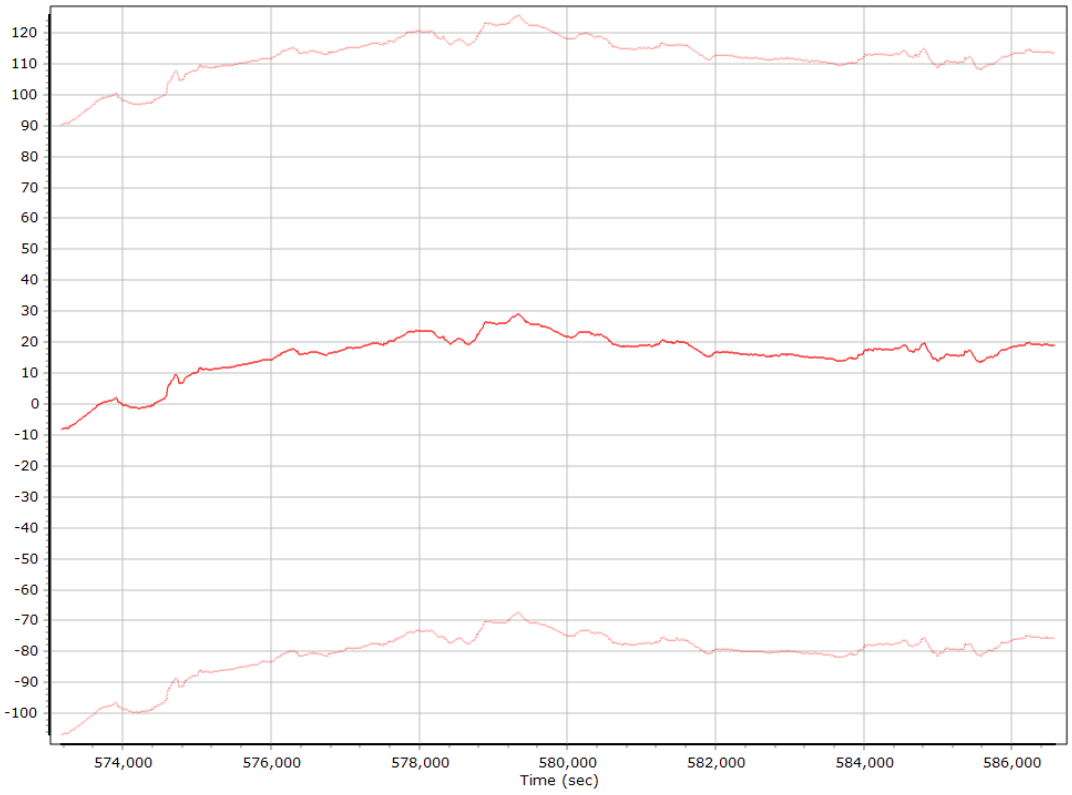
X Accelerometer Bias (micro-g)



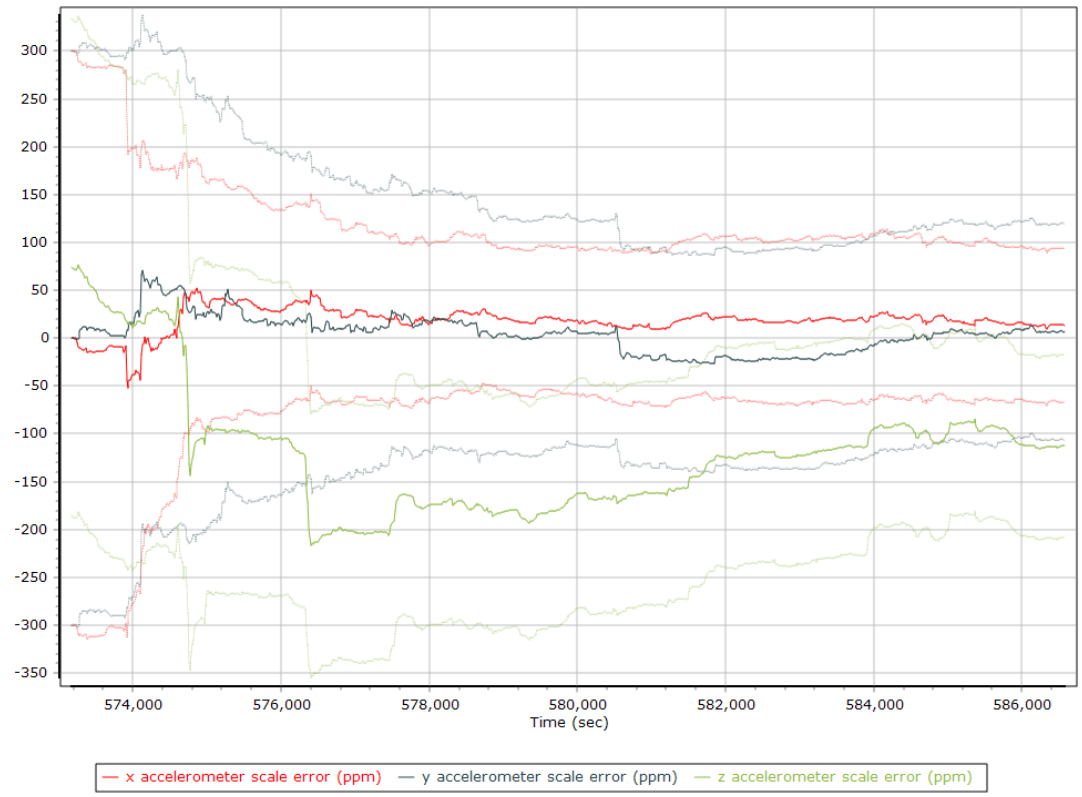
Y Accelerometer Bias (micro-g)



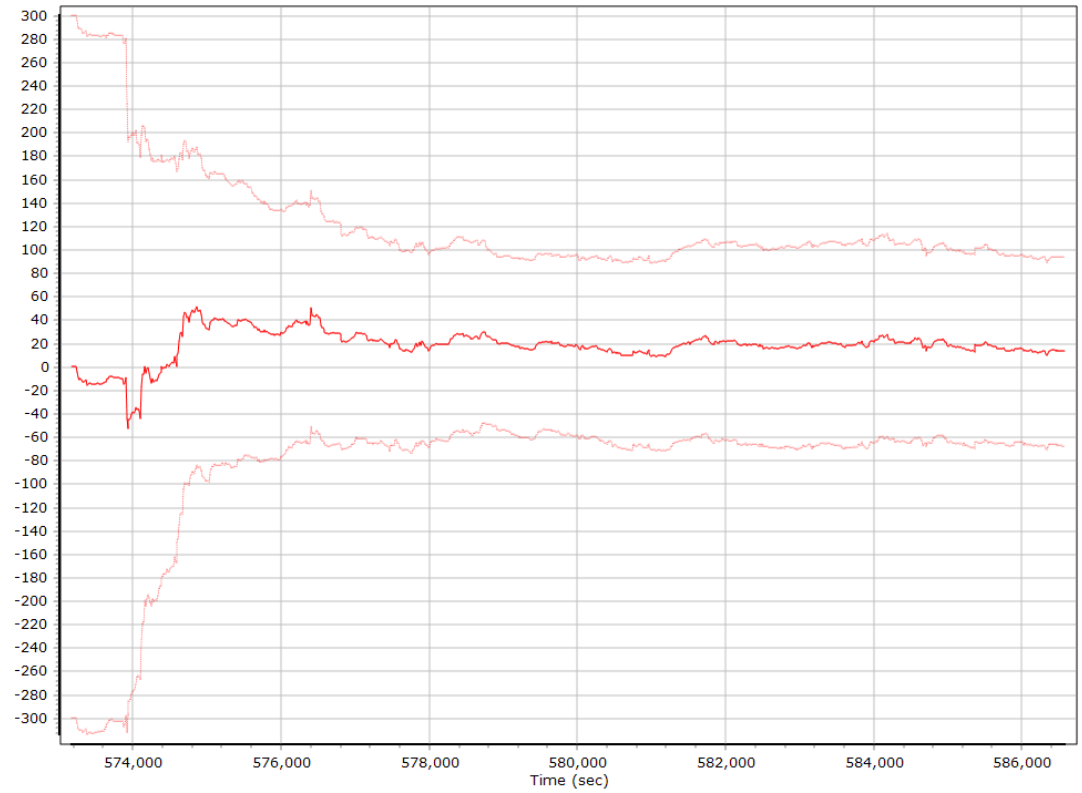
Z Accelerometer Bias (micro-g)



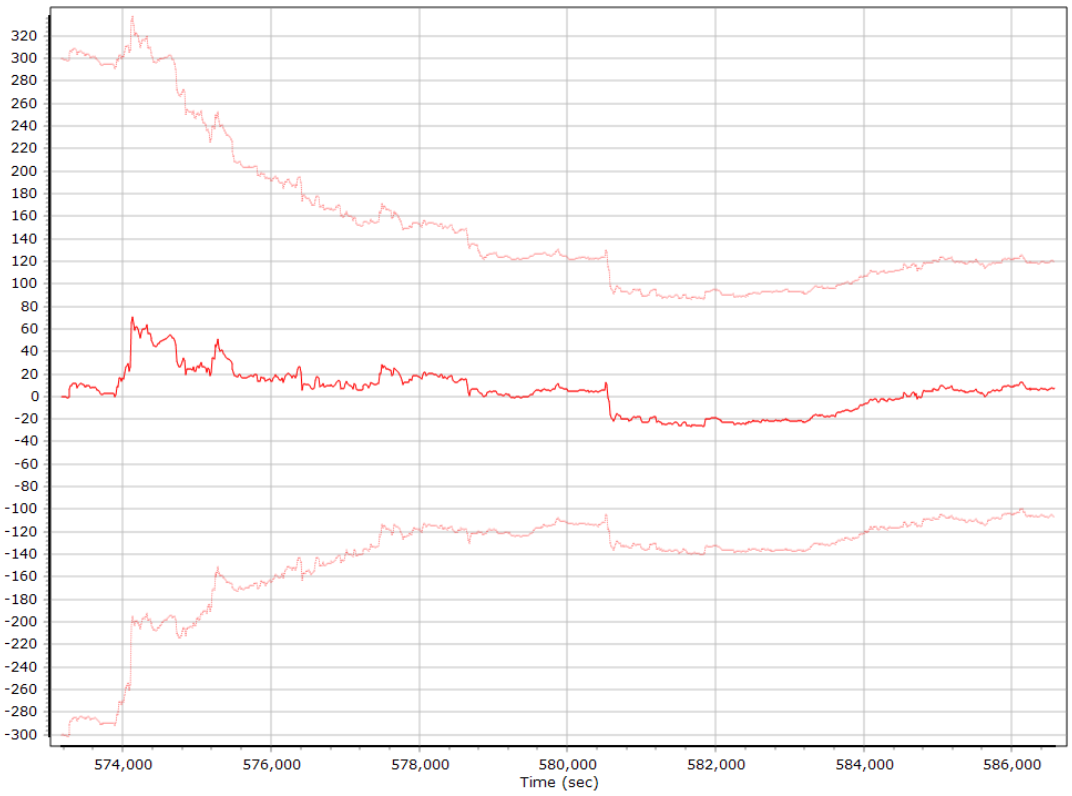
Accelerometer Scale Error (ppm)



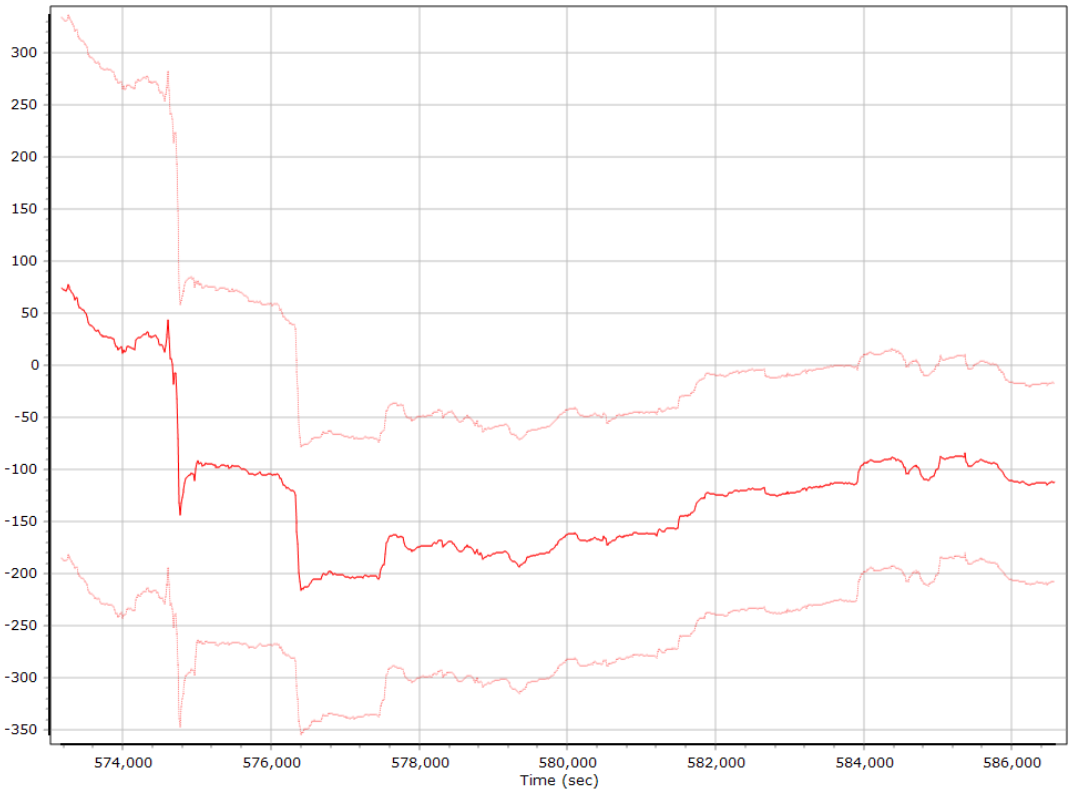
X Accelerometer Scale Error (ppm)



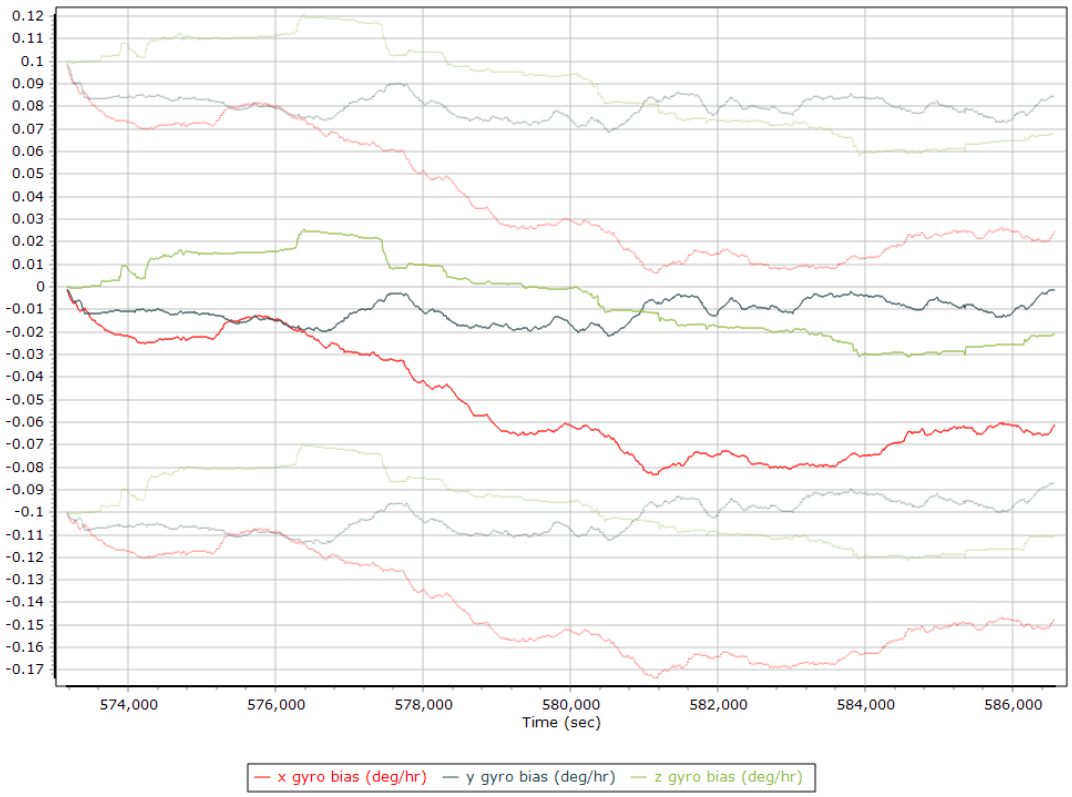
Y Accelerometer Scale Error (ppm)



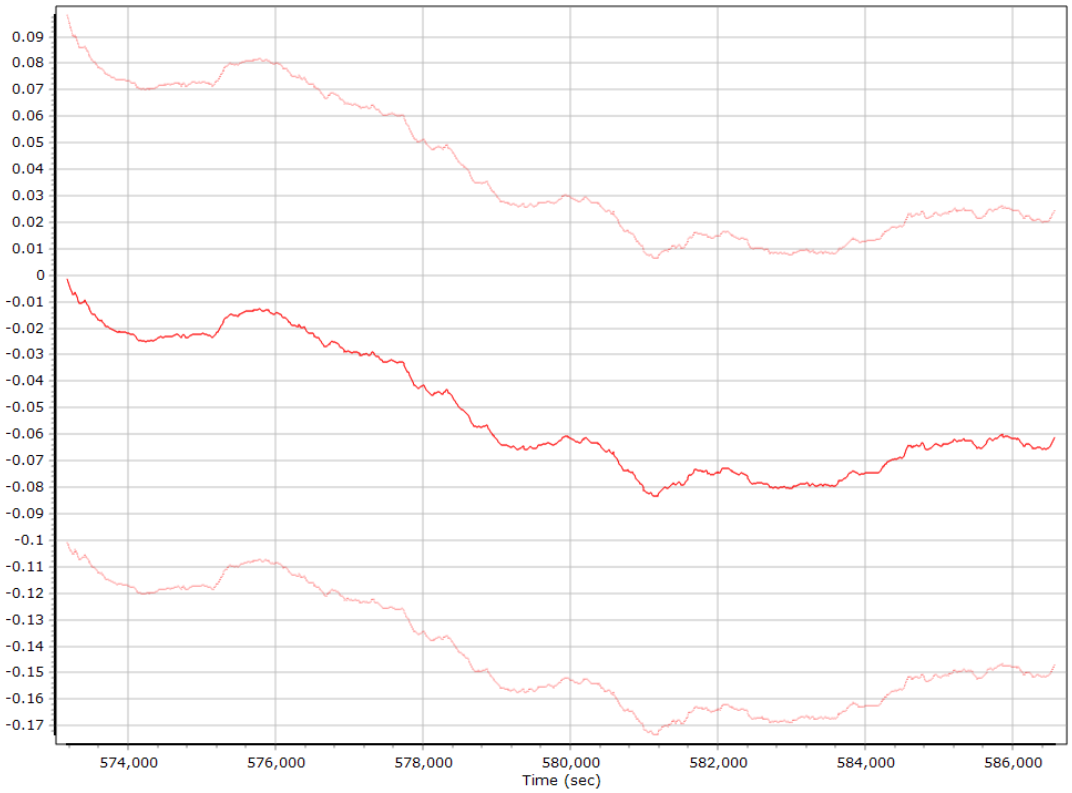
Z Accelerometer Scale Error (ppm)



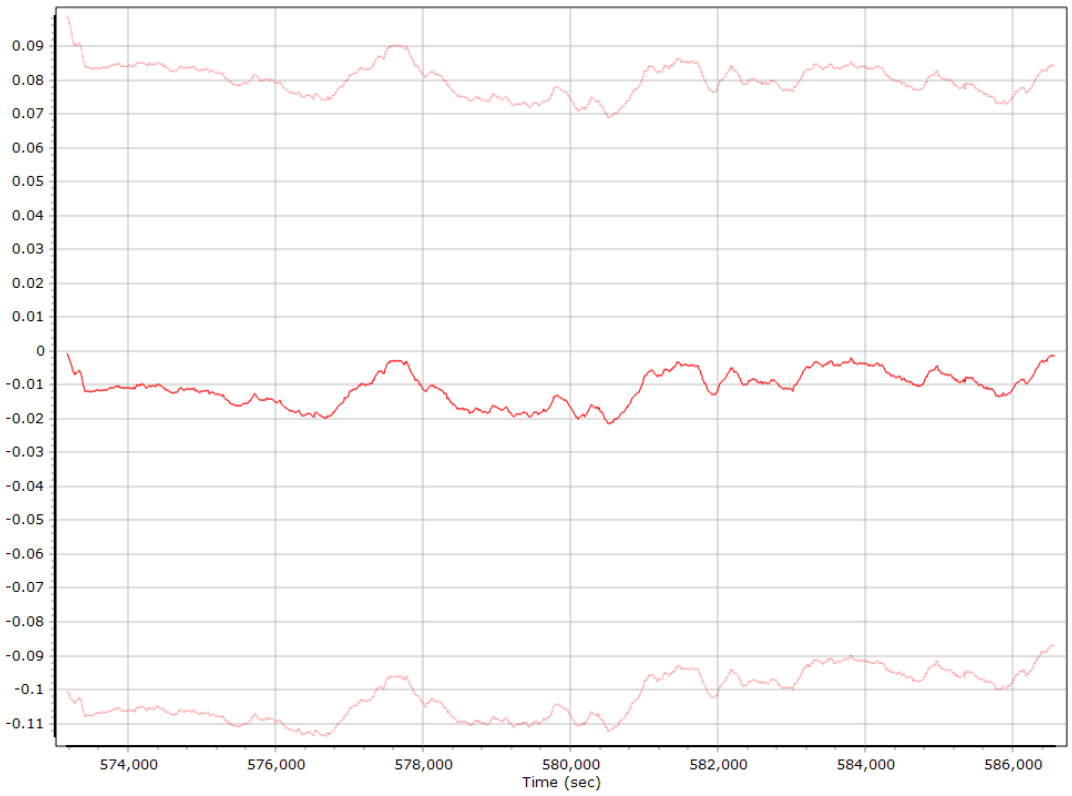
Gyro Bias (deg/h)



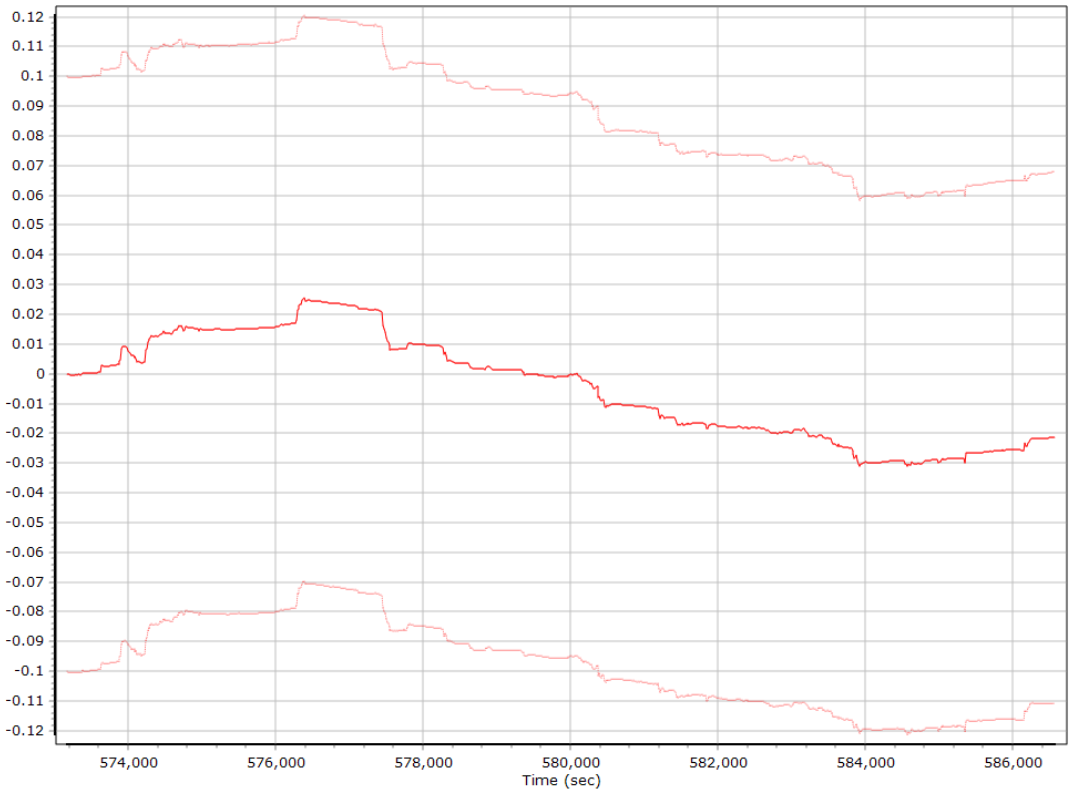
X Gyro Bias (deg/h)



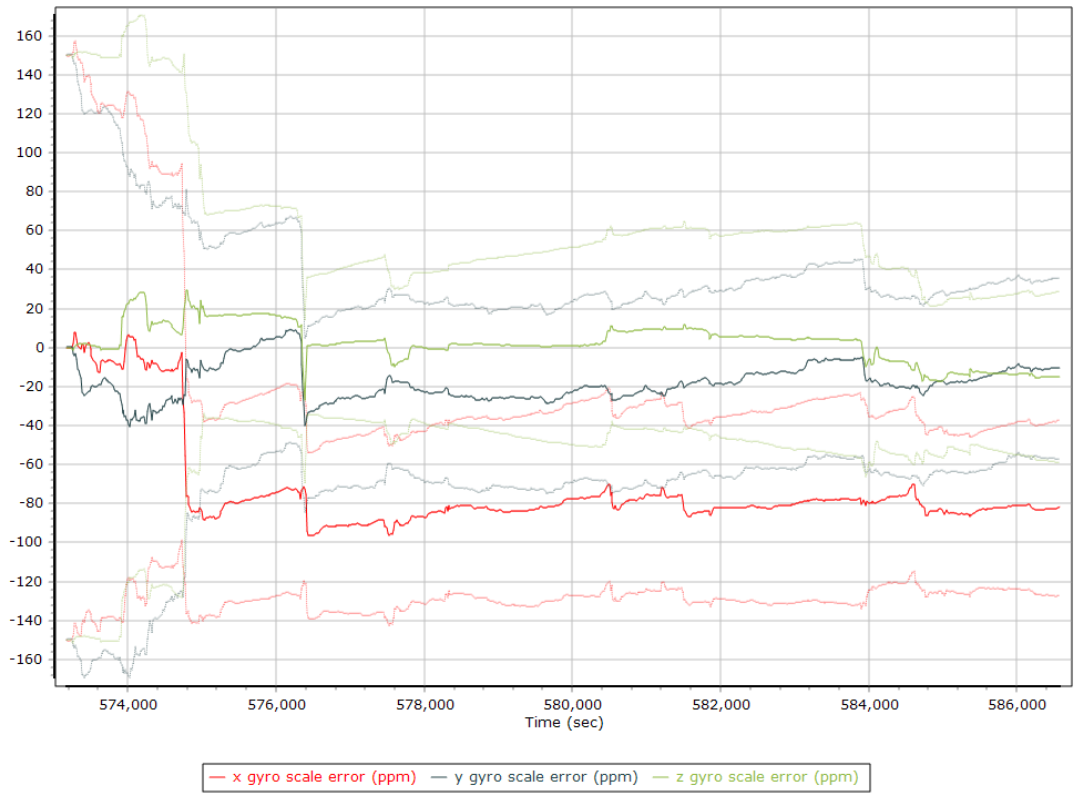
Y Gyro Bias (deg/h)



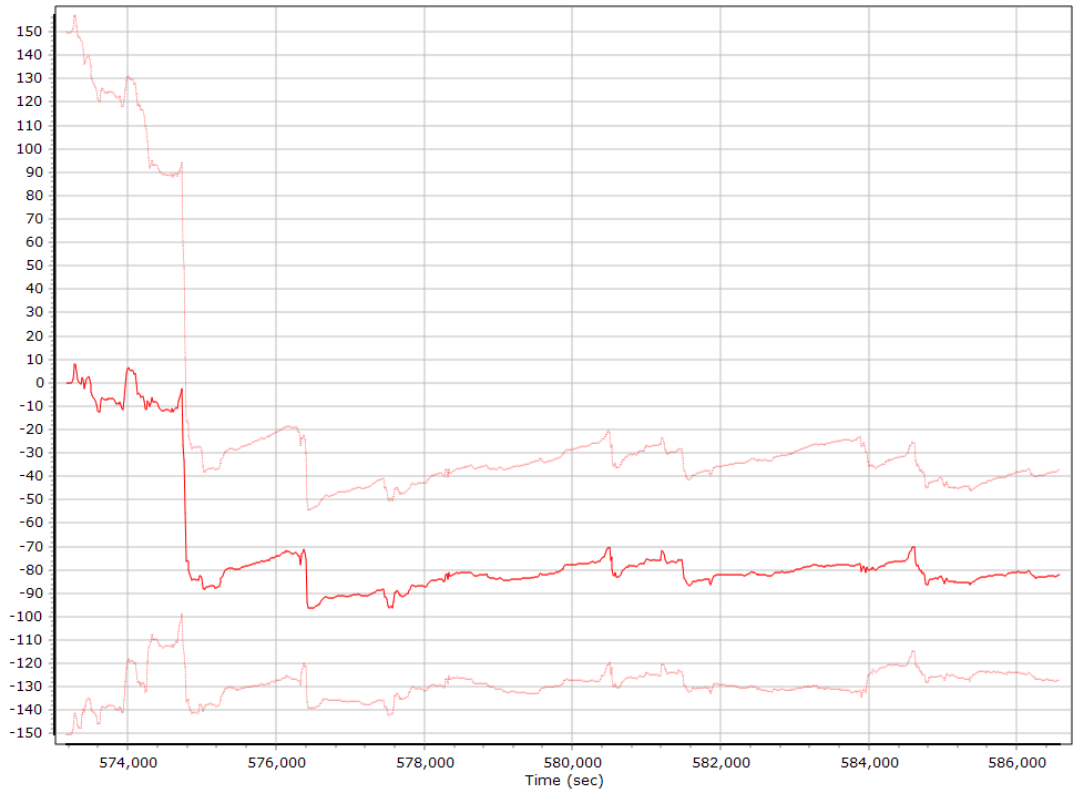
Z Gyro Bias (deg/h)



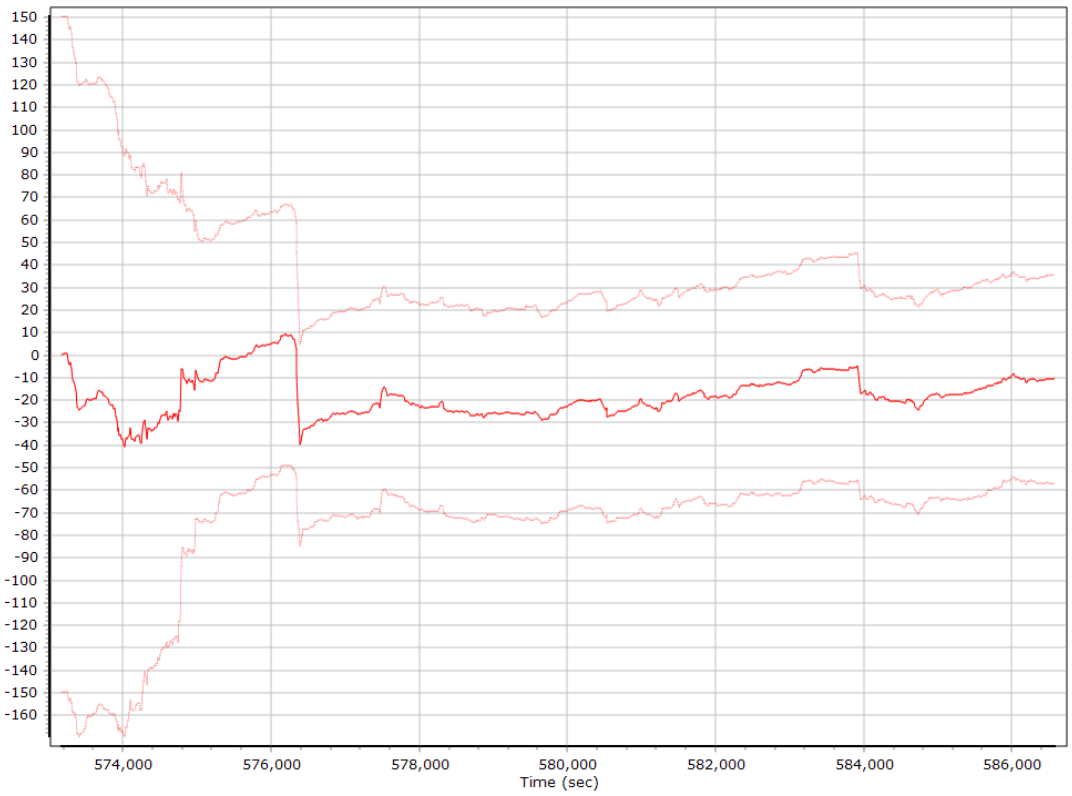
Gyro Scale Error (ppm)



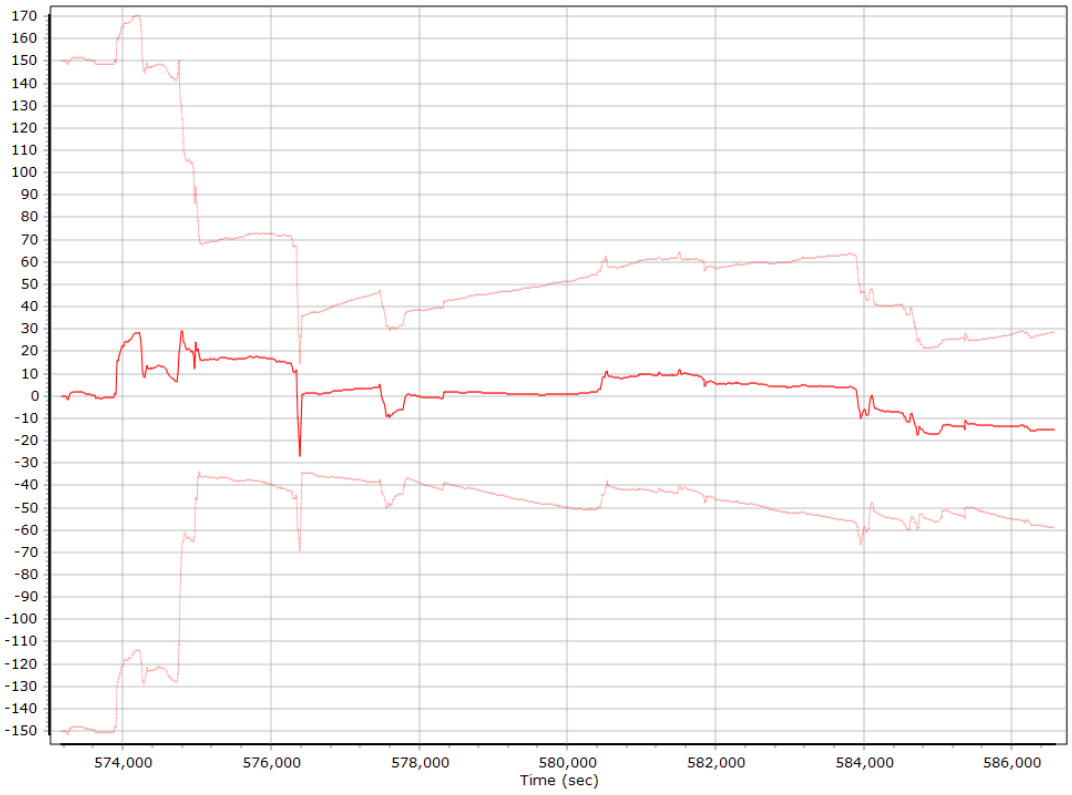
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

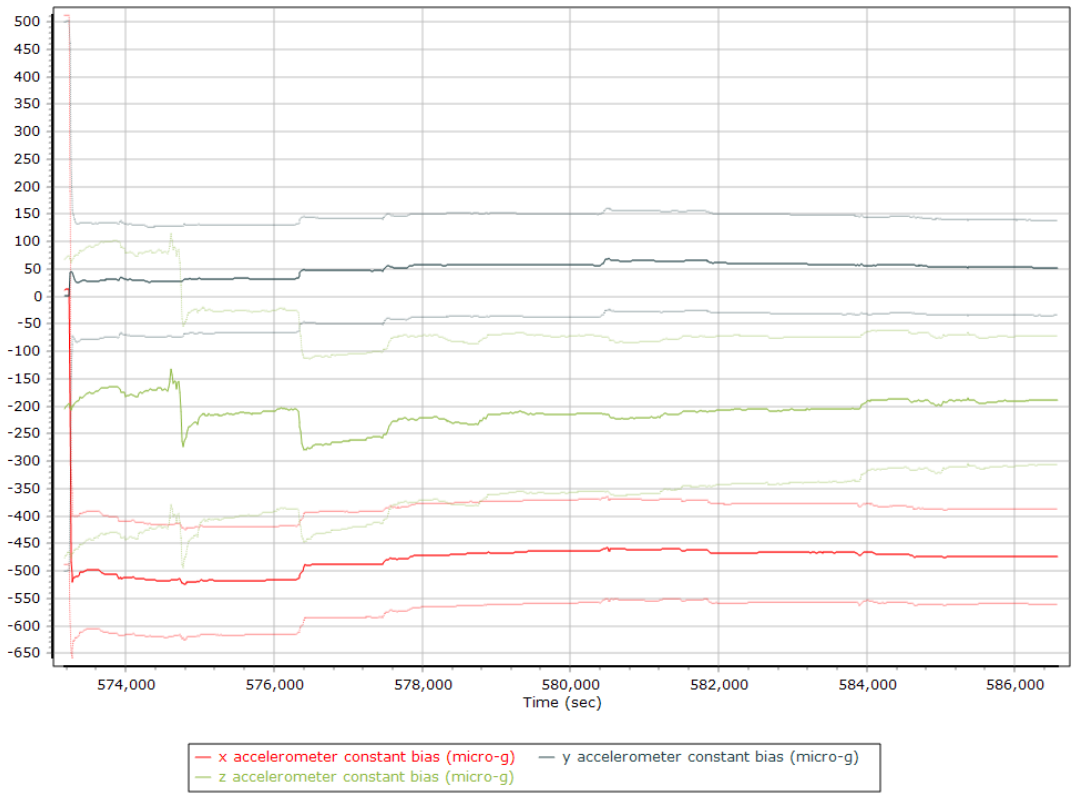


Z Gyro Scale Error (ppm)

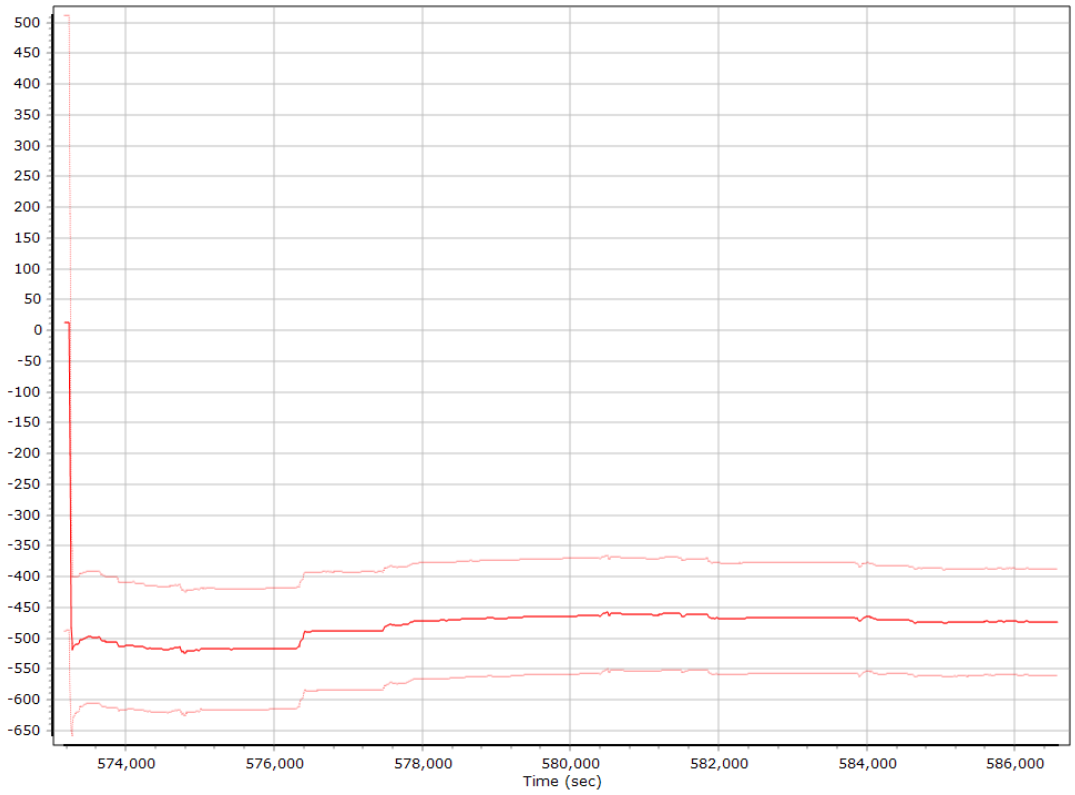


Forward Processed Estimated Constant Errors, Reference Frame

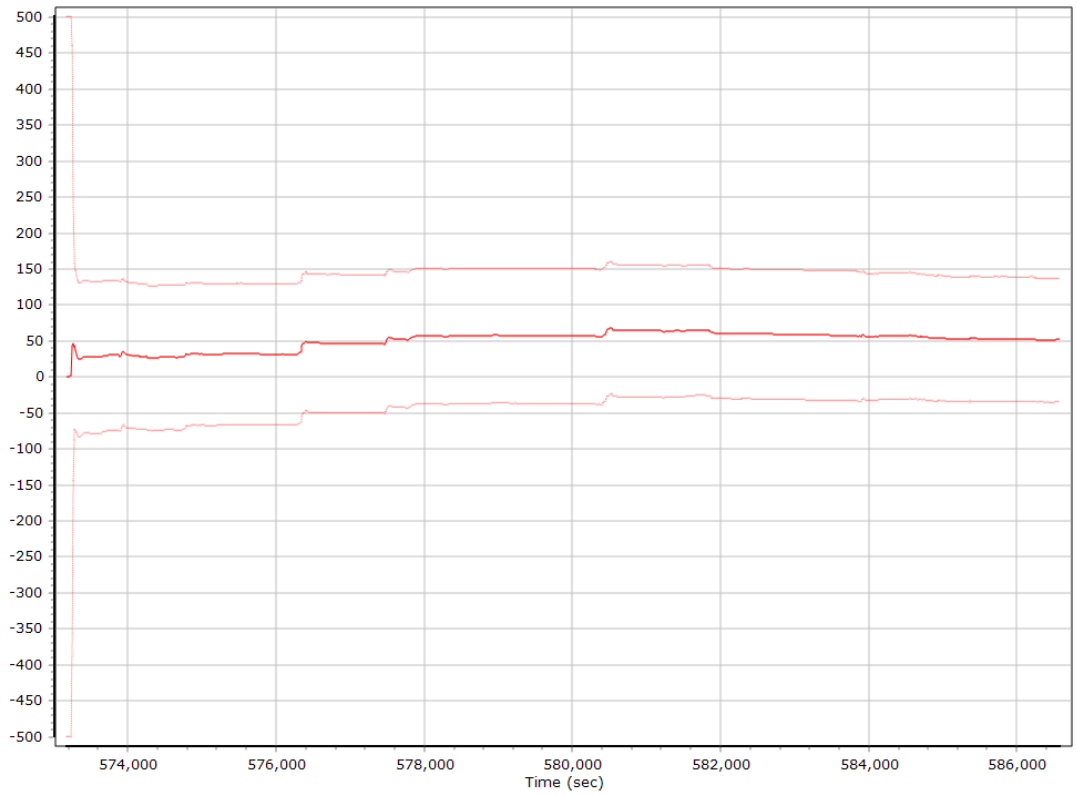
Accelerometer Bias (micro-g)



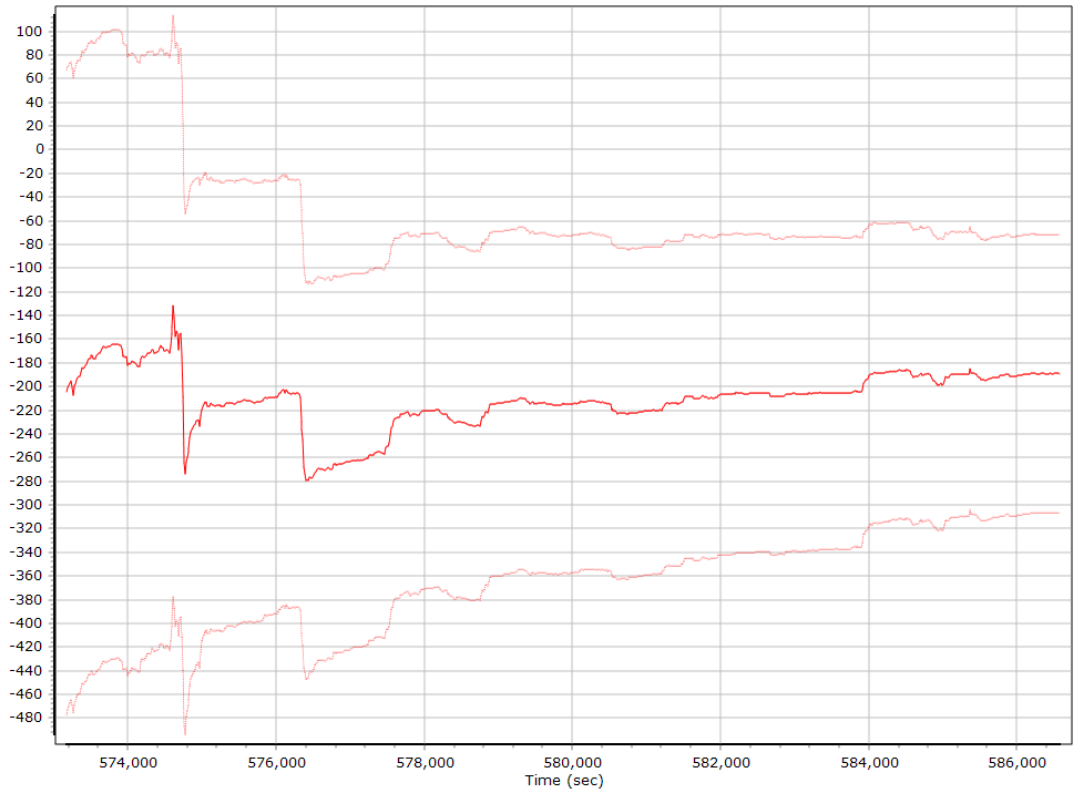
X Accelerometer Bias (micro-g)



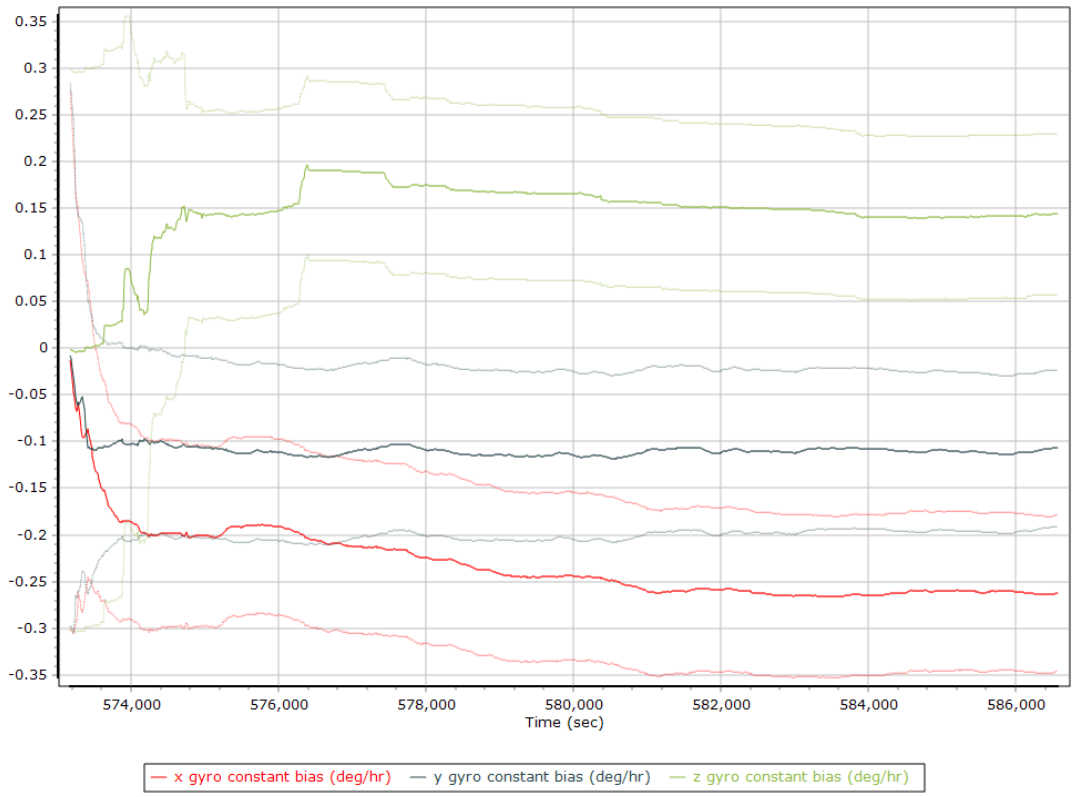
Y Accelerometer Bias (micro-g)



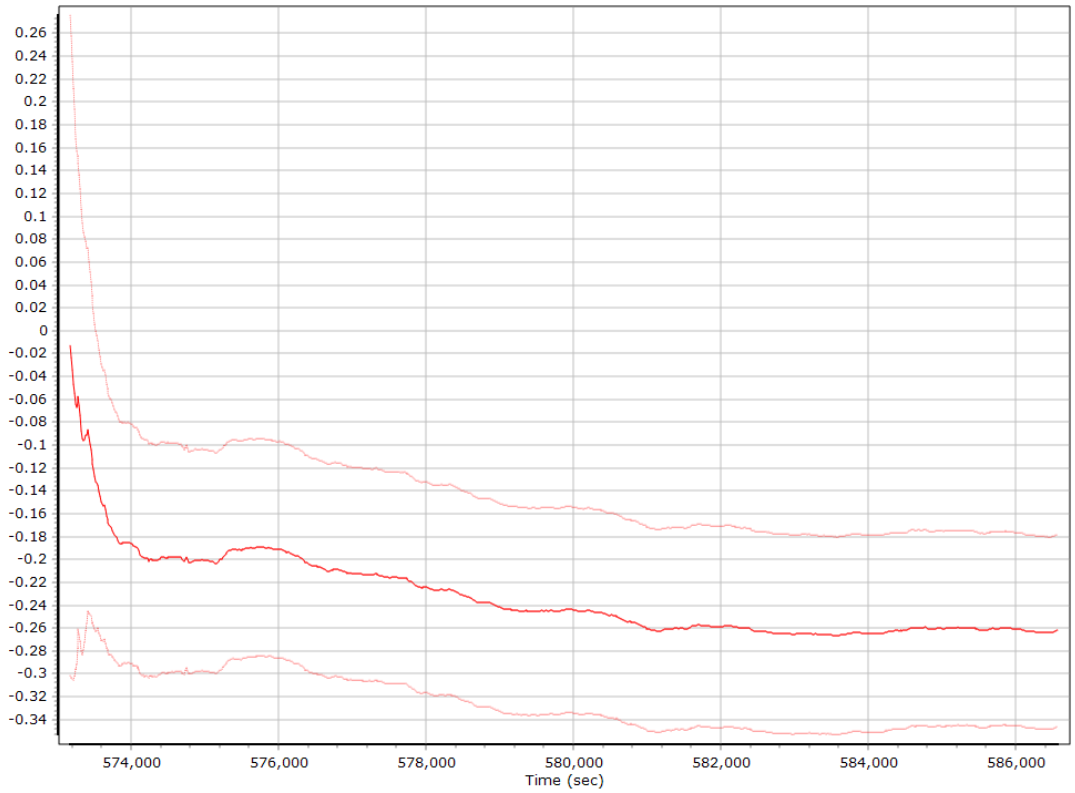
Z Accelerometer Bias (micro-g)



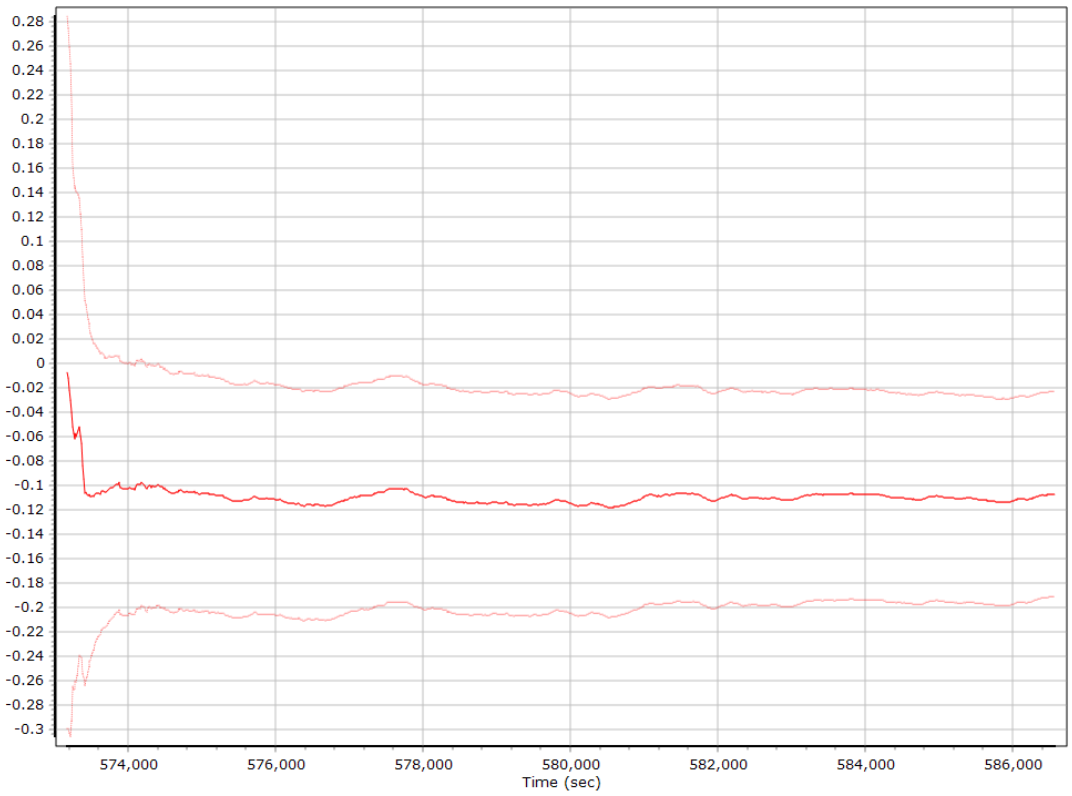
Gyro Bias (deg/h)



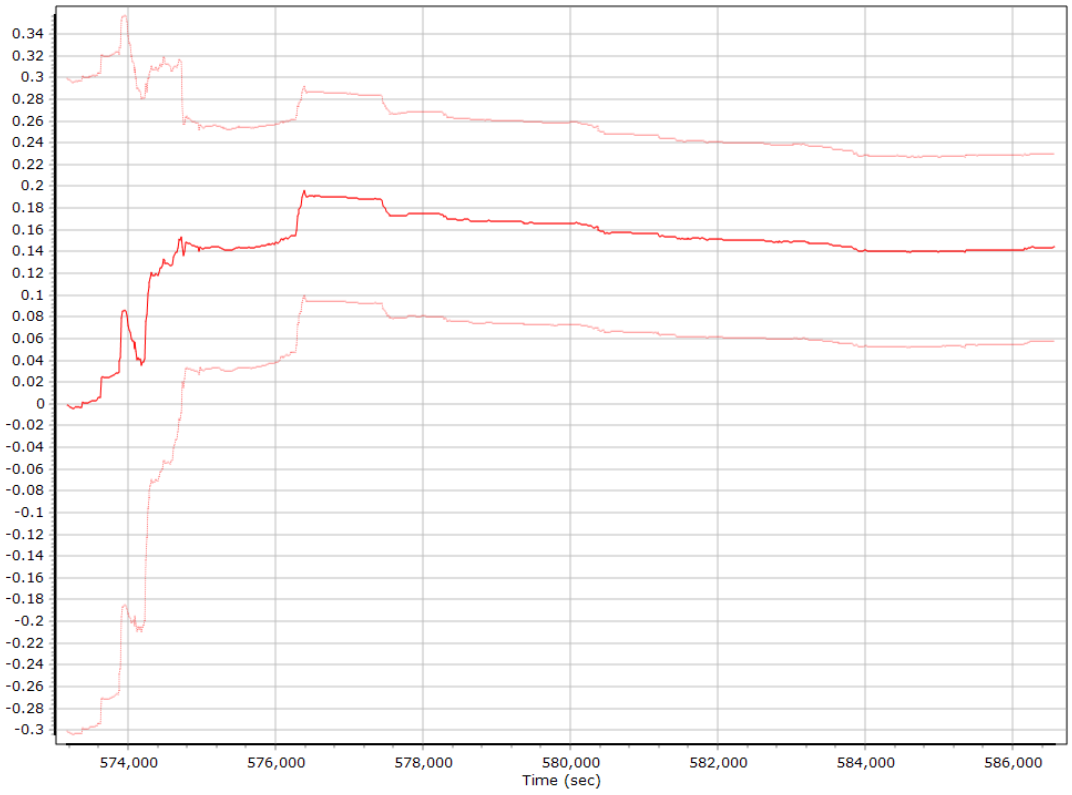
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

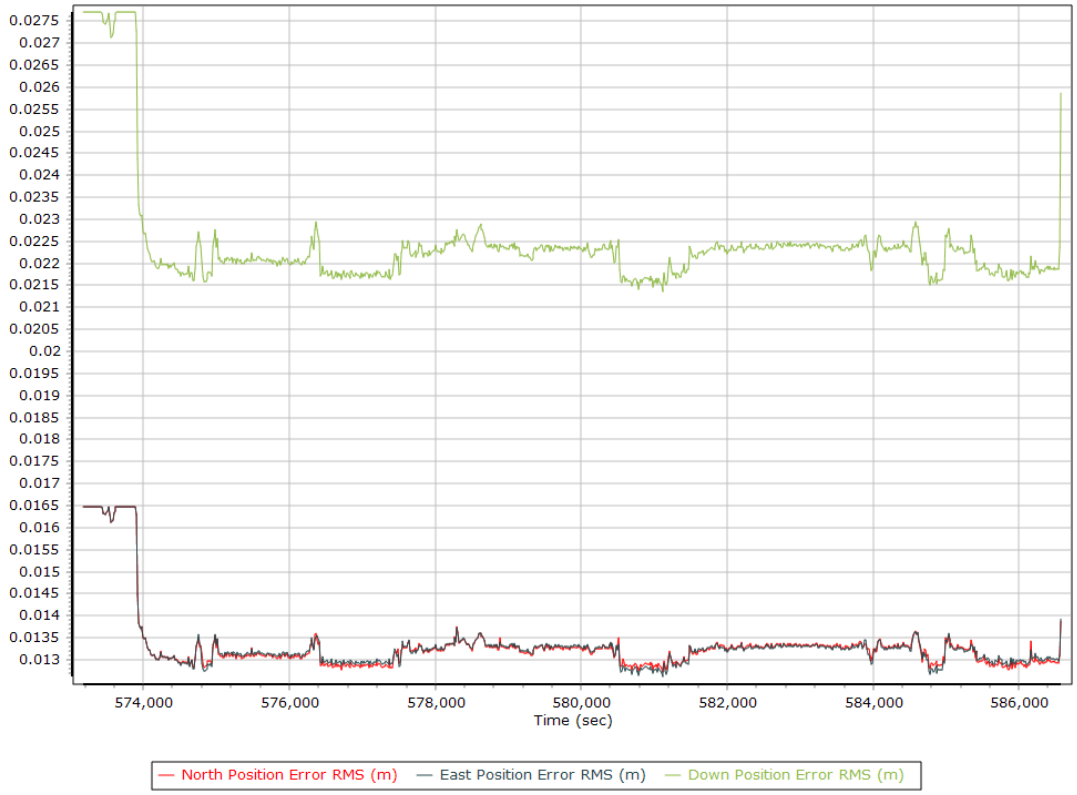


Z Gyro Bias (deg/h)

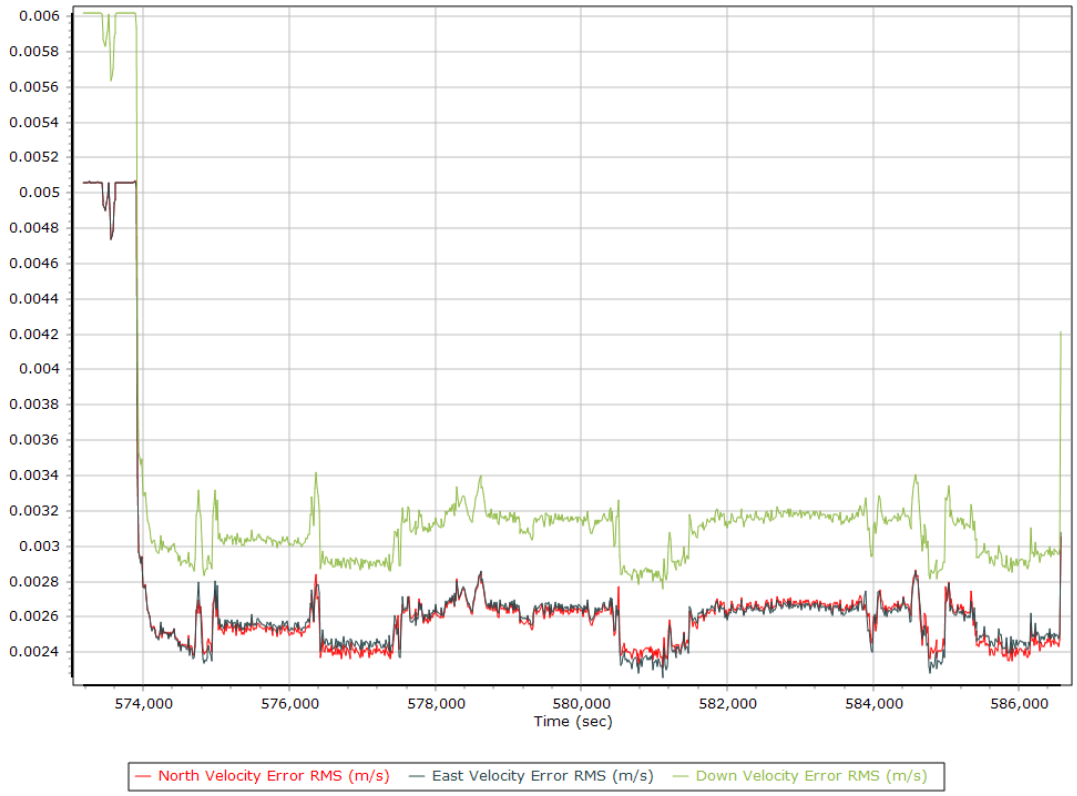


Smoothed Performance Metrics

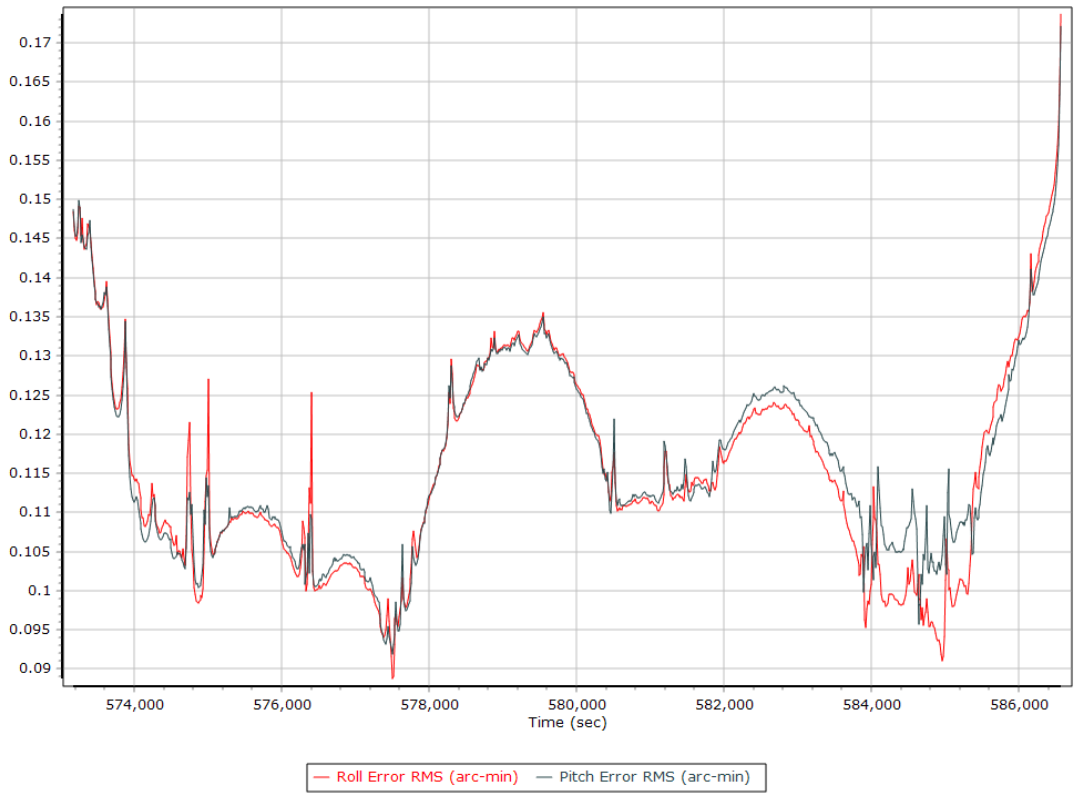
Position Error RMS (m)



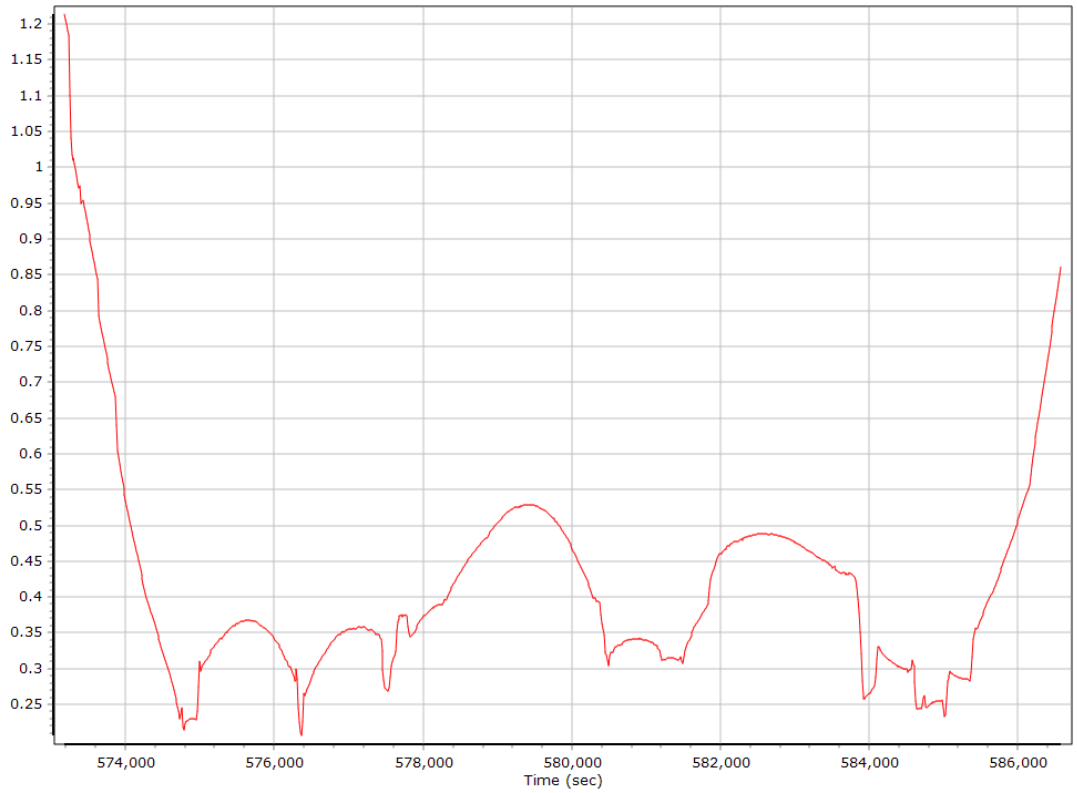
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

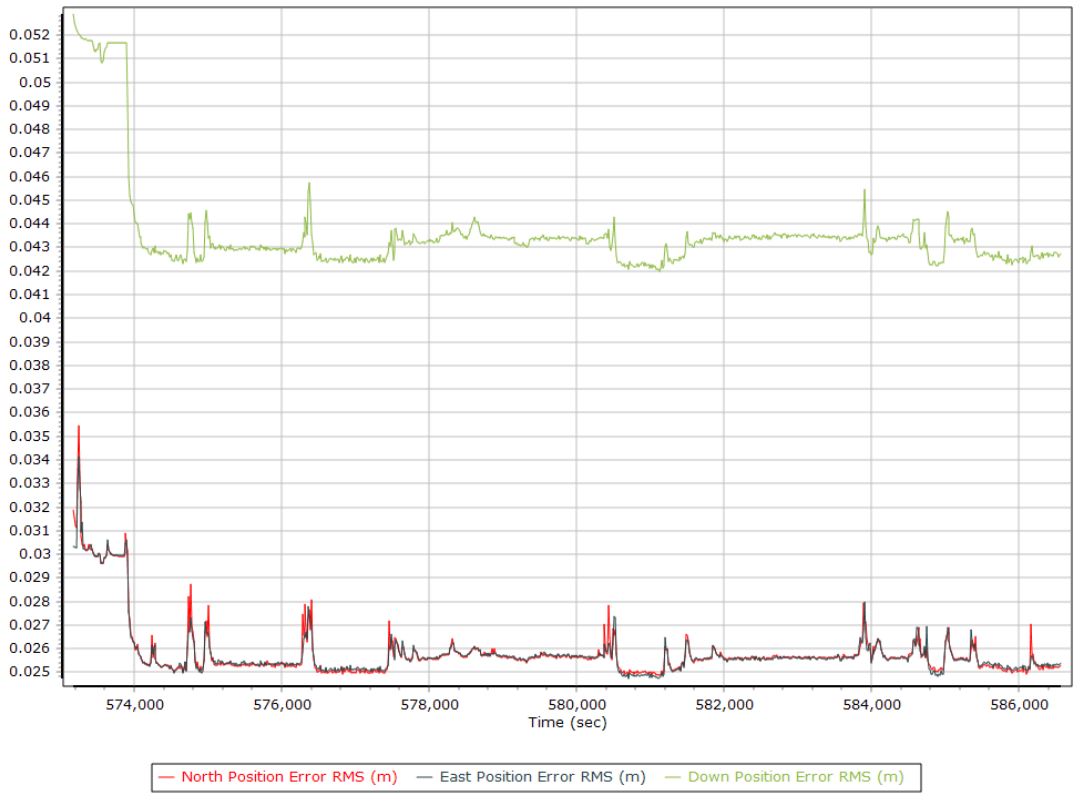


Heading Error RMS (arc-min)

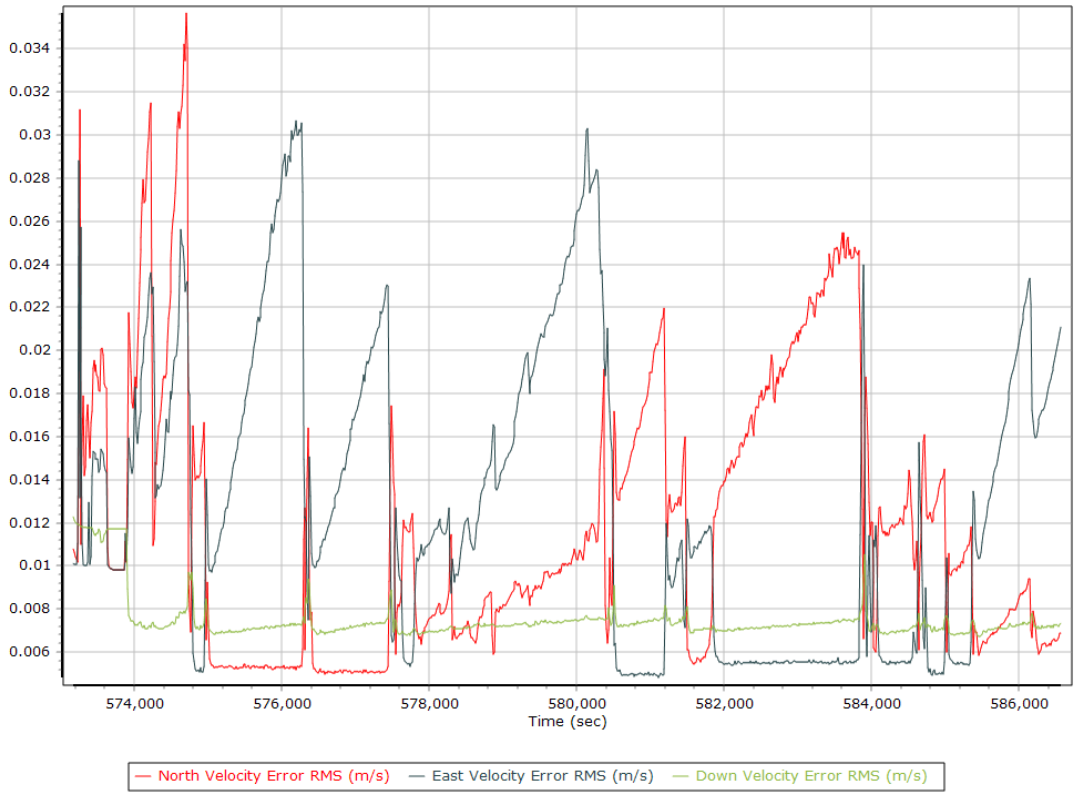


Forward Processed Performance Metrics

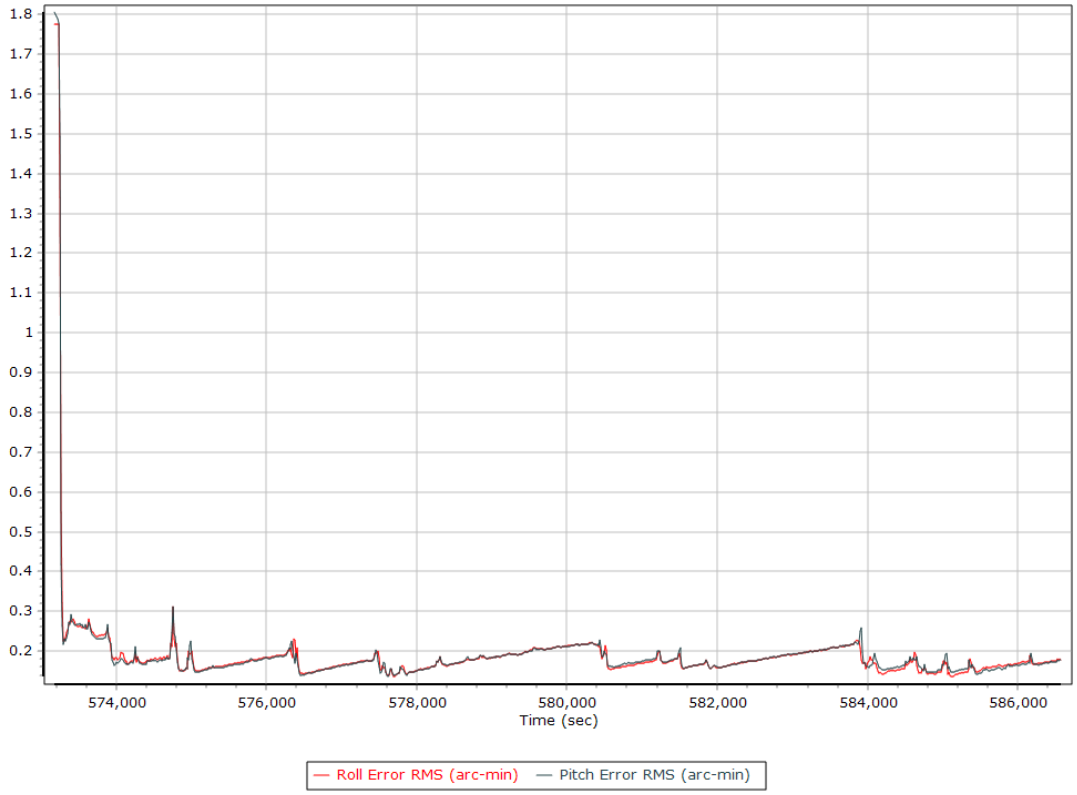
Position Error RMS (m)



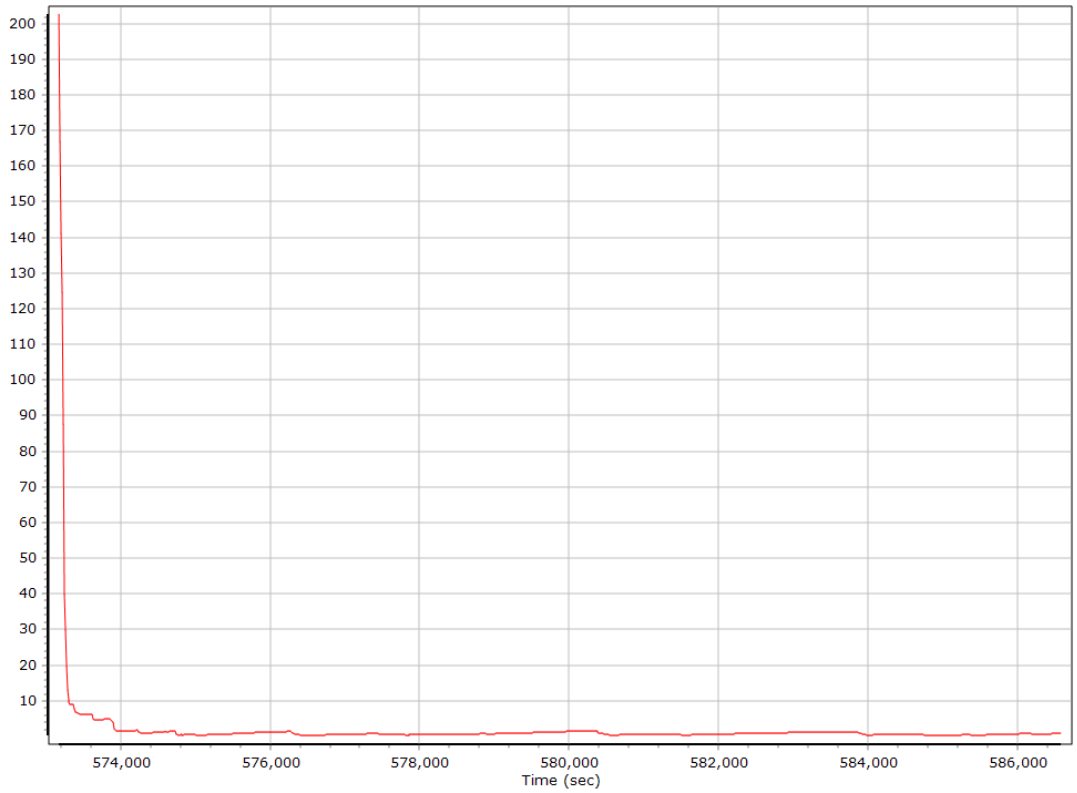
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

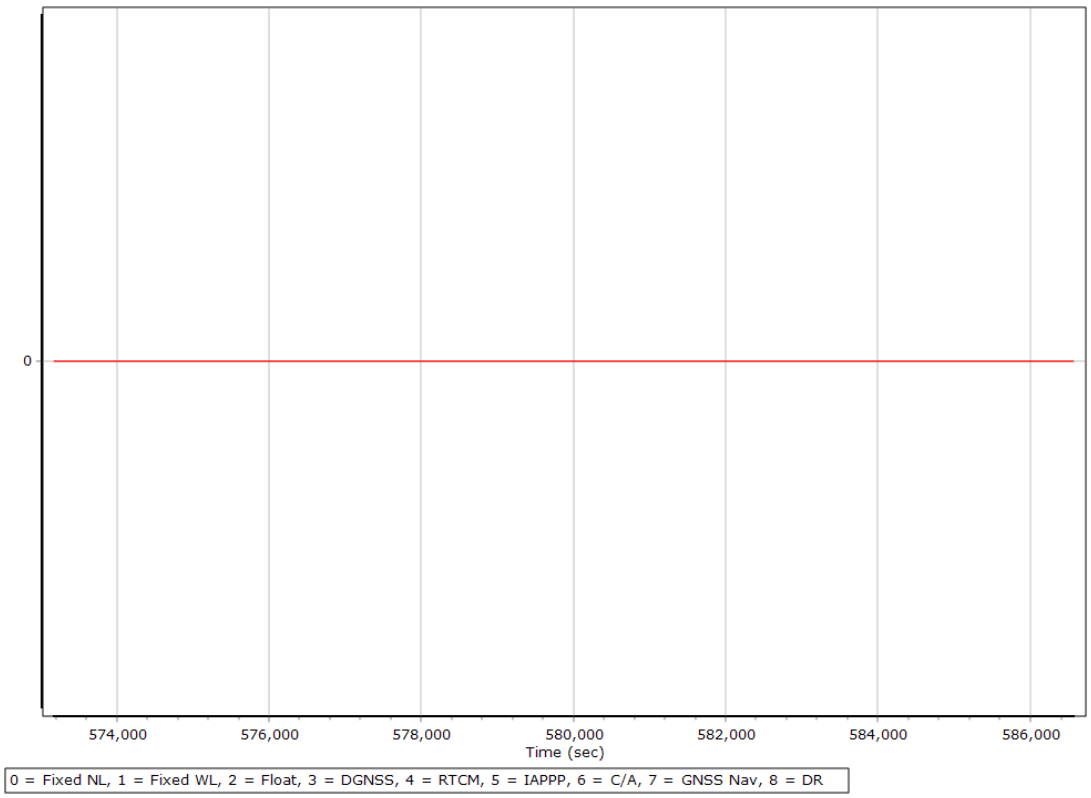


Heading Error RMS (arc-min)

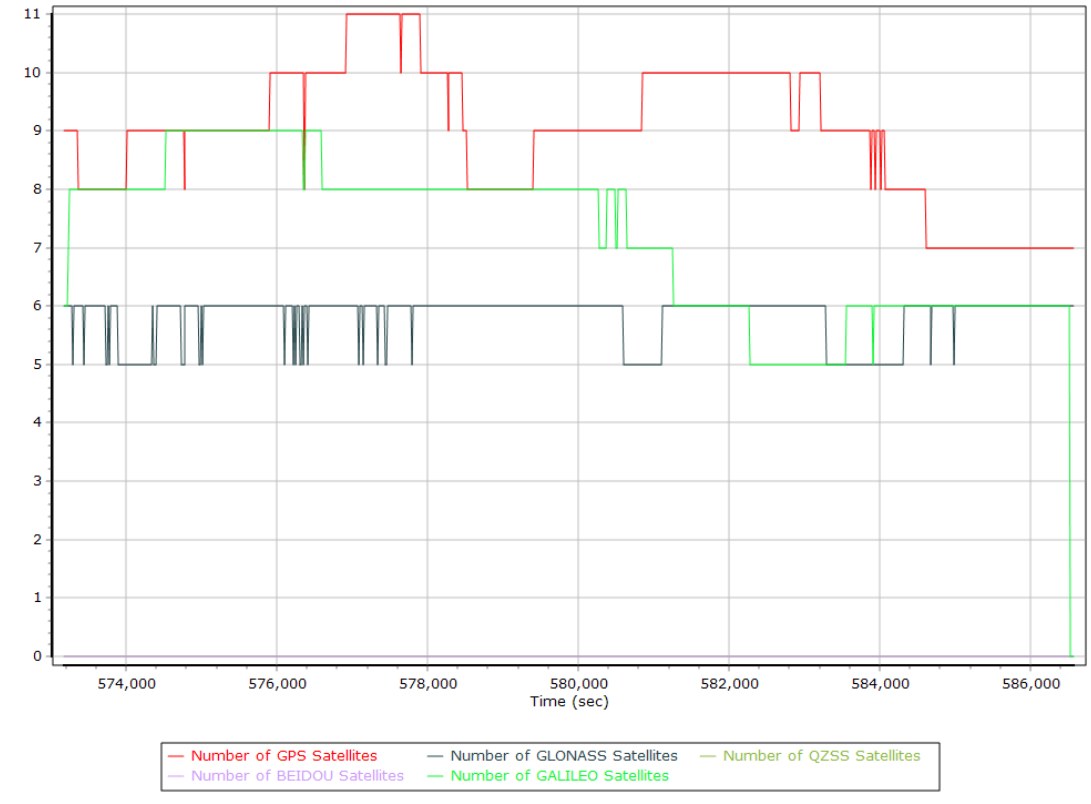


Forward Processed Solution Status

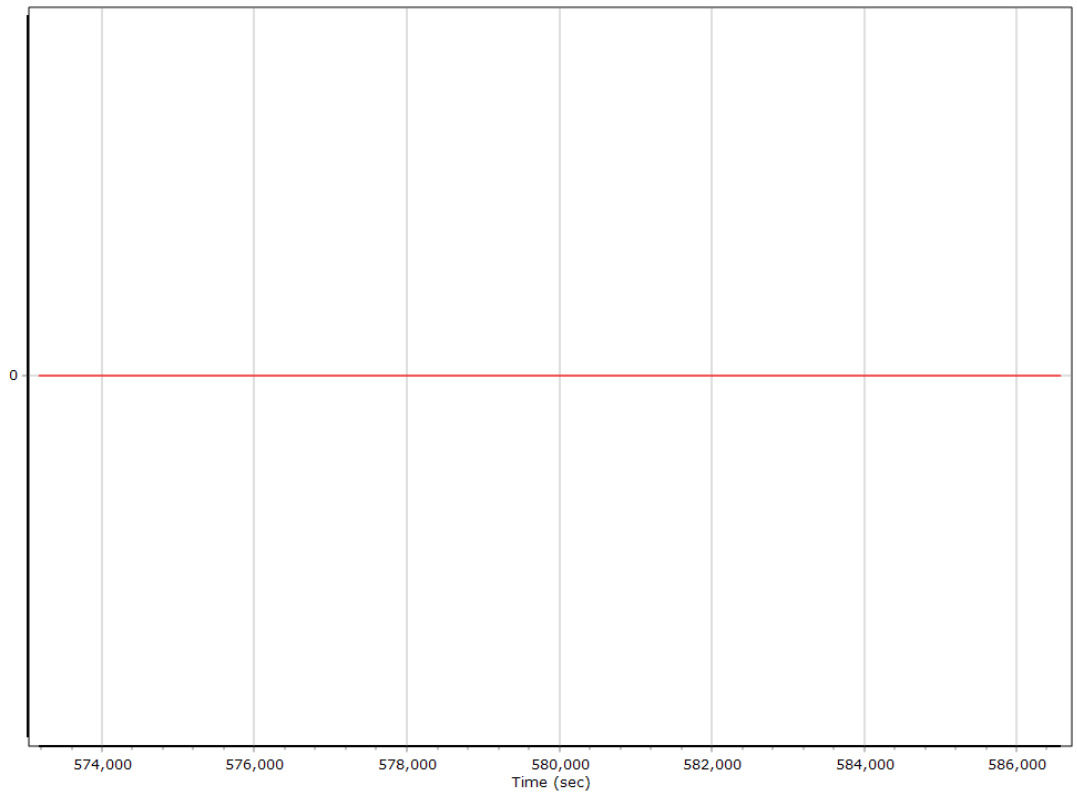
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01032021A_4040
Processing date	2022-01-05 15:23:01
Mission date	2021-01-03 16:51:27
Mission duration	05:02:28.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210103_165108_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0030.21g	GLONASS Broadcast Ephemeris
Ephm0030.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01032021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210103_165108_INS-GPS_1.raw		
Last raw data file	210103_165108_INS-GPS_1.raw		
Start GPS week	2139		
Start time	60668.783 (1/3/2021 4:51:08 PM)		
End time	78811.963 (1/3/2021 9:53:31 PM)		
Start of fine alignment	60926.730 (1/3/2021 4:55:26 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

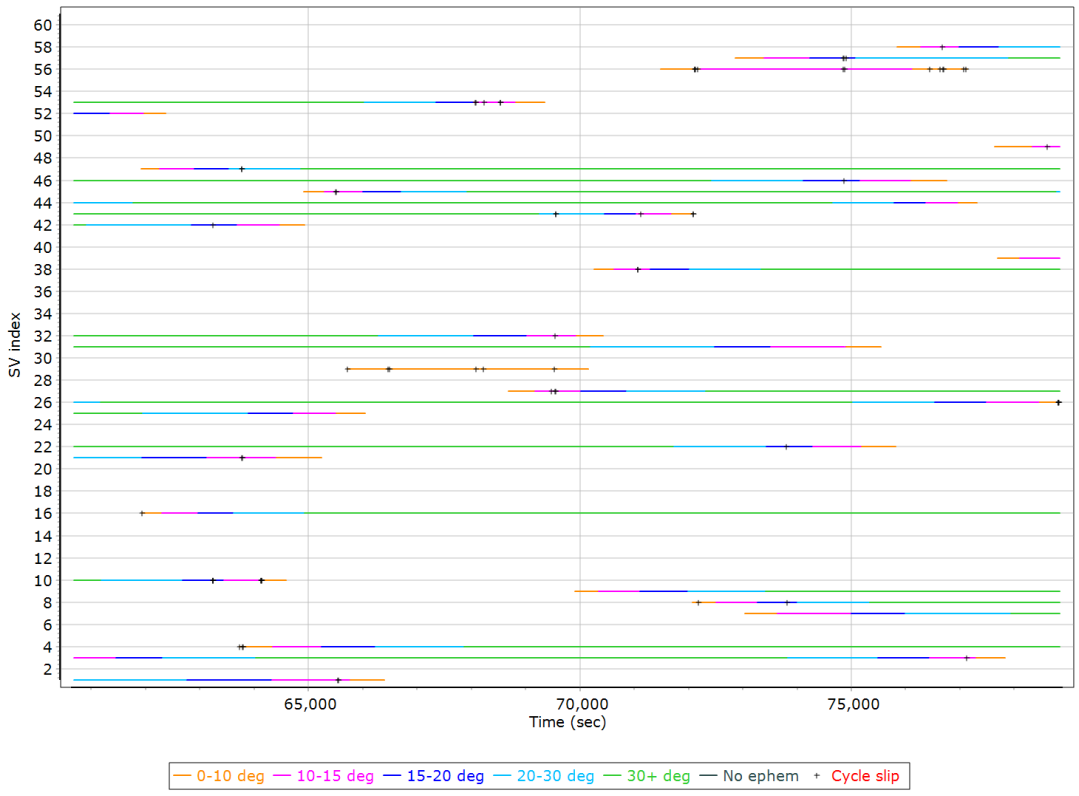
Rover Data QC

Raw IMU Import QC Summary

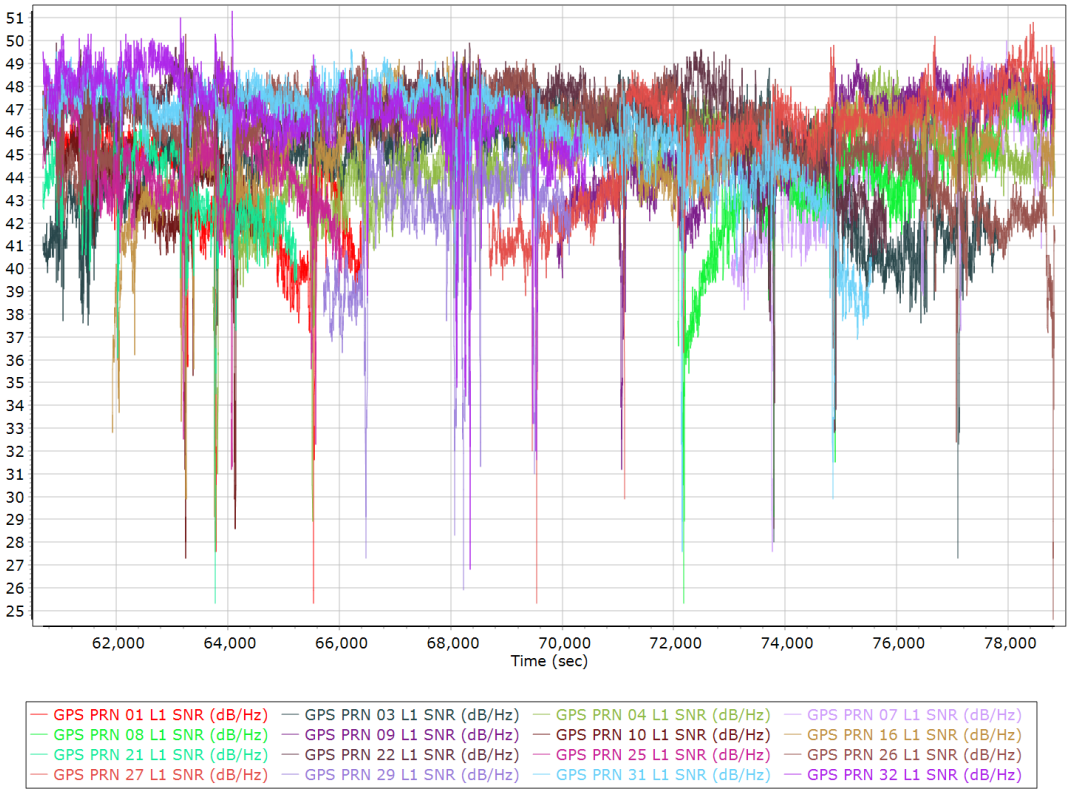
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01032021A_4040.log
IMU Records Processed	3629066
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

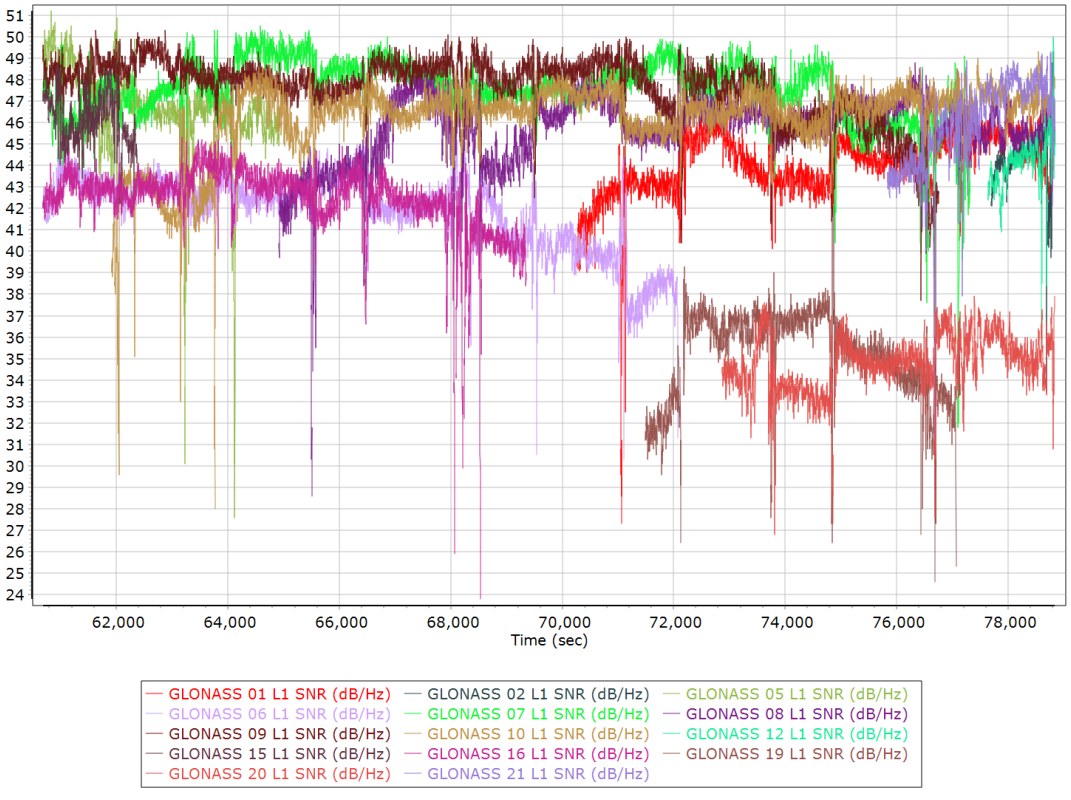
GPS/GLONASS L1 Satellite Lock/Elevation



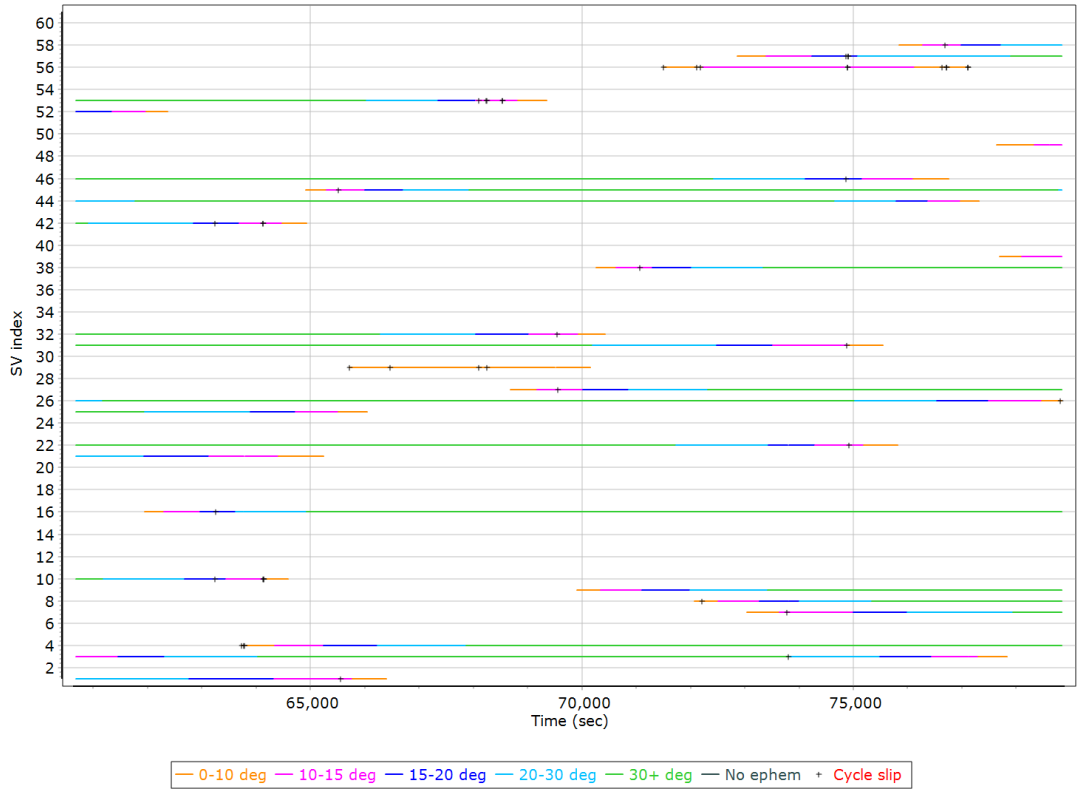
GPS L1 SNR



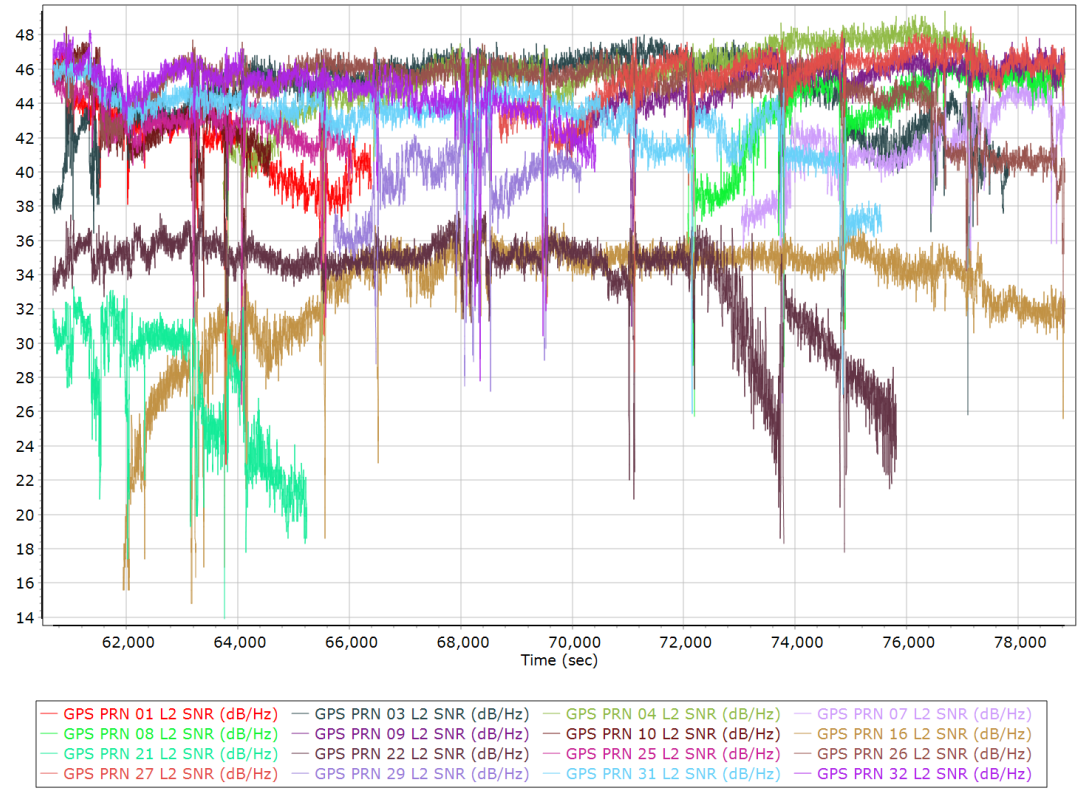
GLONASS L1 SNR



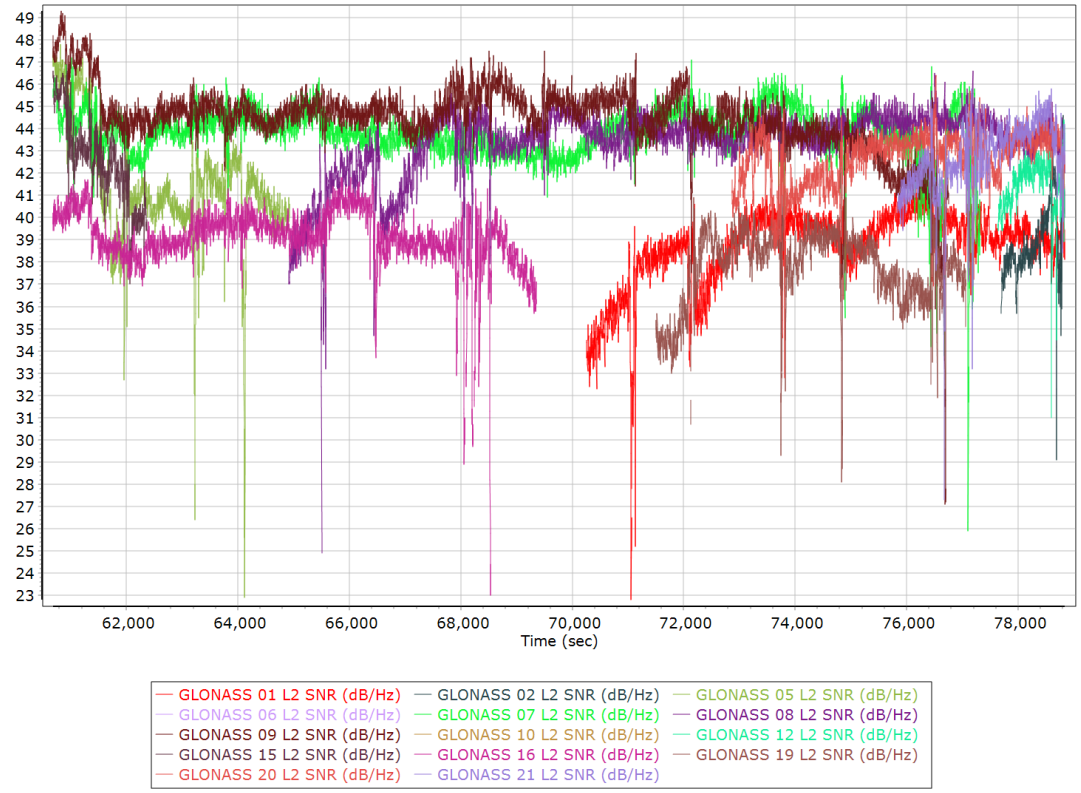
GPS/GLONASS L2 Satellite Lock/Elevation



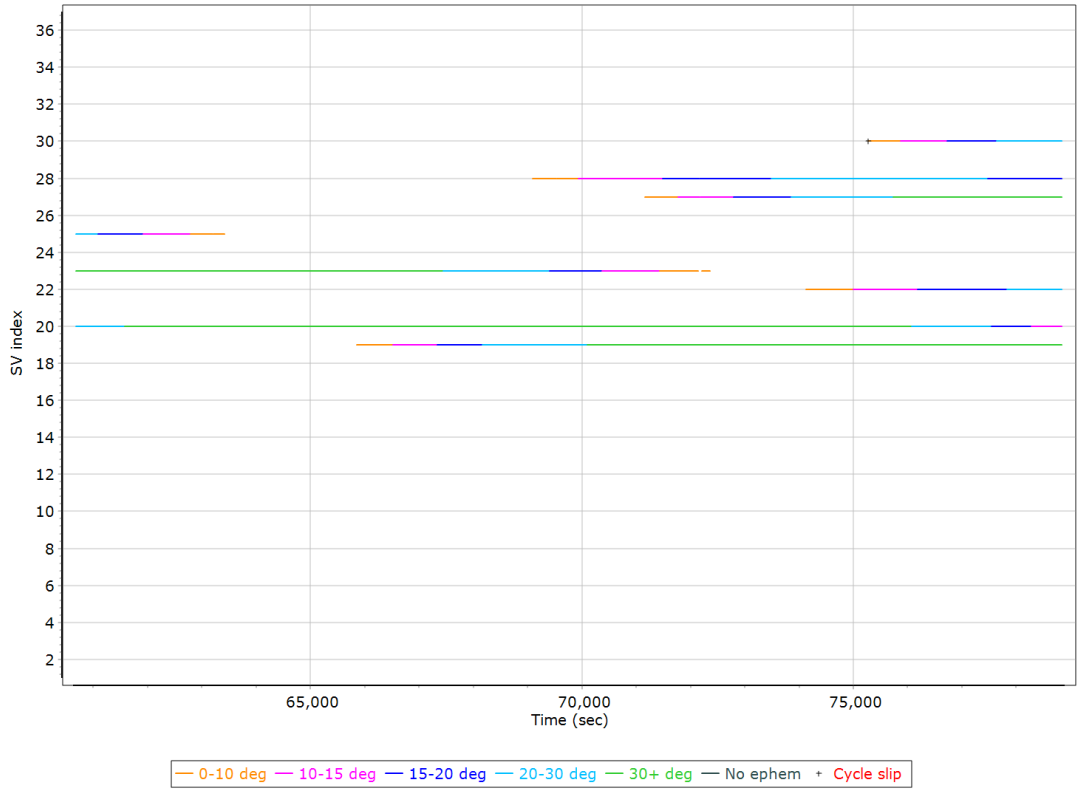
GPS L2 SNR



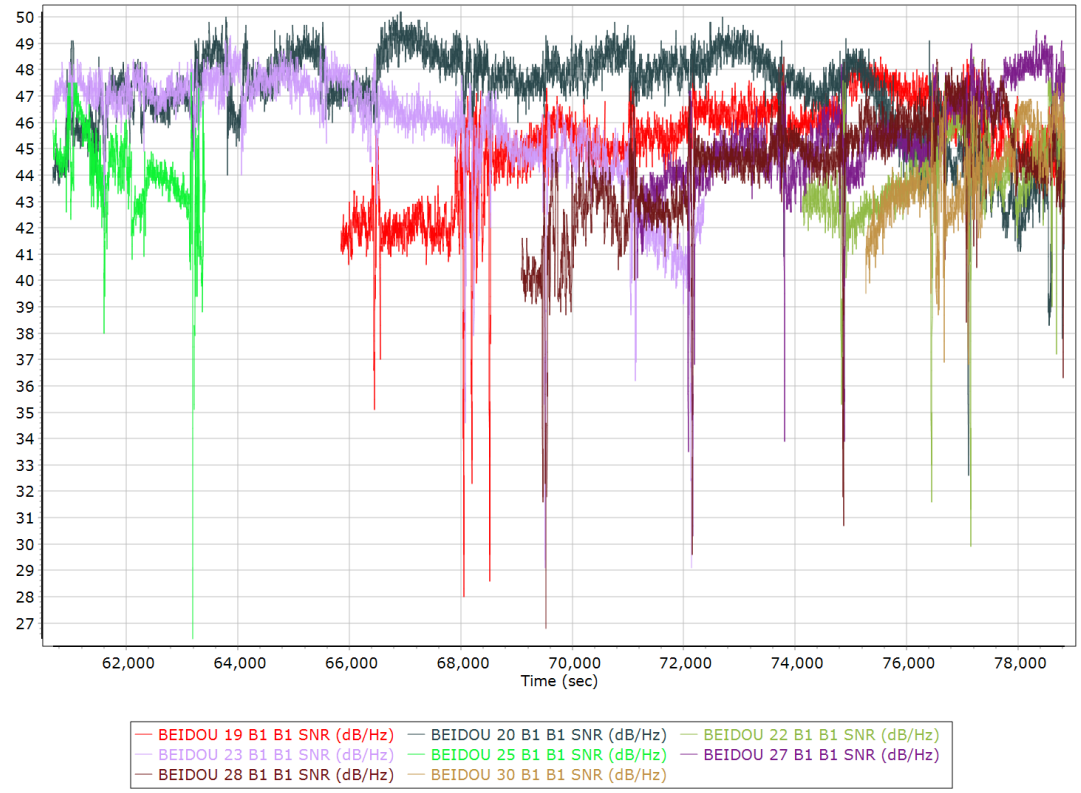
GLONASS L2 SNR



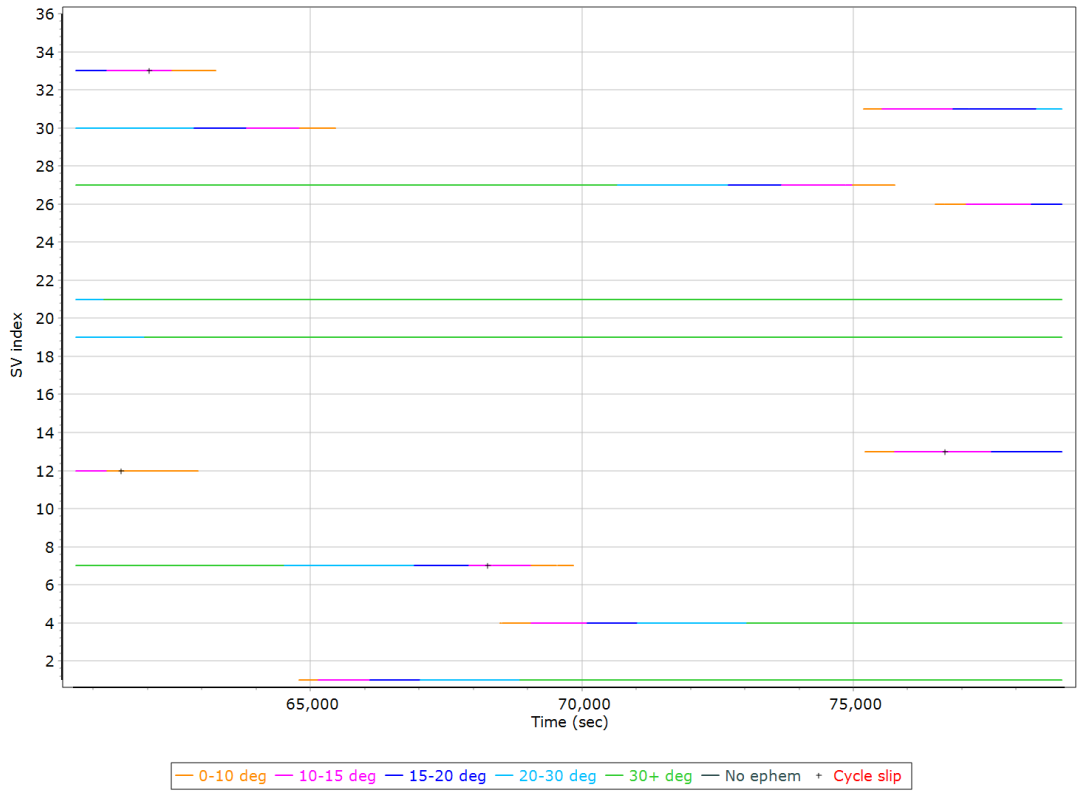
BEIDOU Satellite Lock/Elevation



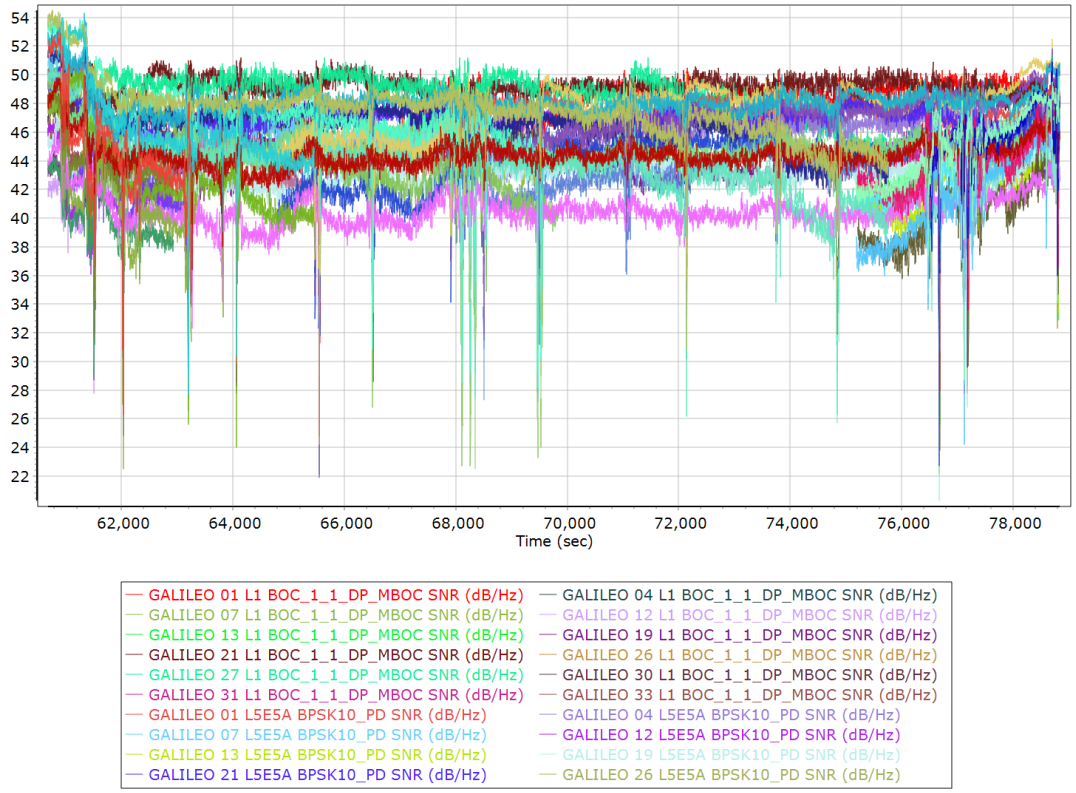
BEIDOU SNR



GALILEO Satellite Lock/Elevation

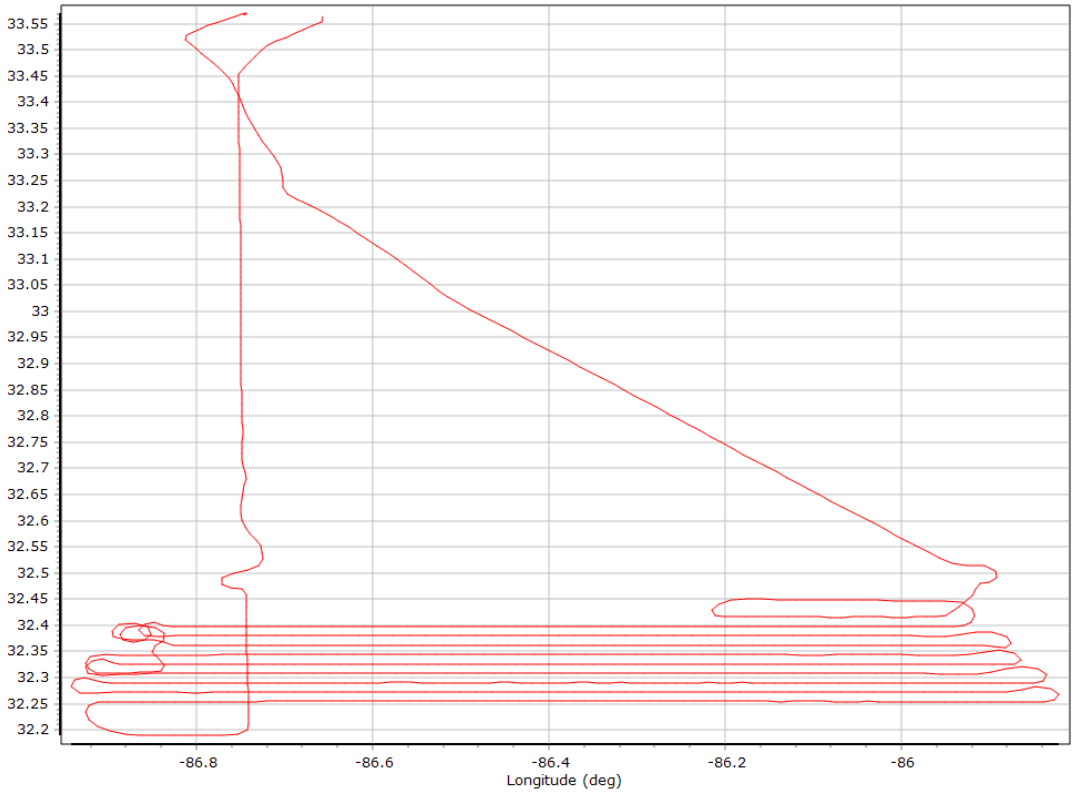


GALILEO SNR

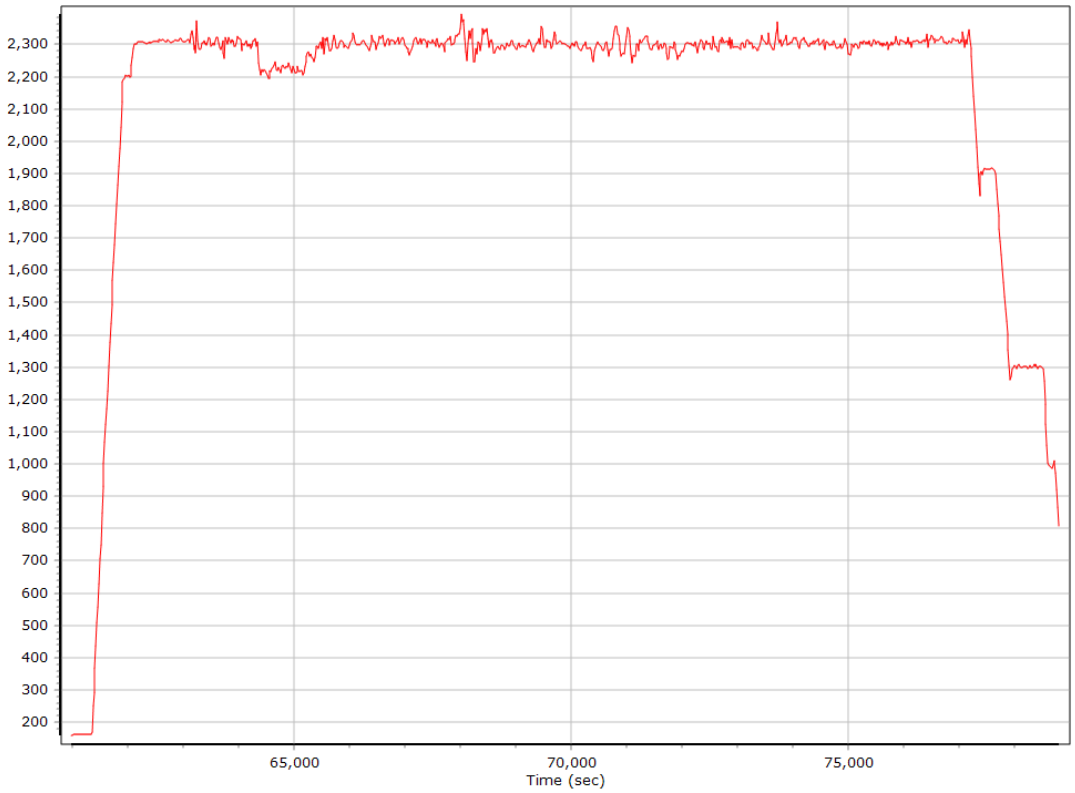

54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
62,000
64,000
66,000
68,000
70,000
72,000
74,000
76,000
78,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

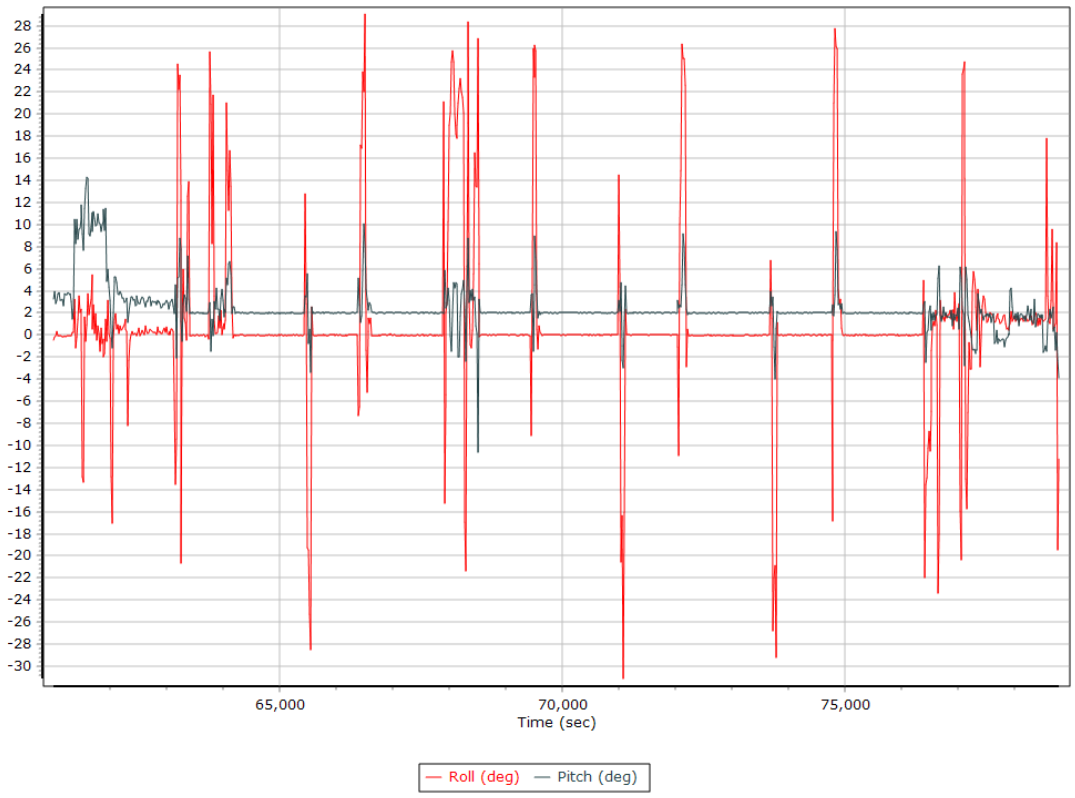
Top View



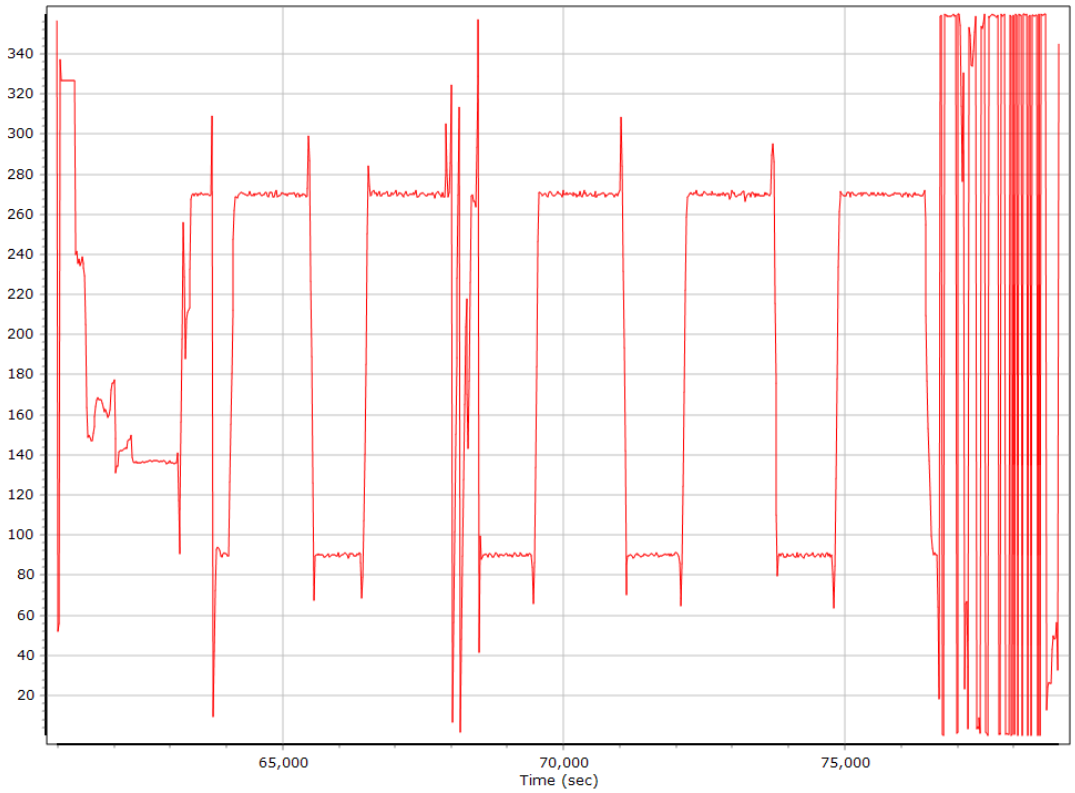
Altitude



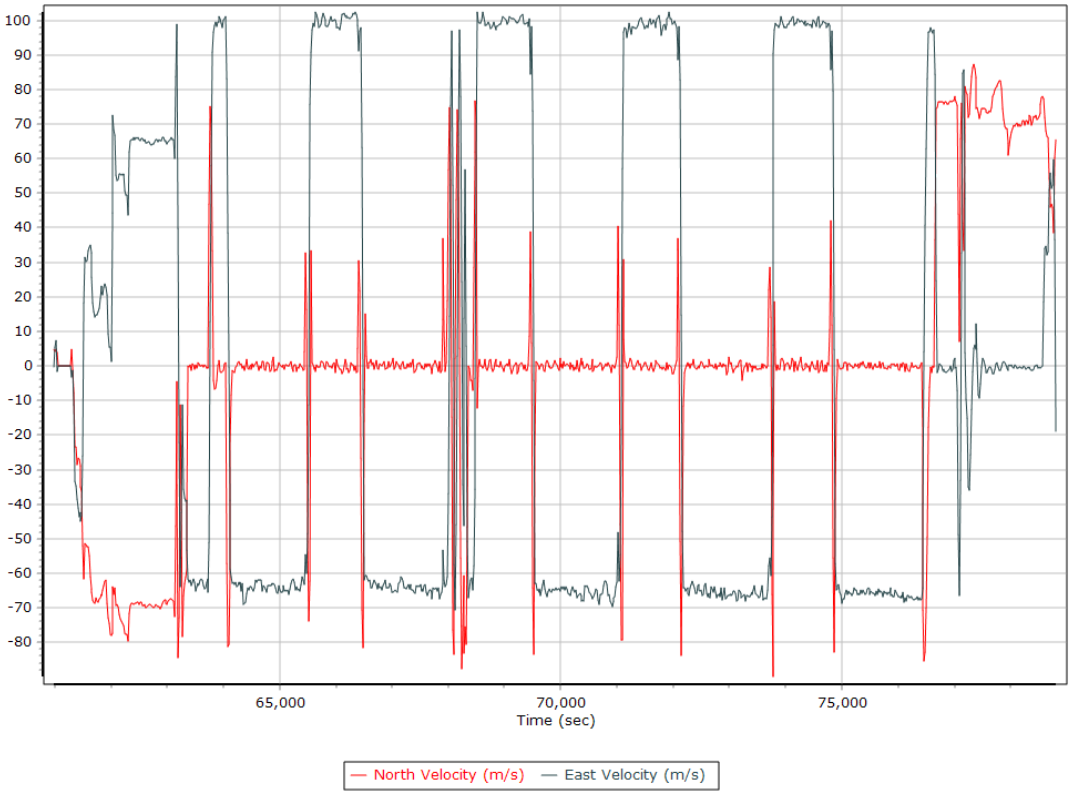
Roll/Pitch



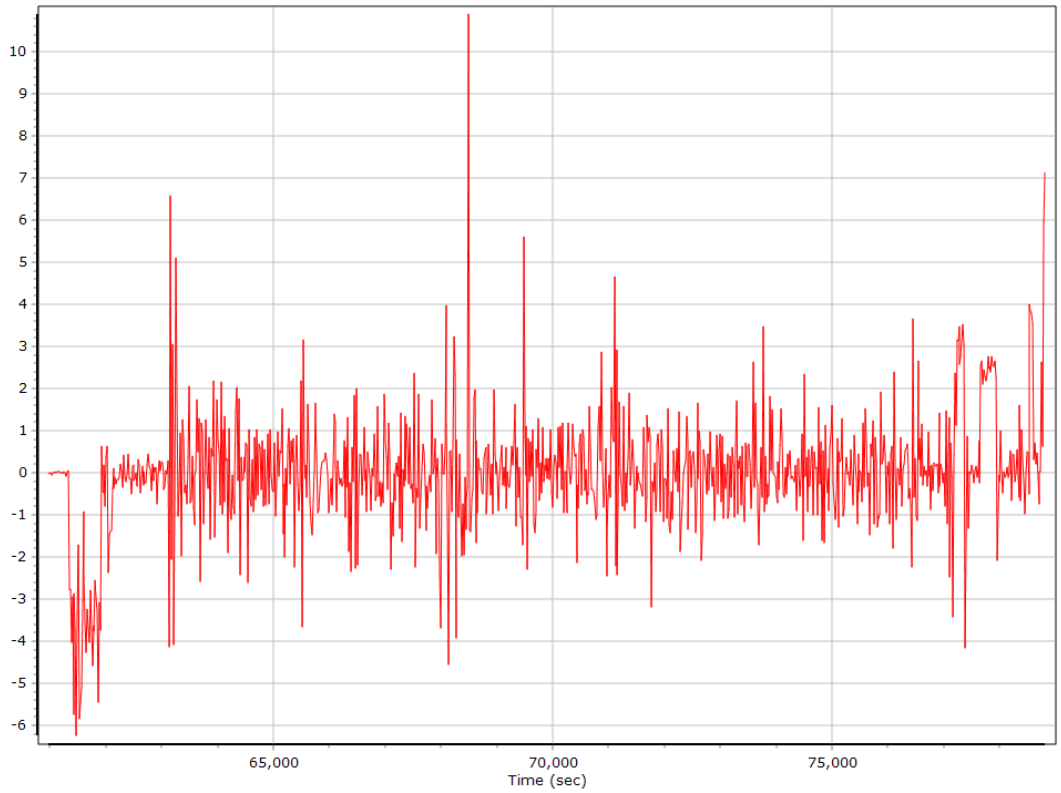
Heading



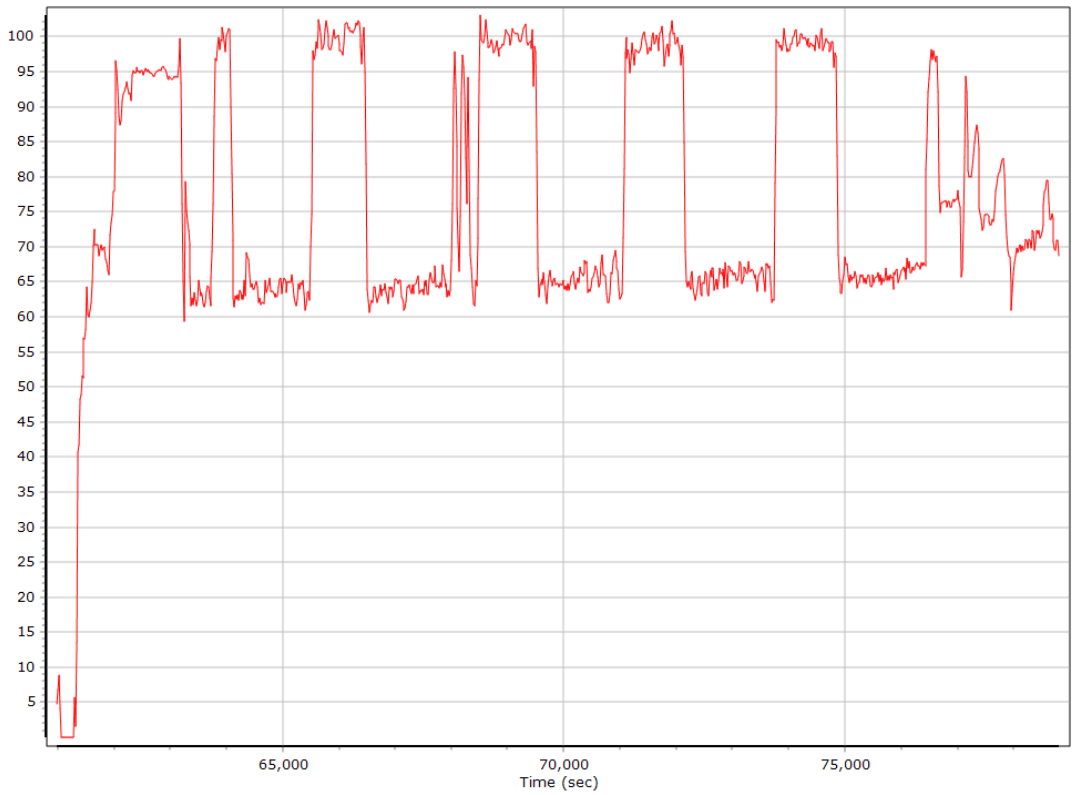
North/East Velocity



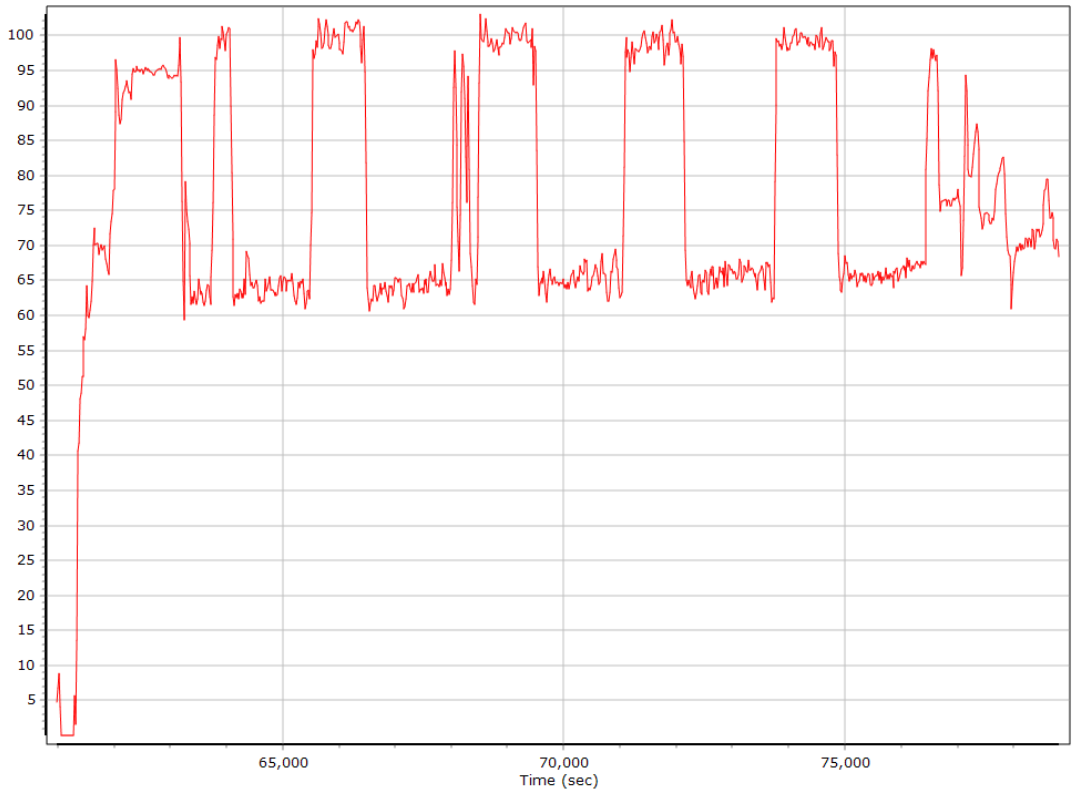
Down Velocity



Total Speed



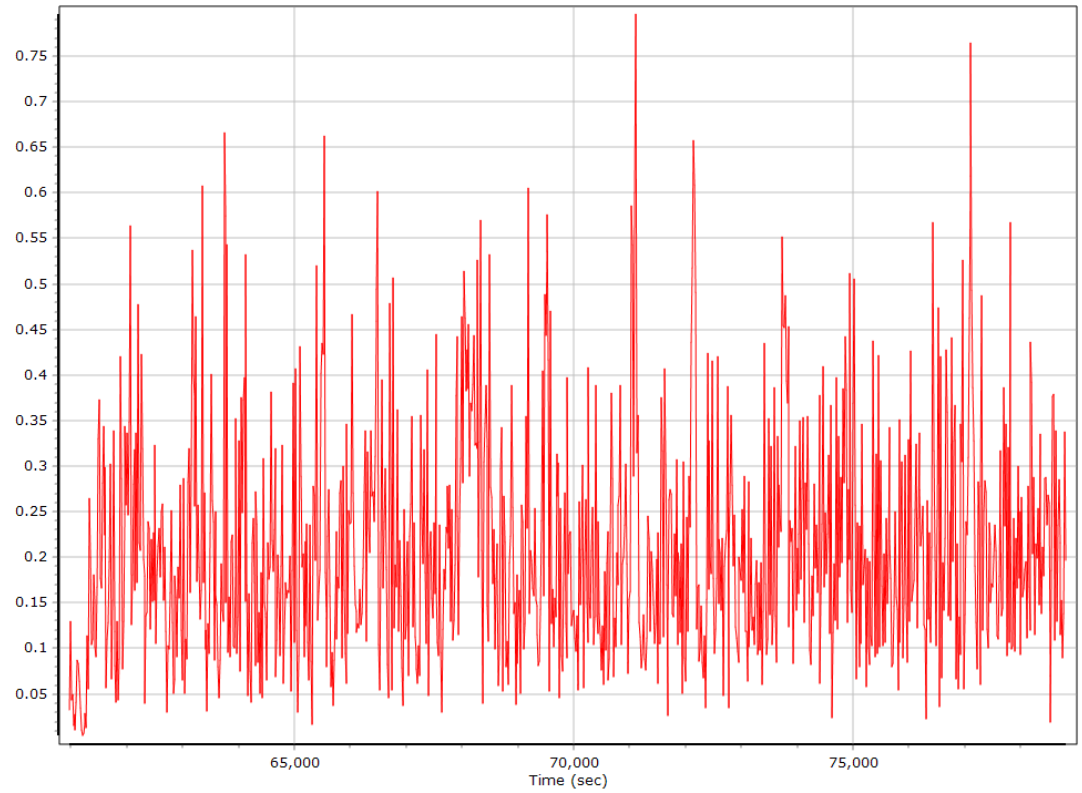
Ground Speed



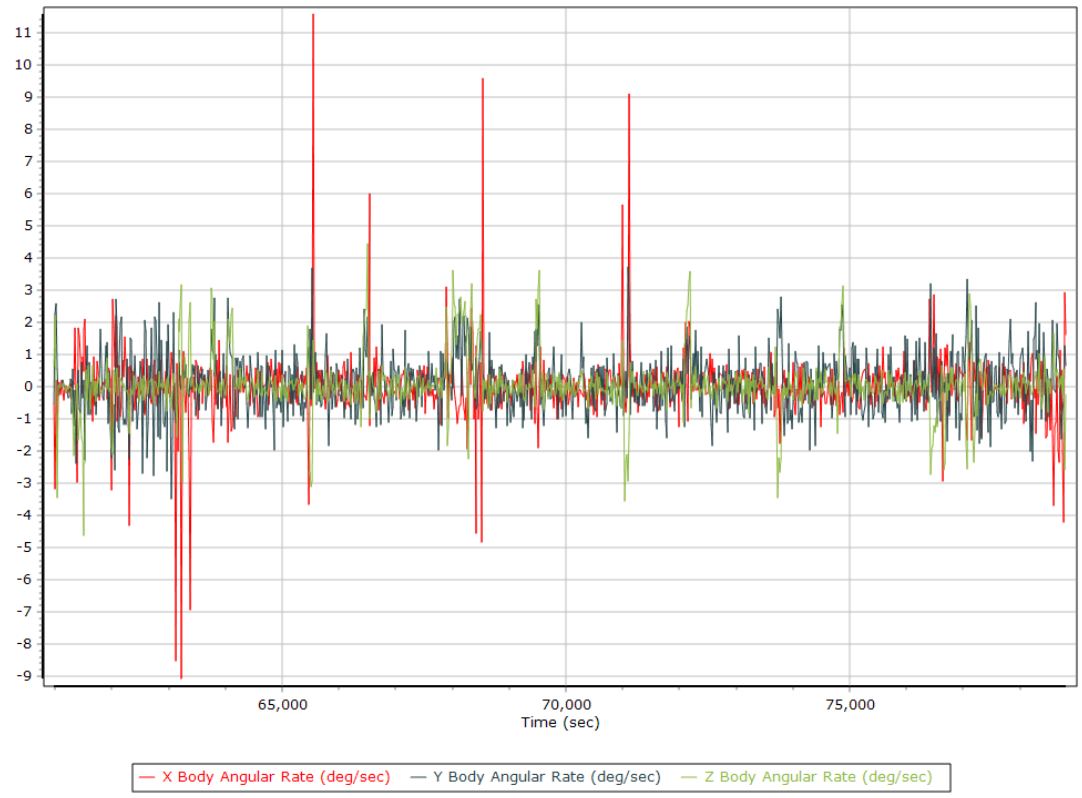
Body Acceleration



Total Body Acceleration

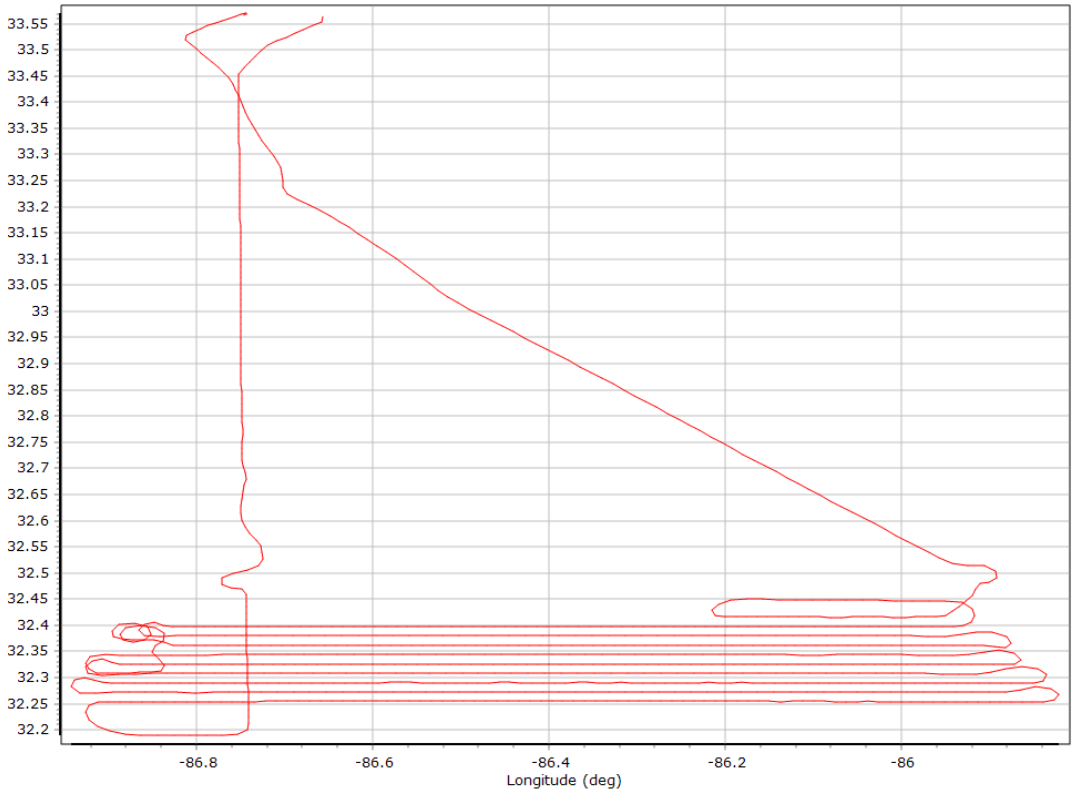


Body Angular Rate

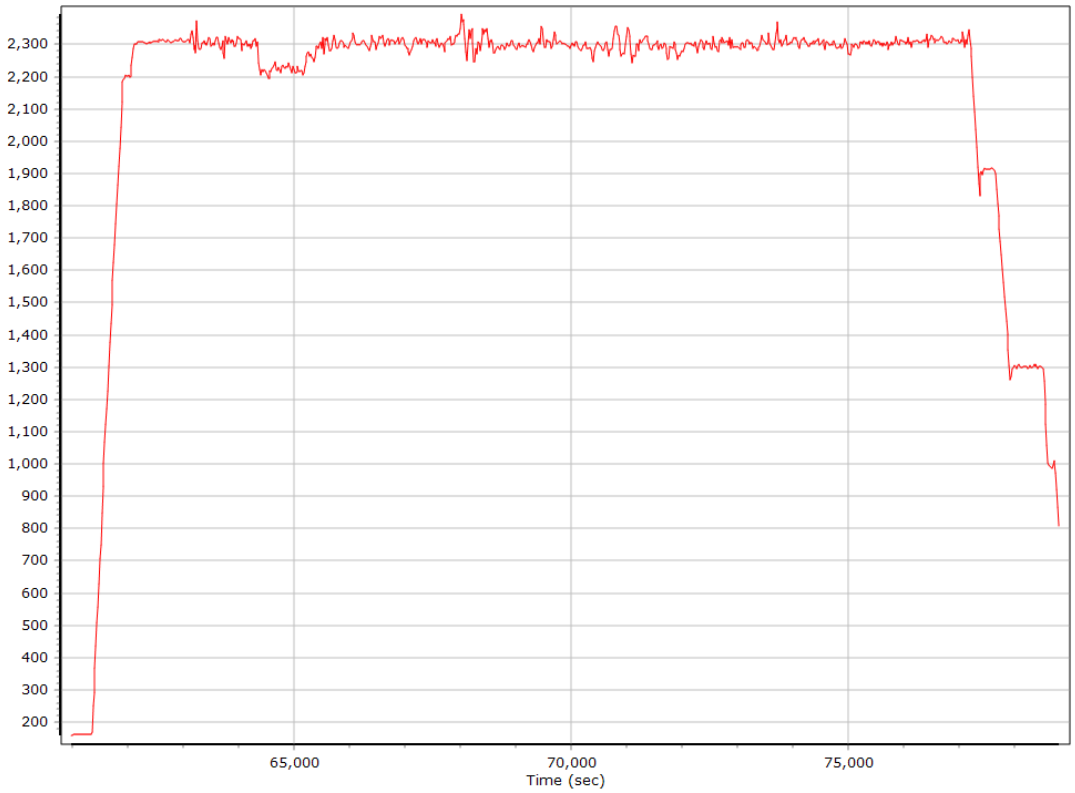


Forward Processed Trajectory Information

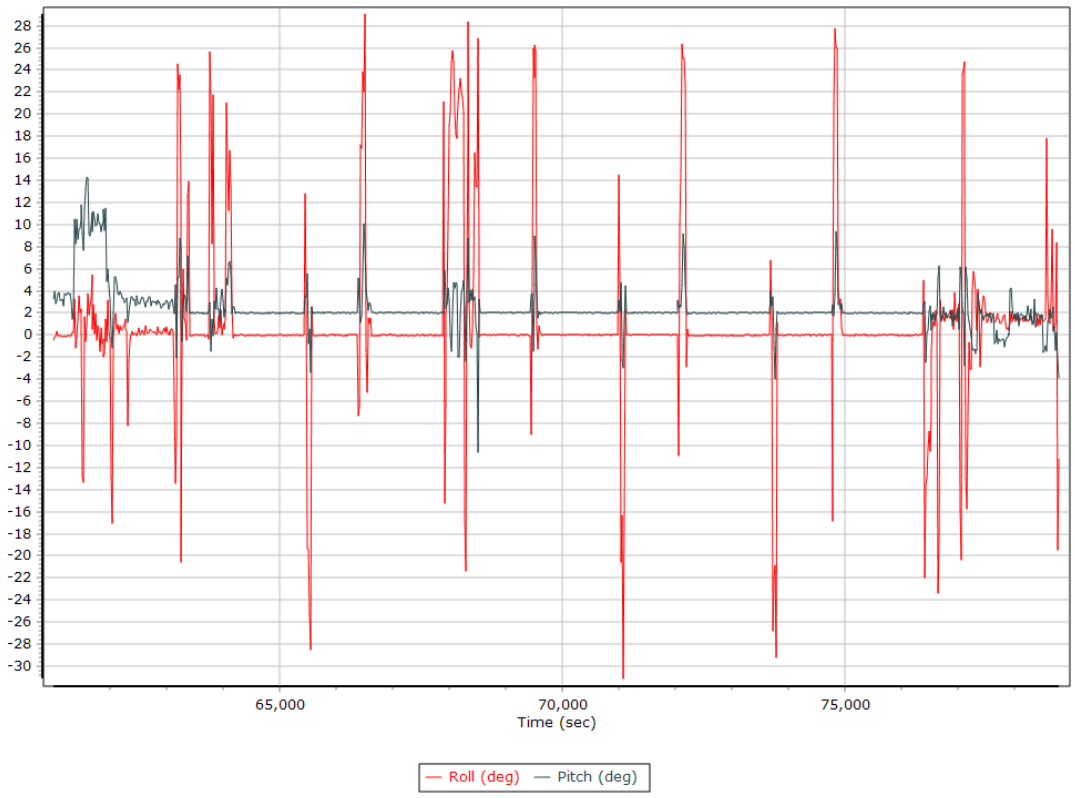
Top View



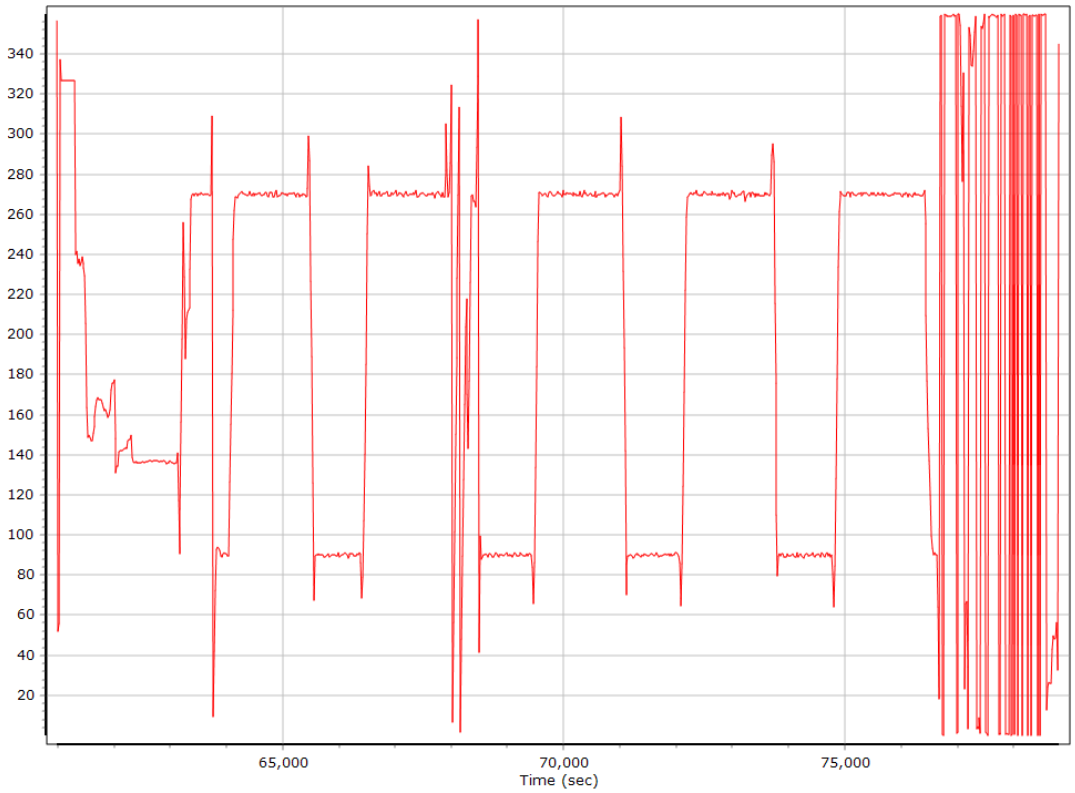
Altitude



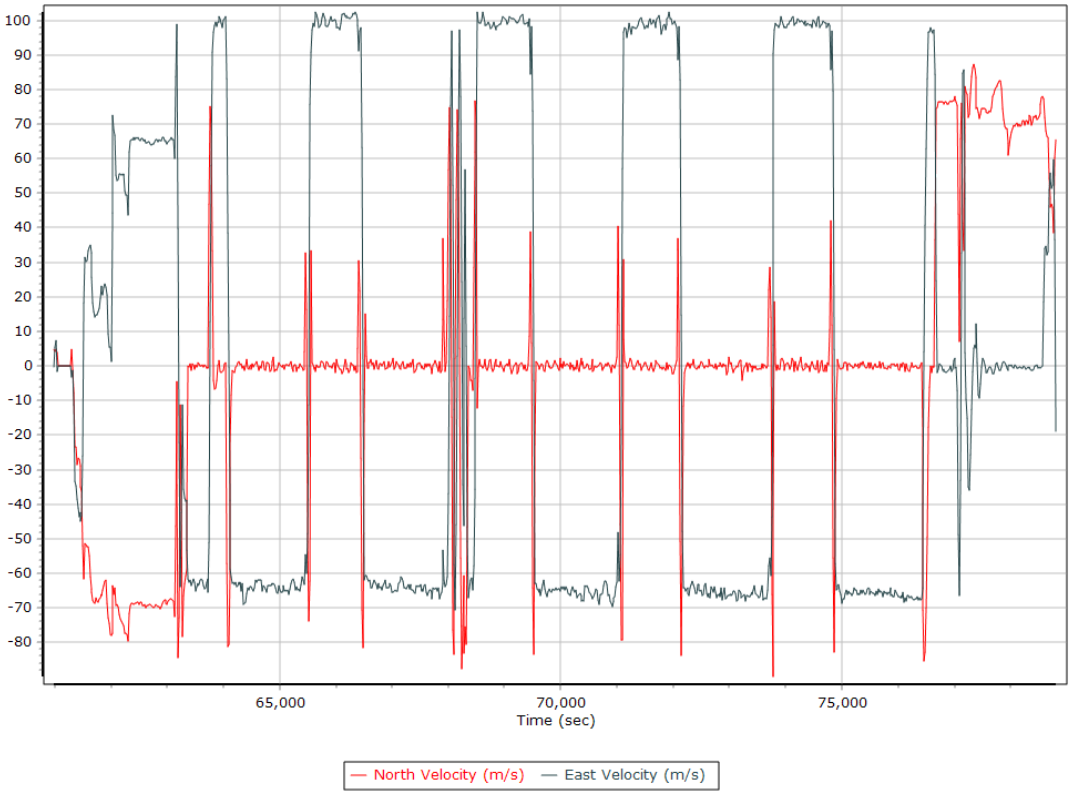
Roll/Pitch



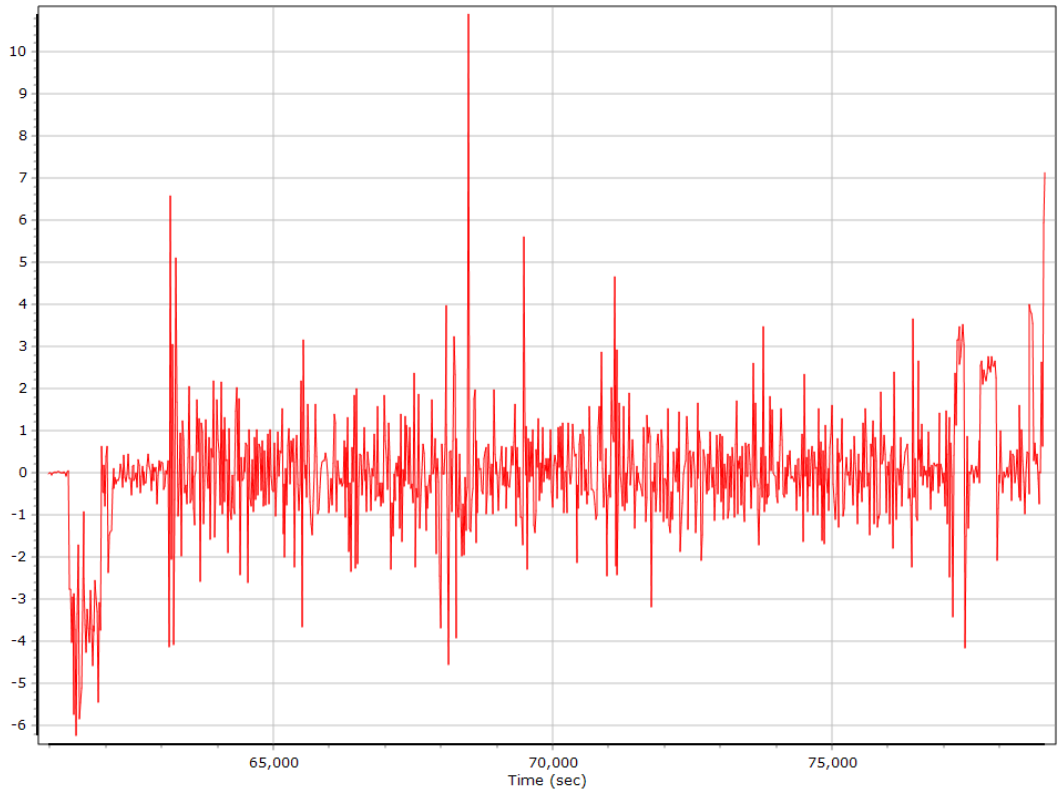
Heading



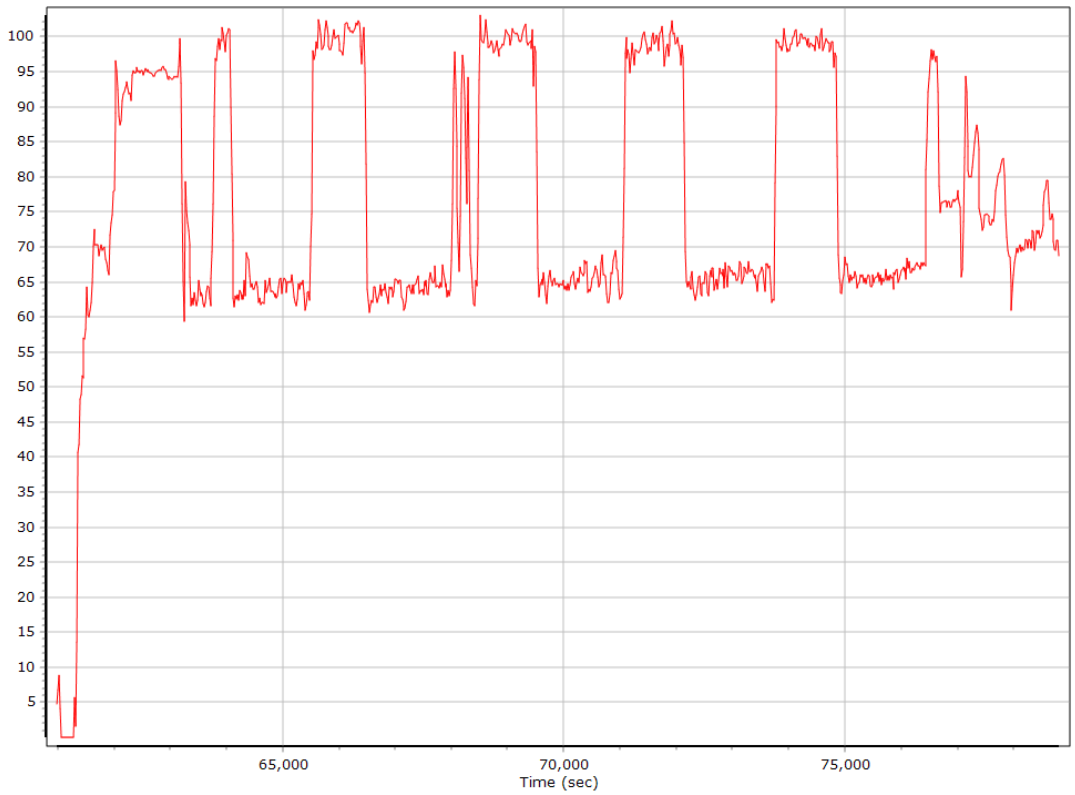
North/East Velocity



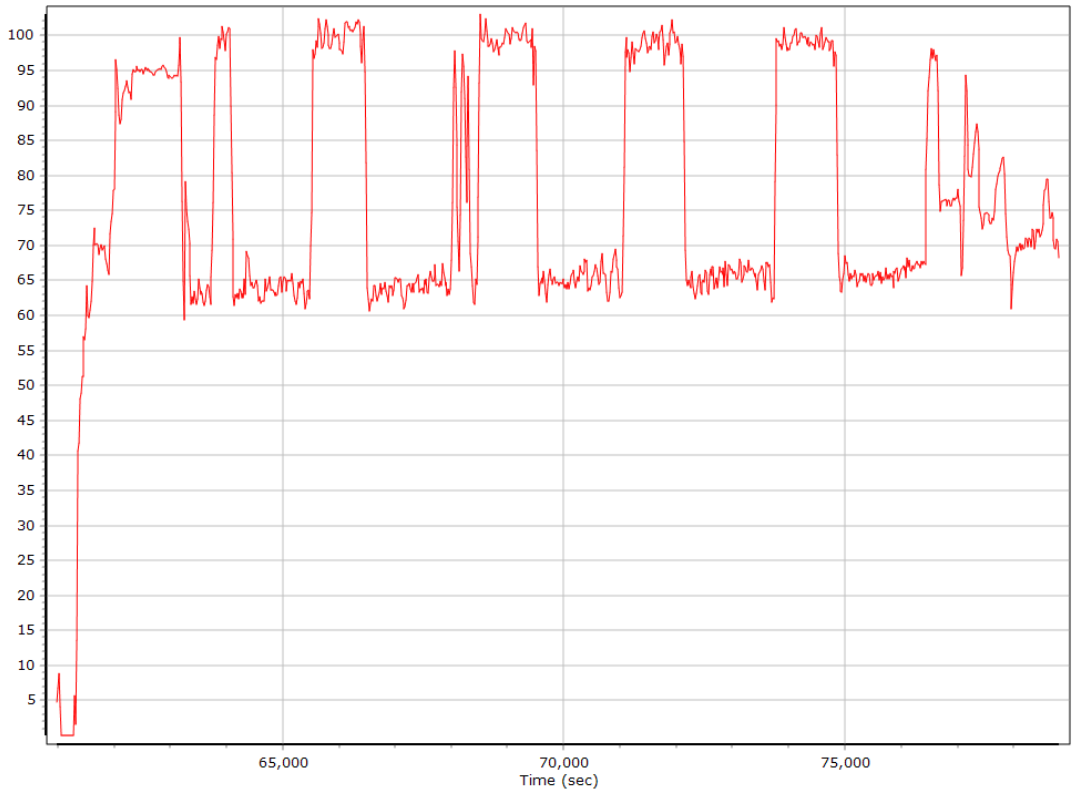
Down Velocity



Total Speed



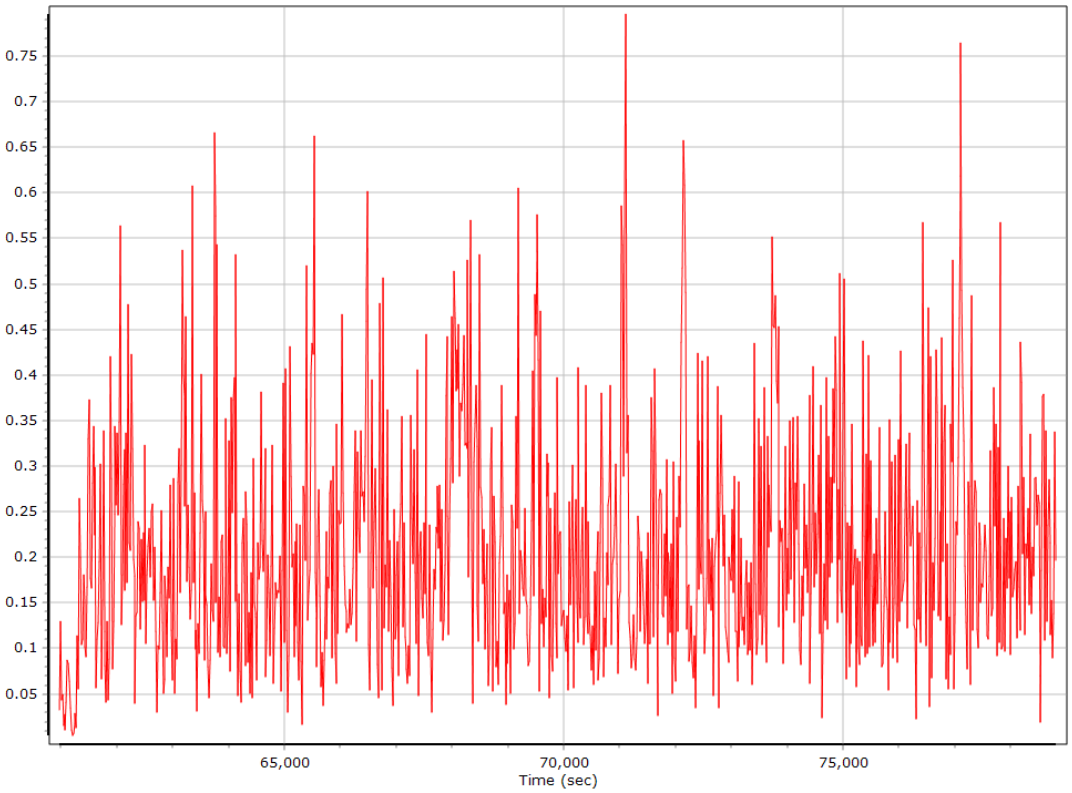
Ground Speed



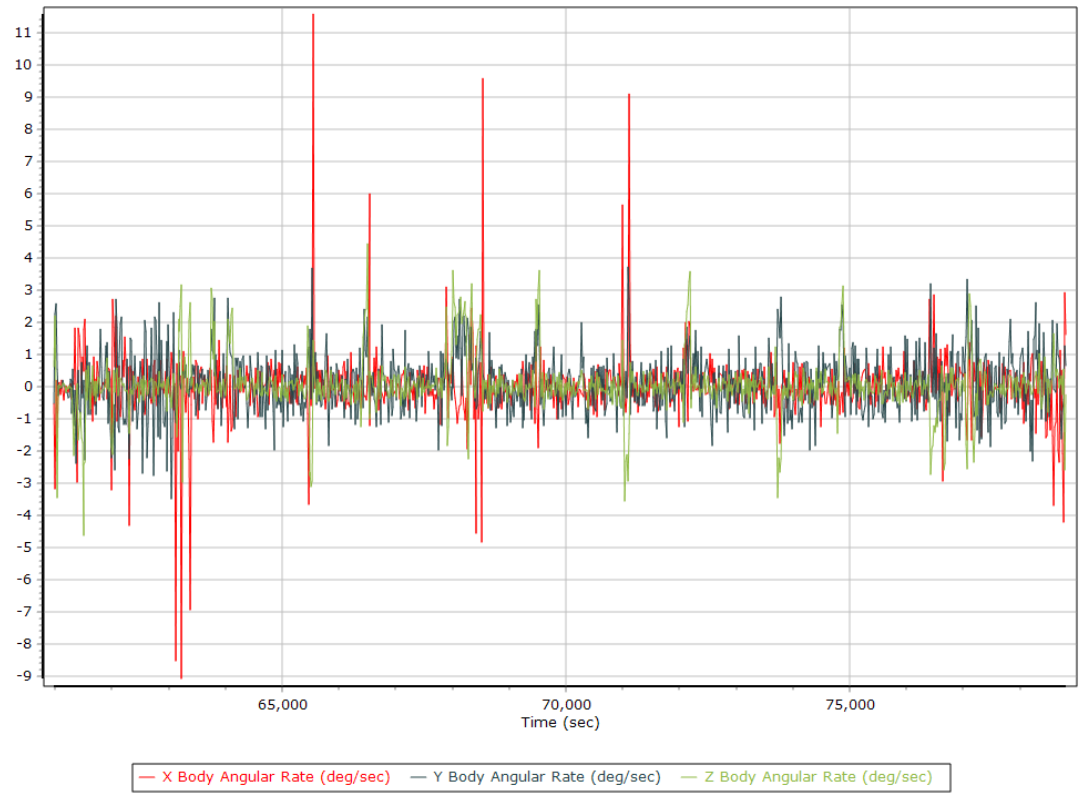
Body Acceleration



Total Body Acceleration



Body Angular Rate

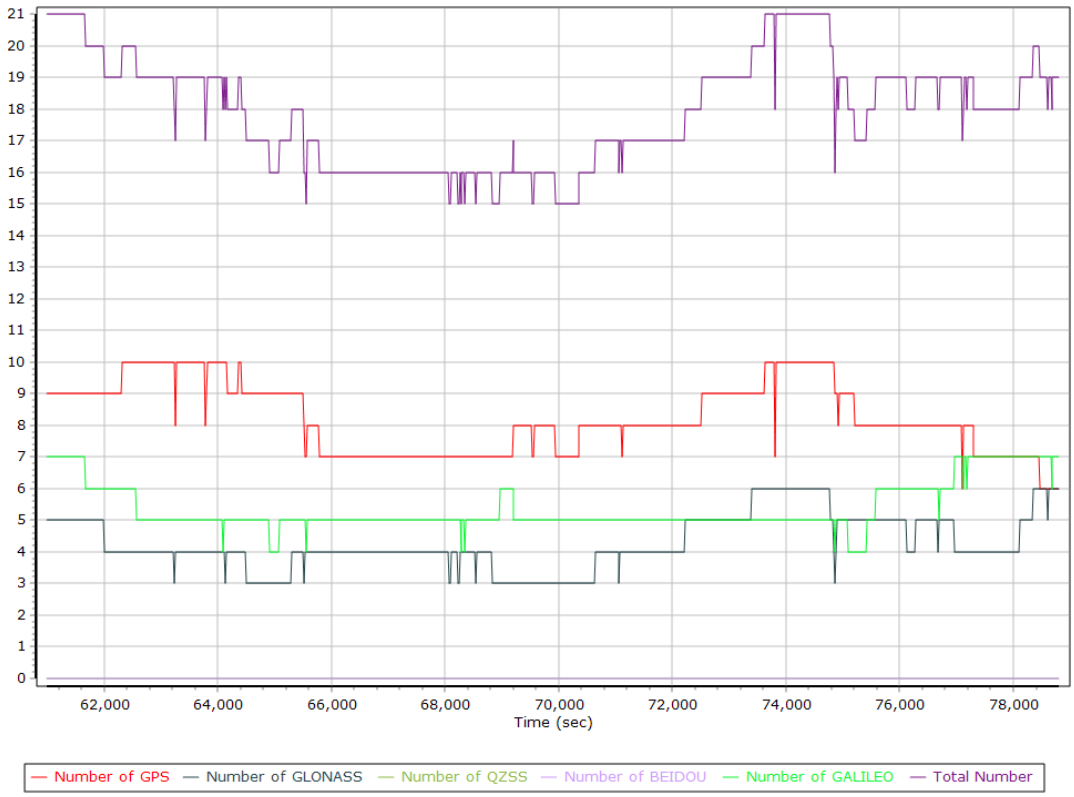


GNSS QC

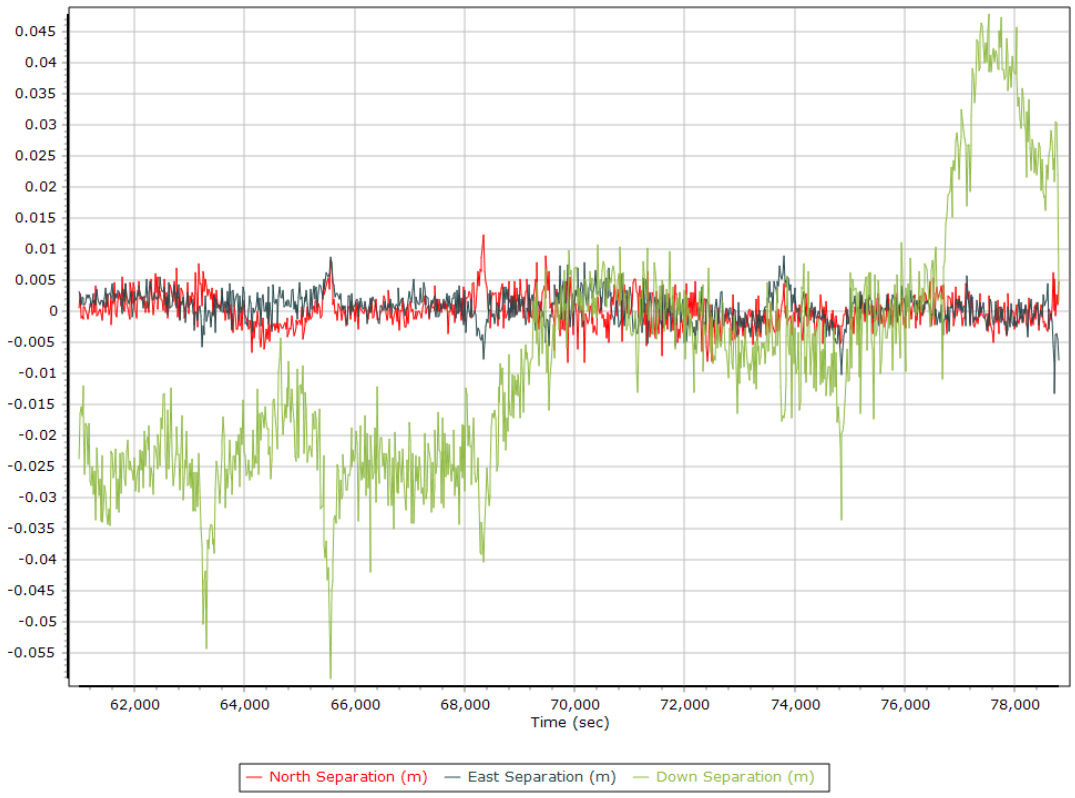
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	10	8
Number of GLONASS SV	3	6	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	4	7	5
Total number of SV	14	21	18
PDOP	1.06	1.94	1.25
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	18142.00	0.00	0.00
Percentage	100.00	0.00	0.00

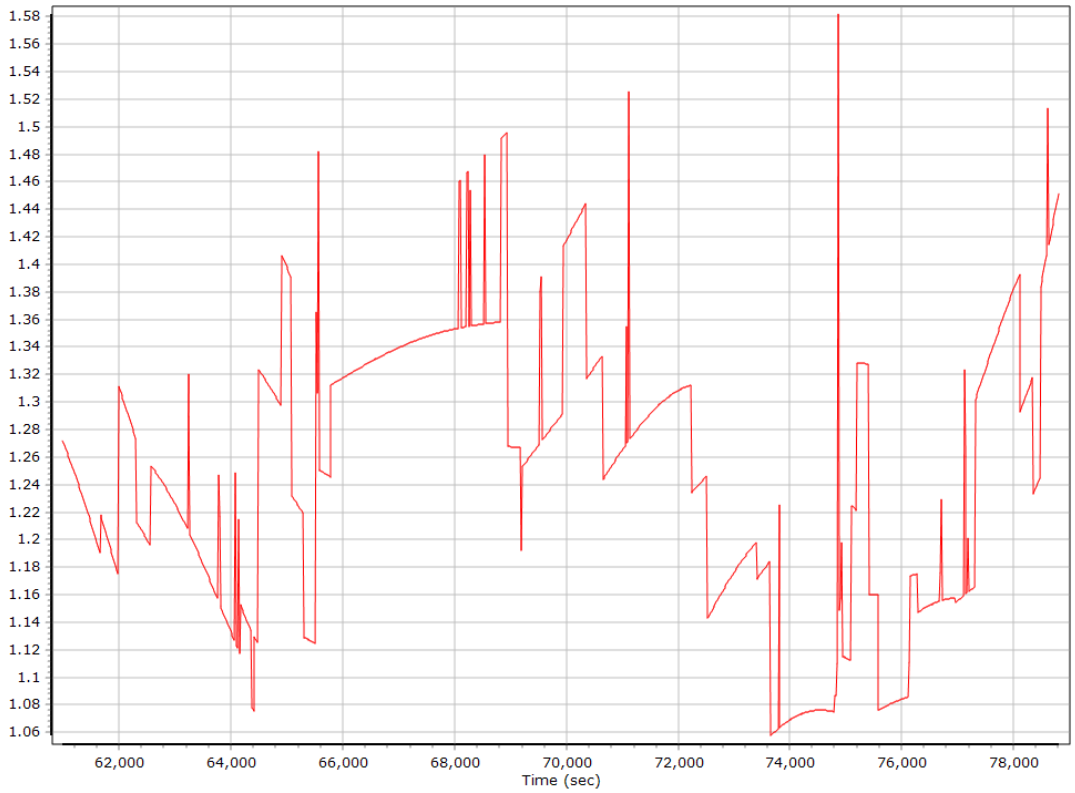
Num SVs in solution



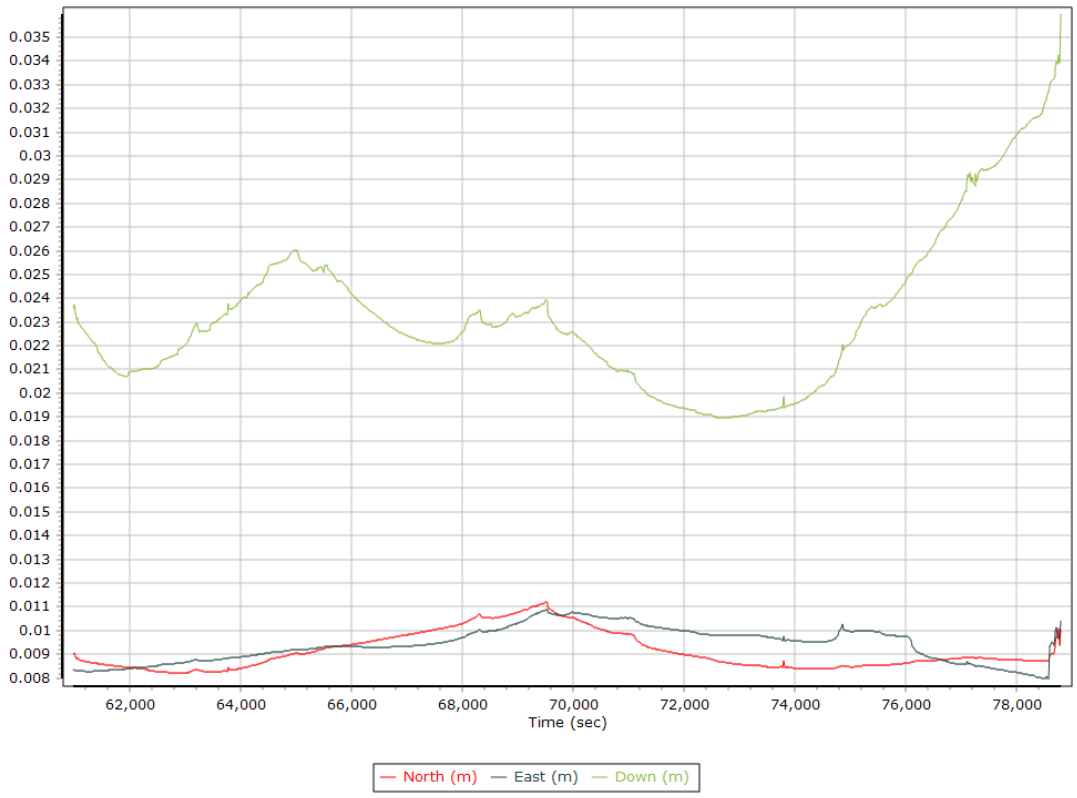
Forward/Reverse Separation



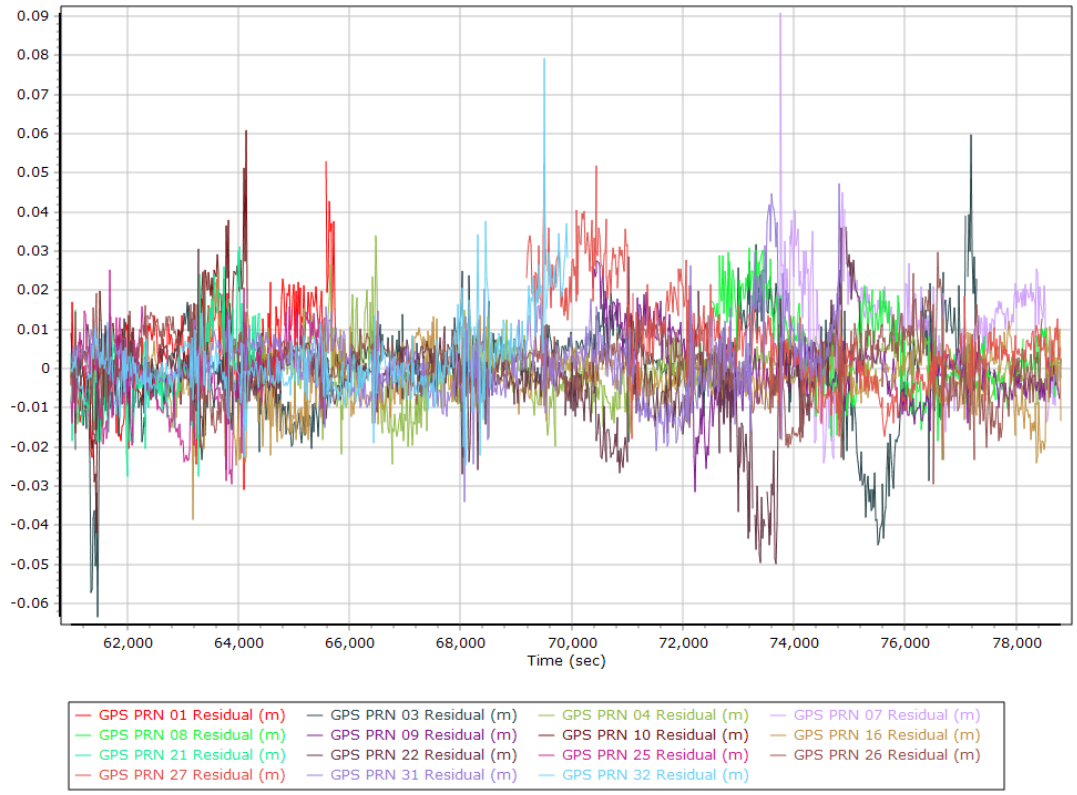
PDOP



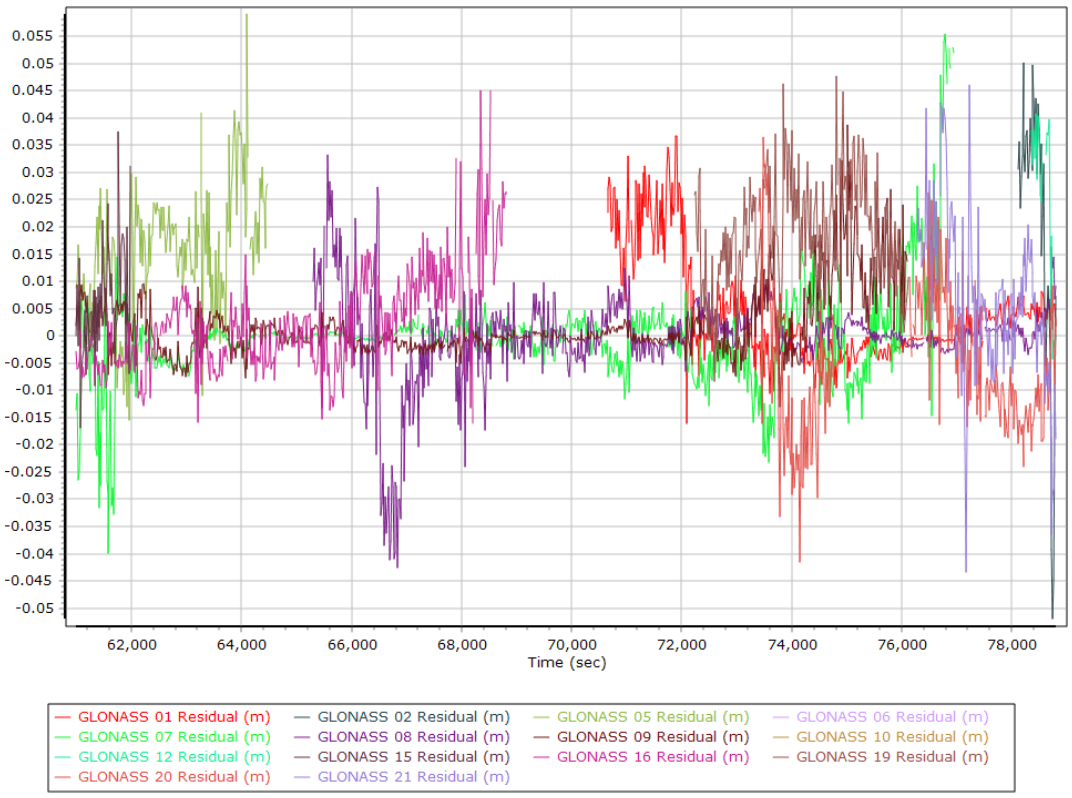
Estimated Position Accuracy



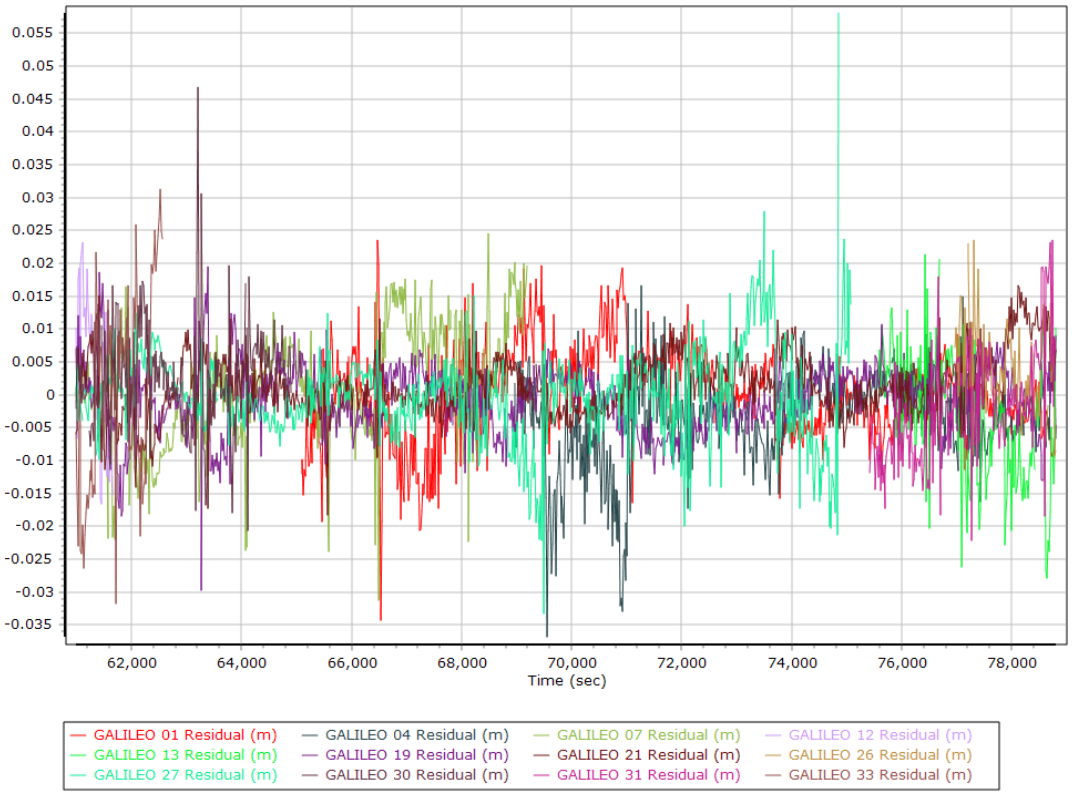
GPS Residuals



GLONASS Residuals



GALILEO Residuals



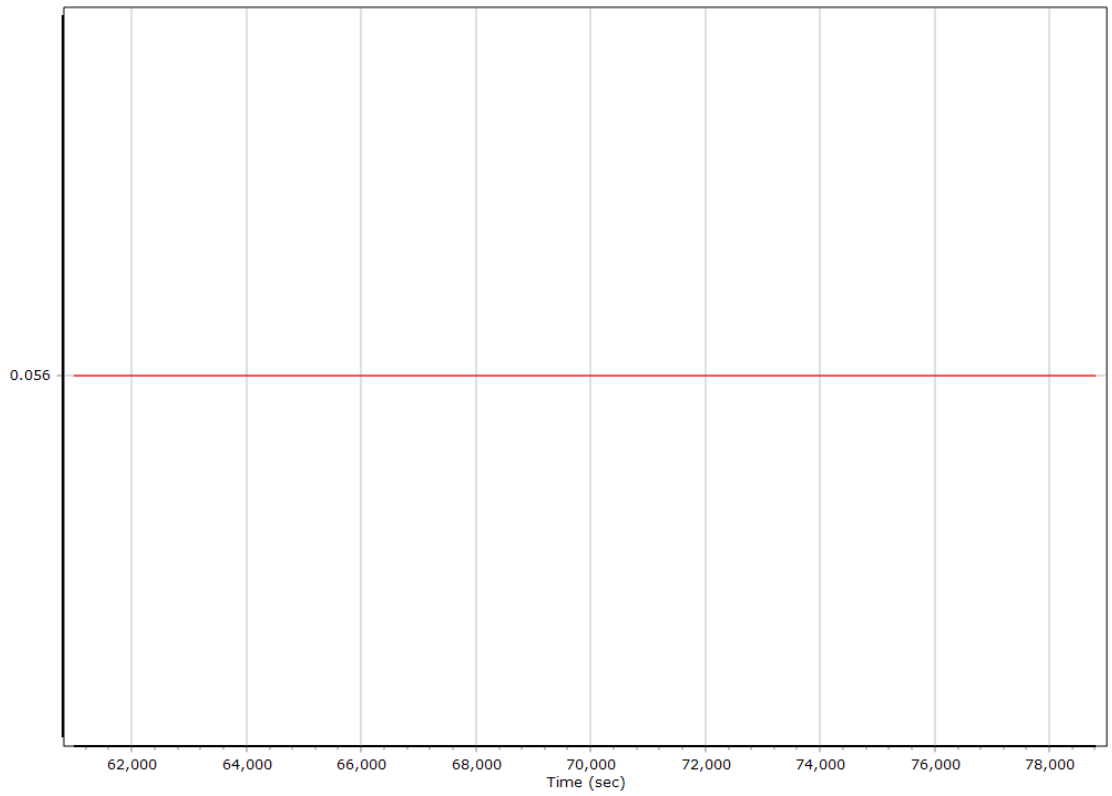
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	60669.000 (1/3/2021 4:51:09 PM)		
Processing end time	78817.000 (1/3/2021 9:53:37 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

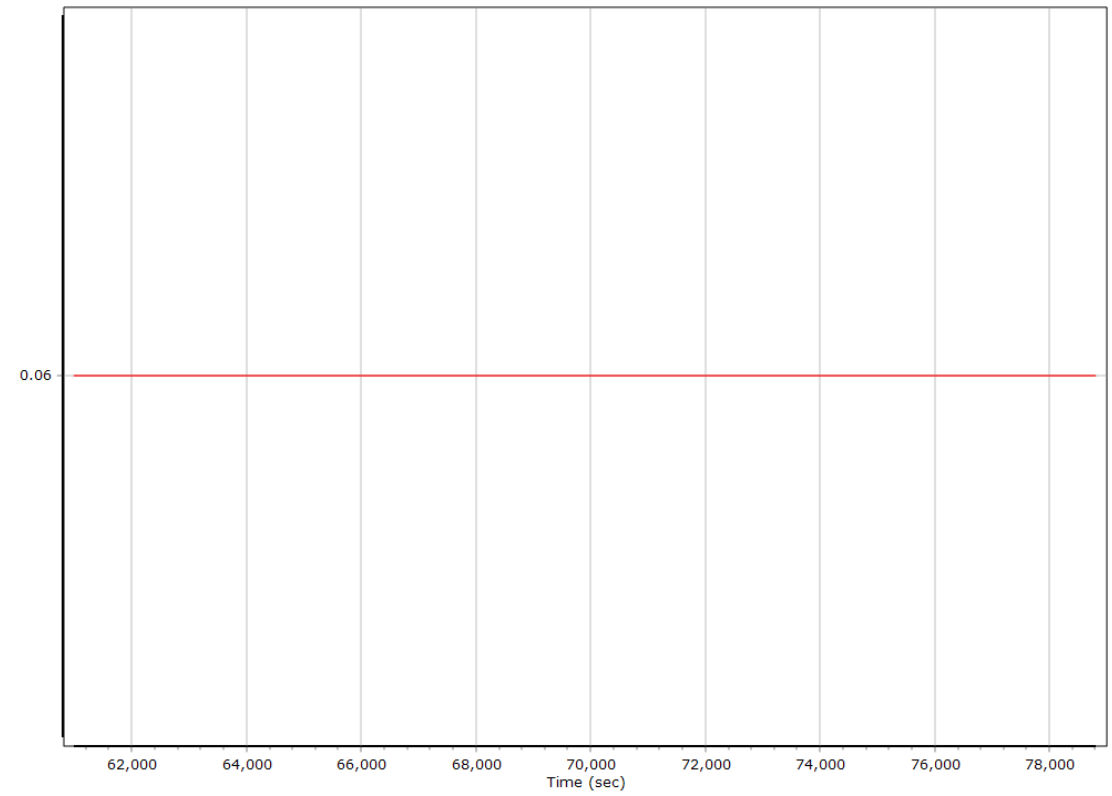
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

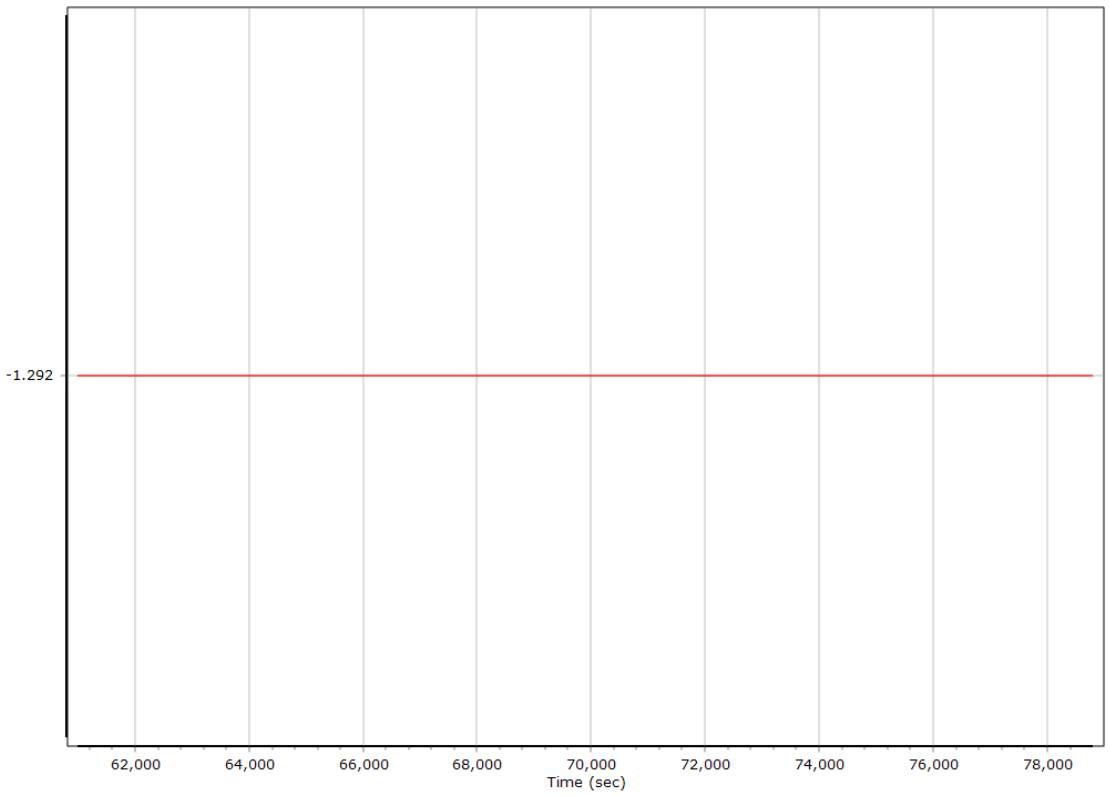
X Reference-Primary GNSS Lever Arm (m)



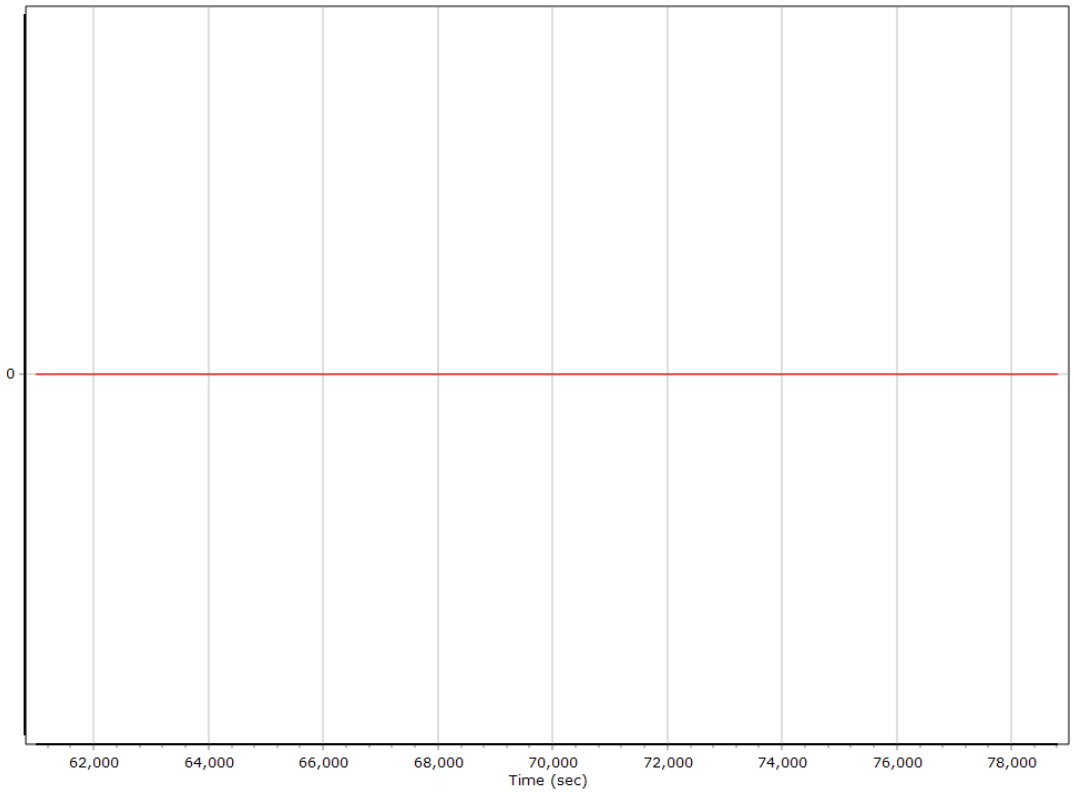
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



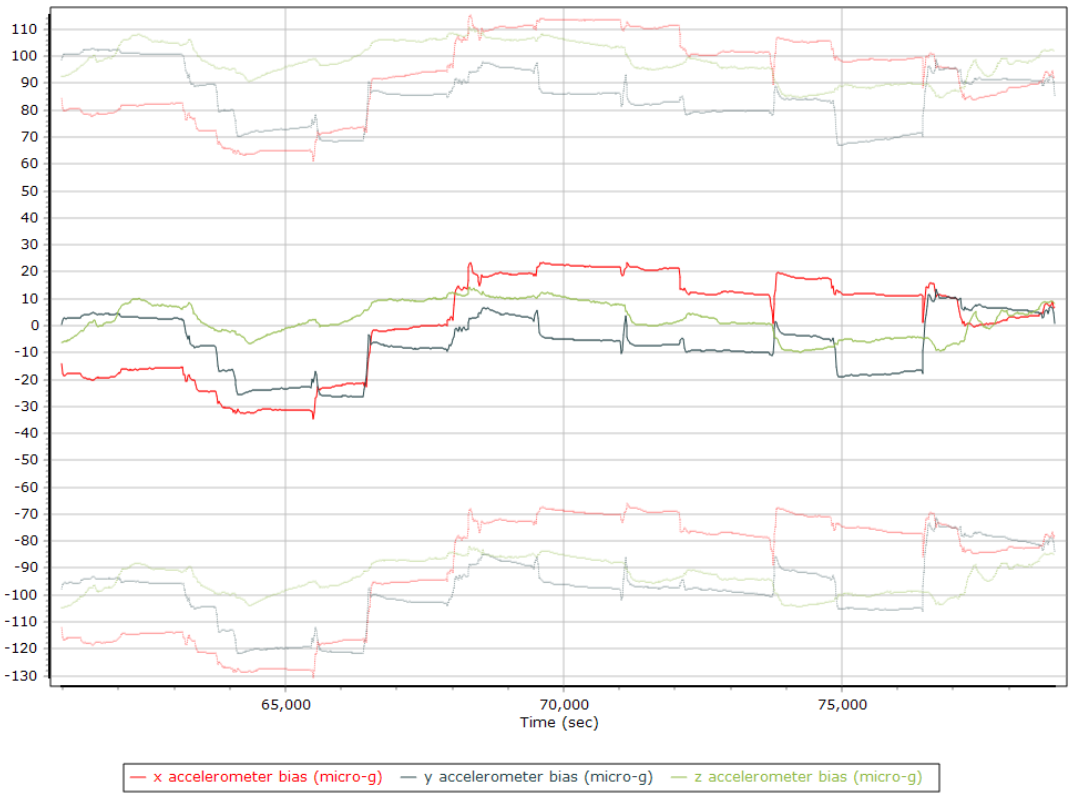
Reference-Primary GNSS Lever Arm Figure of Merit



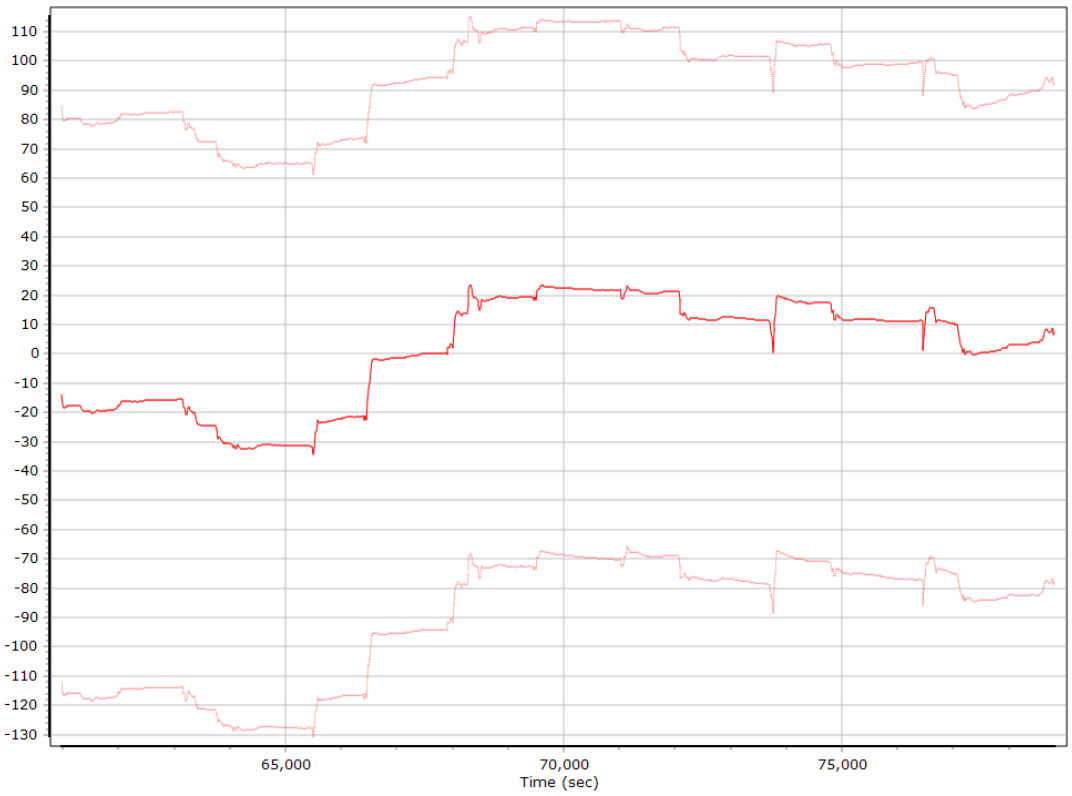
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

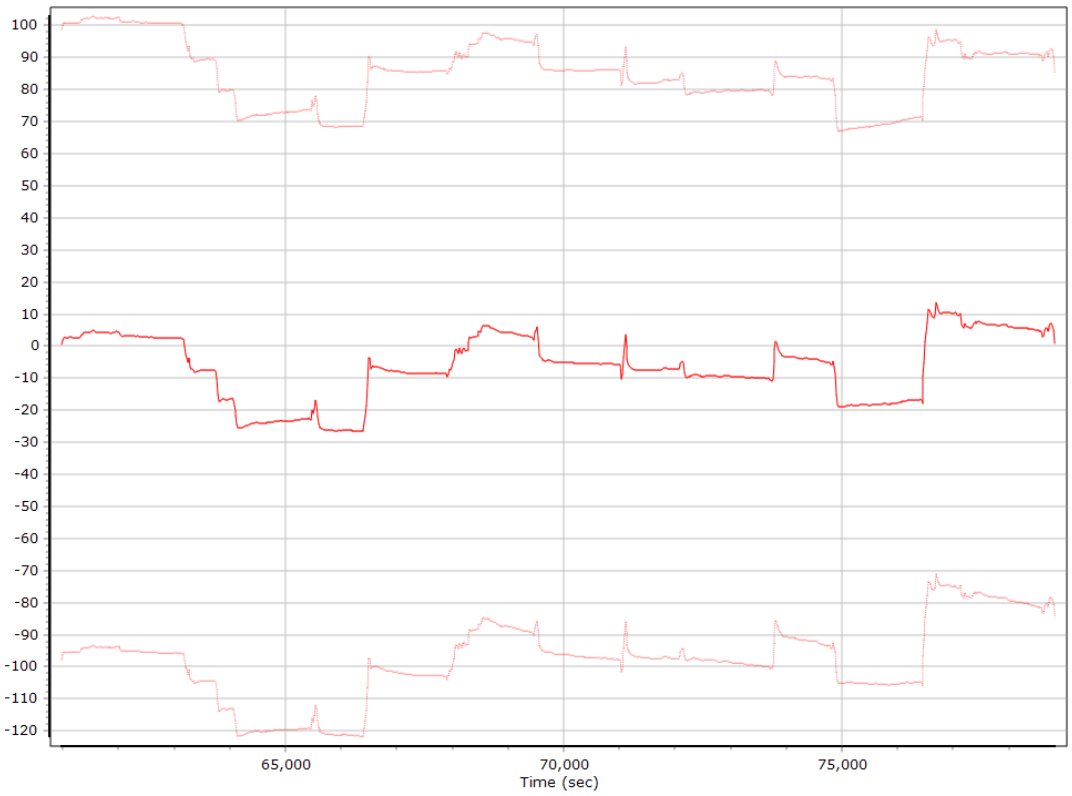
Accelerometer Bias (micro-g)



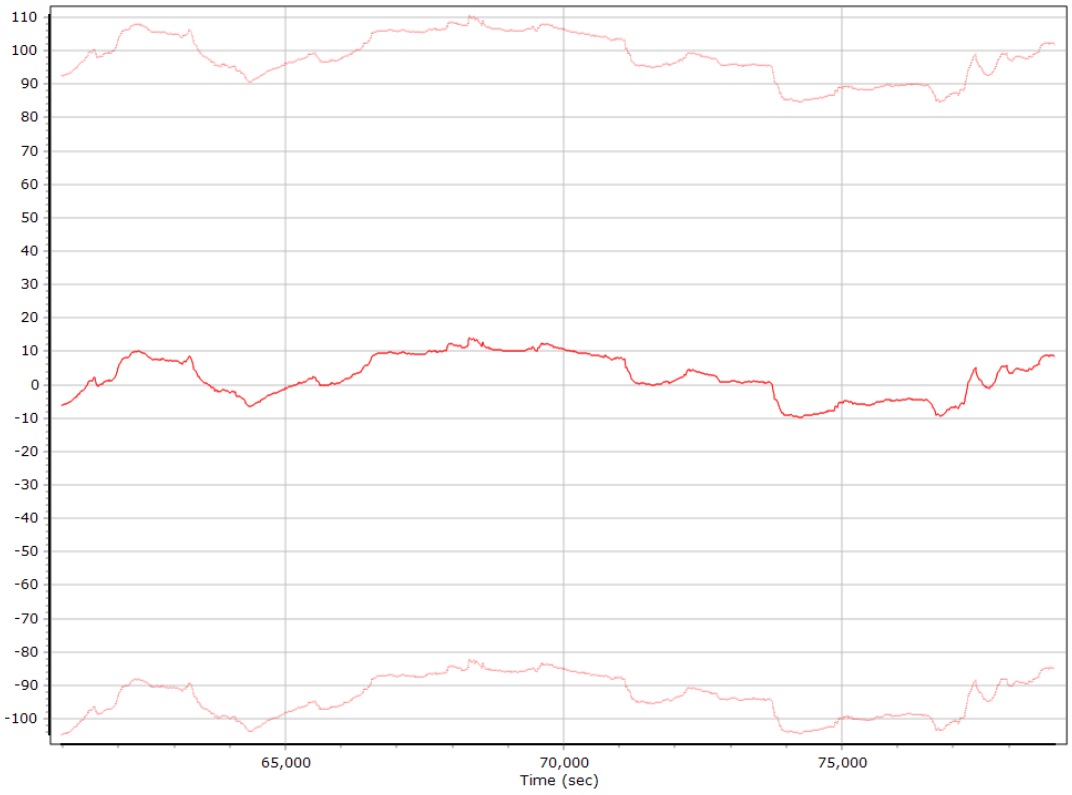
X Accelerometer Bias (micro-g)



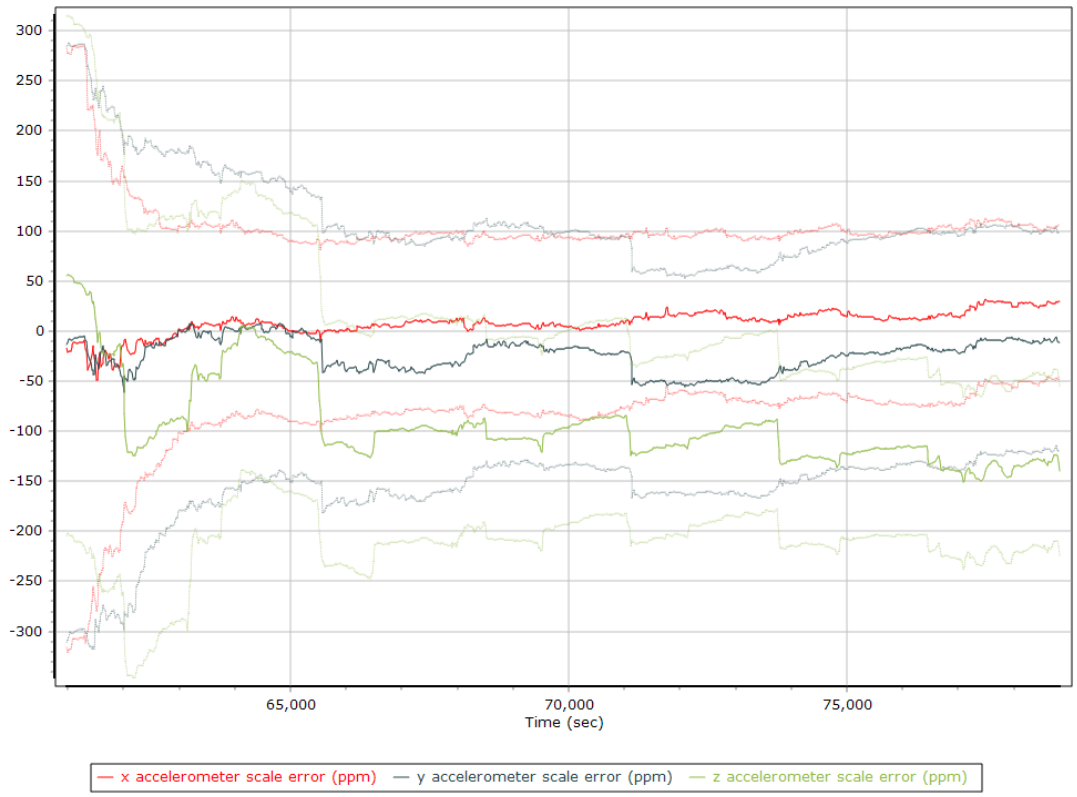
Y Accelerometer Bias (micro-g)



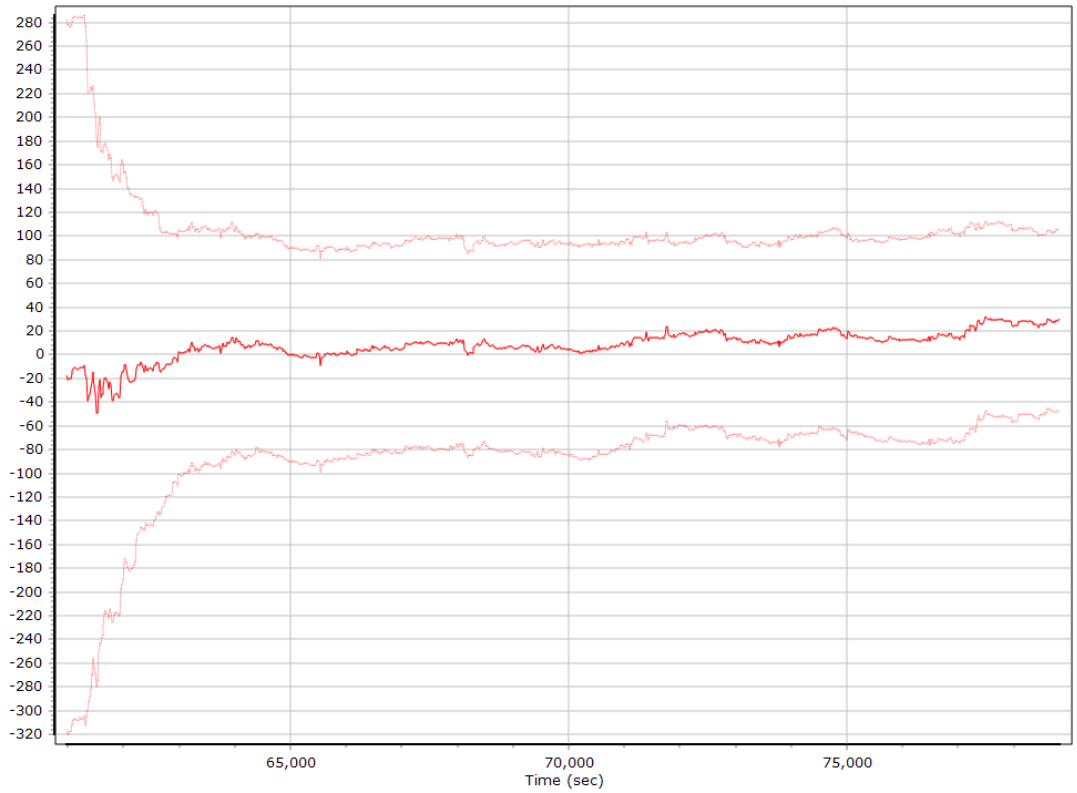
Z Accelerometer Bias (micro-g)



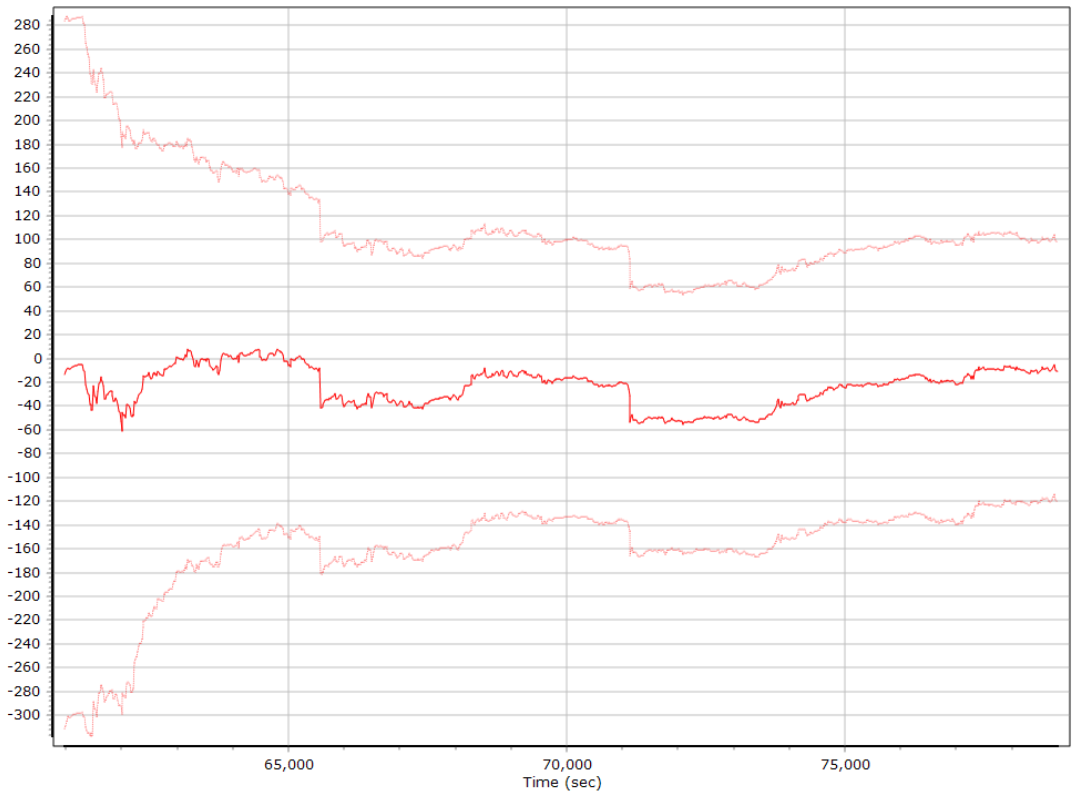
Accelerometer Scale Error (ppm)



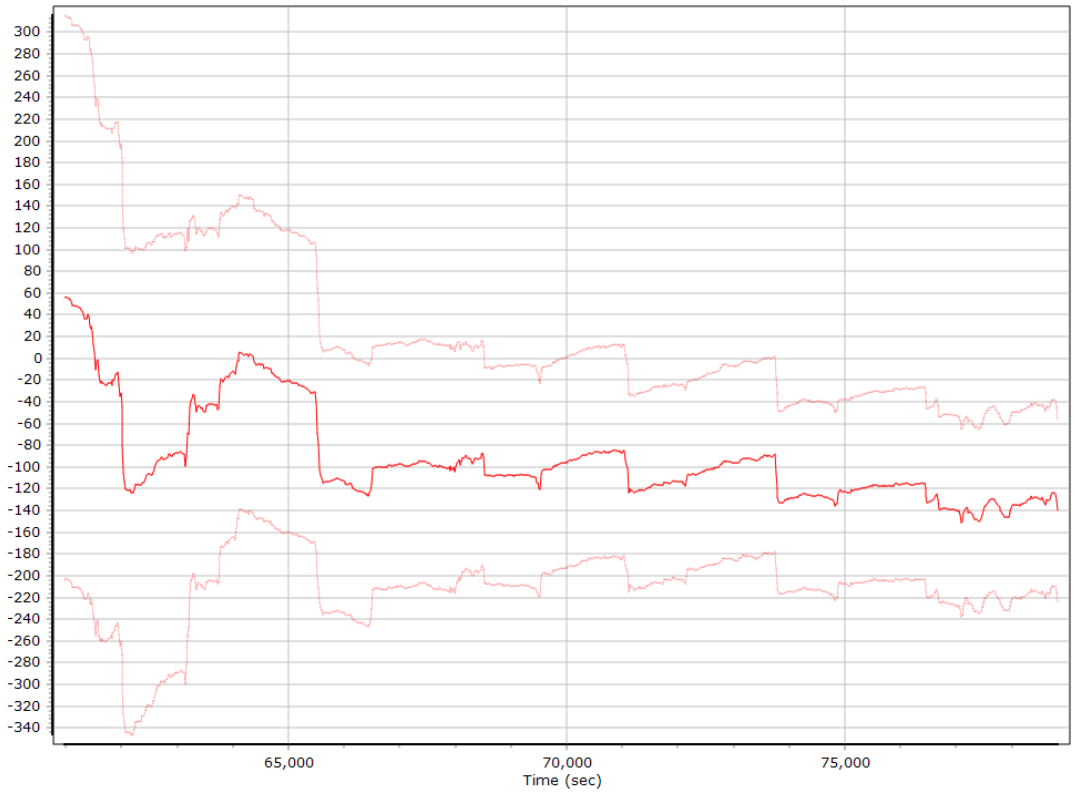
X Accelerometer Scale Error (ppm)



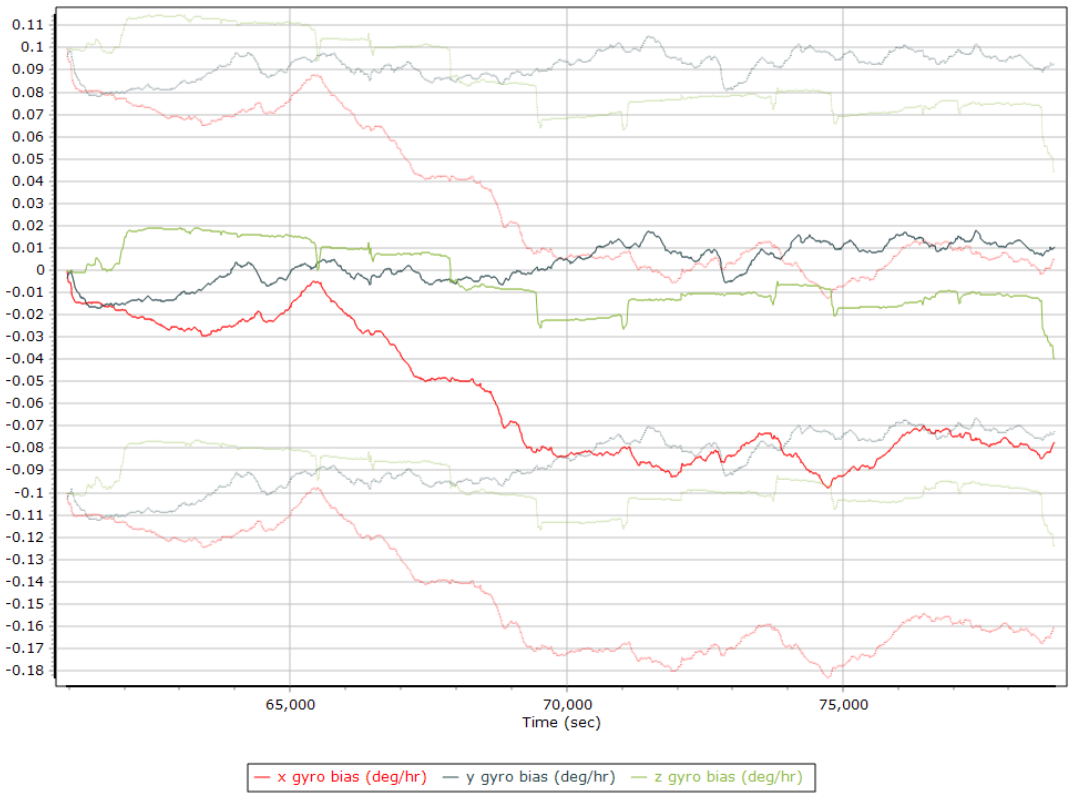
Y Accelerometer Scale Error (ppm)



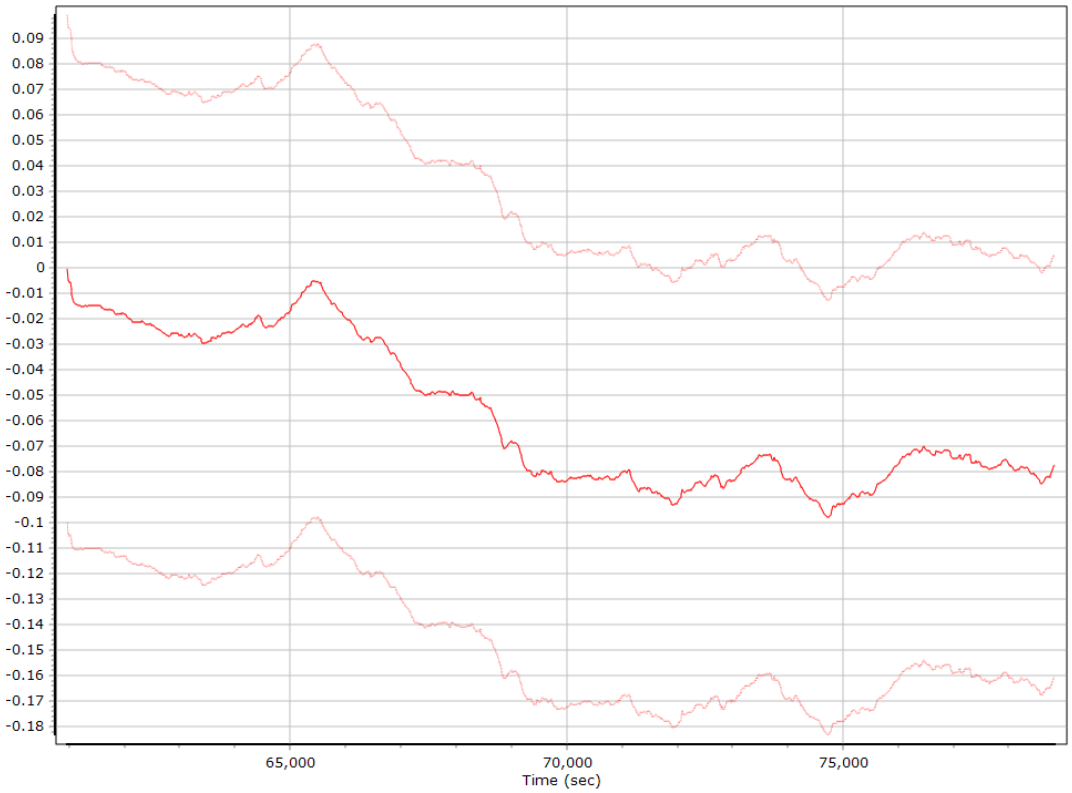
Z Accelerometer Scale Error (ppm)



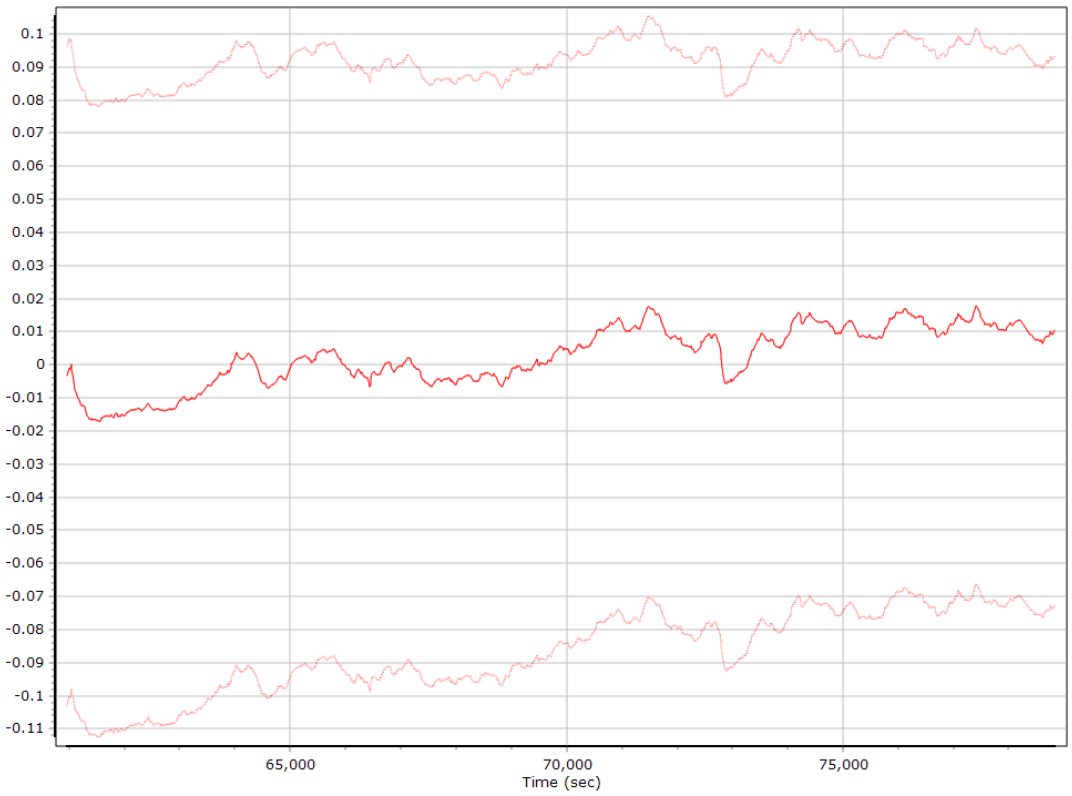
Gyro Bias (deg/h)



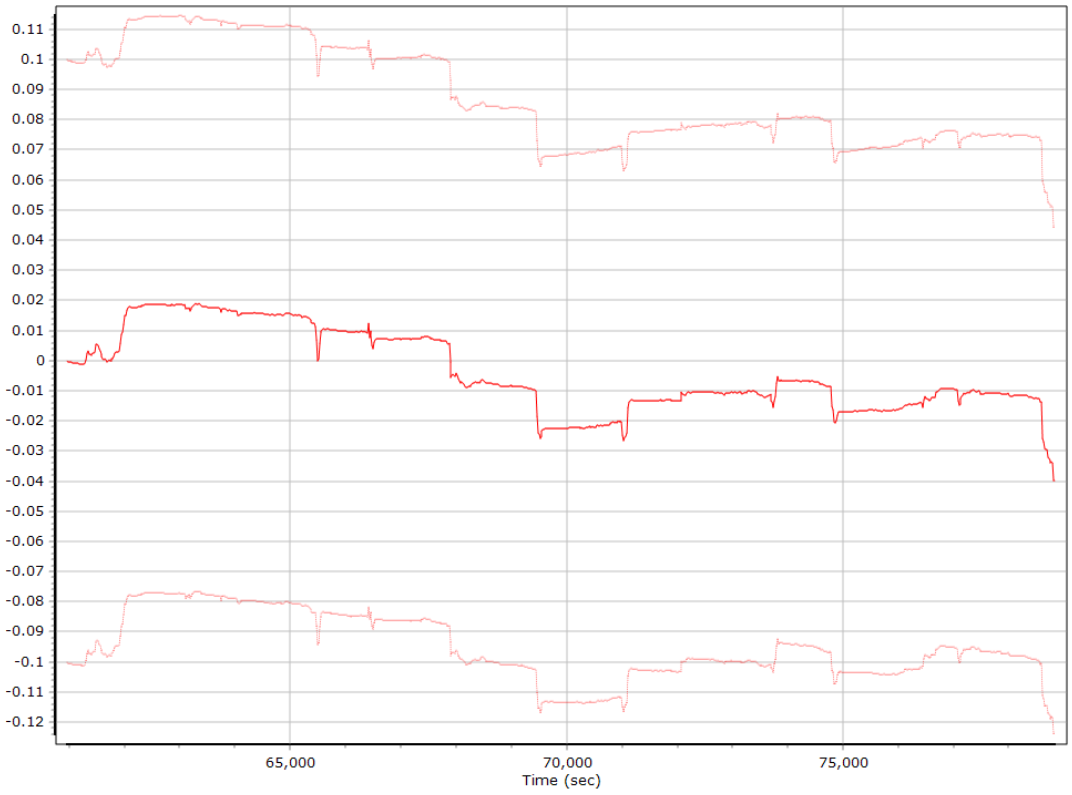
X Gyro Bias (deg/h)



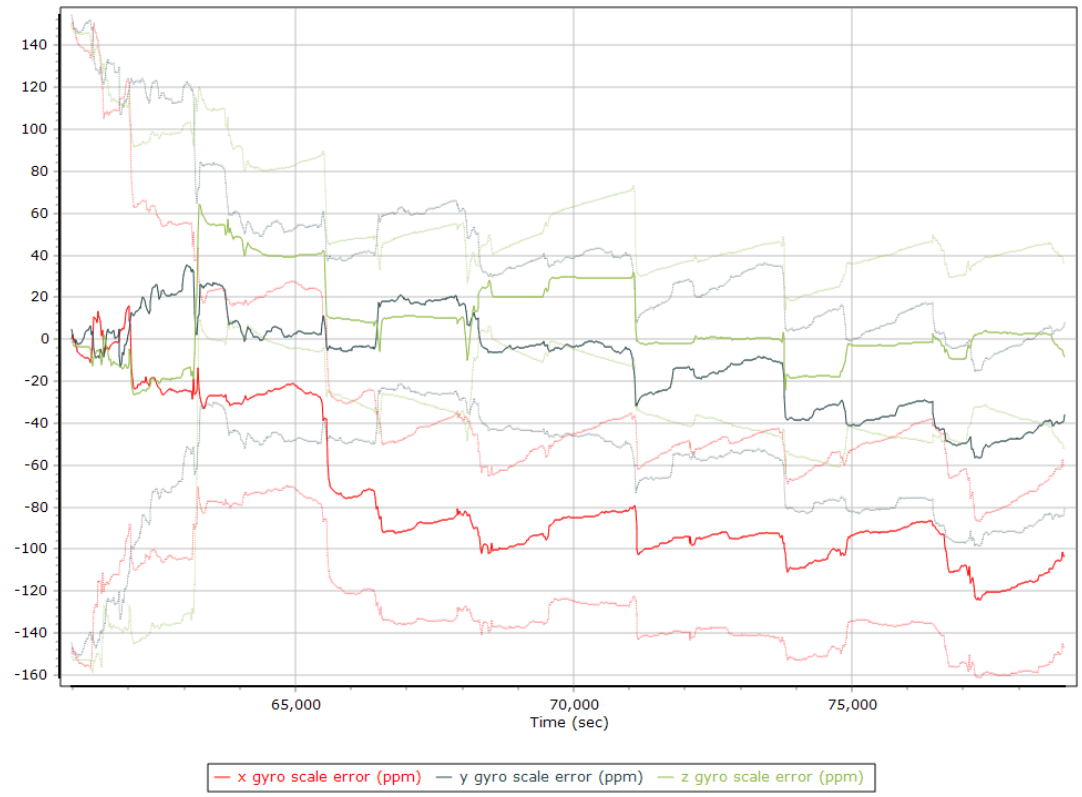
Y Gyro Bias (deg/h)



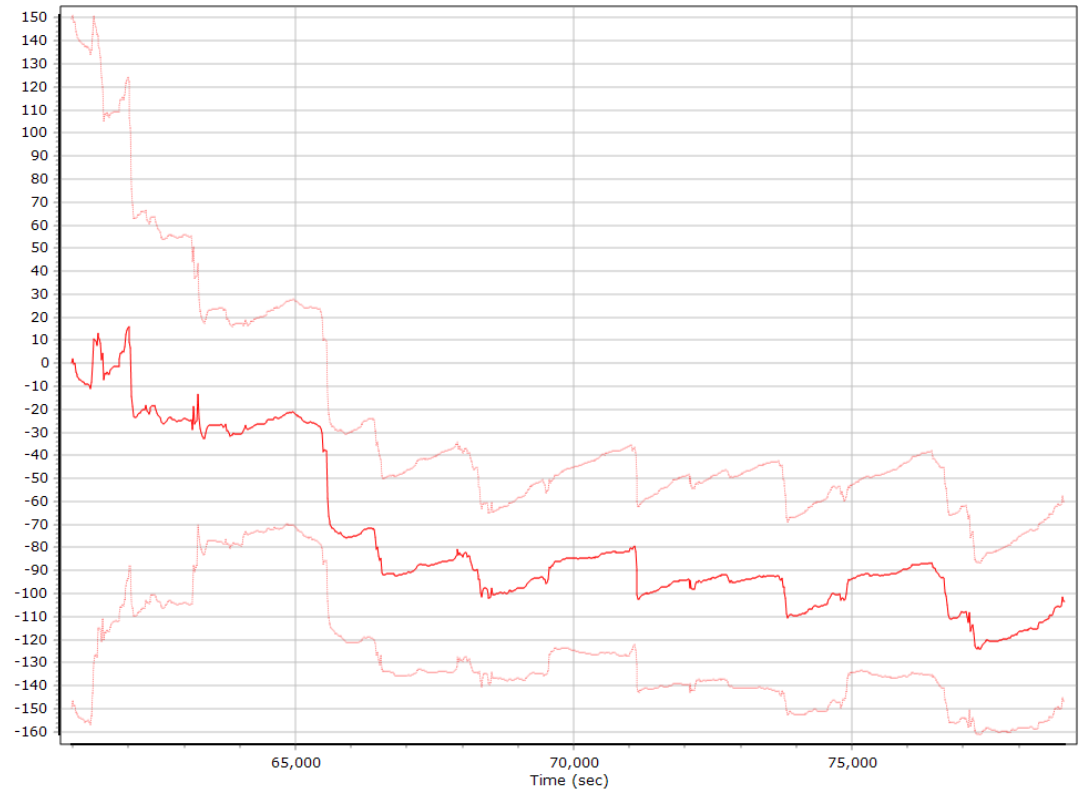
Z Gyro Bias (deg/h)



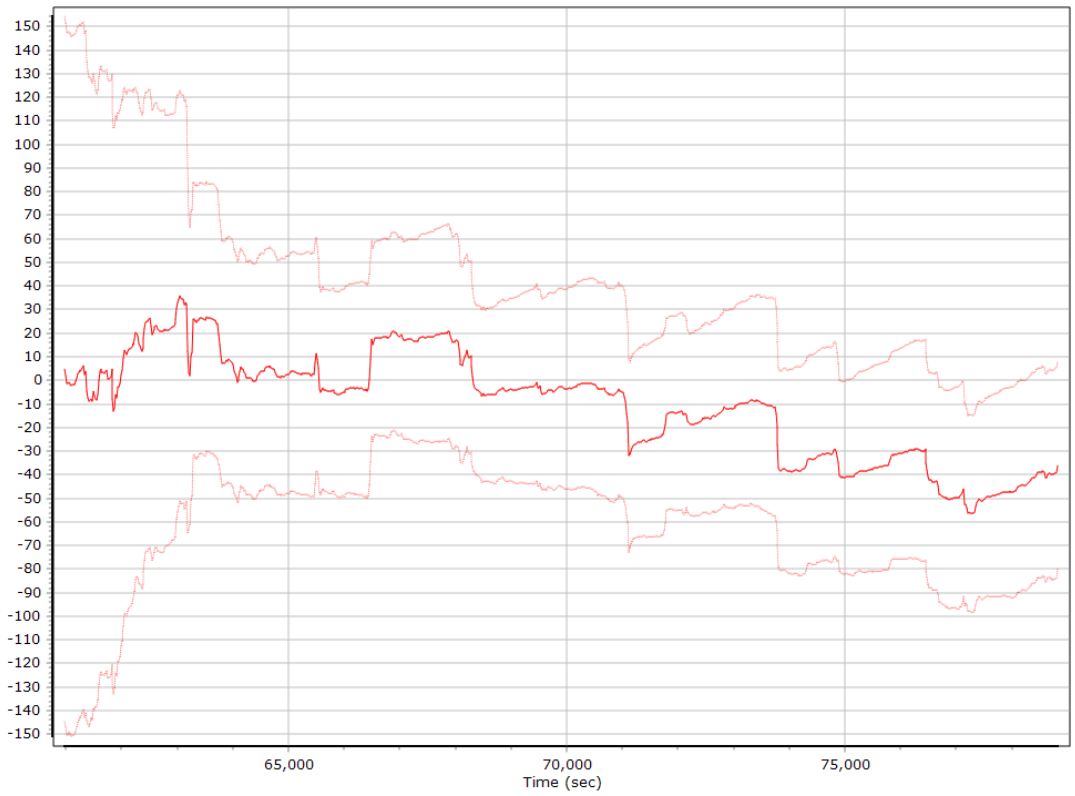
Gyro Scale Error (ppm)



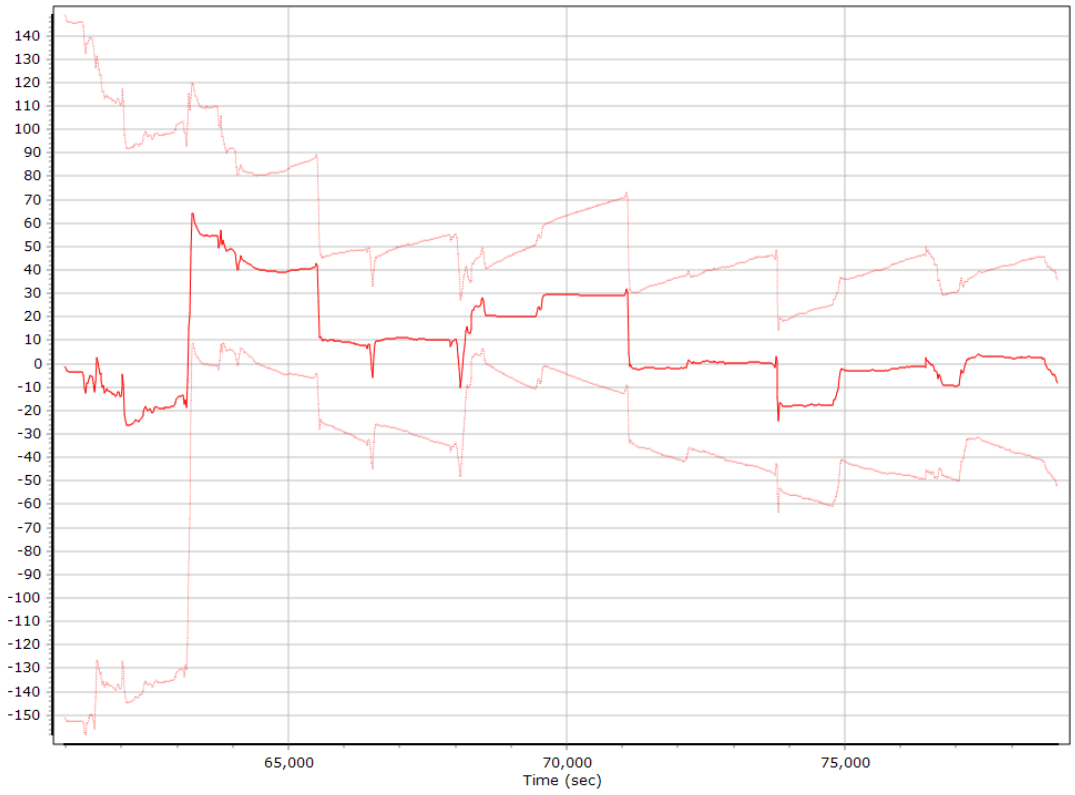
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

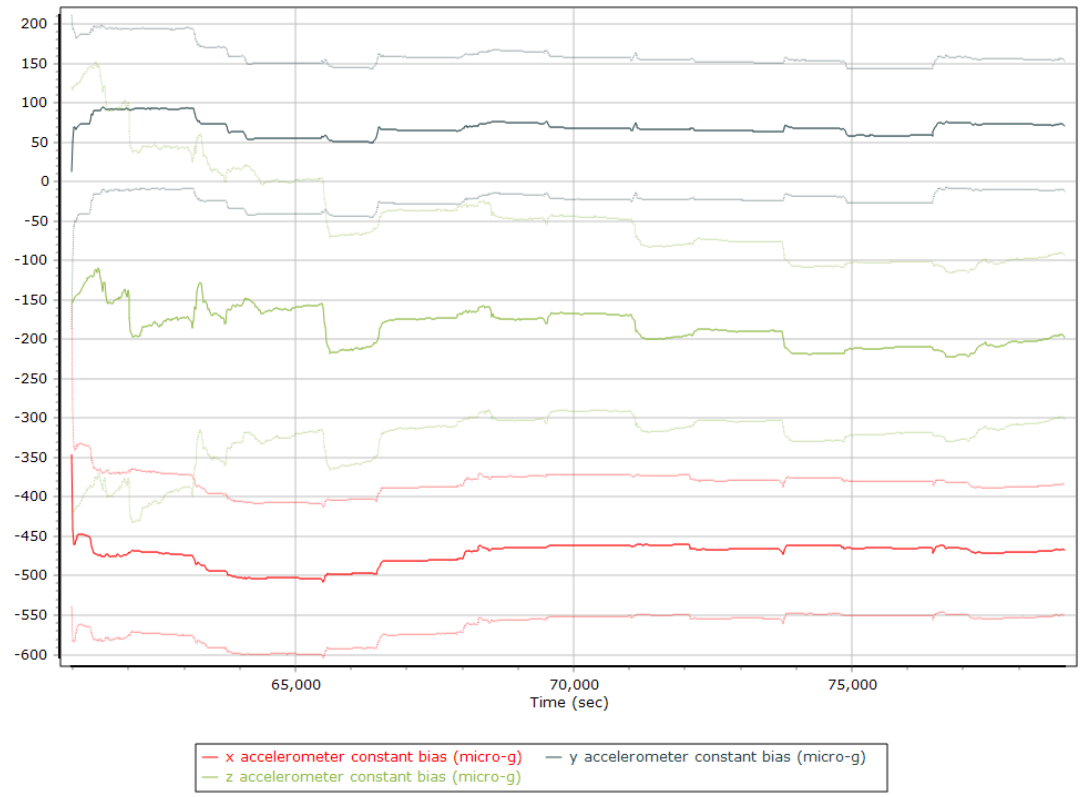


Z Gyro Scale Error (ppm)

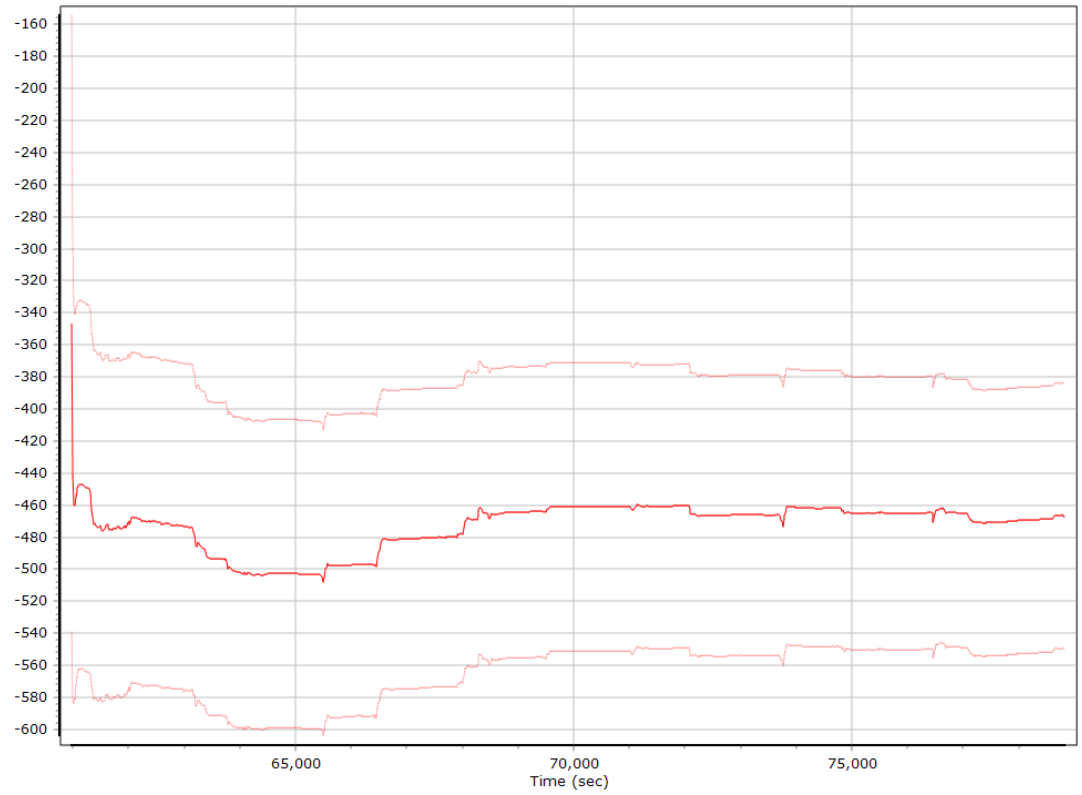


Forward Processed Estimated Constant Errors, Reference Frame

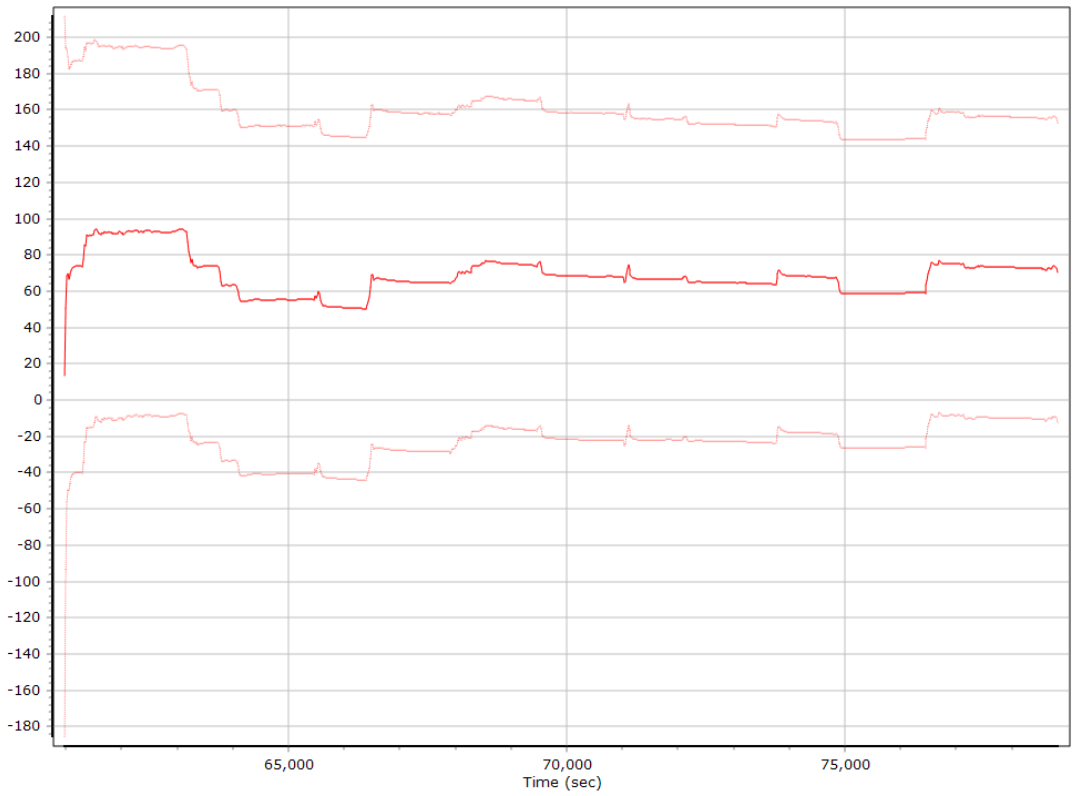
Accelerometer Bias (micro-g)



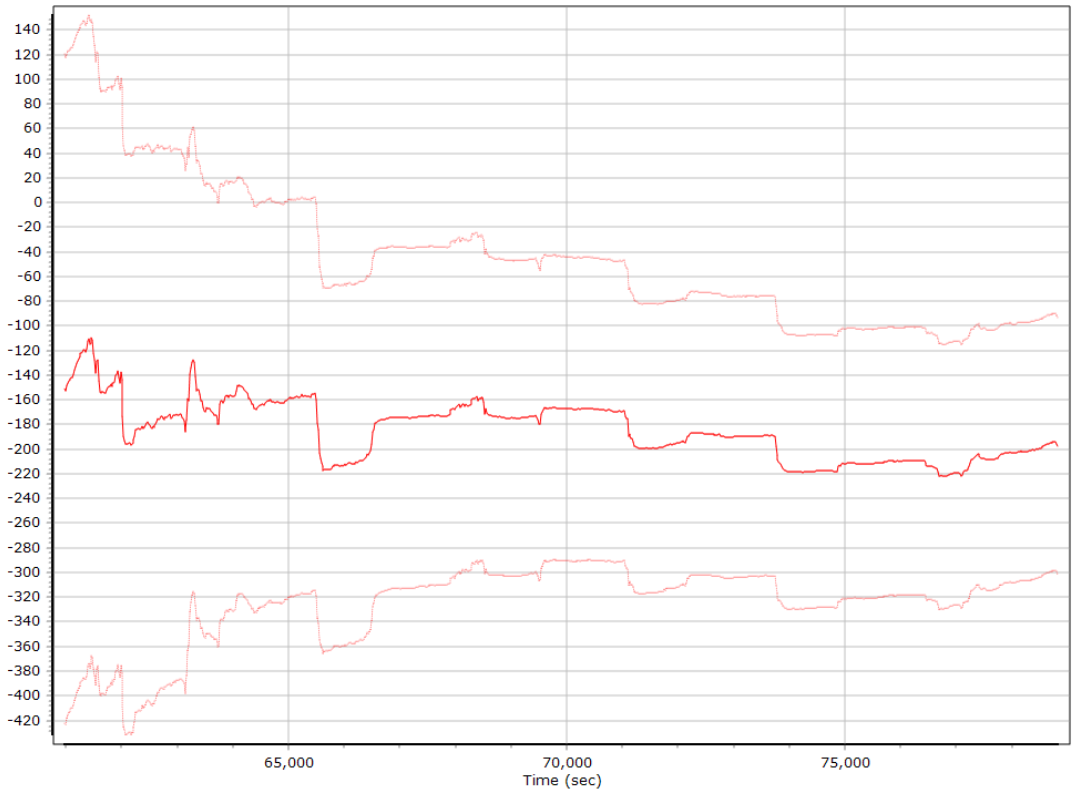
X Accelerometer Bias (micro-g)



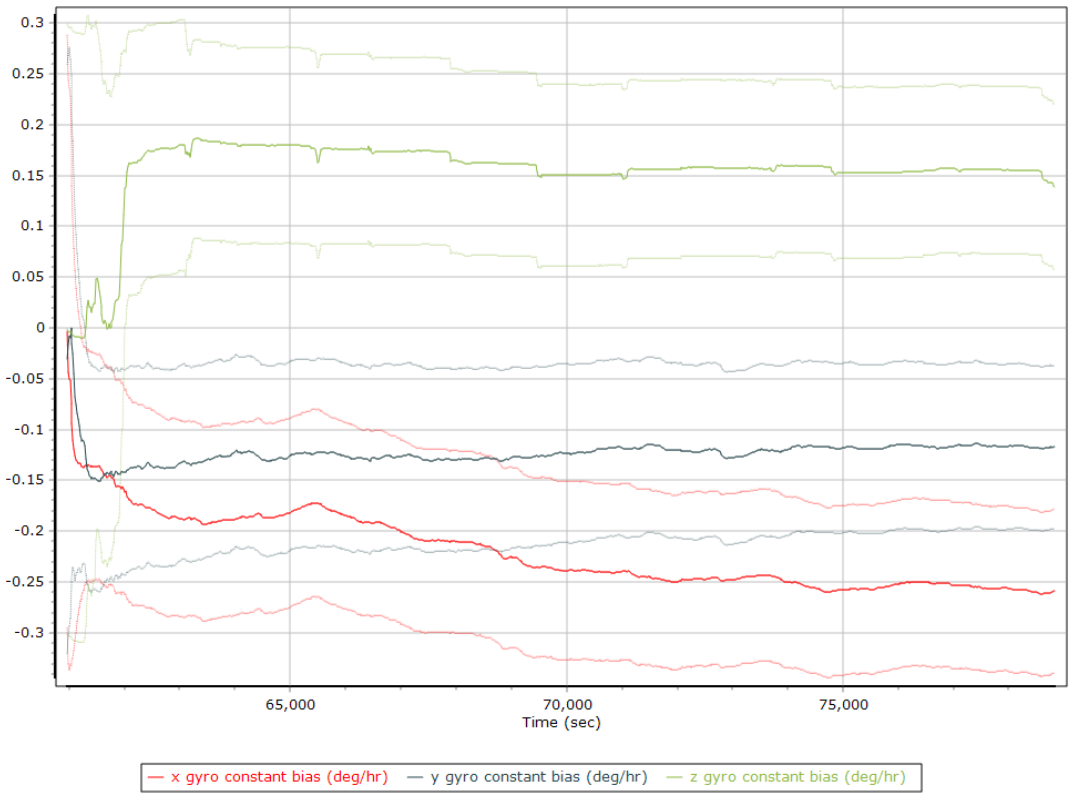
Y Accelerometer Bias (micro-g)



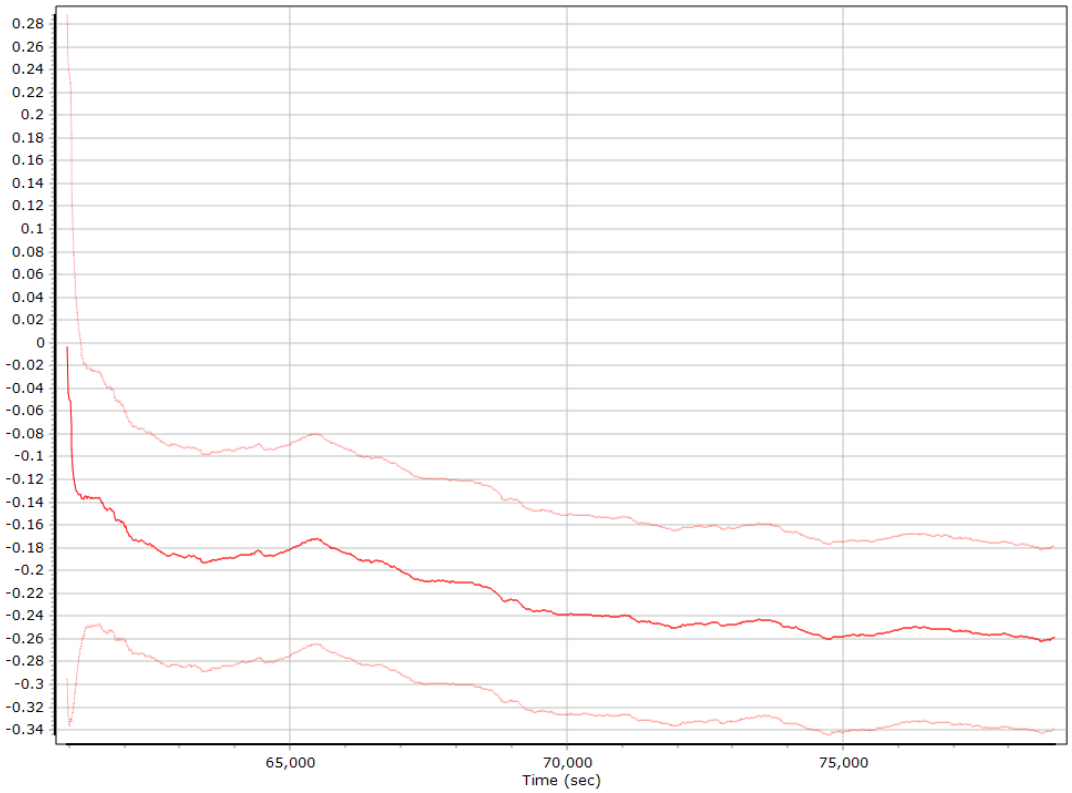
Z Accelerometer Bias (micro-g)



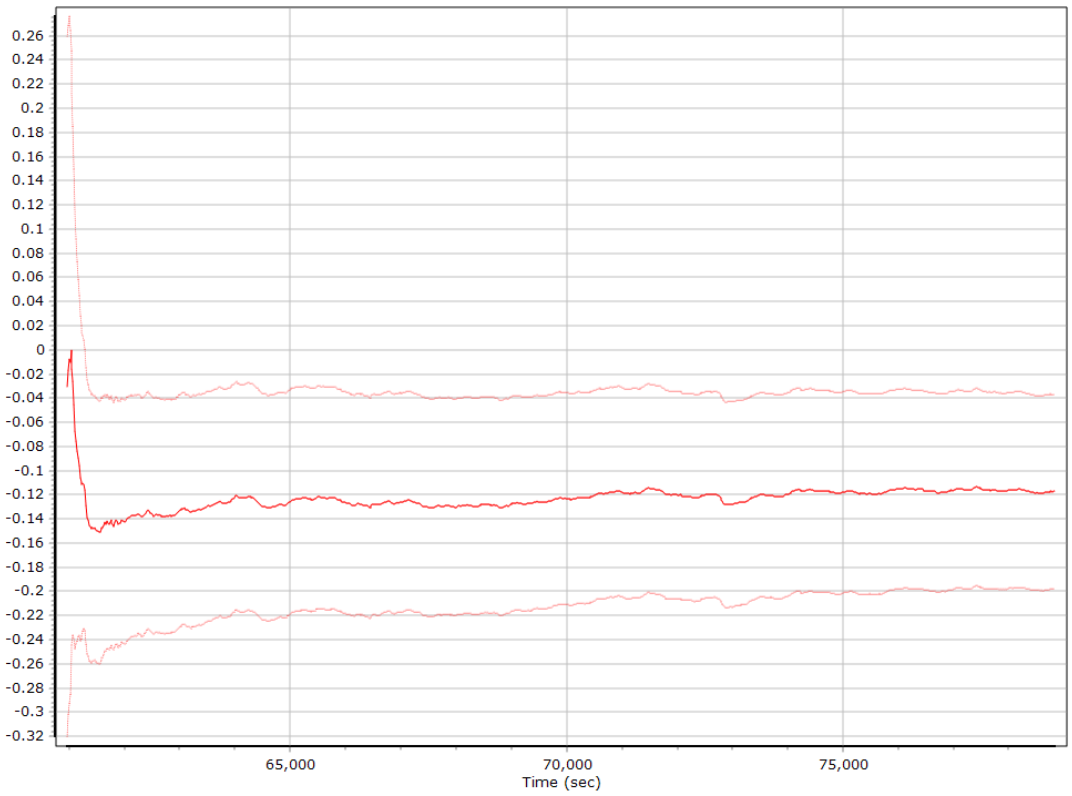
Gyro Bias (deg/h)



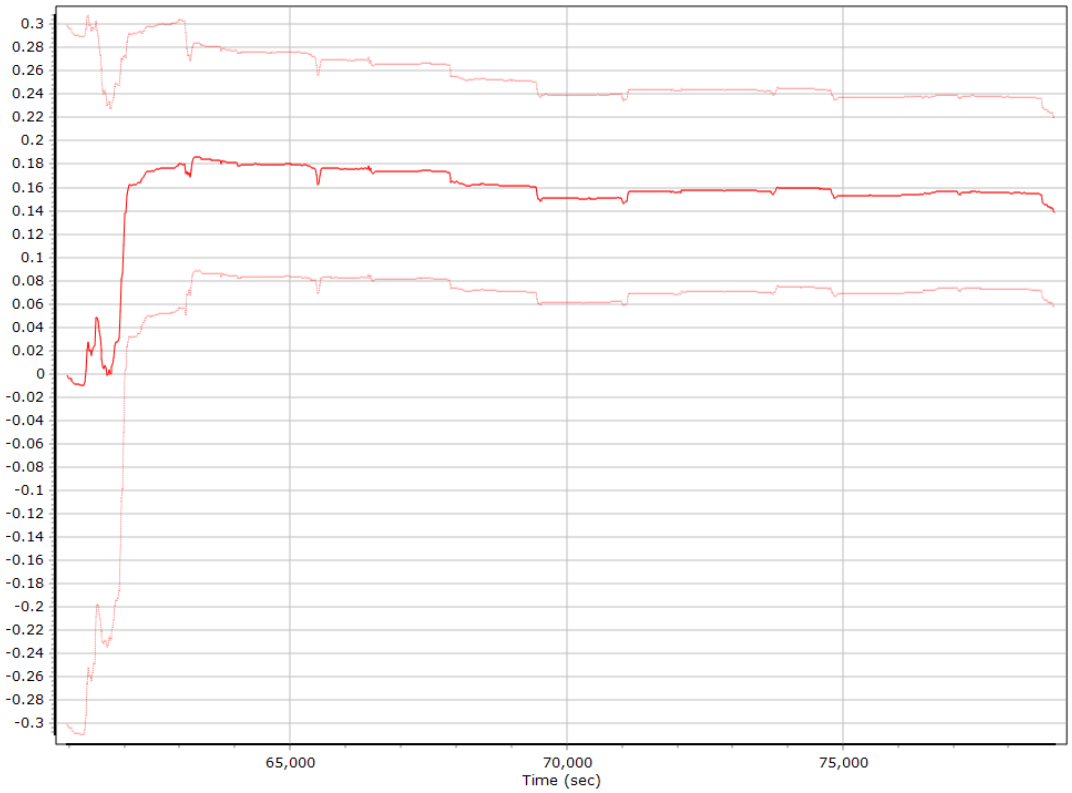
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

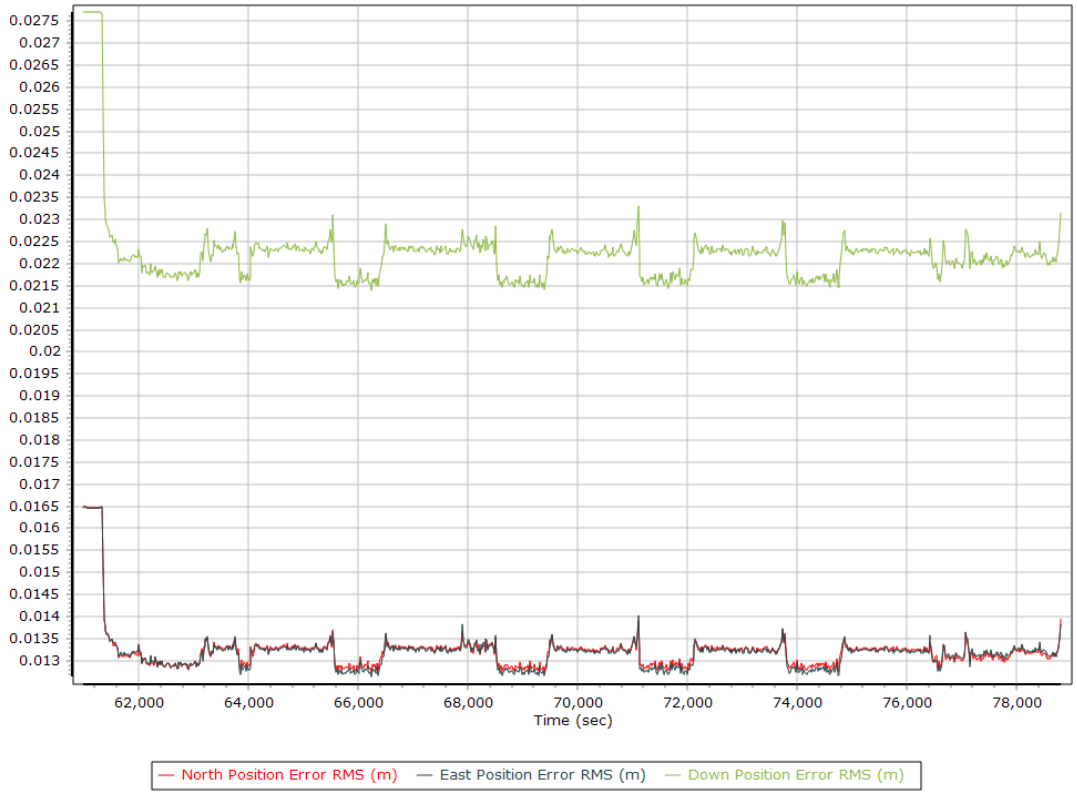


Z Gyro Bias (deg/h)

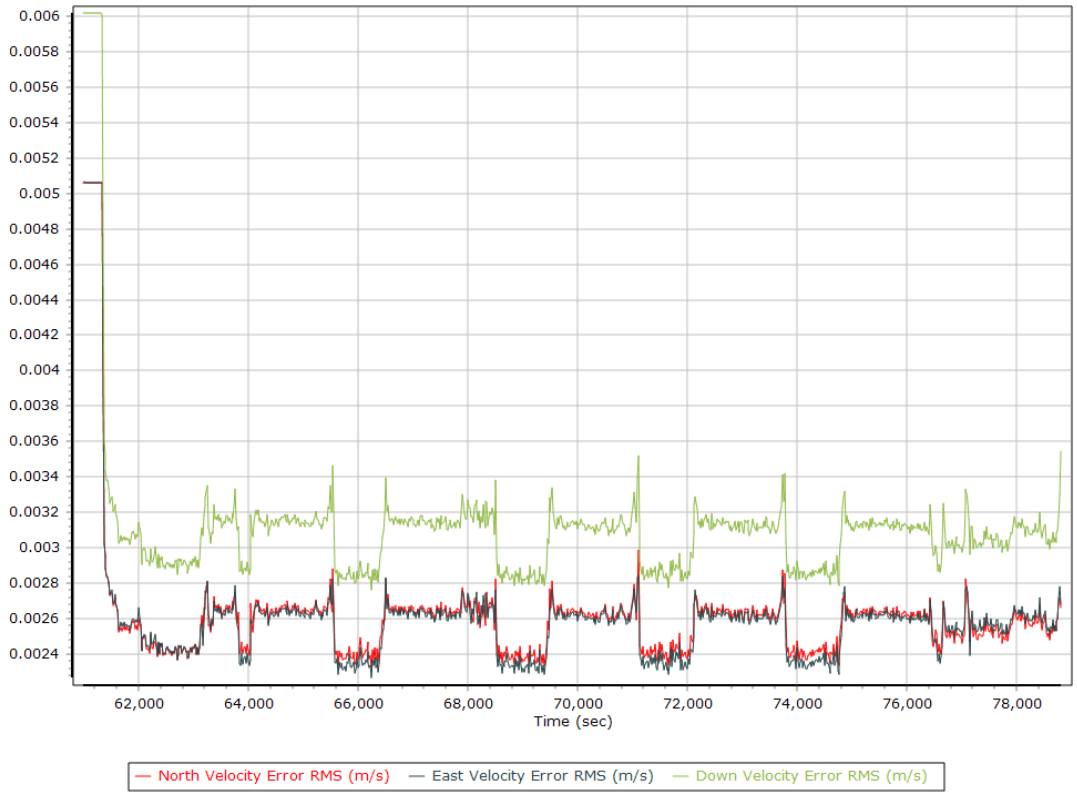


Smoothed Performance Metrics

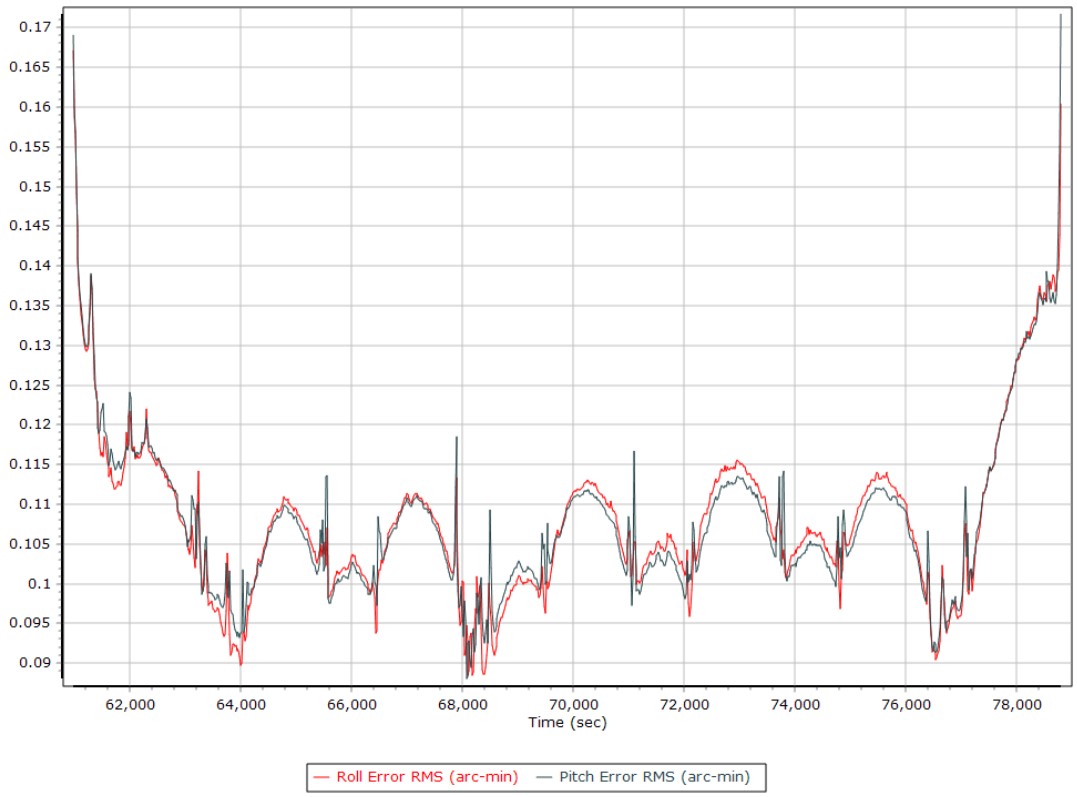
Position Error RMS (m)



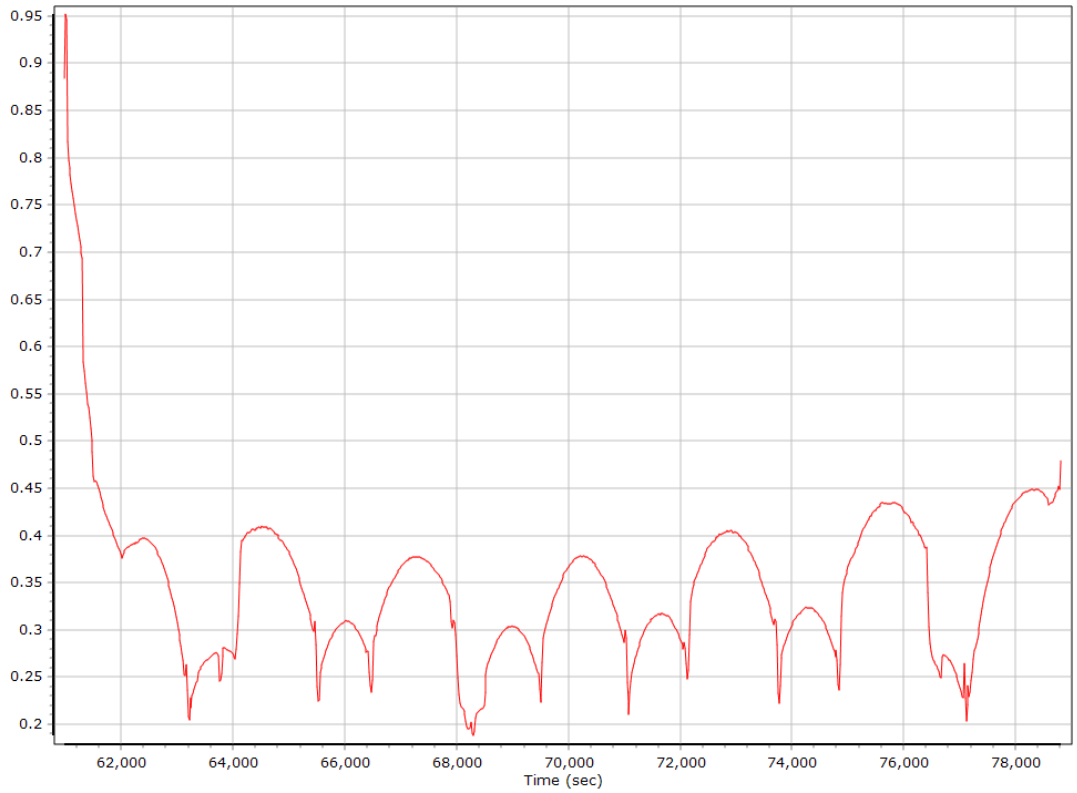
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

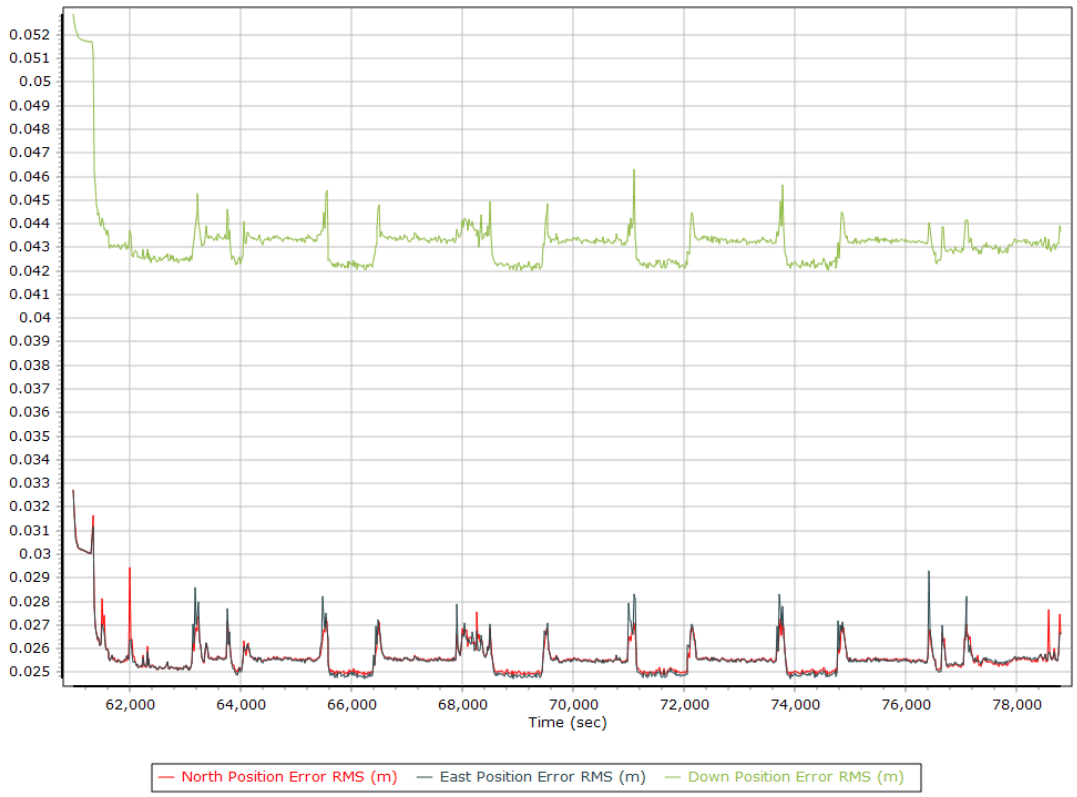


Heading Error RMS (arc-min)

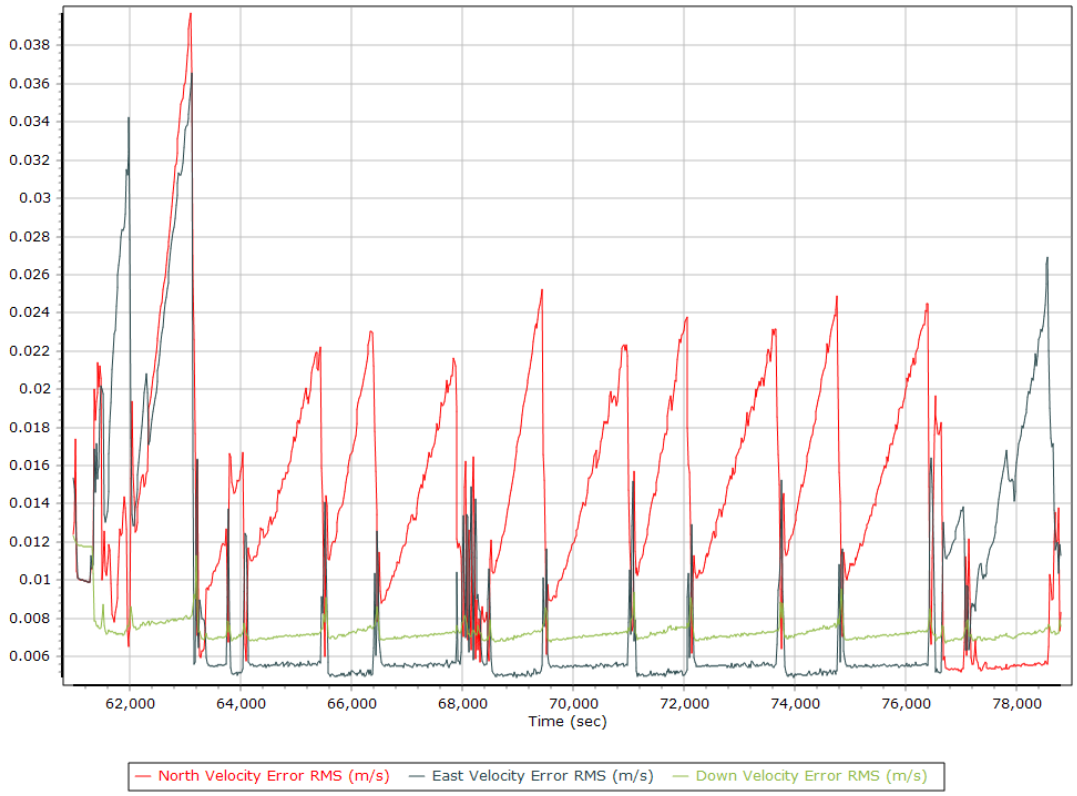


Forward Processed Performance Metrics

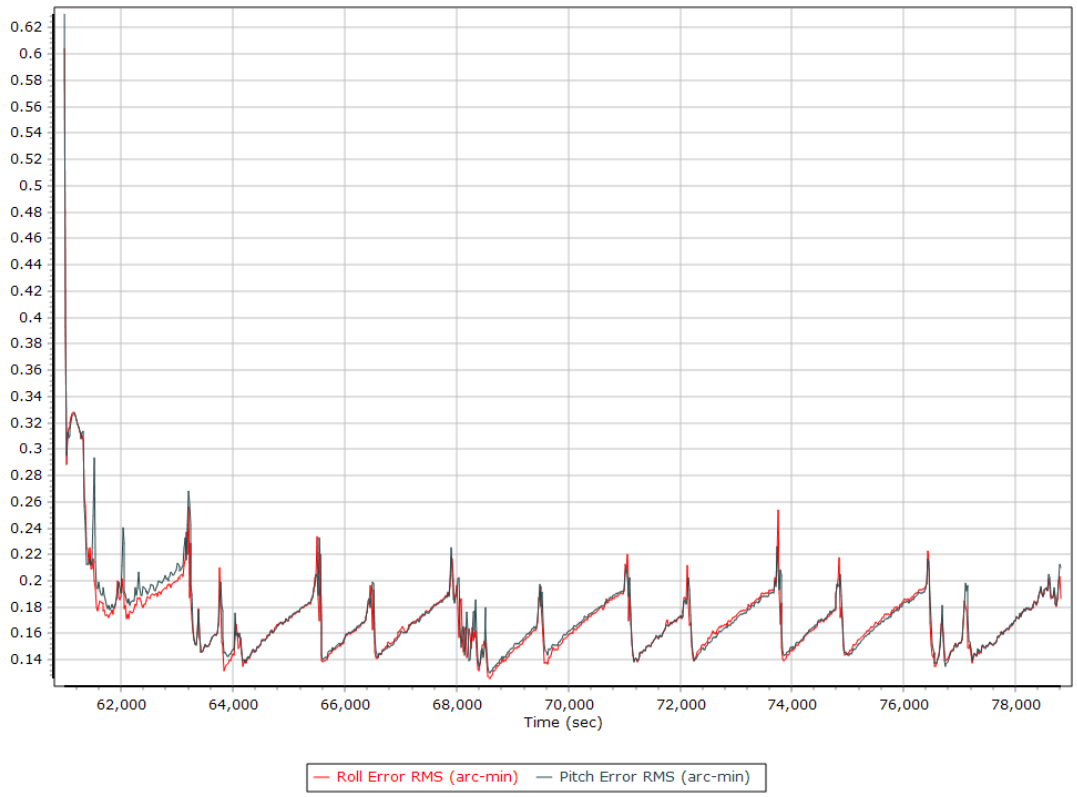
Position Error RMS (m)



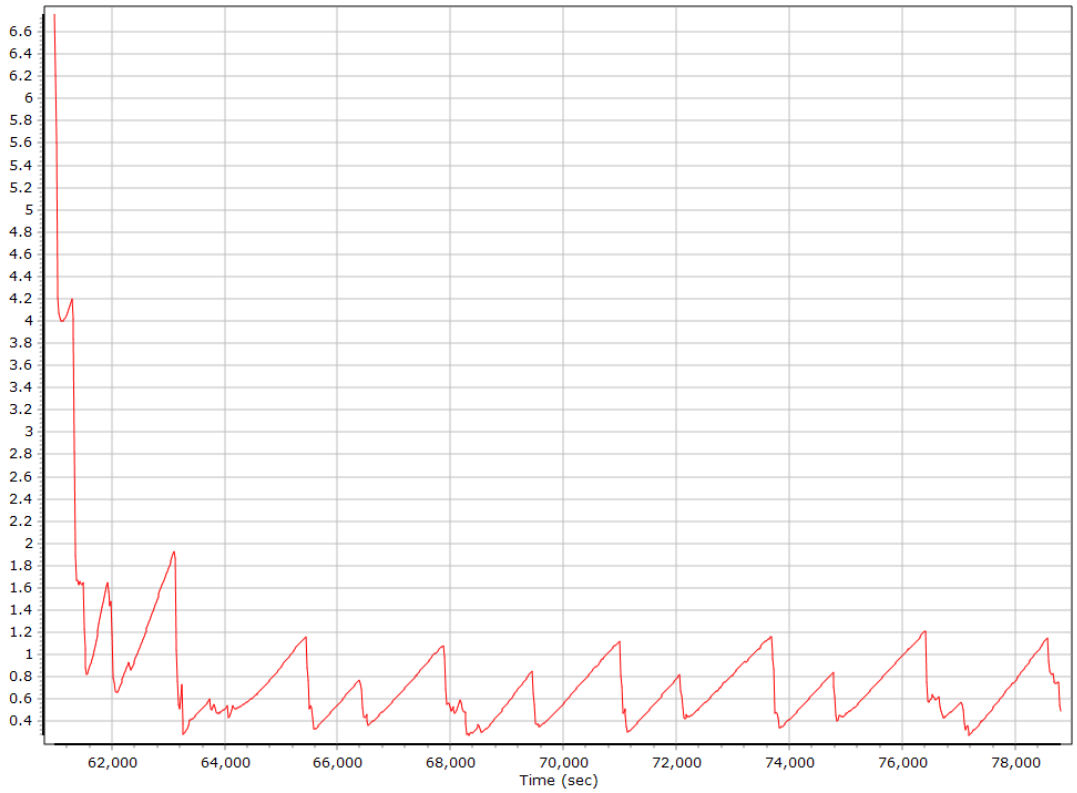
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

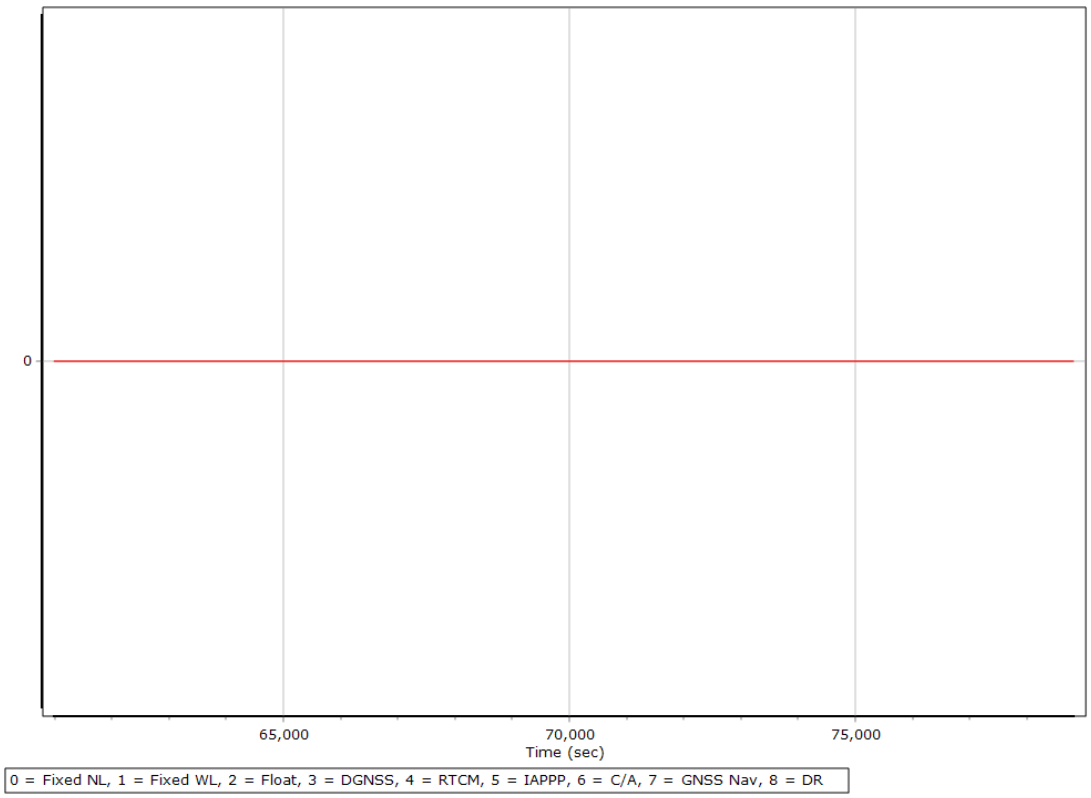


Heading Error RMS (arc-min)

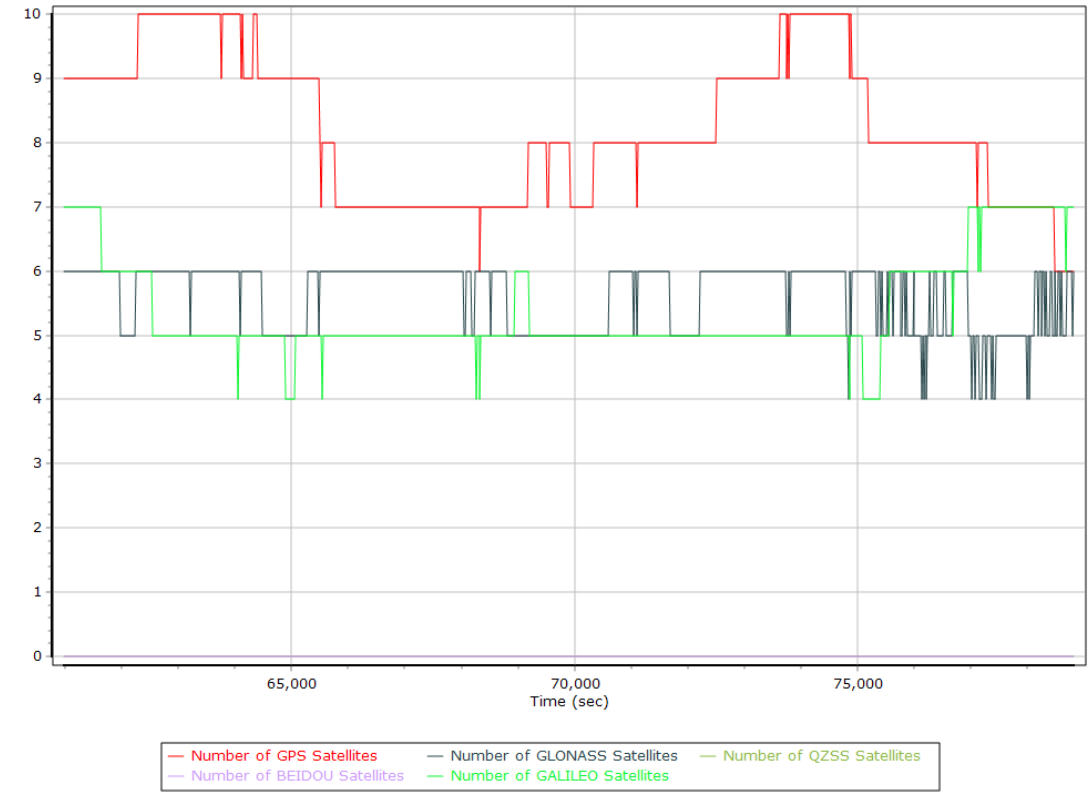


Forward Processed Solution Status

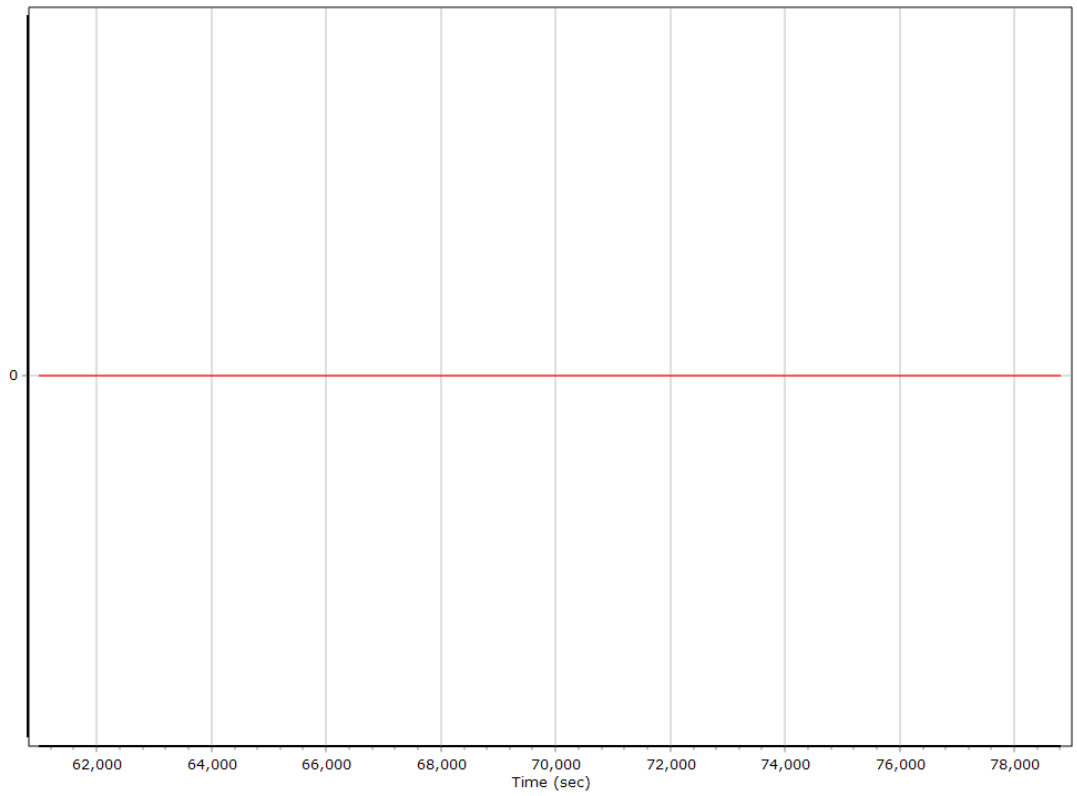
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01042021A_4040
Processing date	2022-01-05 15:25:06
Mission date	2021-01-04 15:04:20
Mission duration	02:58:31.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210104_150401_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0040.21g	GLONASS Broadcast Ephemeris
Ephm0040.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01042021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210104_150401_INS-GPS_1.raw		
Last raw data file	210104_150401_INS-GPS_1.raw		
Start GPS week	2139		
Start time	140641.897 (1/4/2021 3:04:01 PM)		
End time	151353.729 (1/4/2021 6:02:33 PM)		
Start of fine alignment	140883.645 (1/4/2021 3:08:03 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

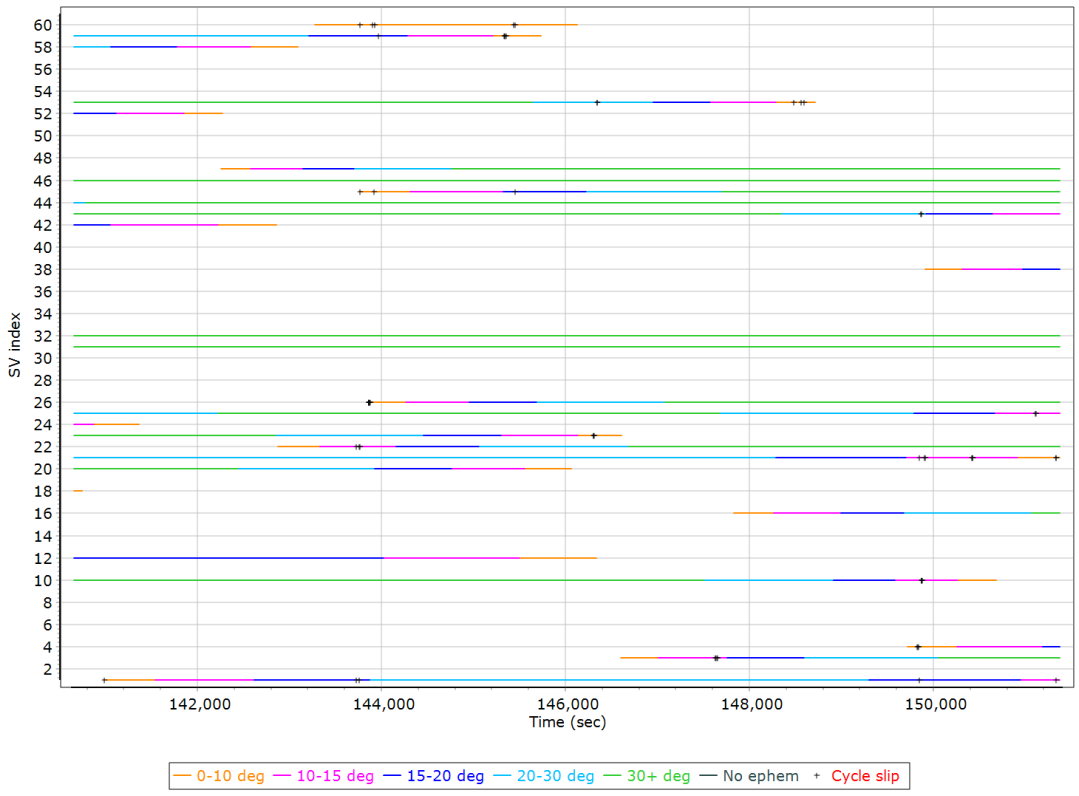
Rover Data QC

Raw IMU Import QC Summary

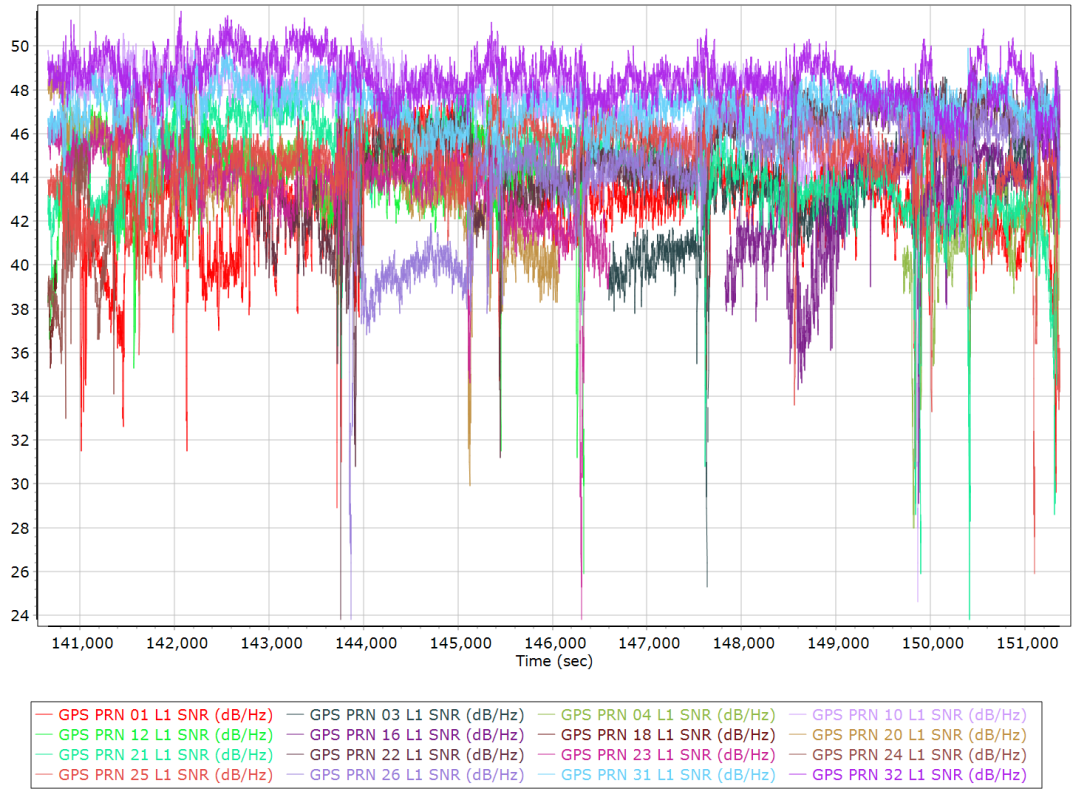
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01042021A_4040.log
IMU Records Processed	2142009
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

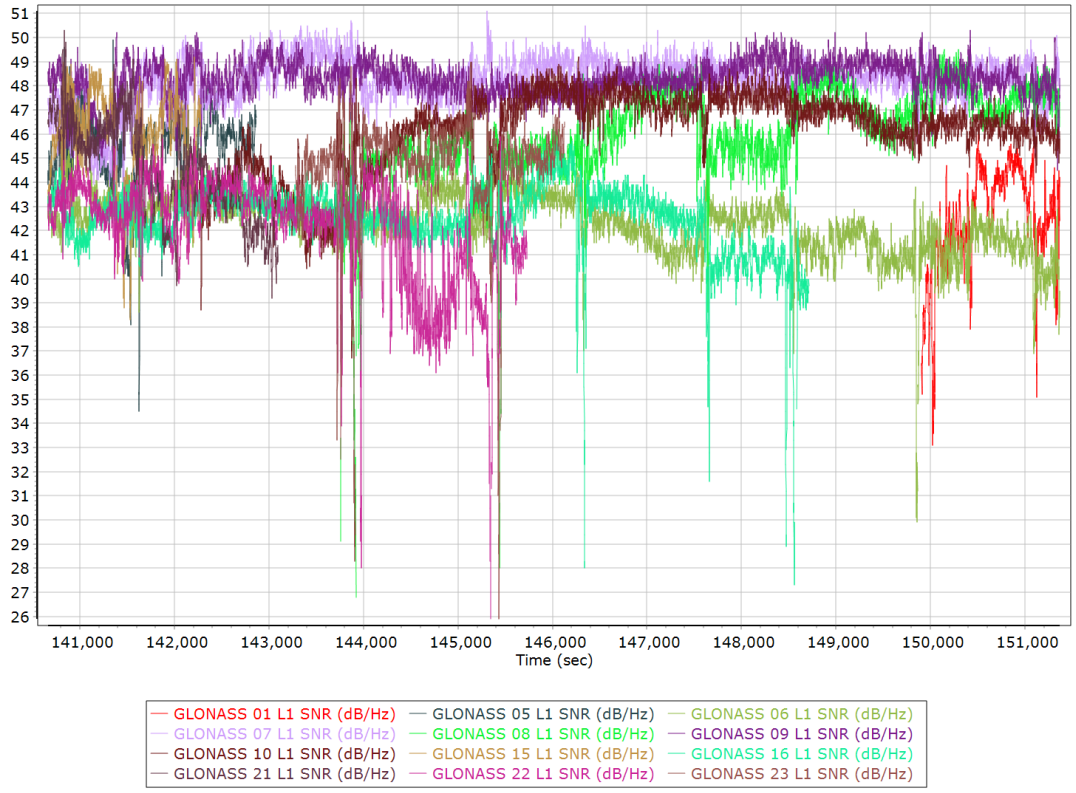
GPS/GLONASS L1 Satellite Lock/Elevation



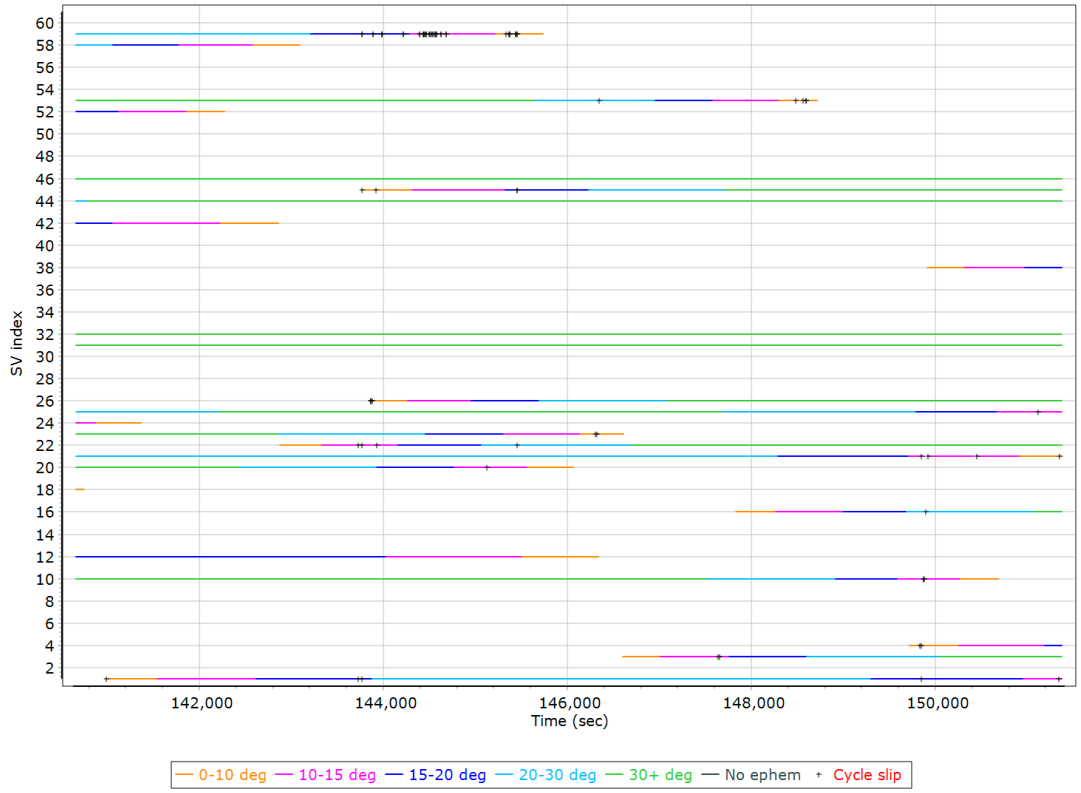
GPS L1 SNR



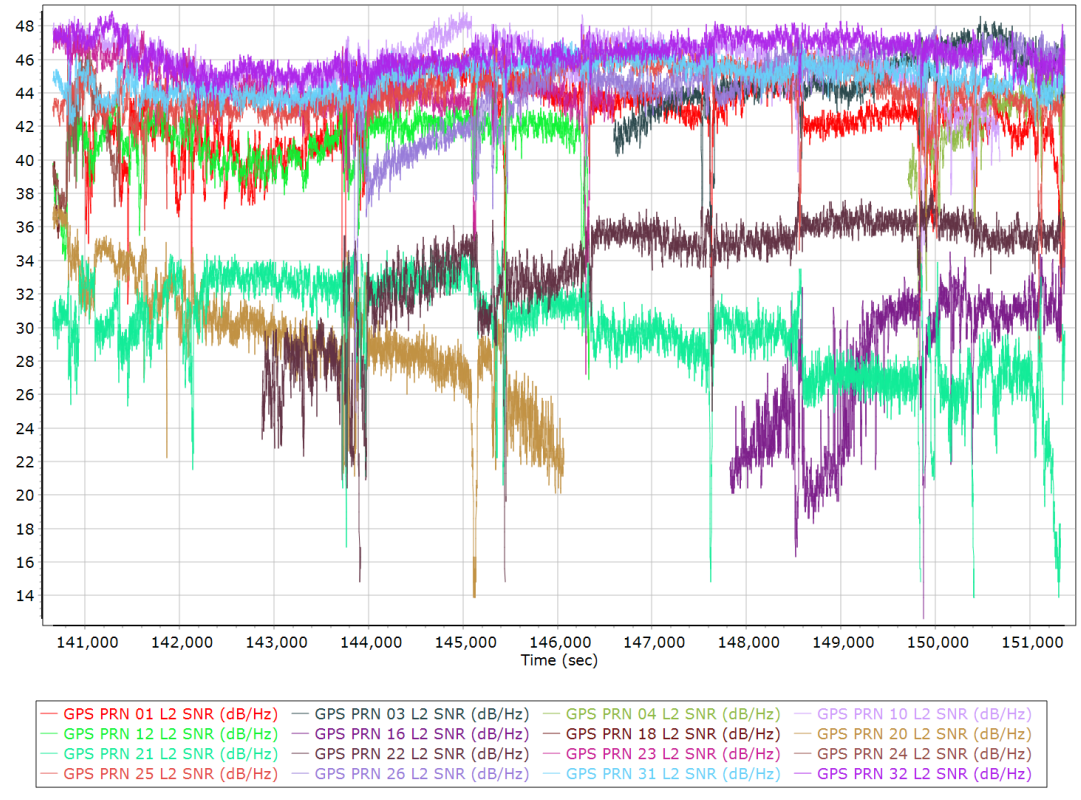
GLONASS L1 SNR



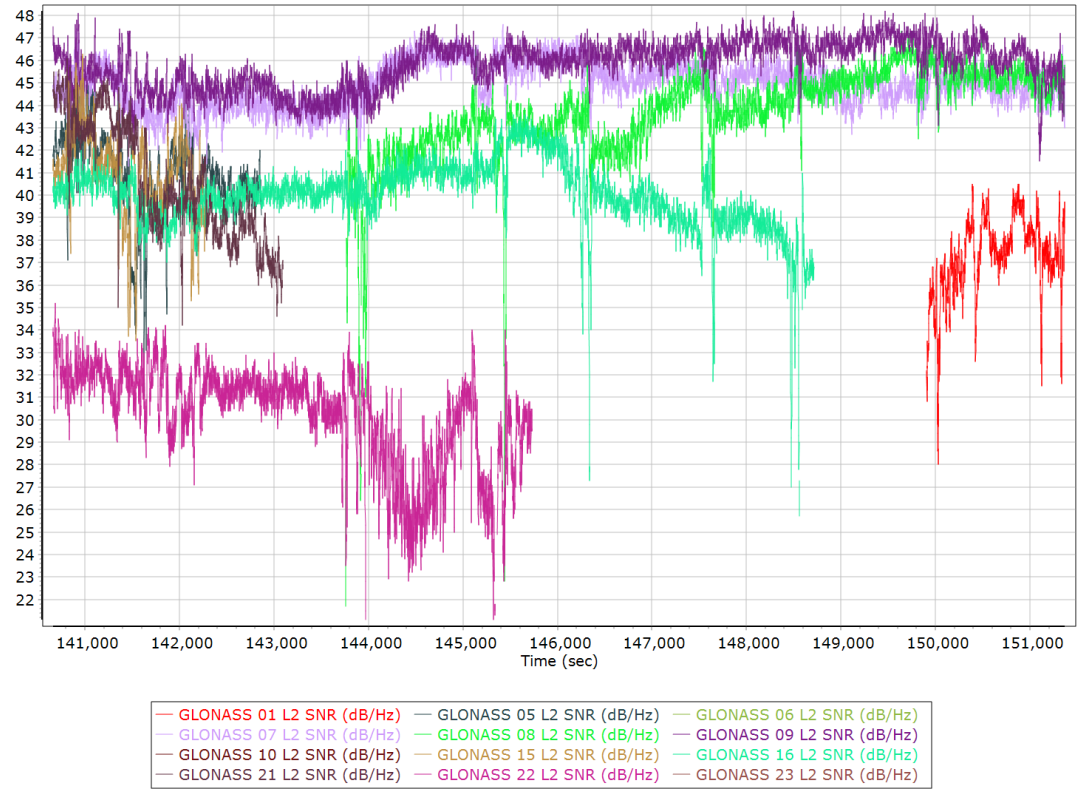
GPS/GLONASS L2 Satellite Lock/Elevation



GPS L2 SNR



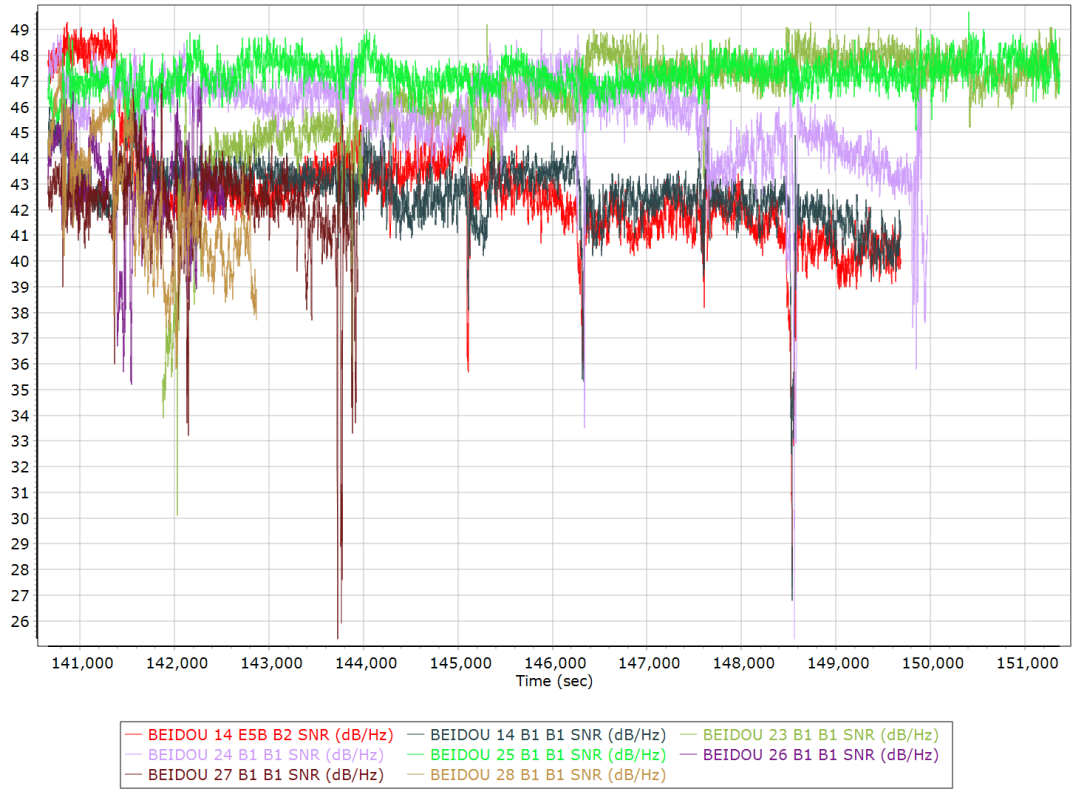
GLONASS L2 SNR



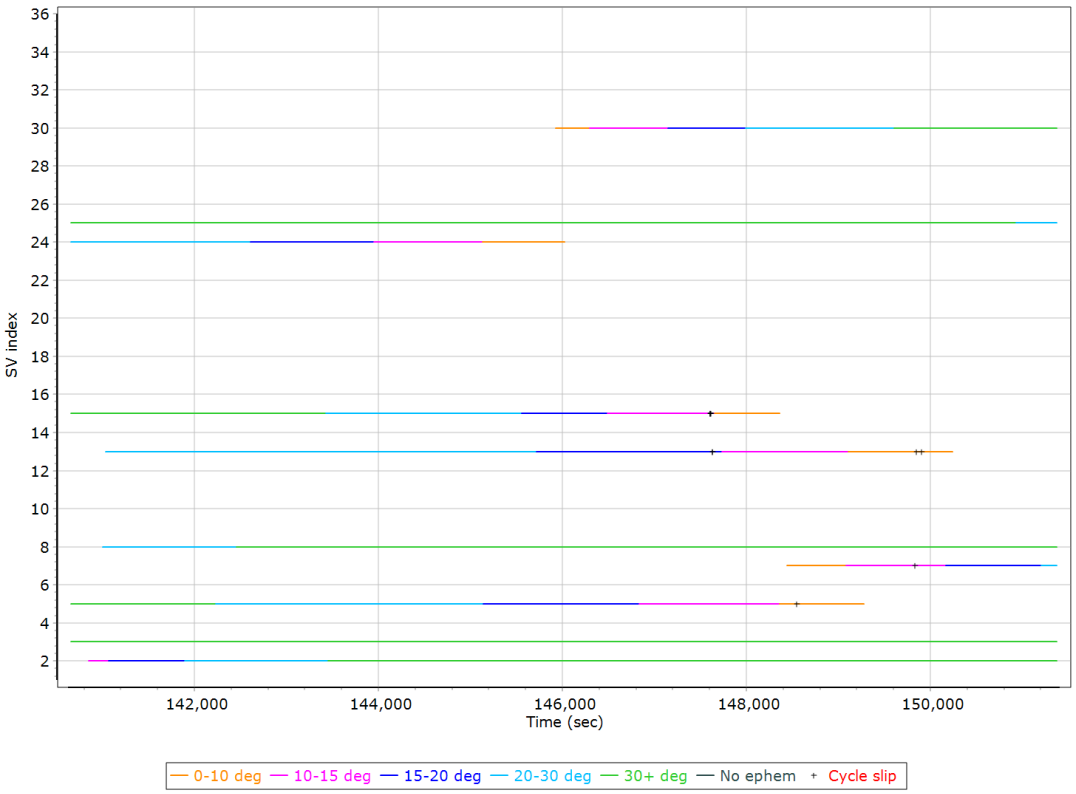
BEIDOU Satellite Lock/Elevation



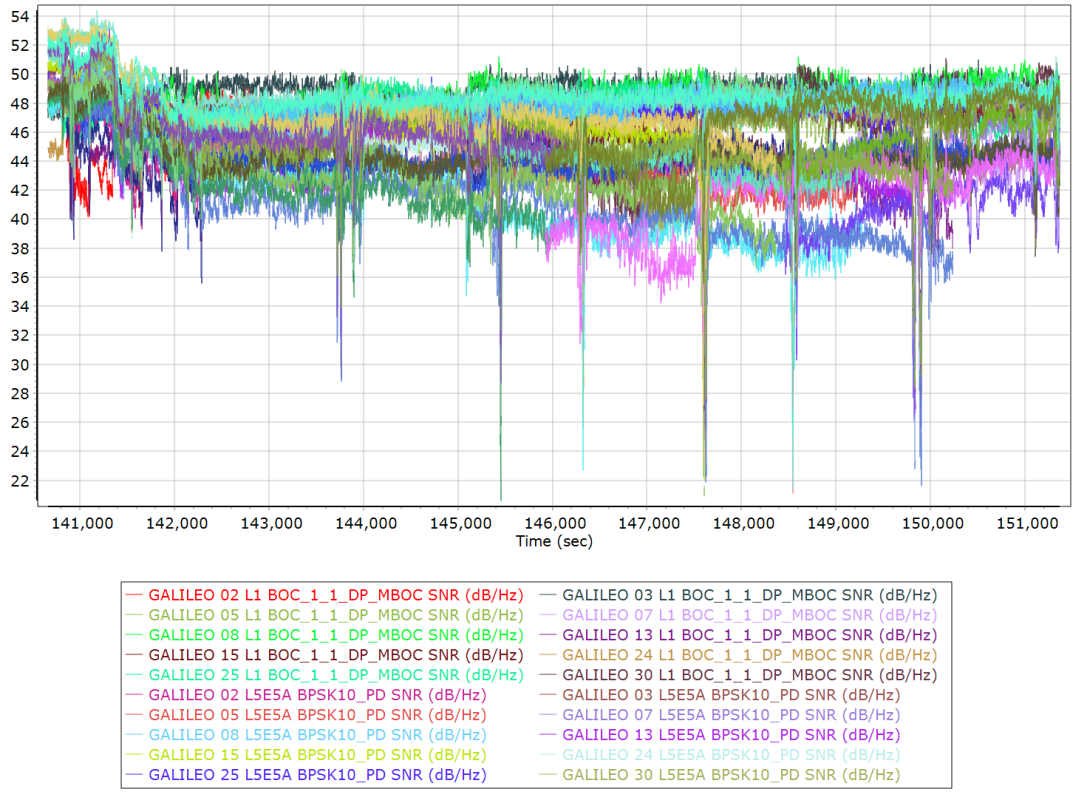
BEIDOU SNR



GALILEO Satellite Lock/Elevation

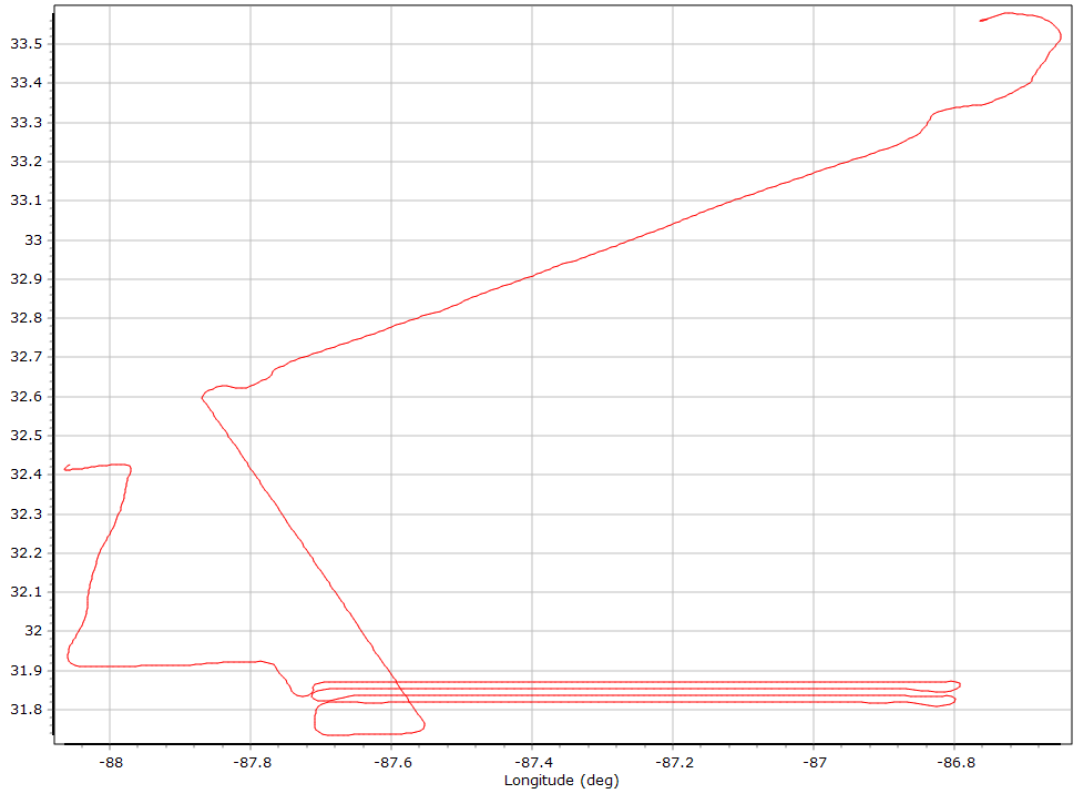


GALILEO SNR

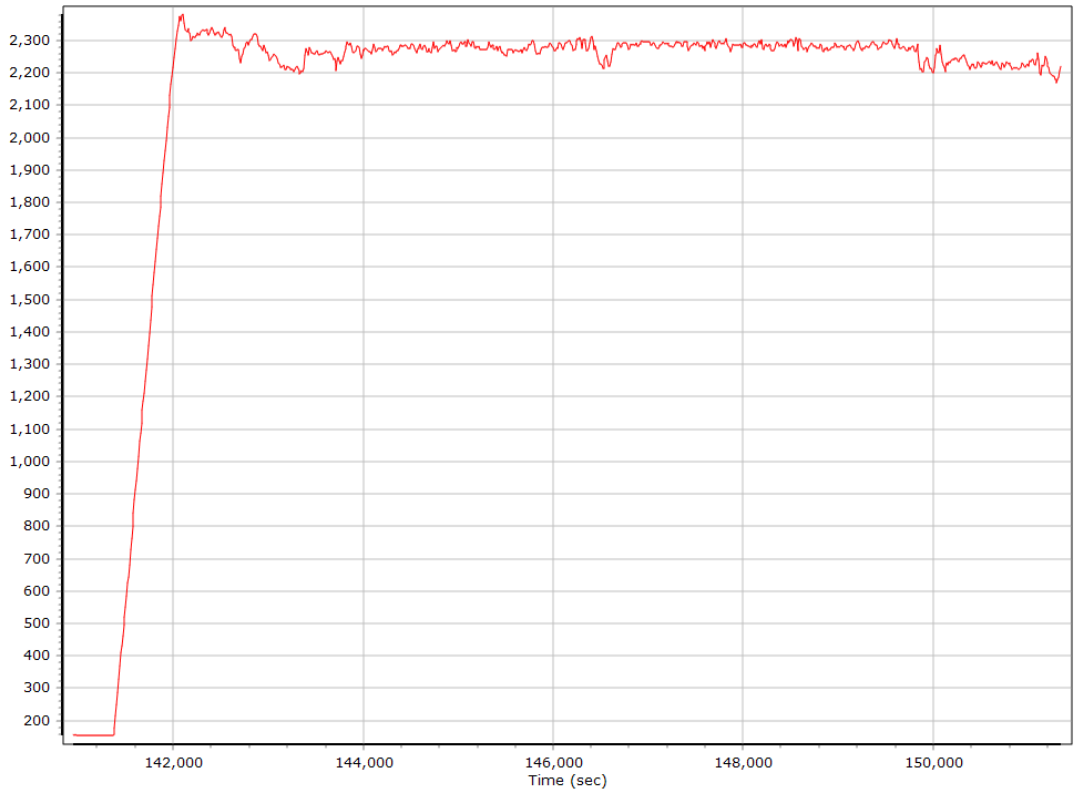

54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
141,000
142,000
143,000
144,000
145,000
146,000
147,000
148,000
149,000
150,000
151,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 25 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

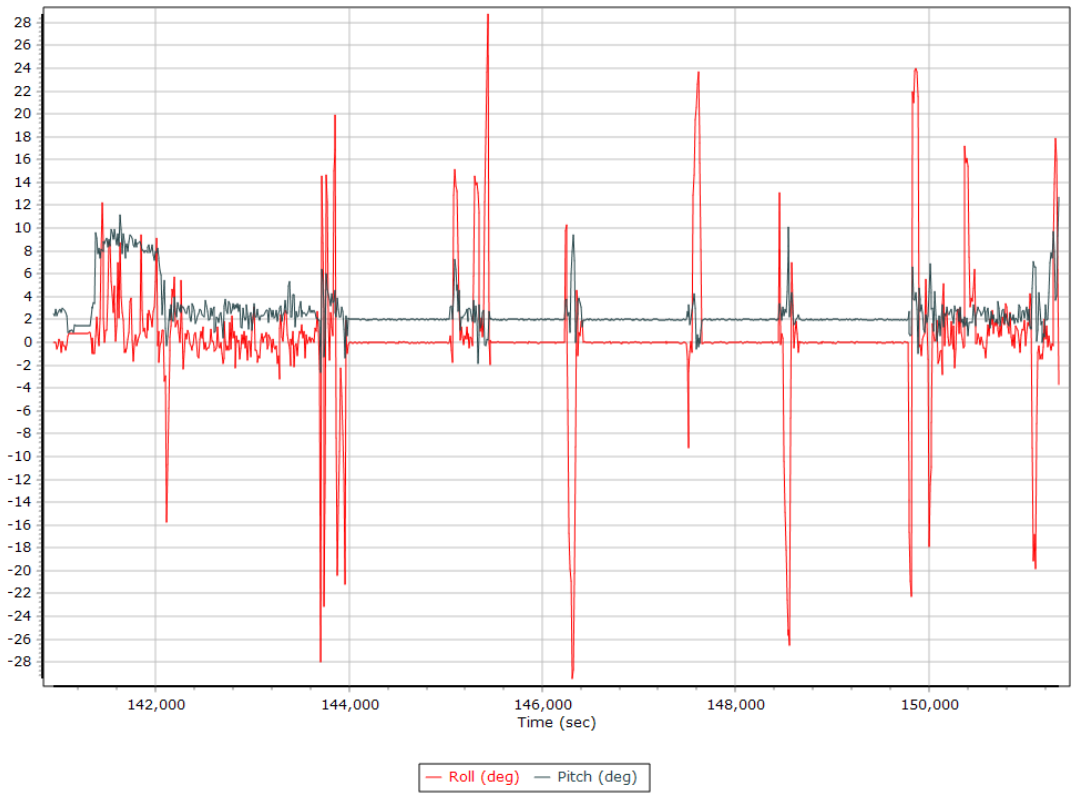
Top View



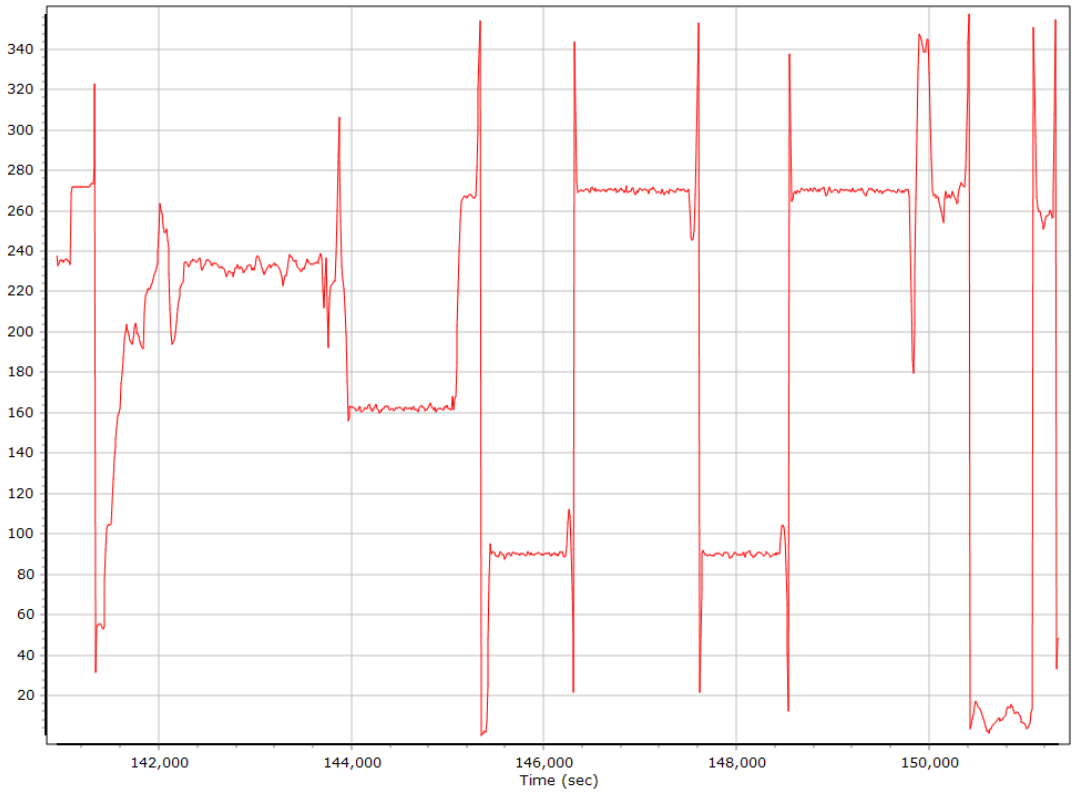
Altitude



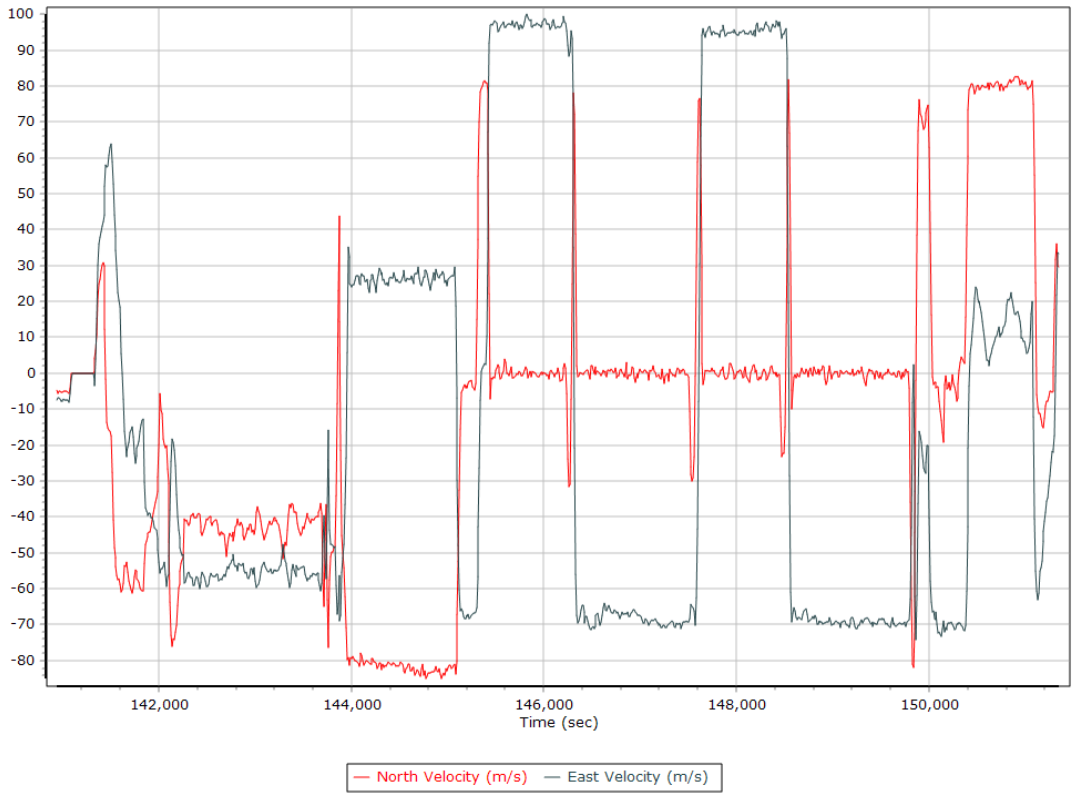
Roll/Pitch



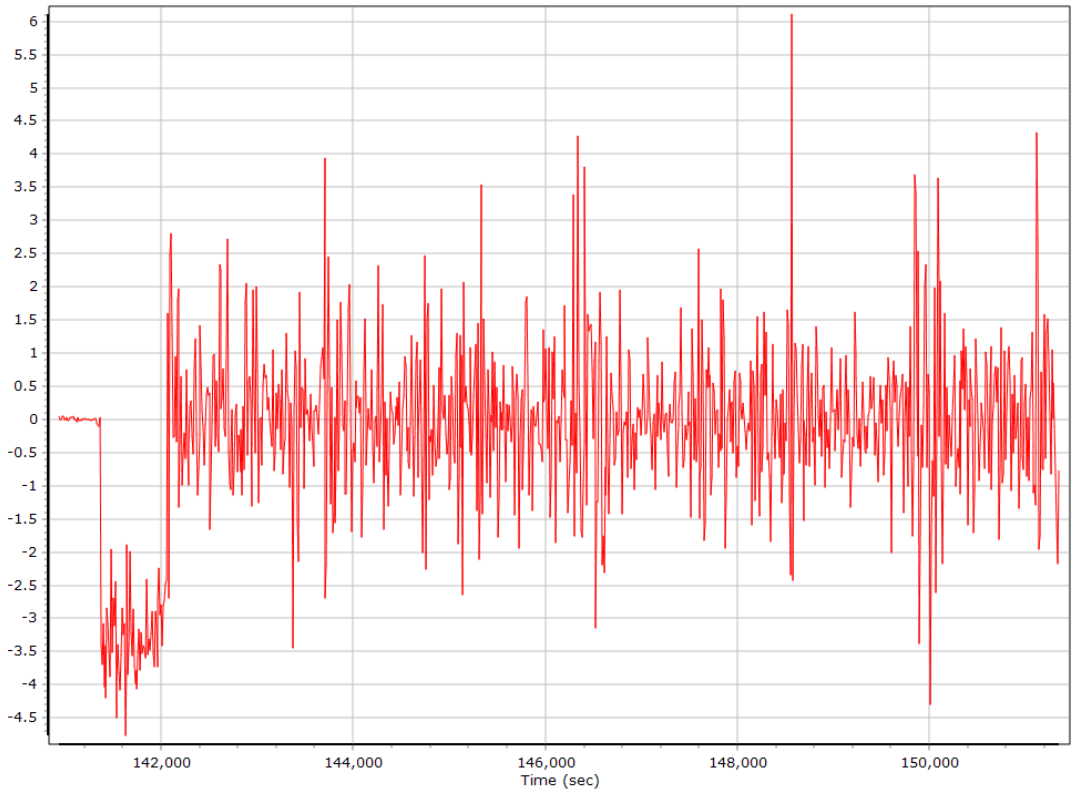
Heading



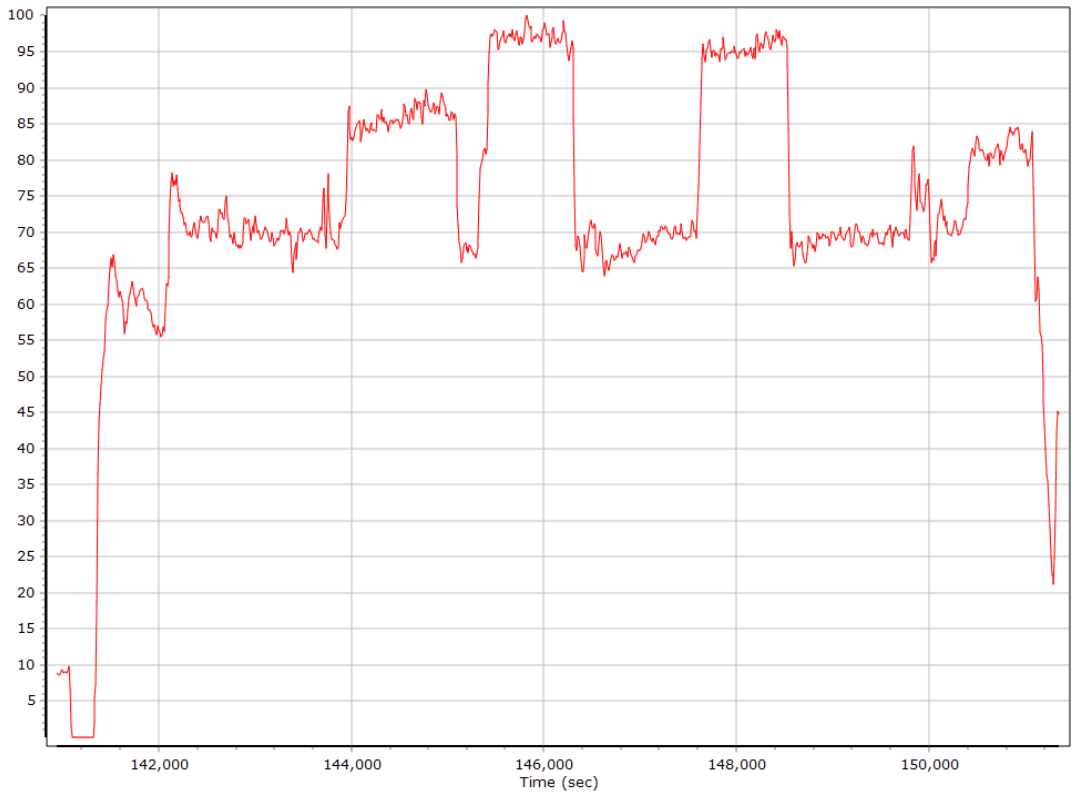
North/East Velocity



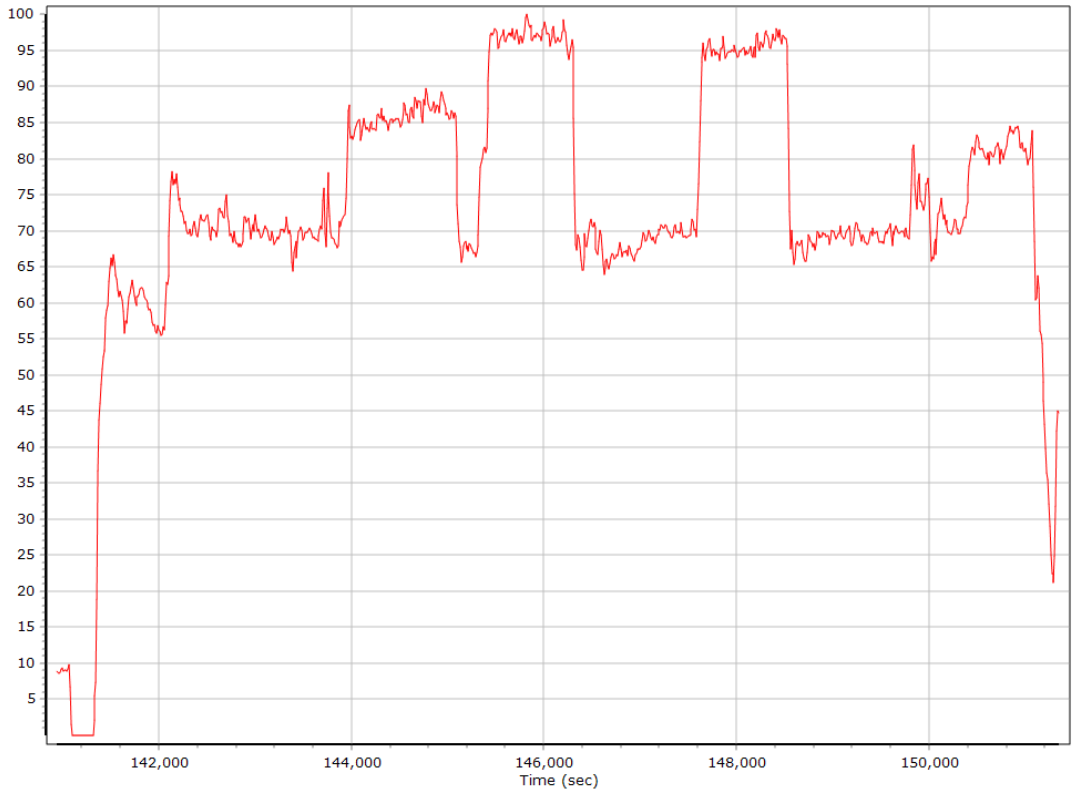
Down Velocity



Total Speed



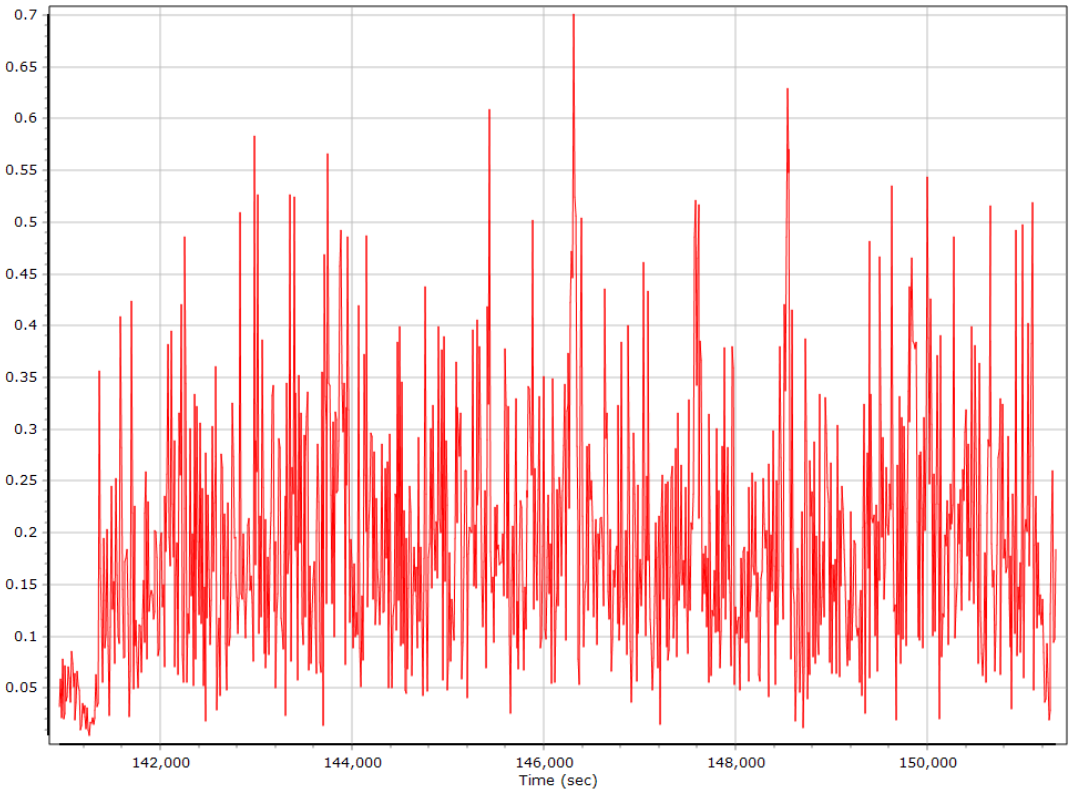
Ground Speed



Body Acceleration



Total Body Acceleration

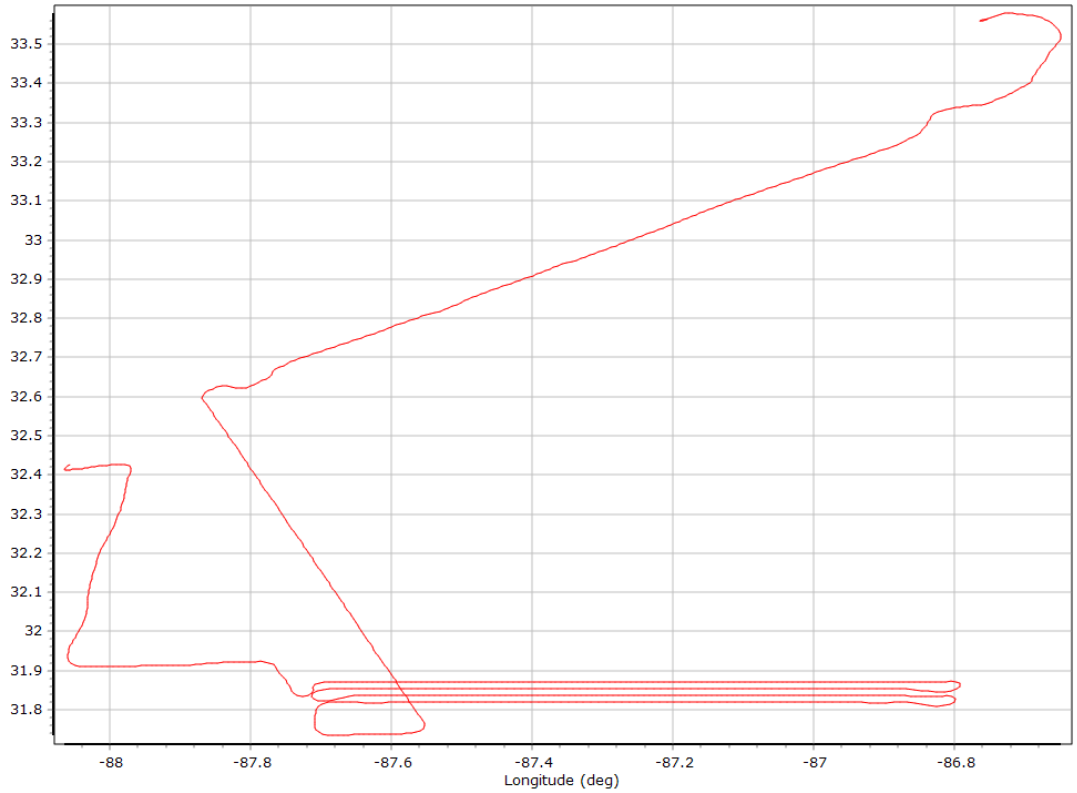


Body Angular Rate

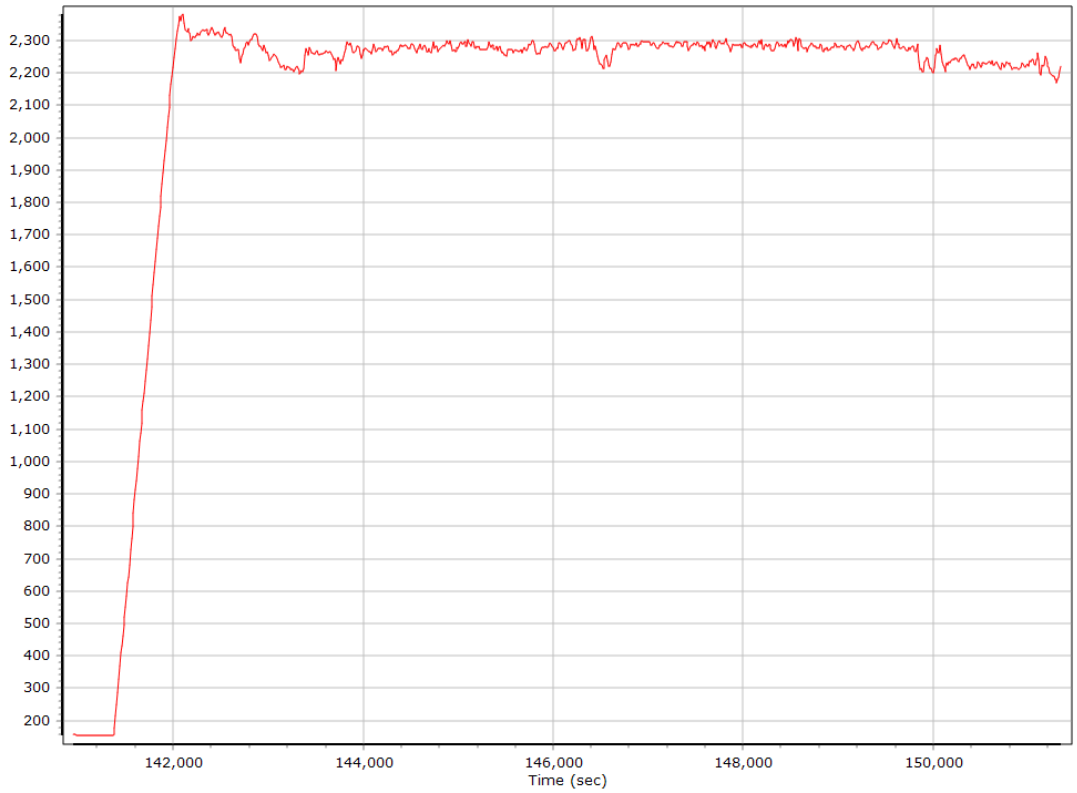


Forward Processed Trajectory Information

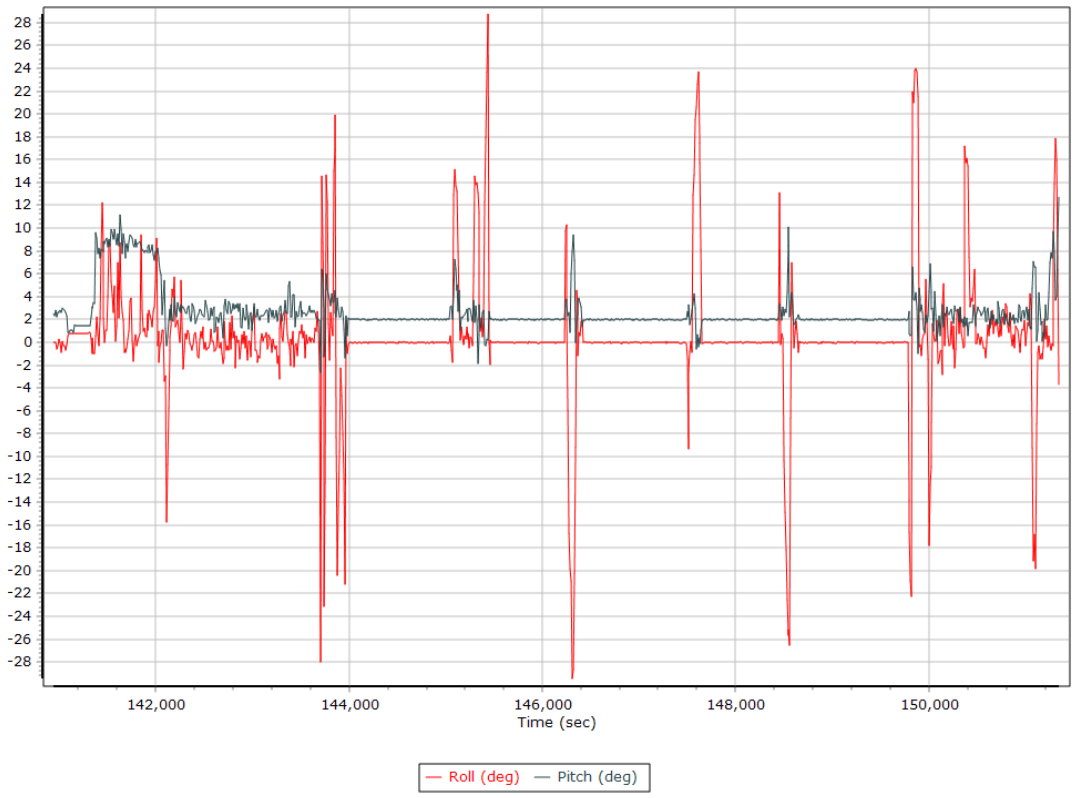
Top View



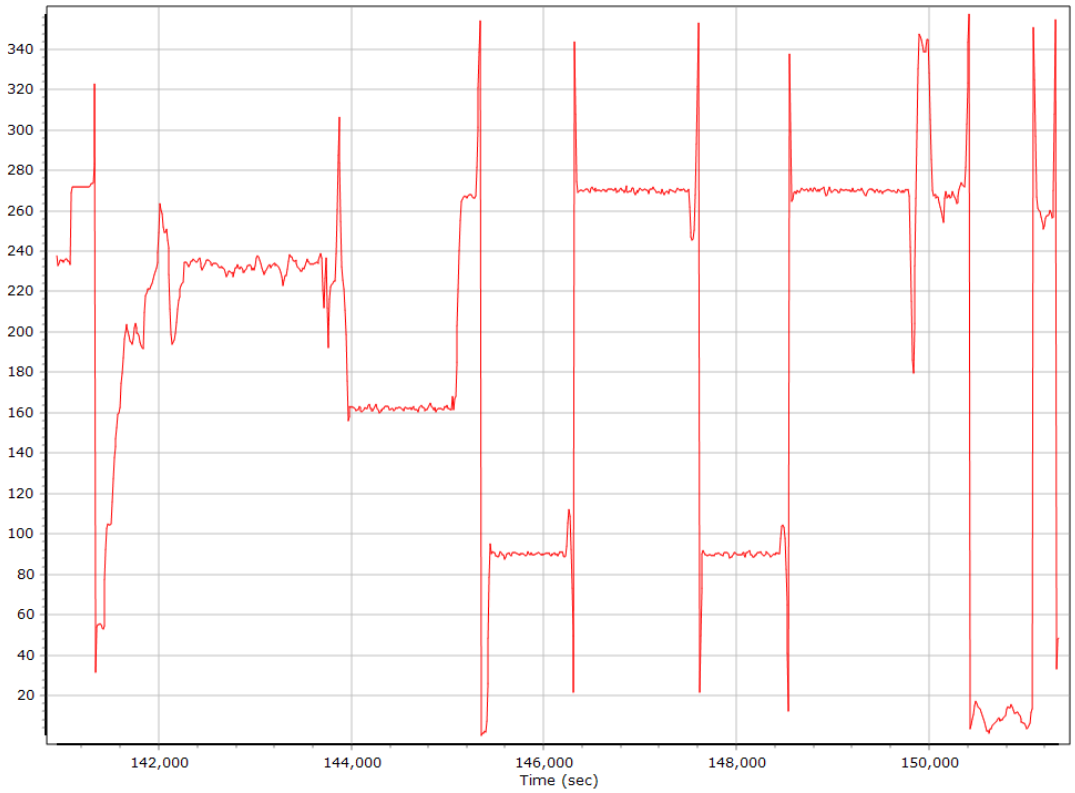
Altitude



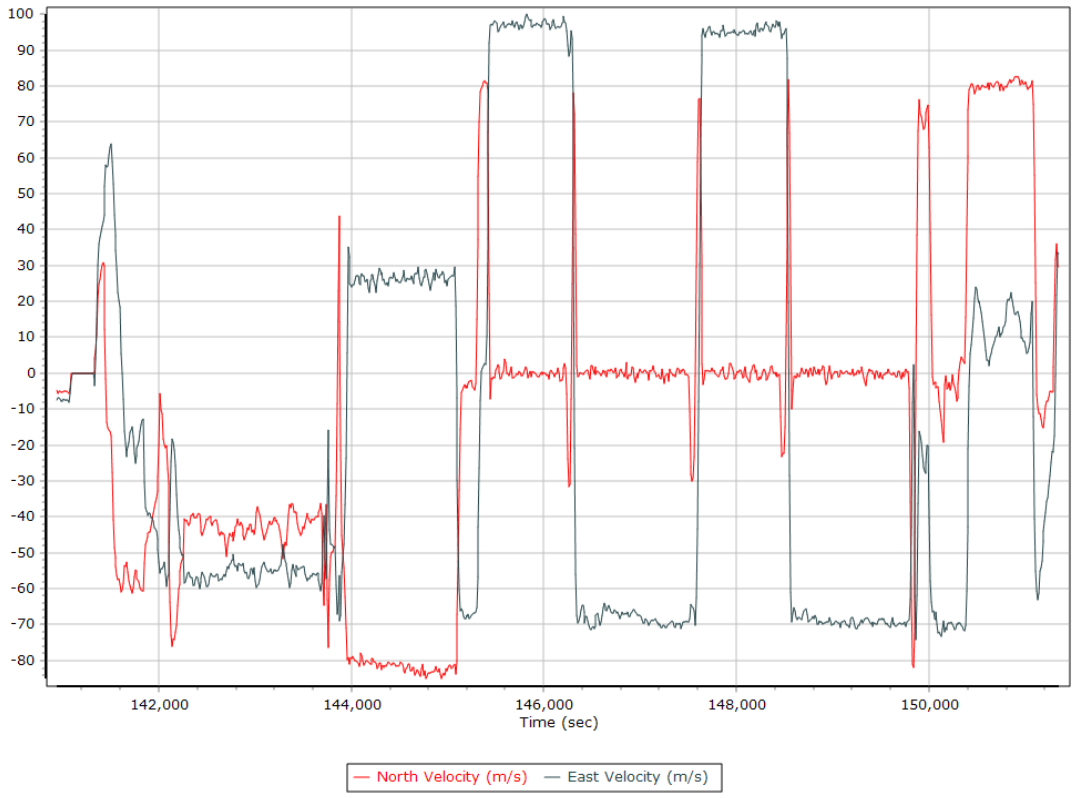
Roll/Pitch



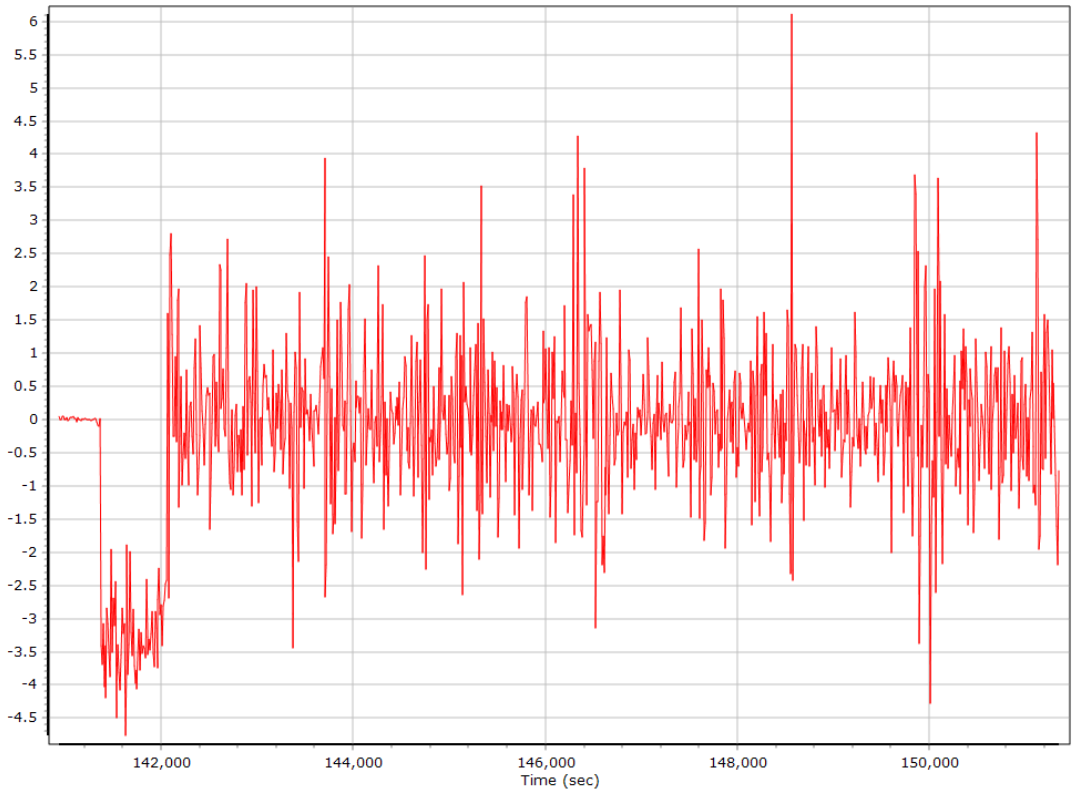
Heading



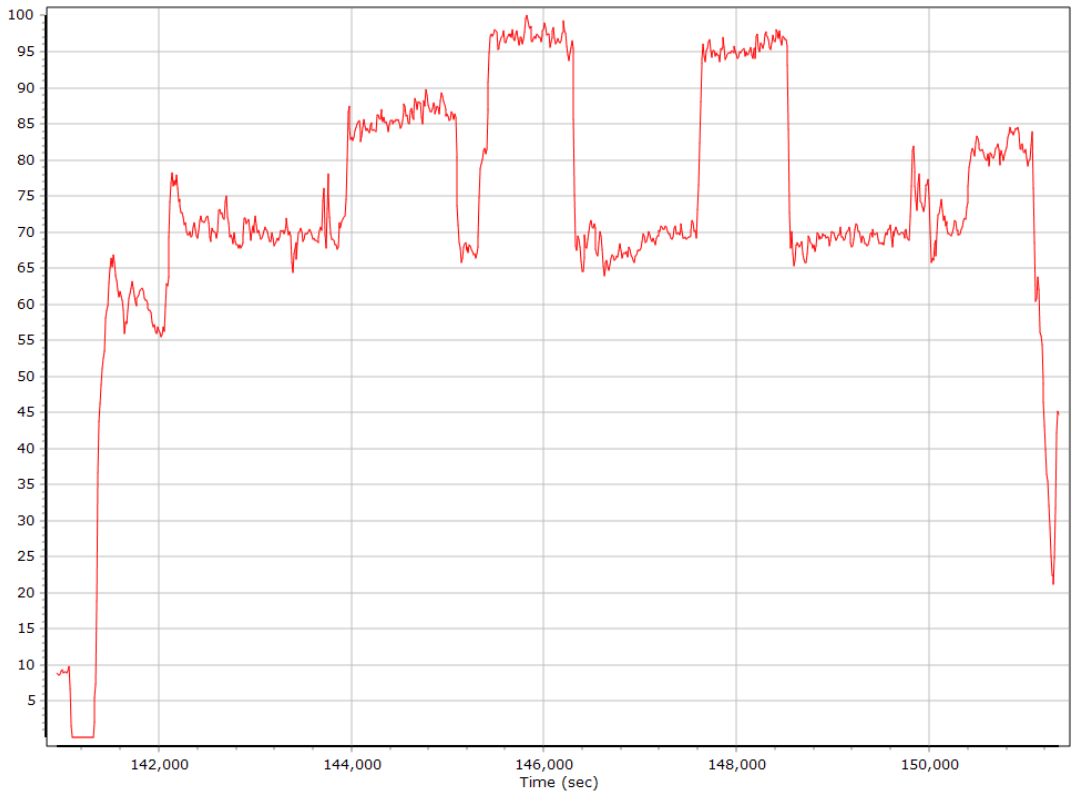
North/East Velocity



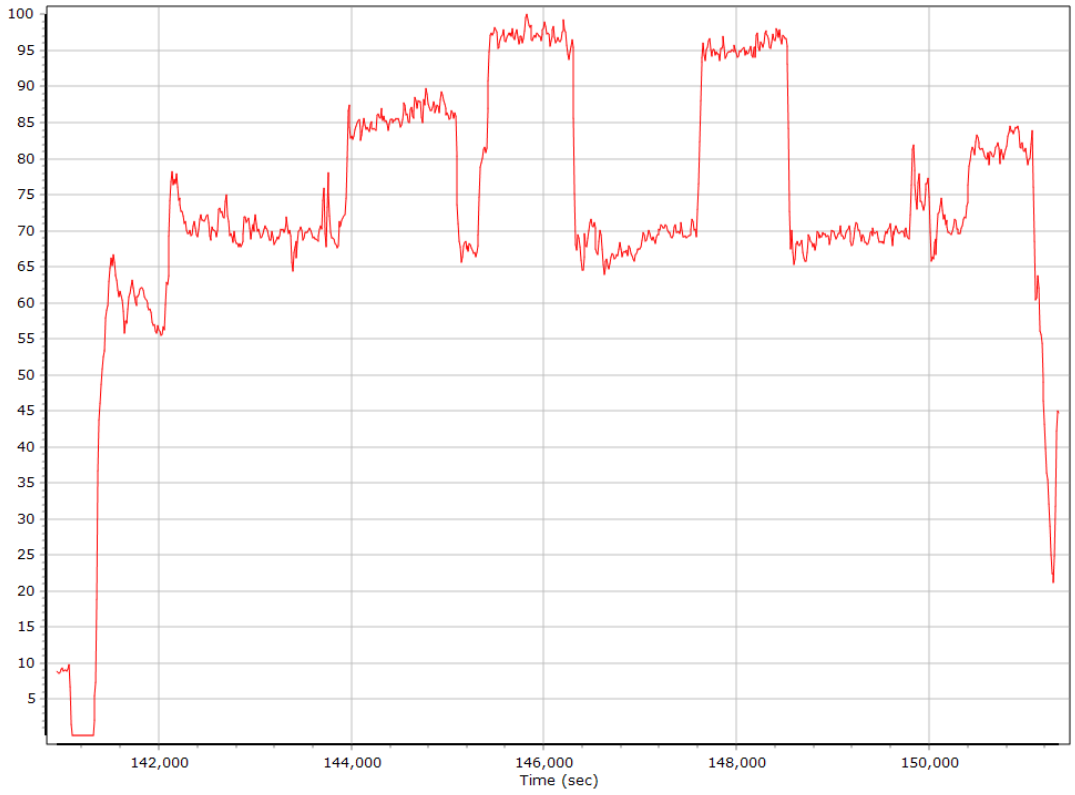
Down Velocity



Total Speed



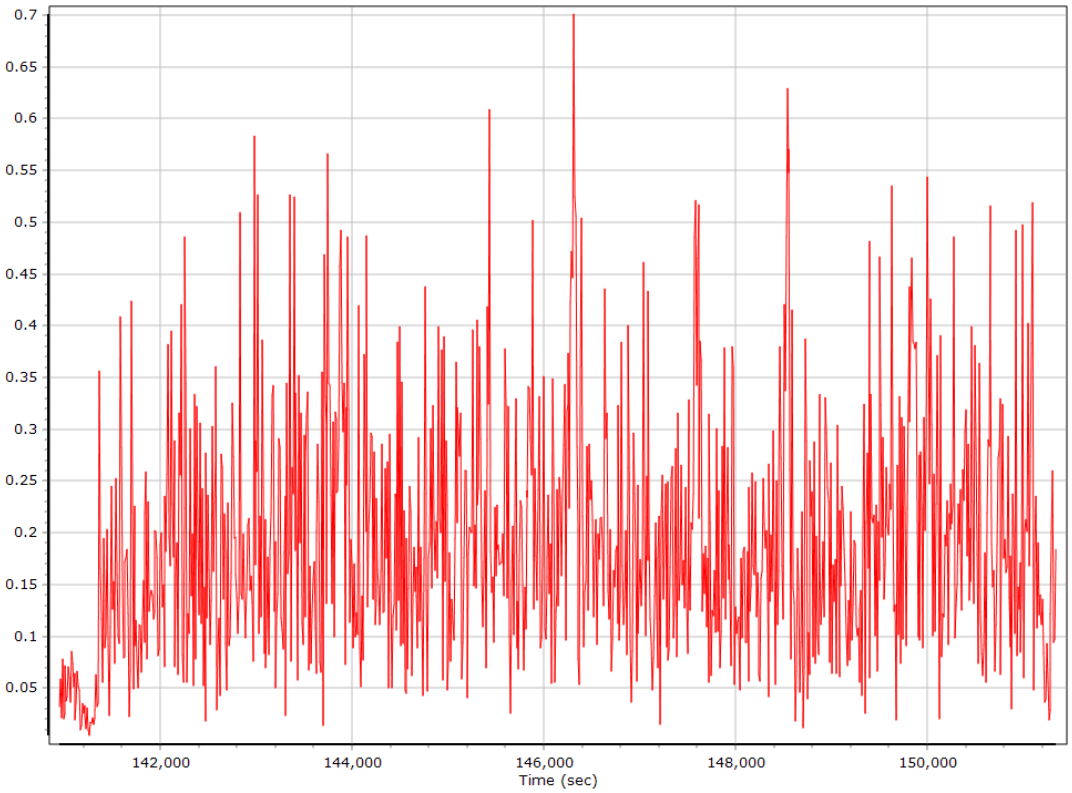
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

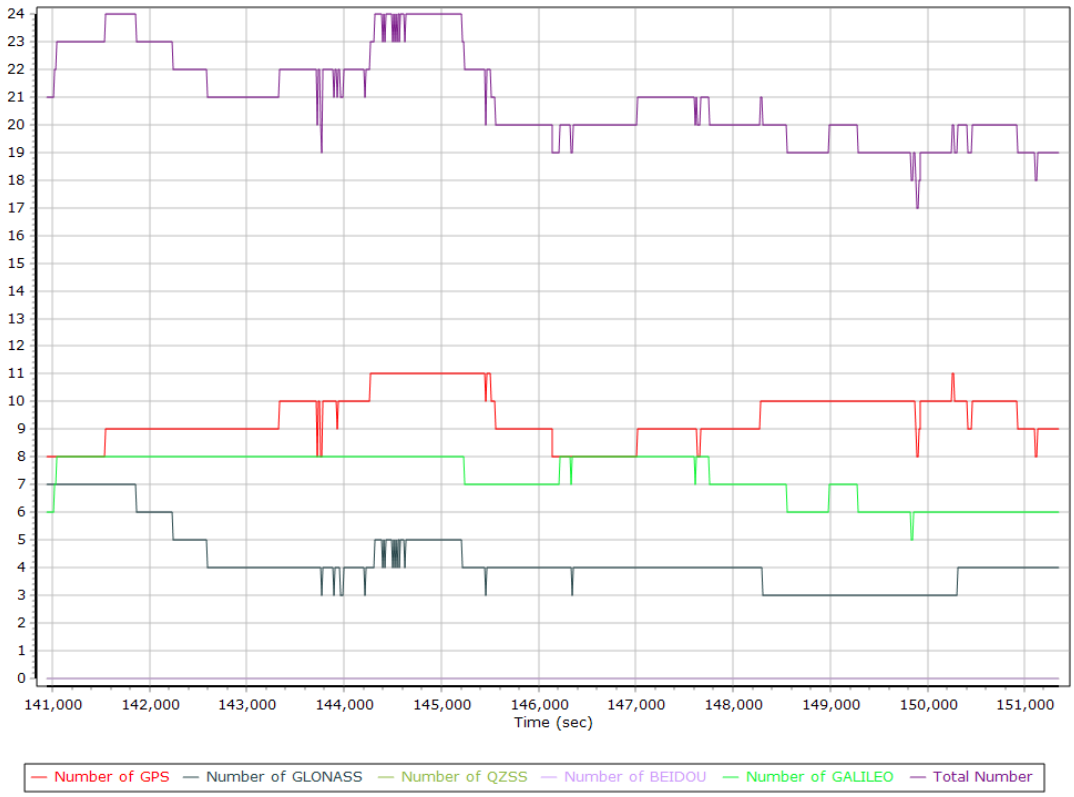


GNSS QC

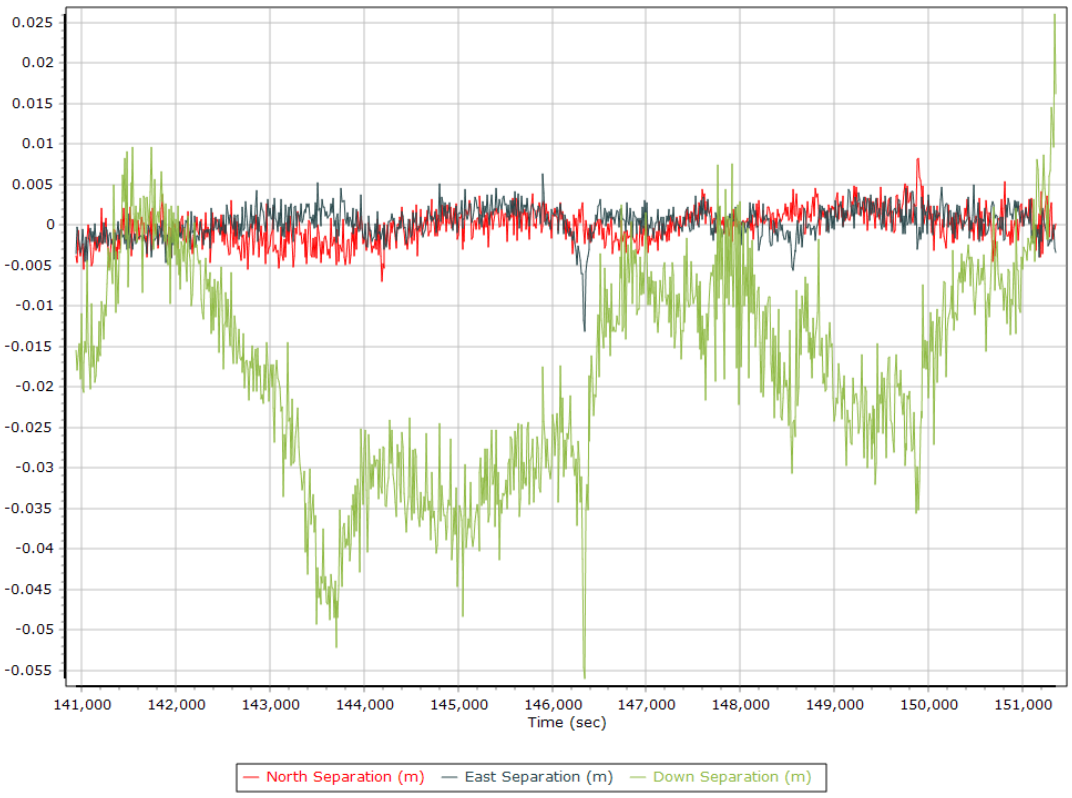
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	7	11	9
Number of GLONASS SV	3	7	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	8	7
Total number of SV	16	24	21
PDOP	0.97	1.57	1.20
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	10690.00	0.00	0.00
Percentage	100.00	0.00	0.00

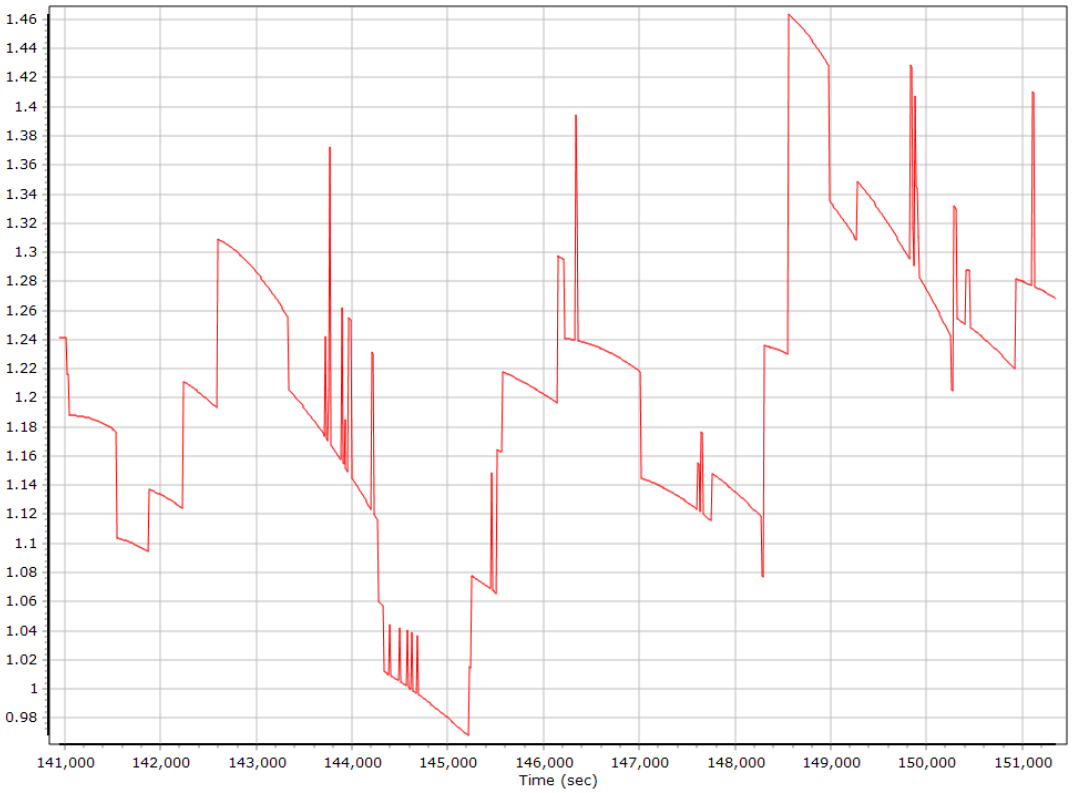
Num SVs in solution



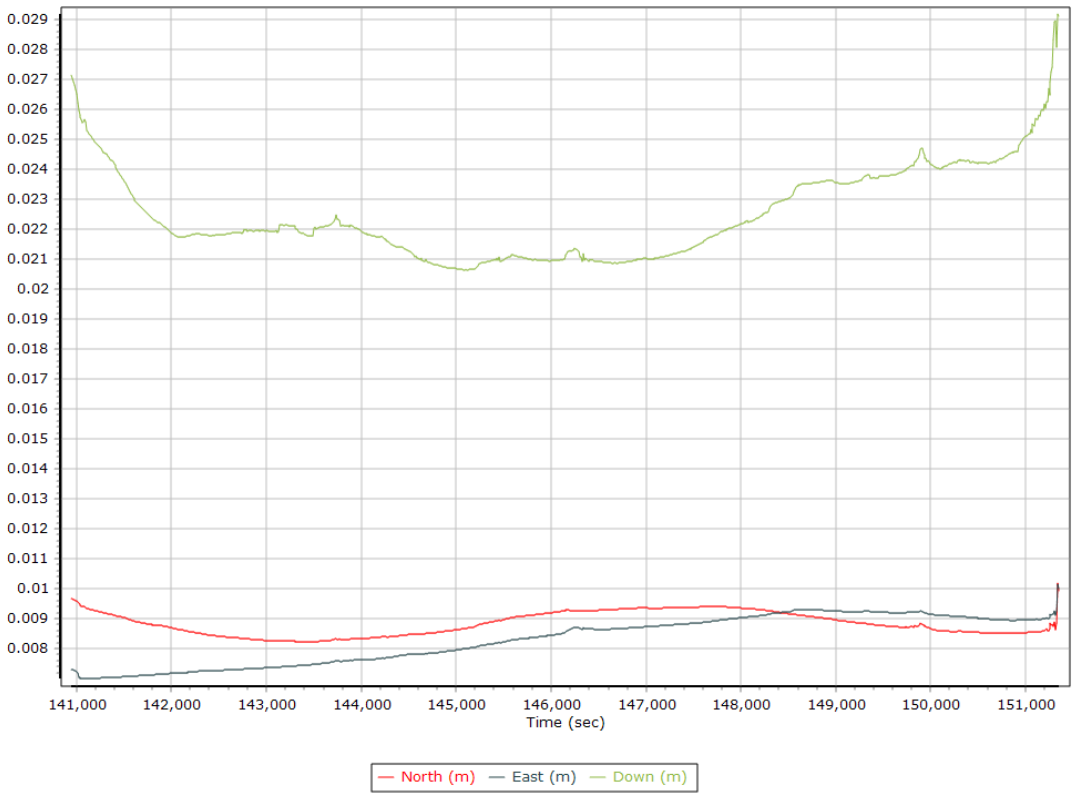
Forward/Reverse Separation



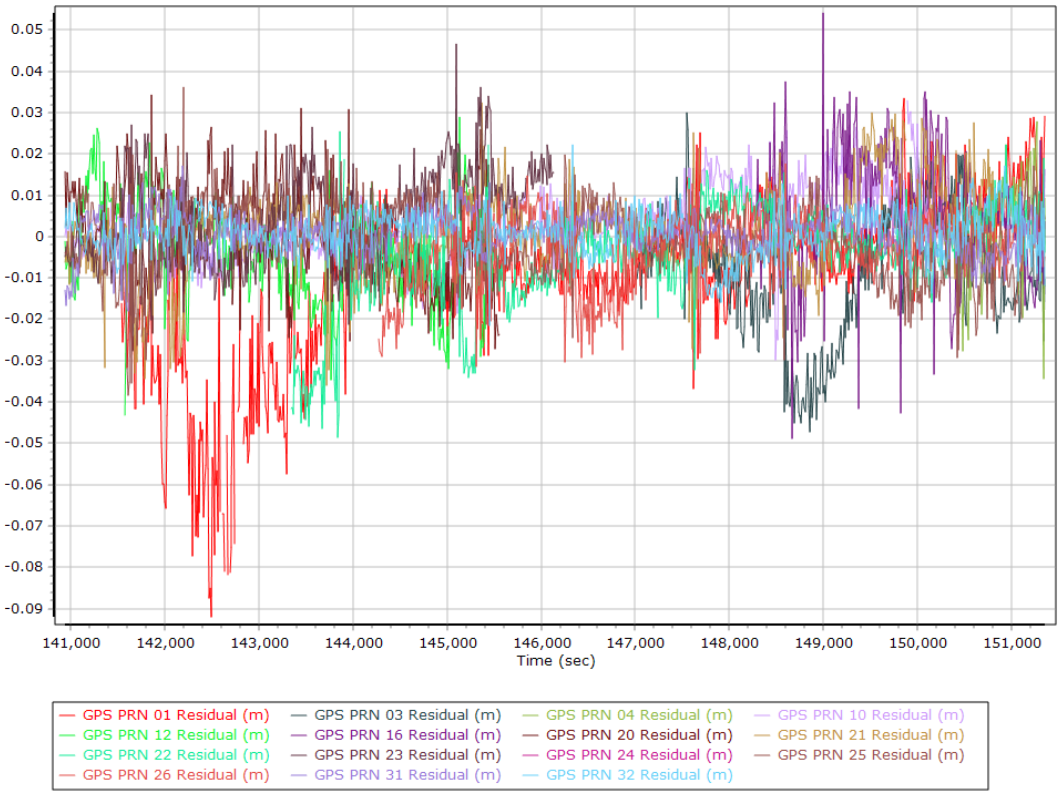
PDOP



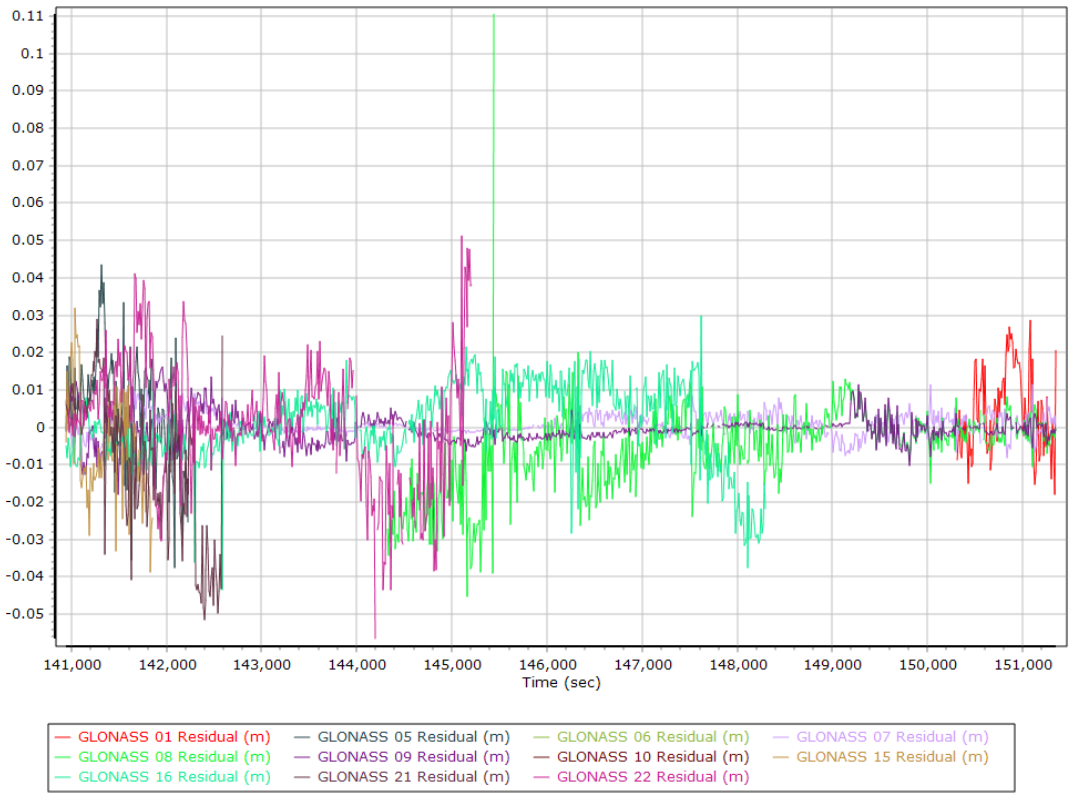
Estimated Position Accuracy



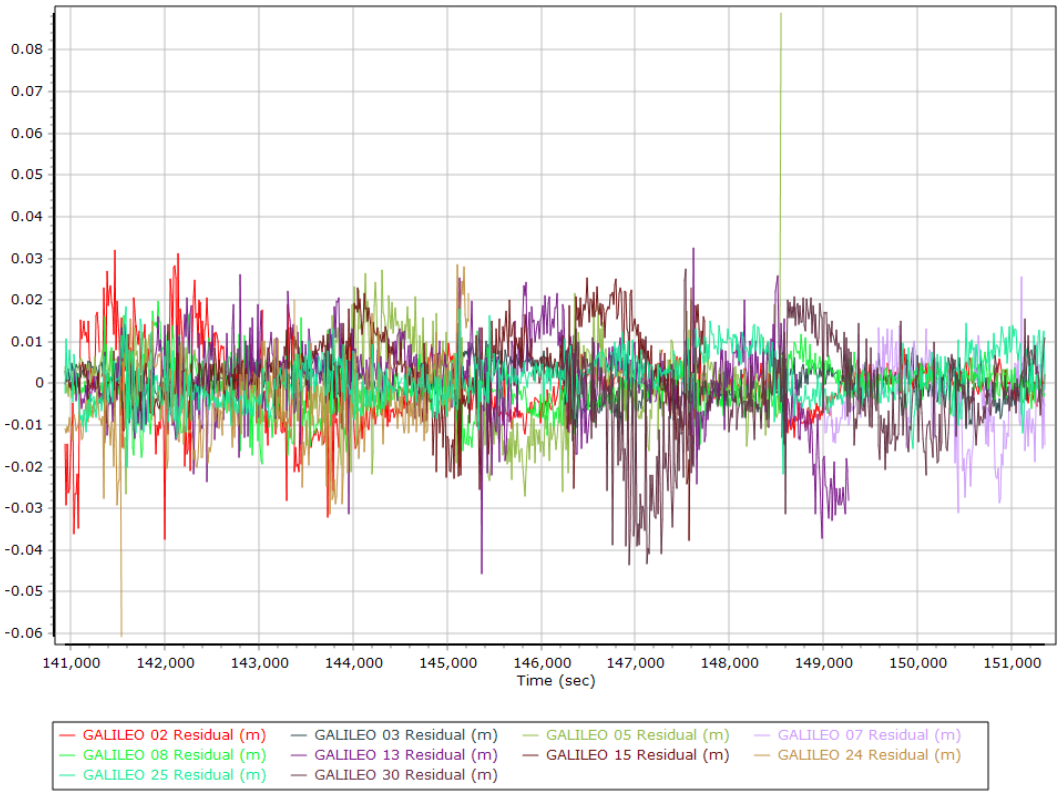
GPS Residuals



GLONASS Residuals



GALILEO Residuals



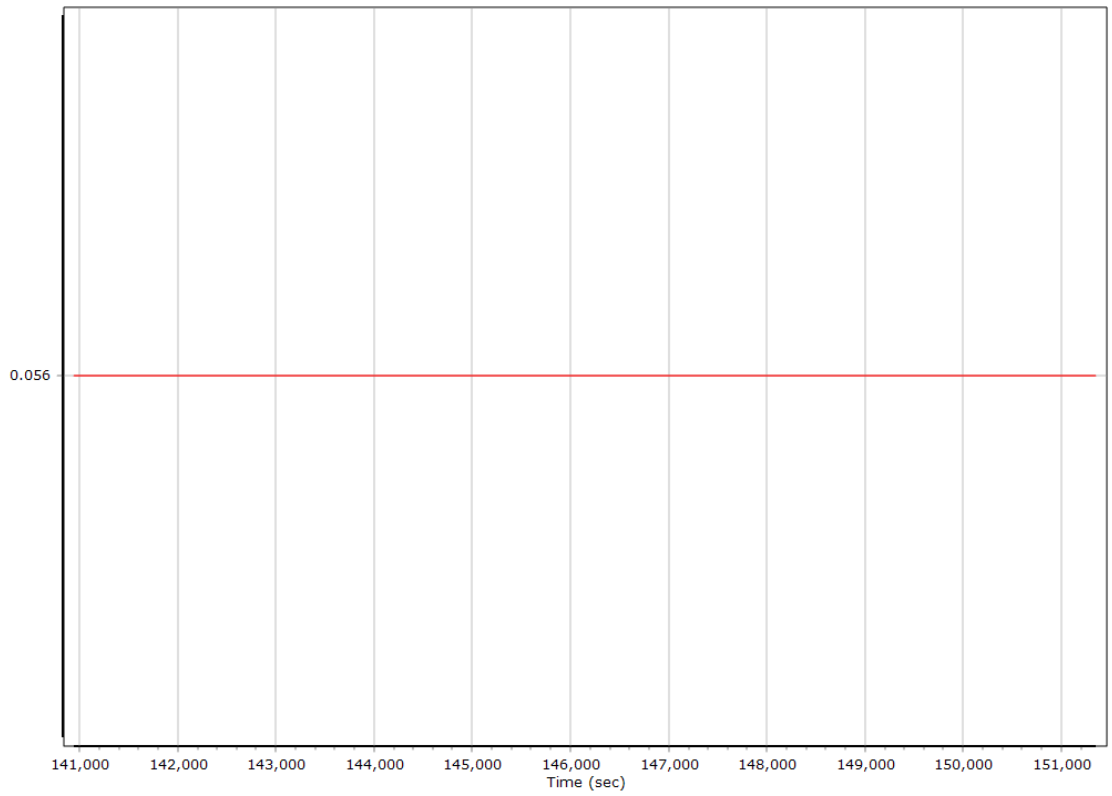
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	140642.000 (1/4/2021 3:04:02 PM)		
Processing end time	151353.000 (1/4/2021 6:02:33 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

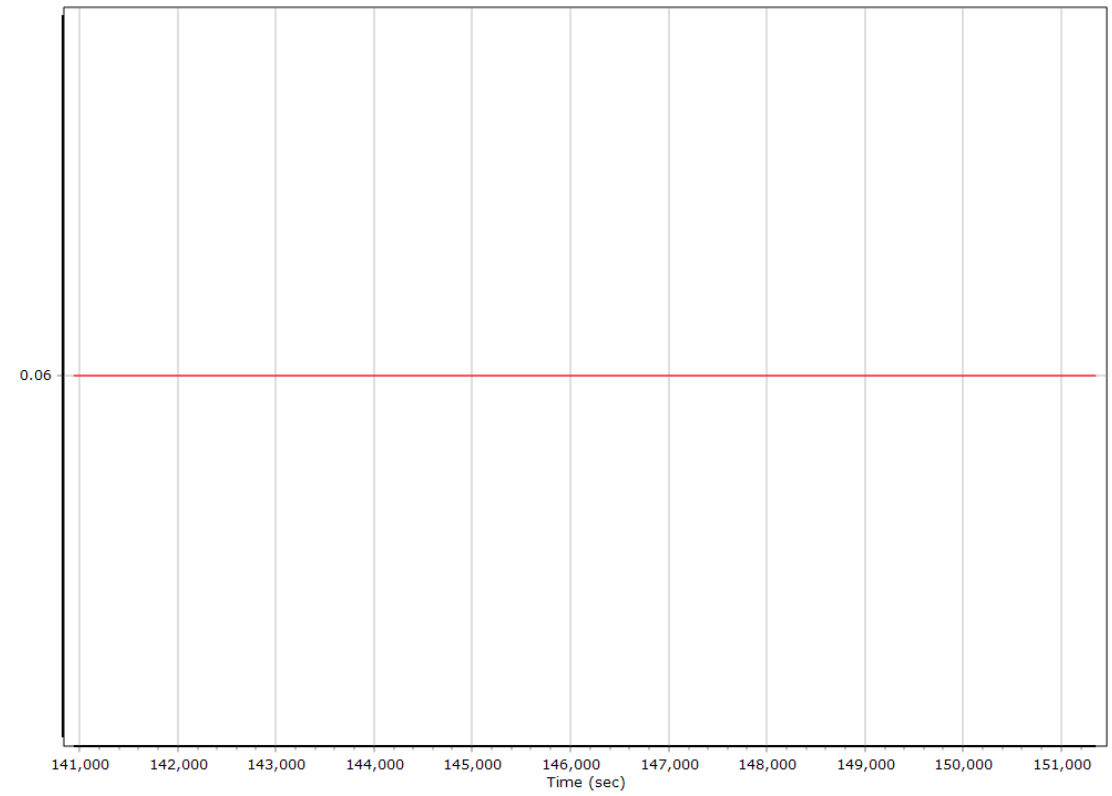
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

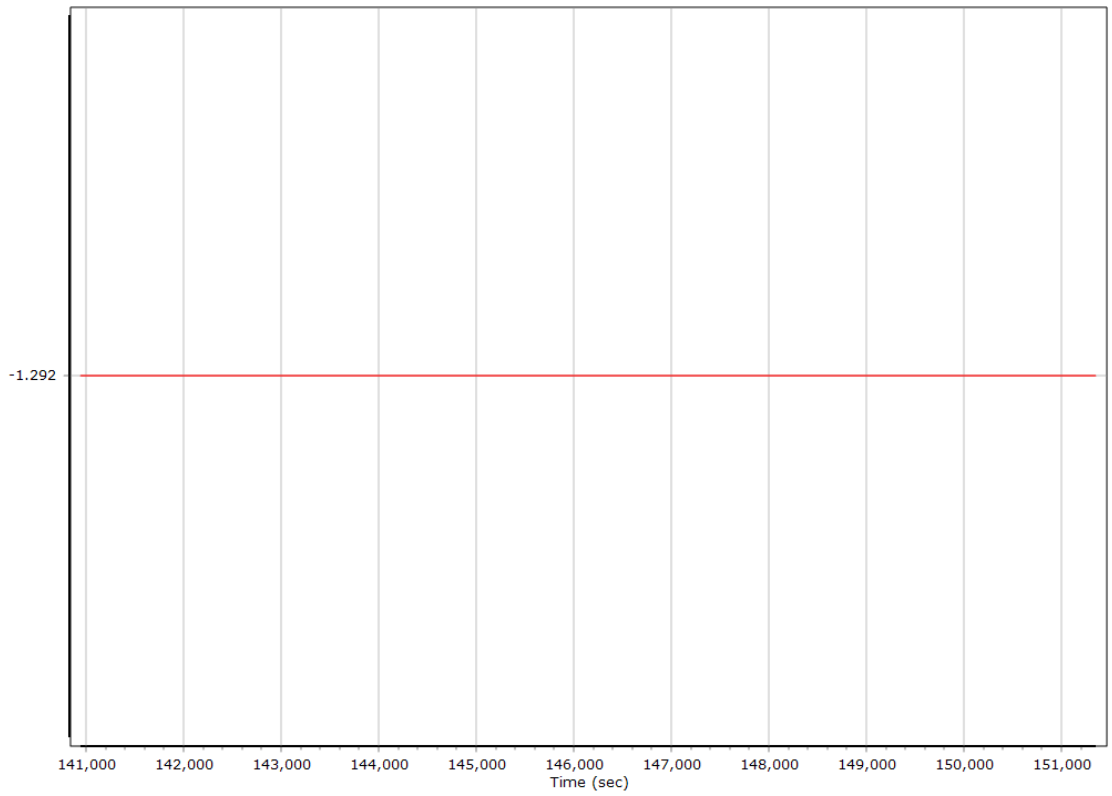
X Reference-Primary GNSS Lever Arm (m)



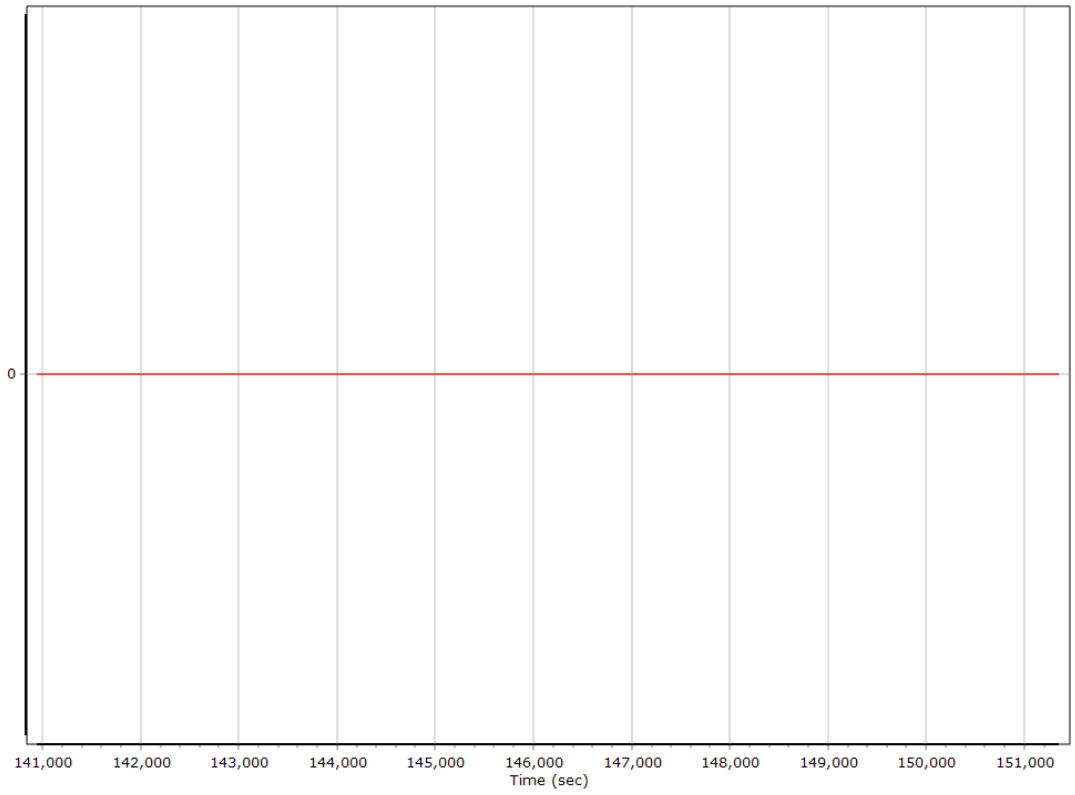
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



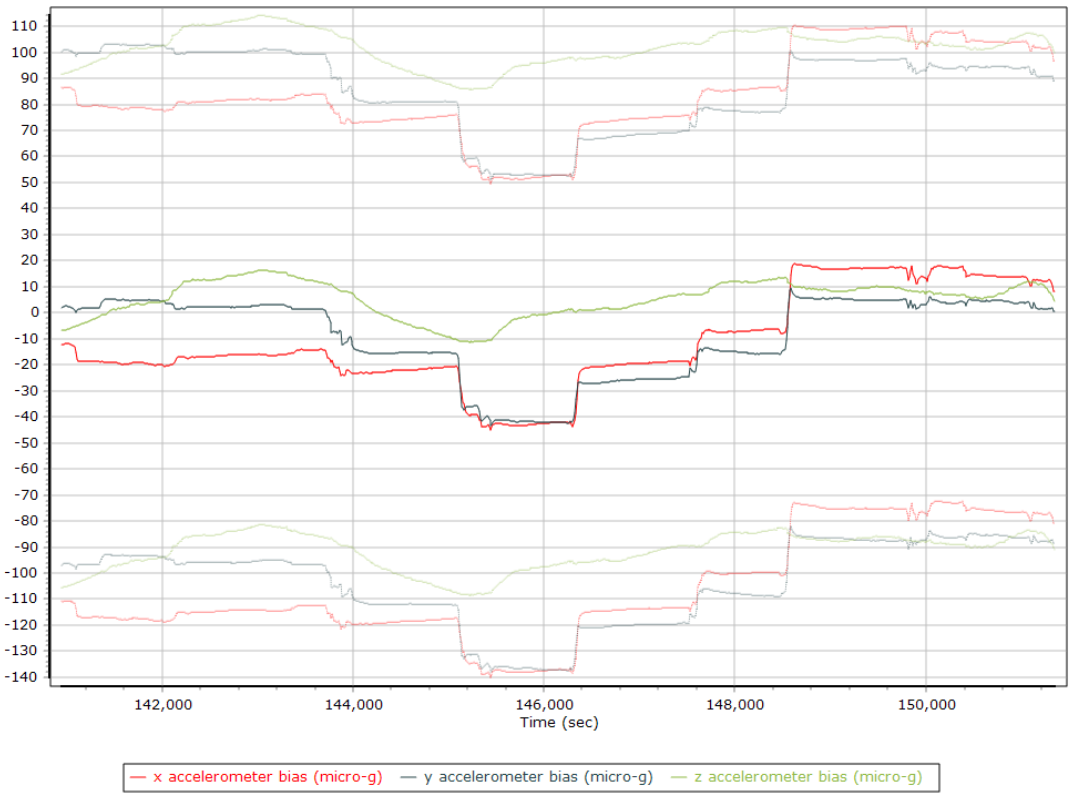
Reference-Primary GNSS Lever Arm Figure of Merit



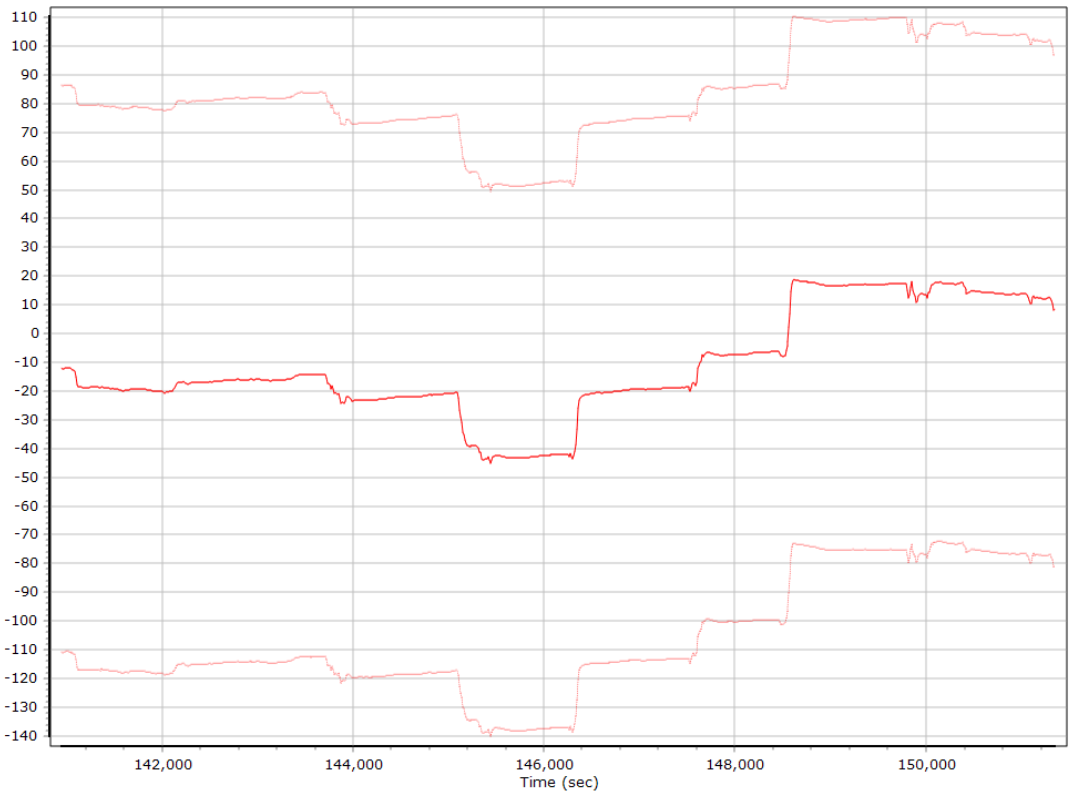
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

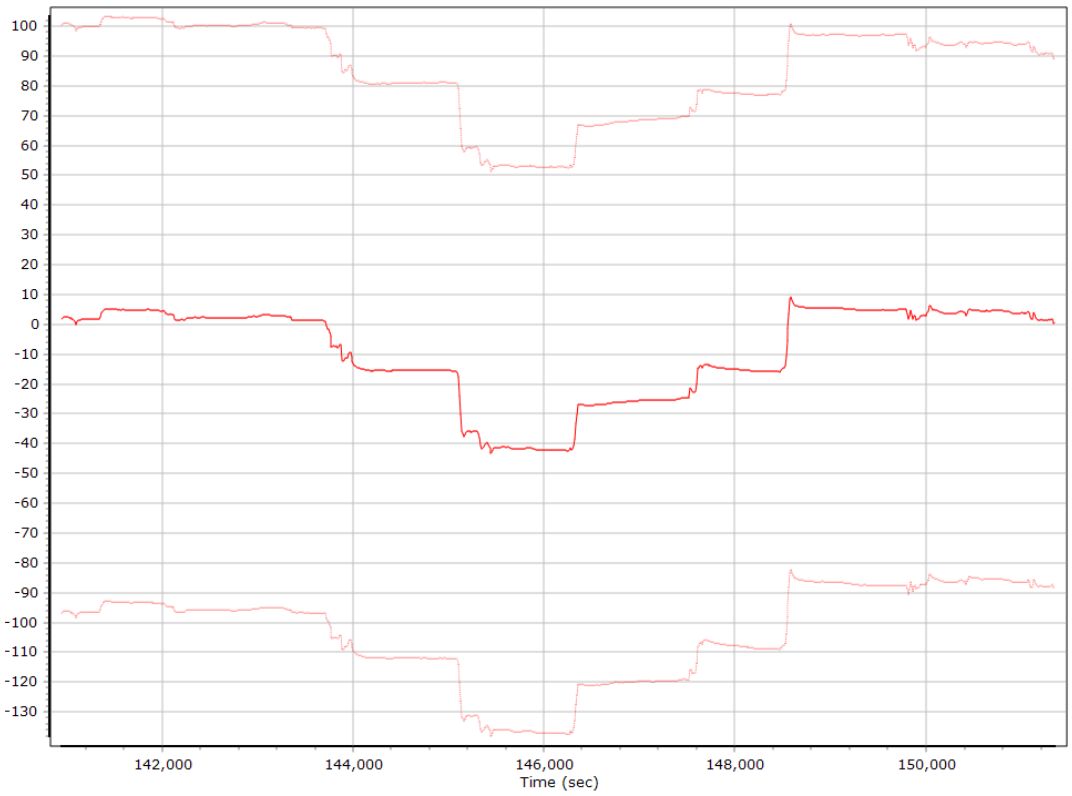
Accelerometer Bias (micro-g)



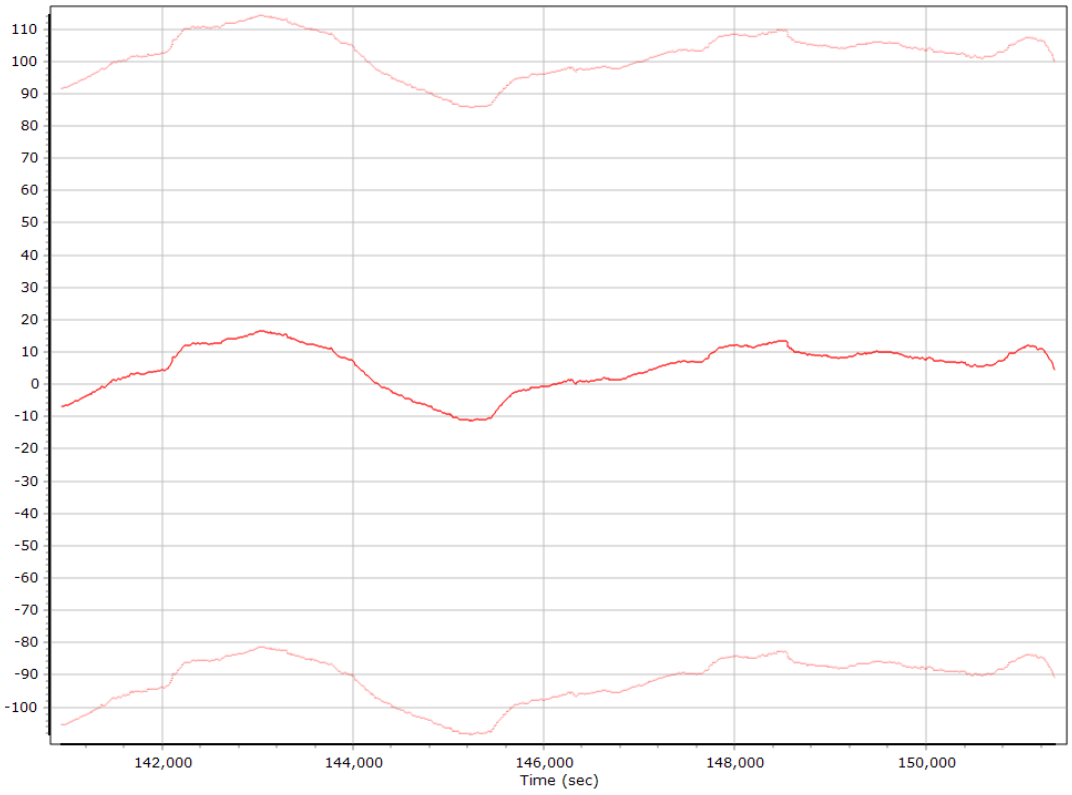
X Accelerometer Bias (micro-g)



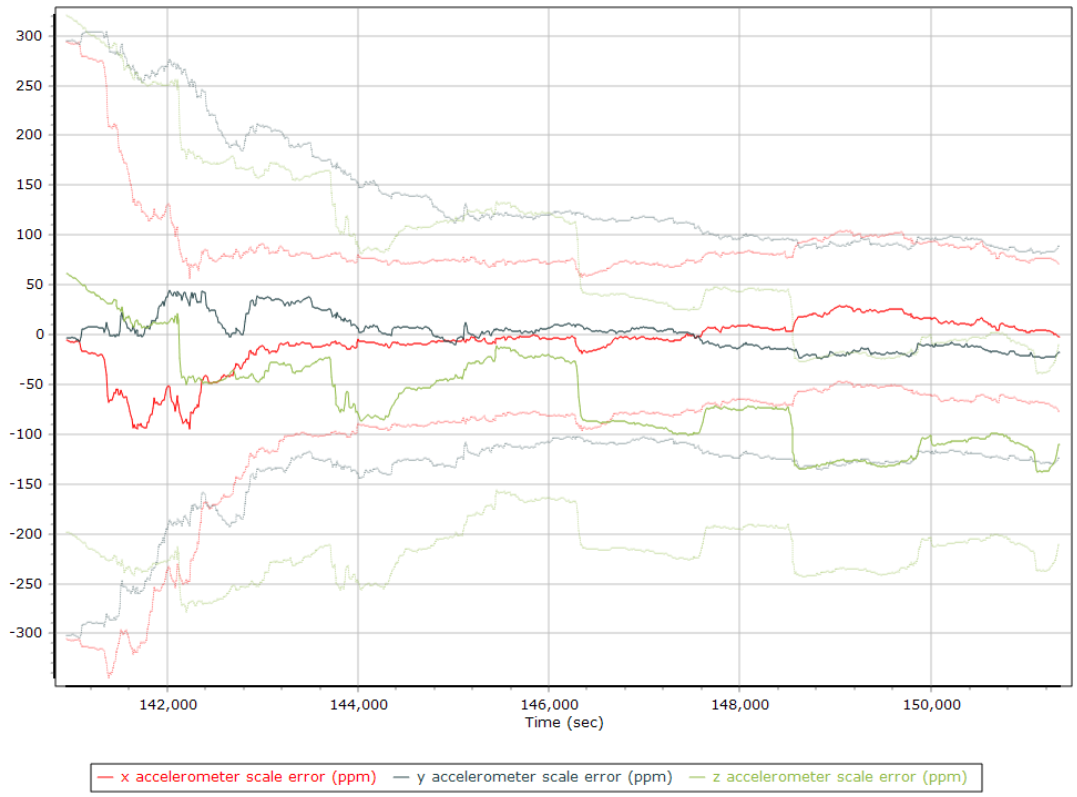
Y Accelerometer Bias (micro-g)



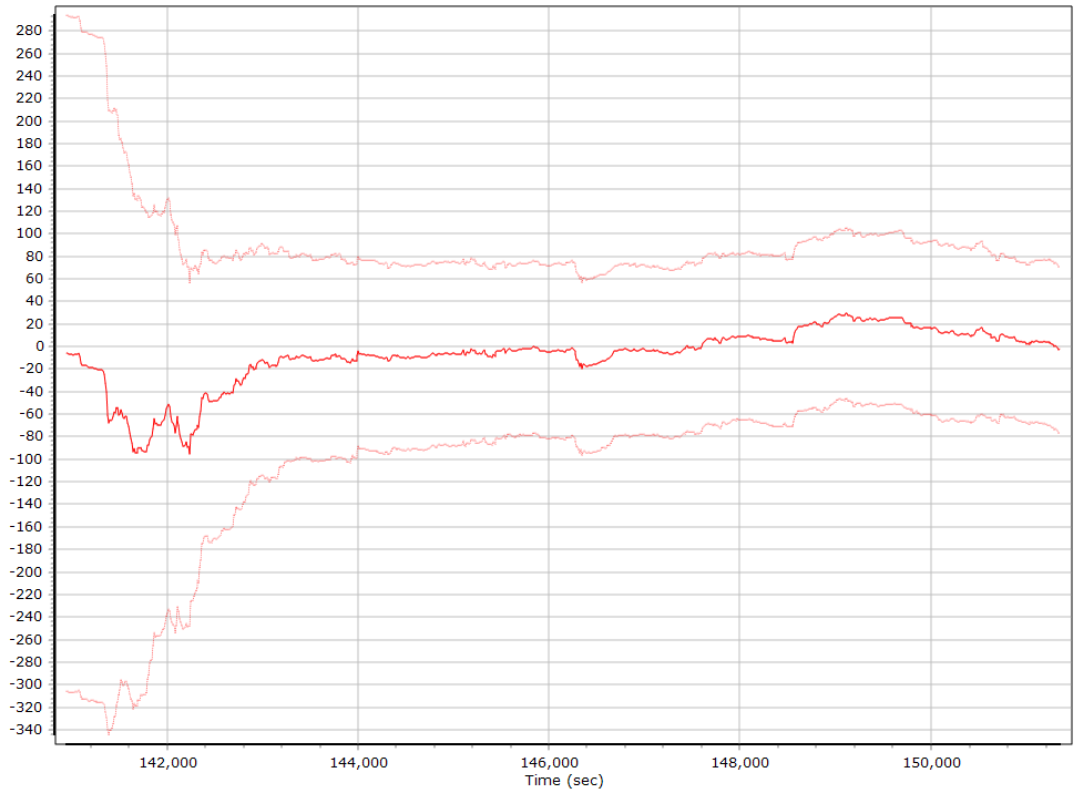
Z Accelerometer Bias (micro-g)



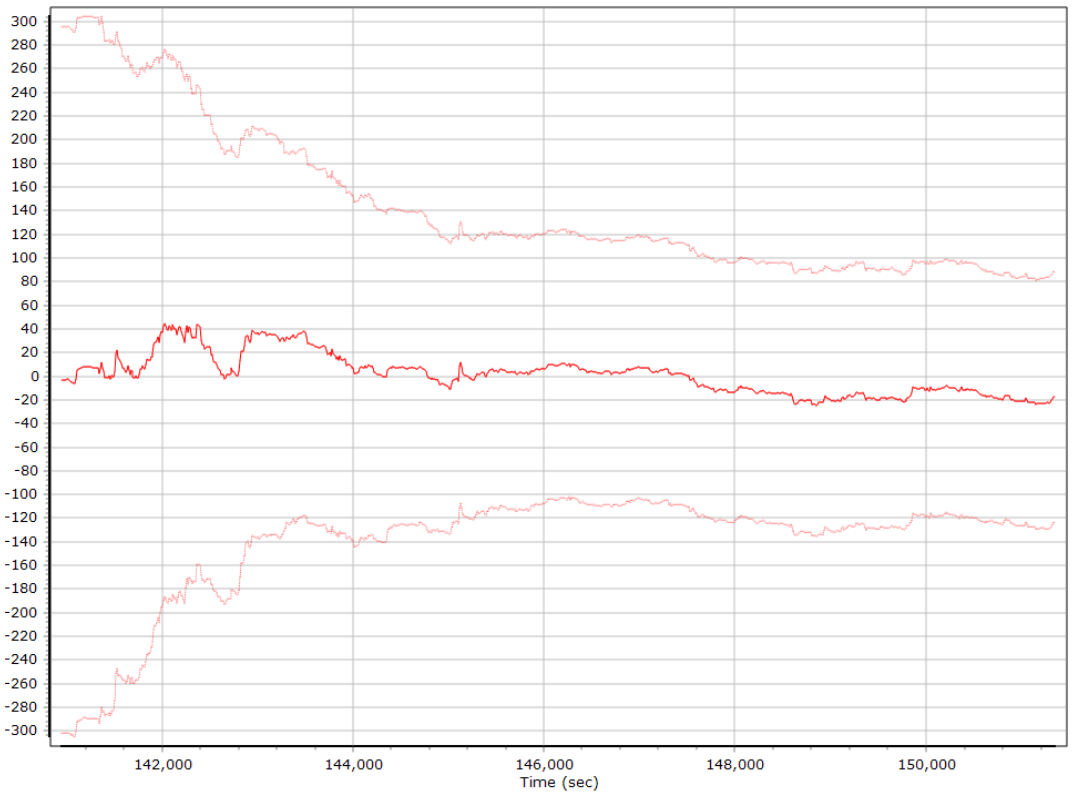
Accelerometer Scale Error (ppm)



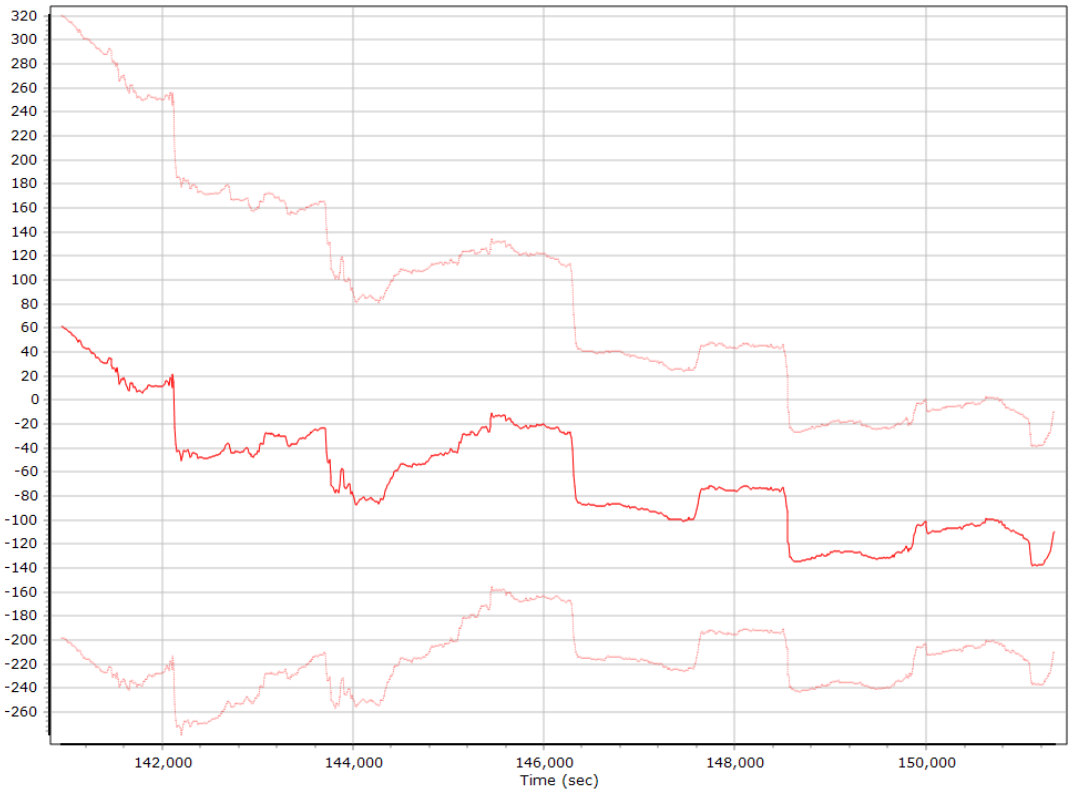
X Accelerometer Scale Error (ppm)



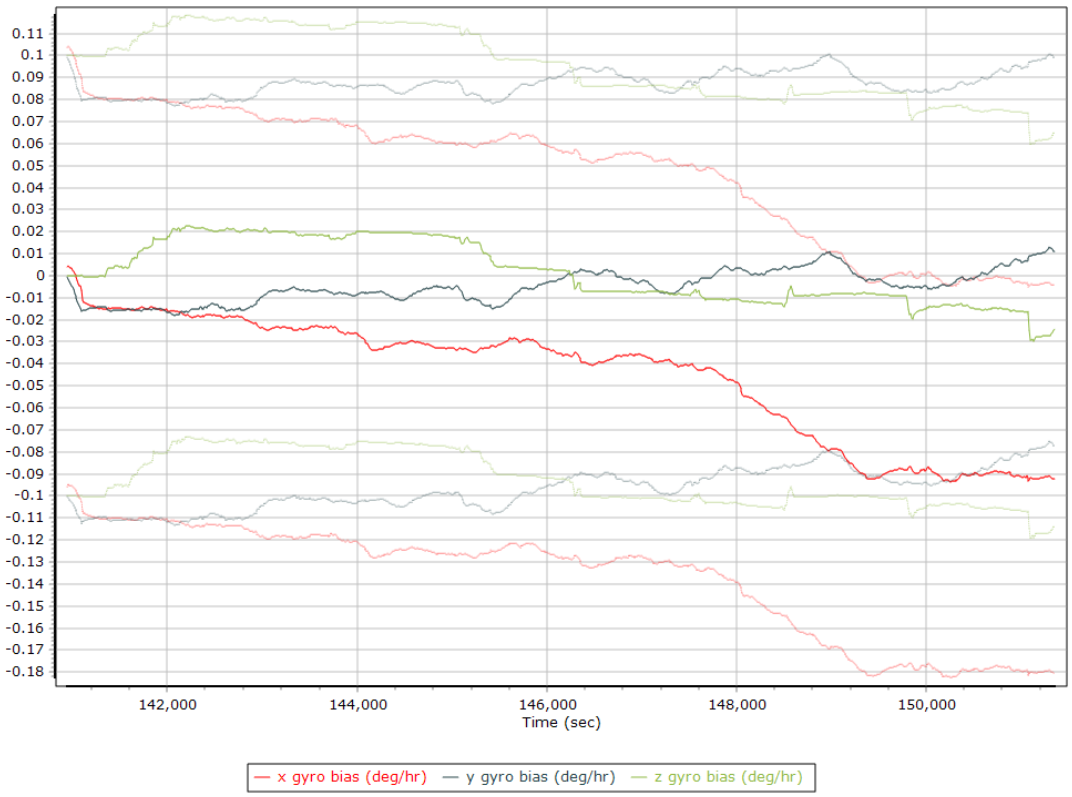
Y Accelerometer Scale Error (ppm)



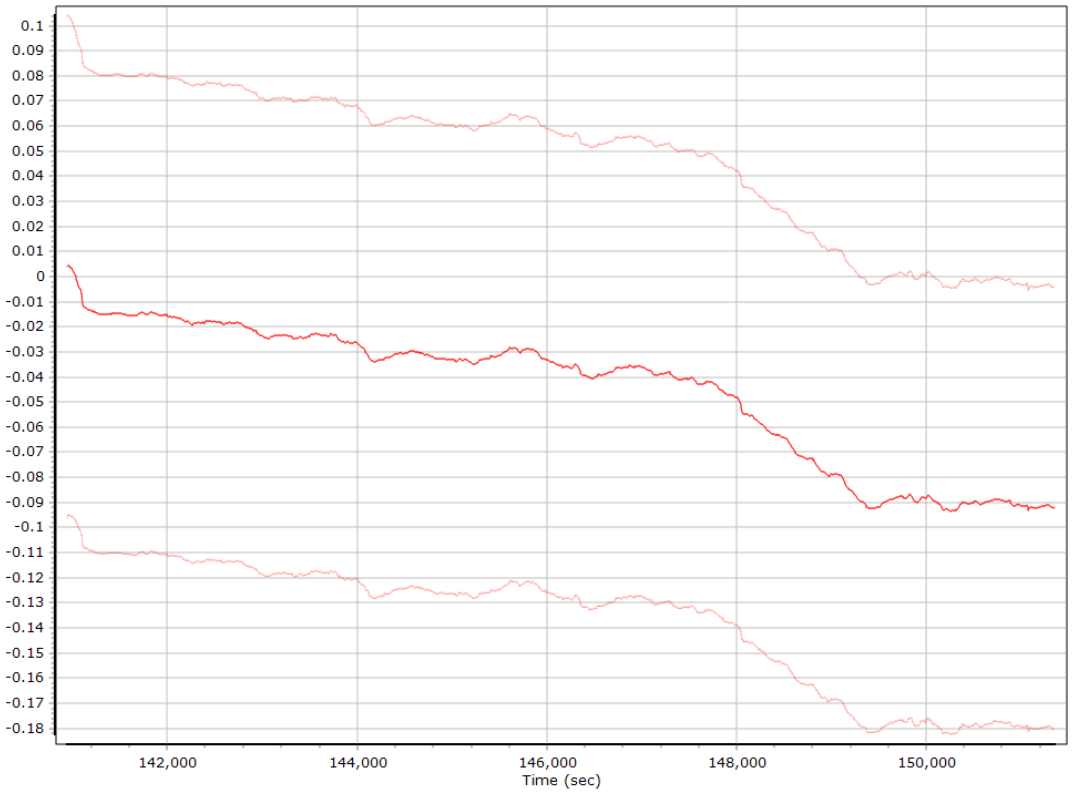
Z Accelerometer Scale Error (ppm)



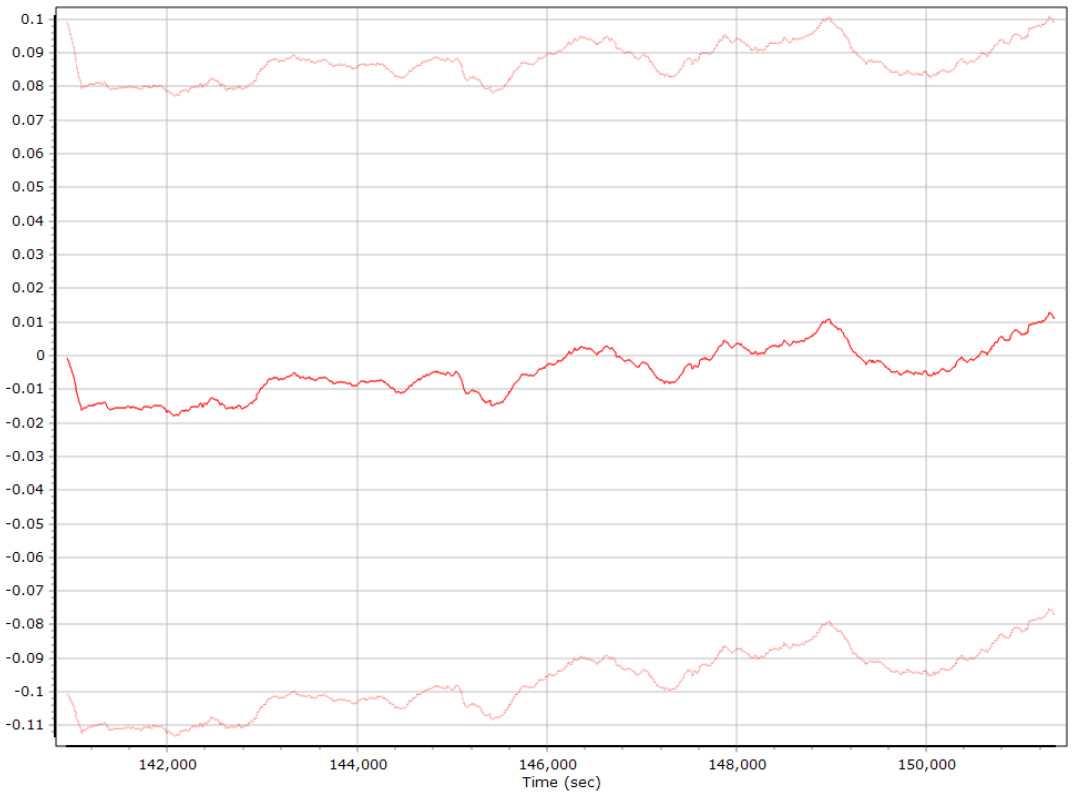
Gyro Bias (deg/h)



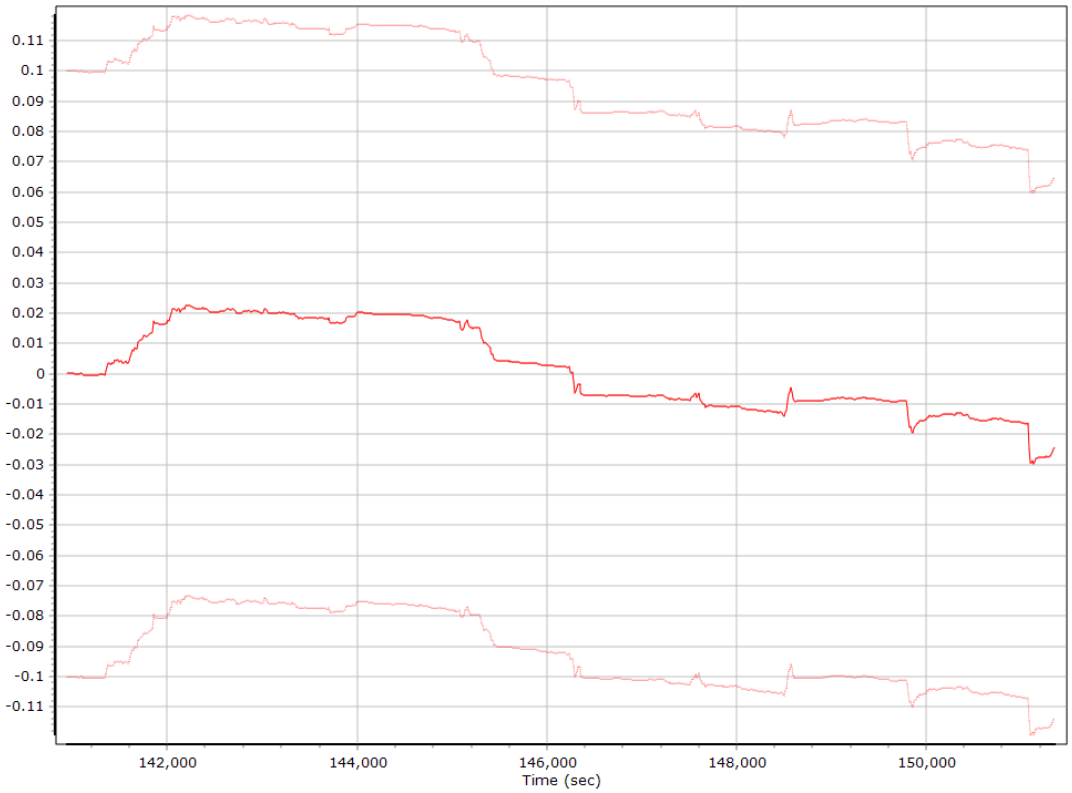
X Gyro Bias (deg/h)



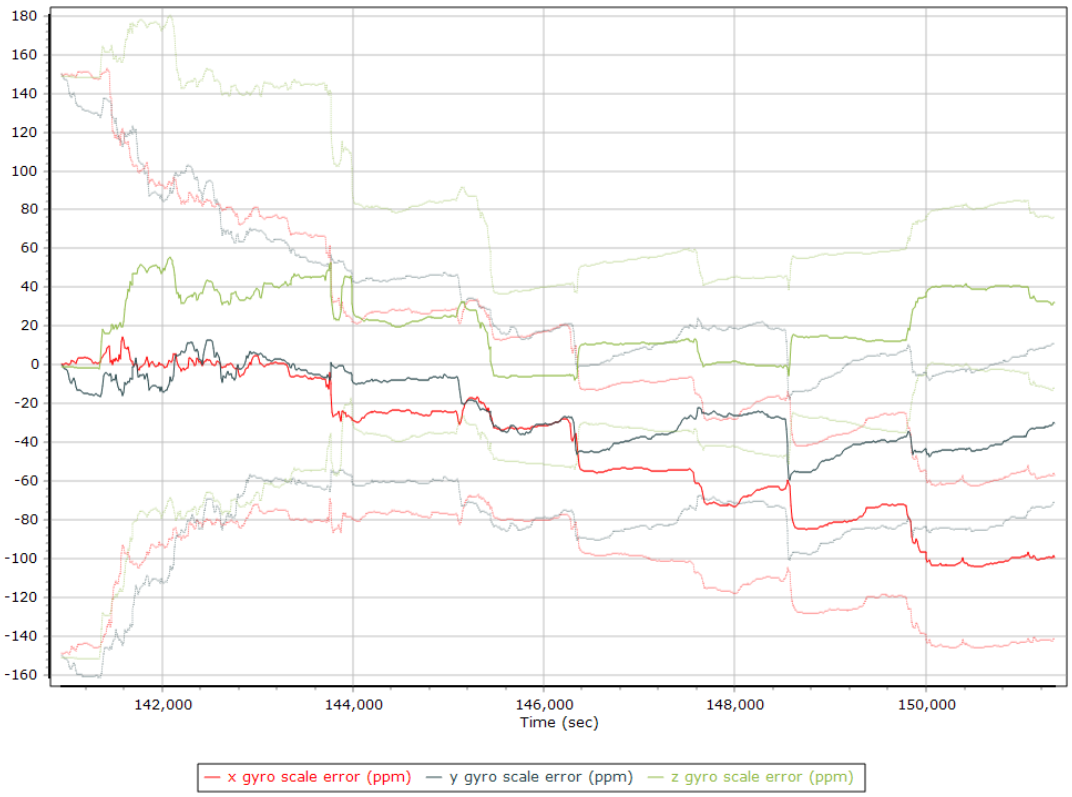
Y Gyro Bias (deg/h)



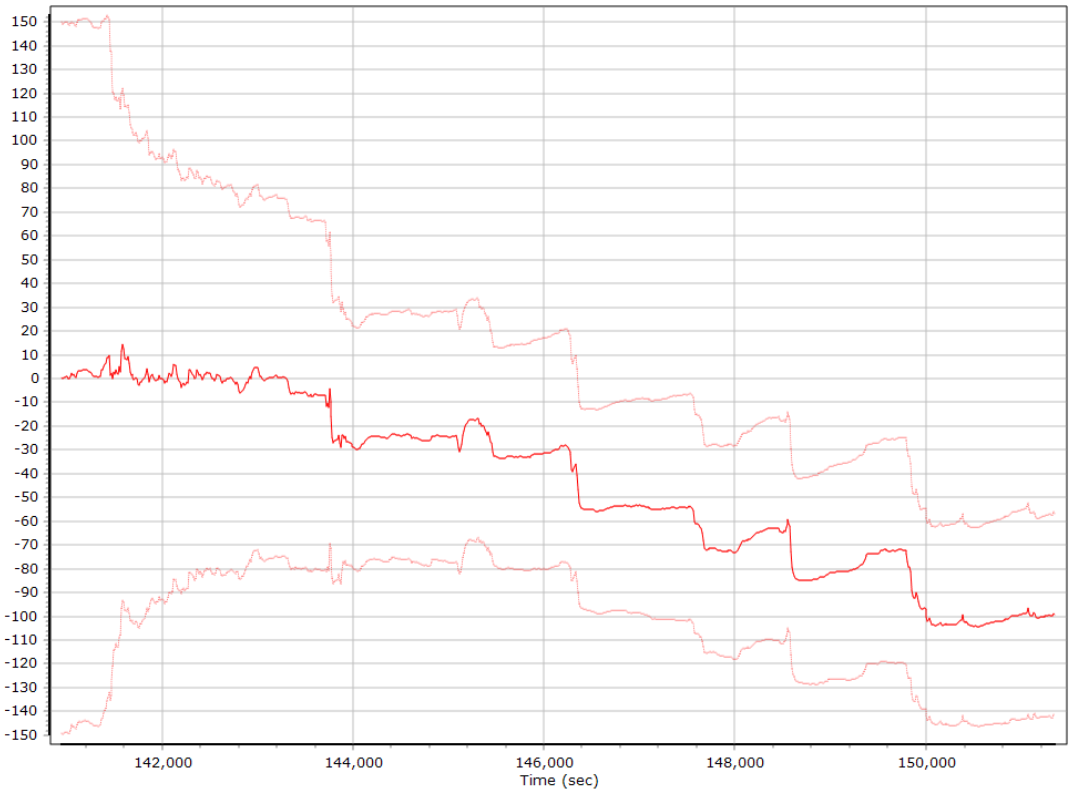
Z Gyro Bias (deg/h)



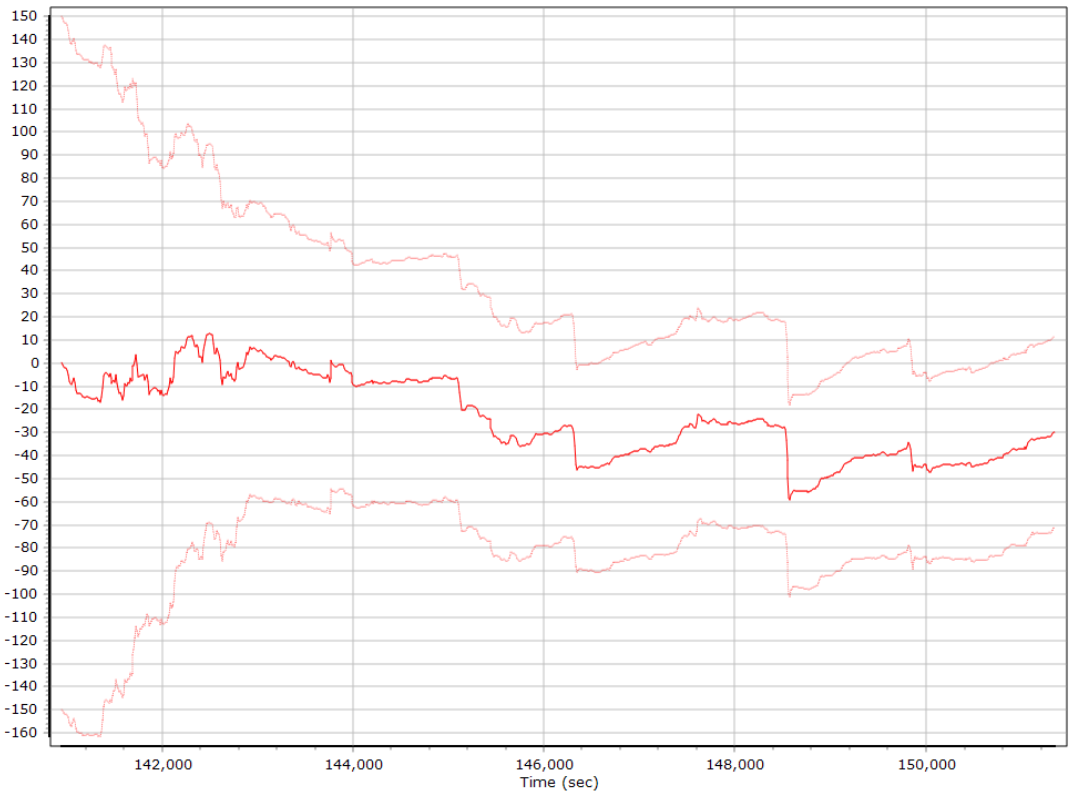
Gyro Scale Error (ppm)



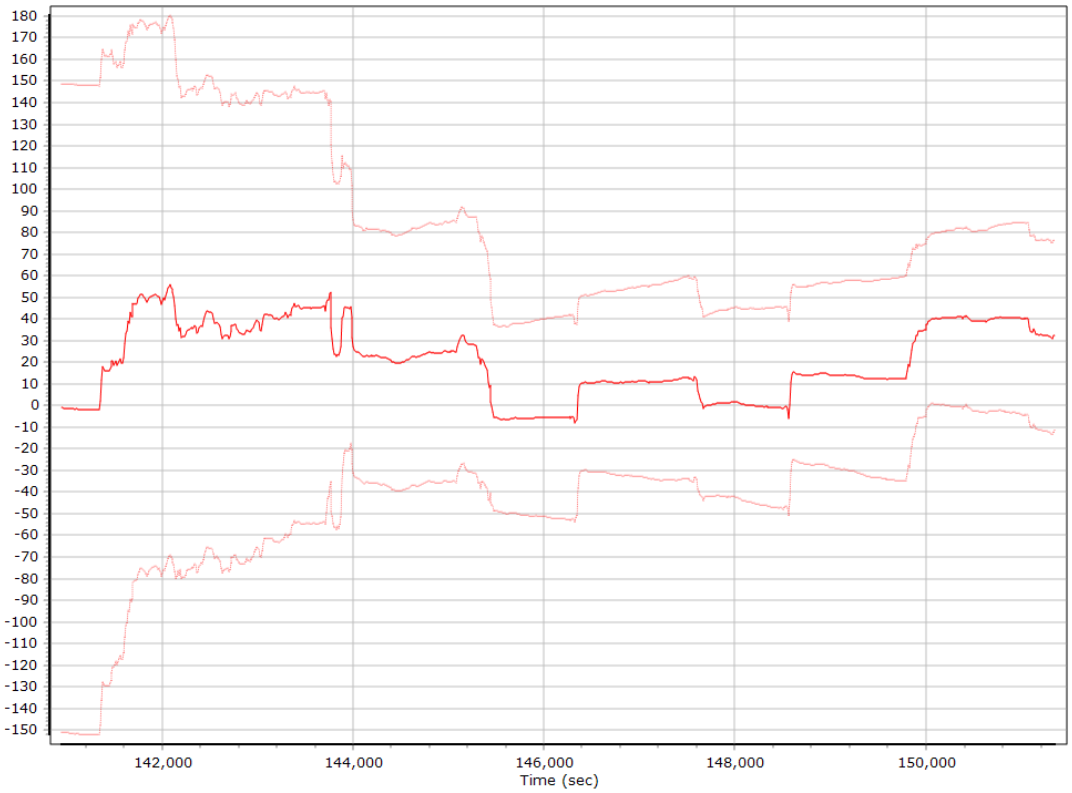
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

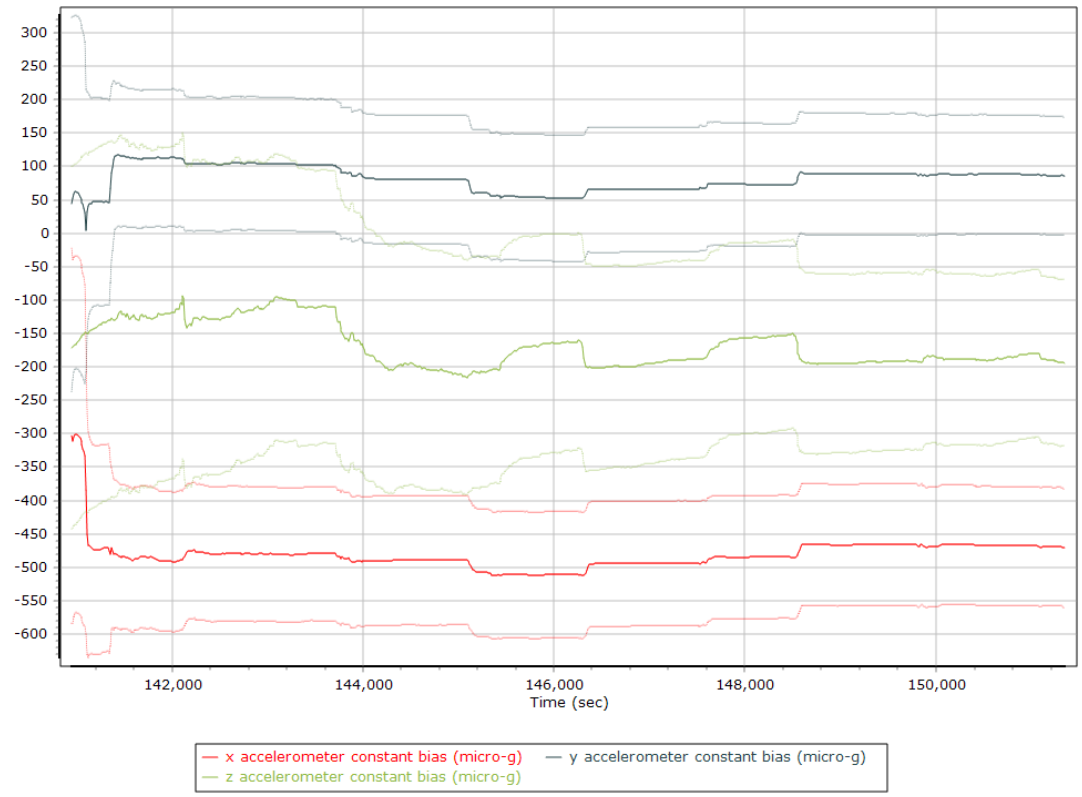


Z Gyro Scale Error (ppm)

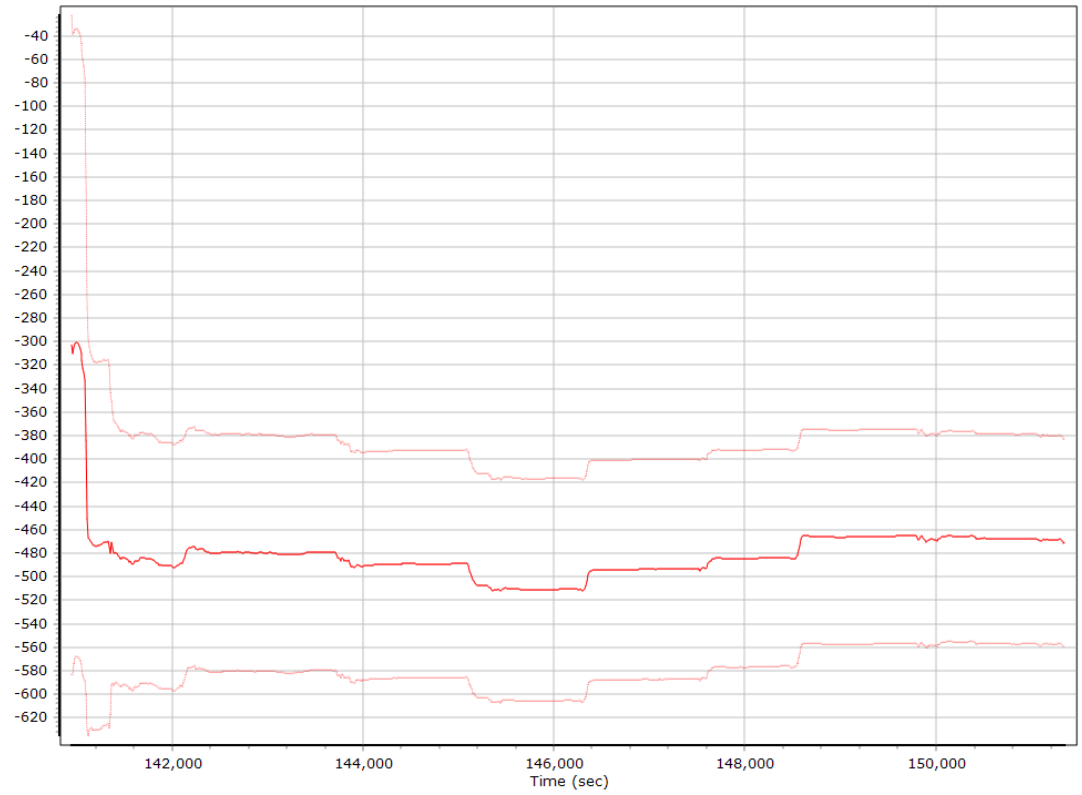


Forward Processed Estimated Constant Errors, Reference Frame

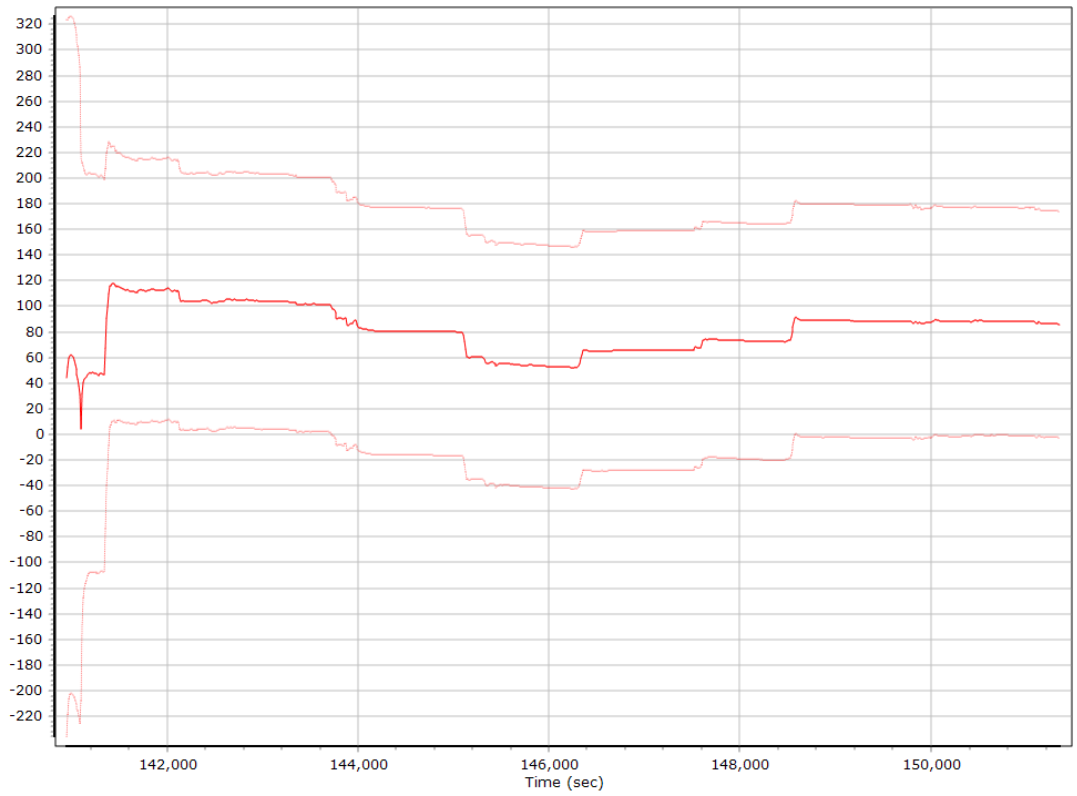
Accelerometer Bias (micro-g)



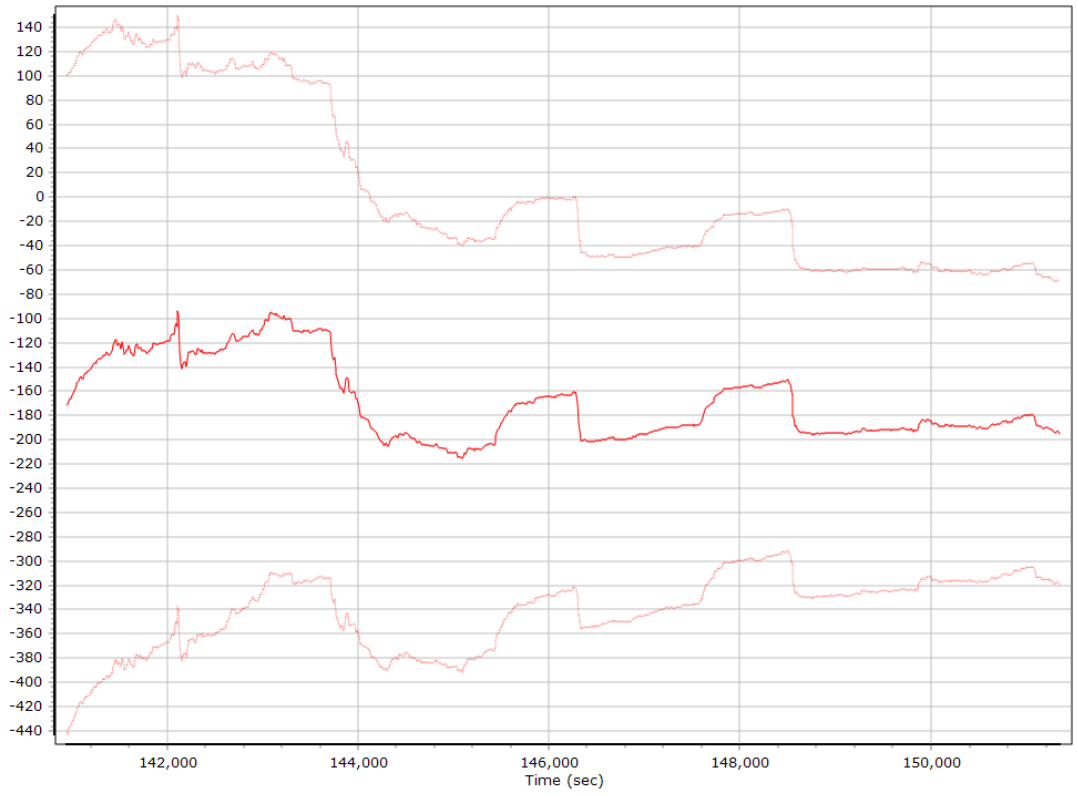
X Accelerometer Bias (micro-g)



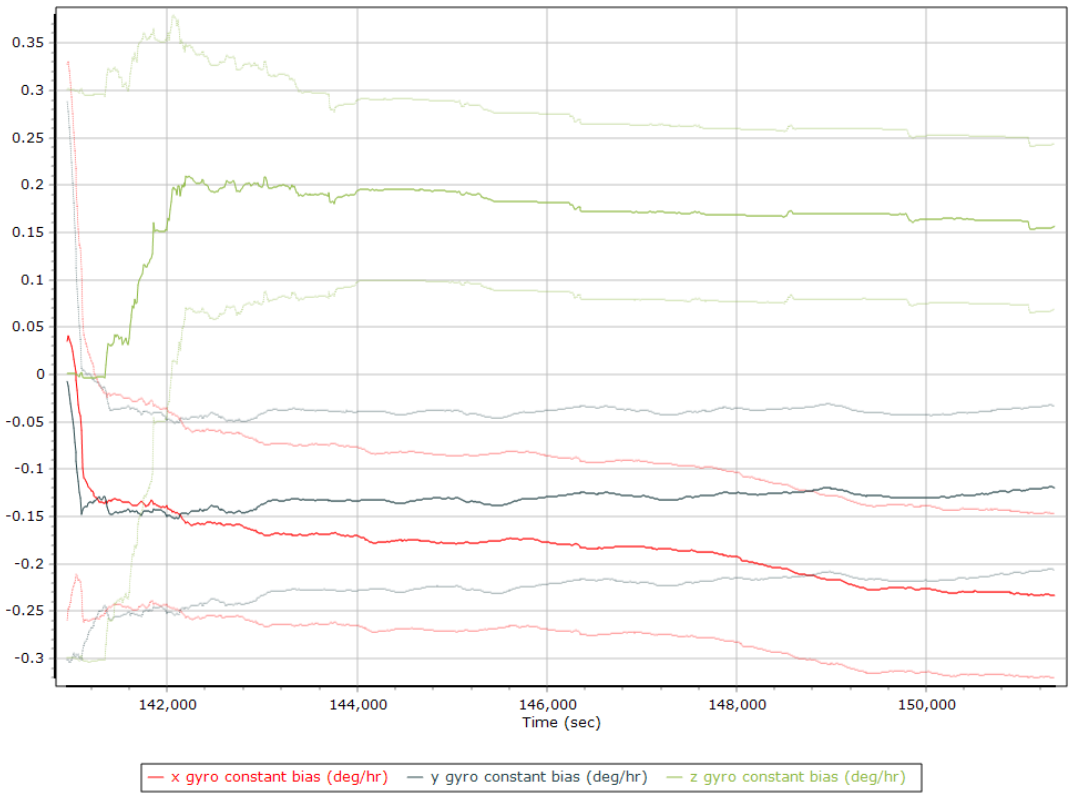
Y Accelerometer Bias (micro-g)



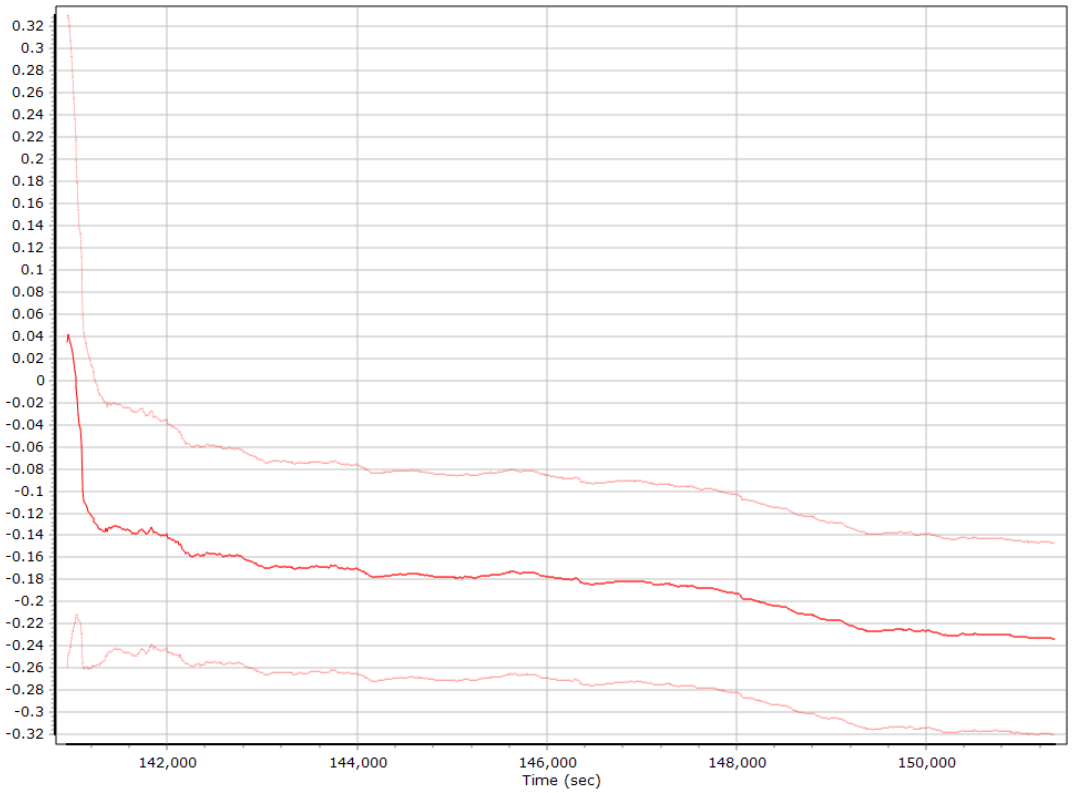
Z Accelerometer Bias (micro-g)



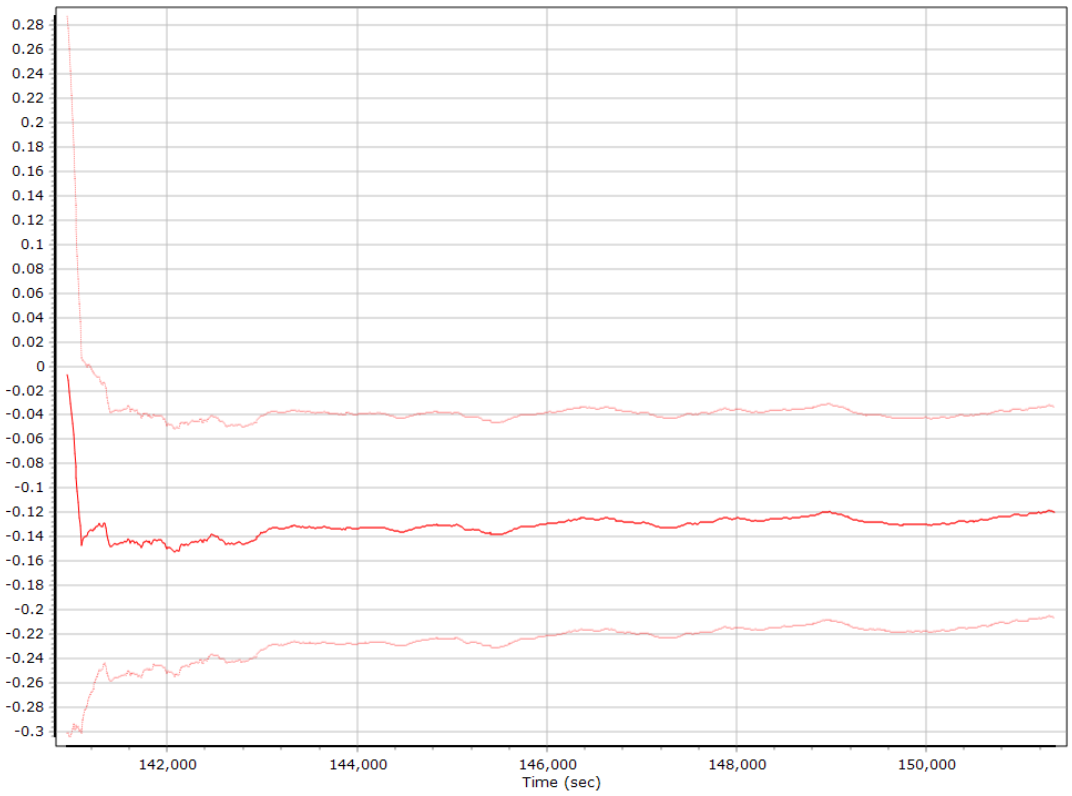
Gyro Bias (deg/h)



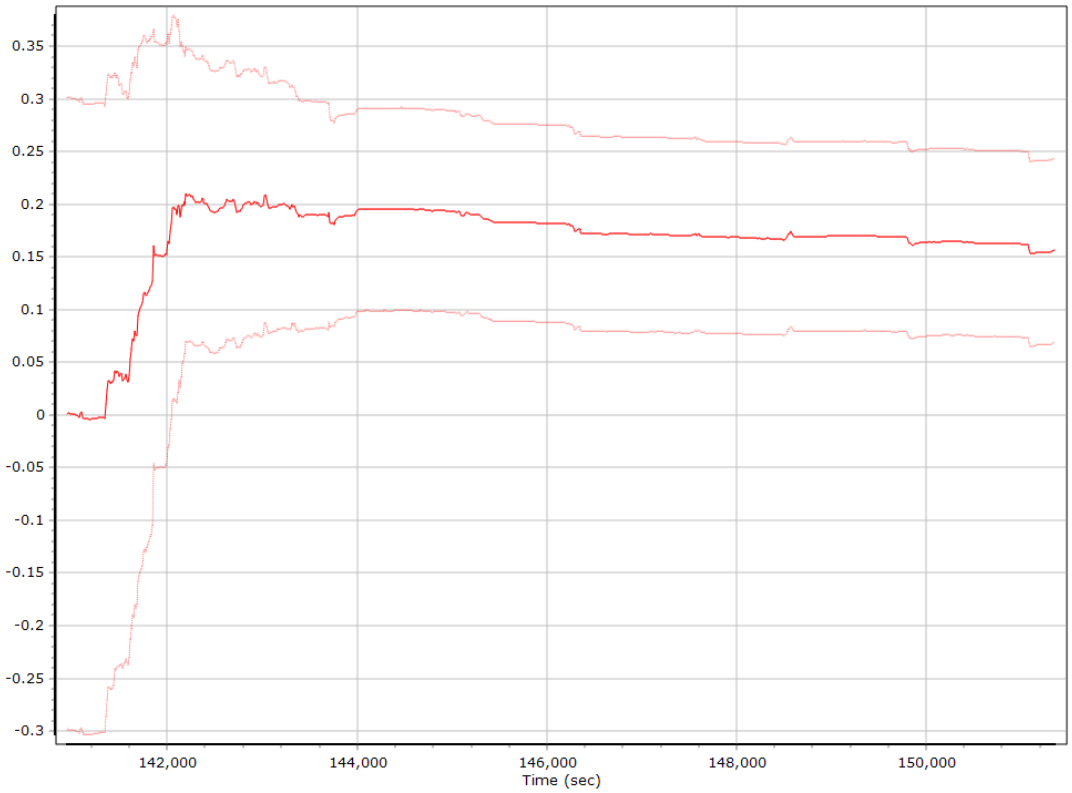
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

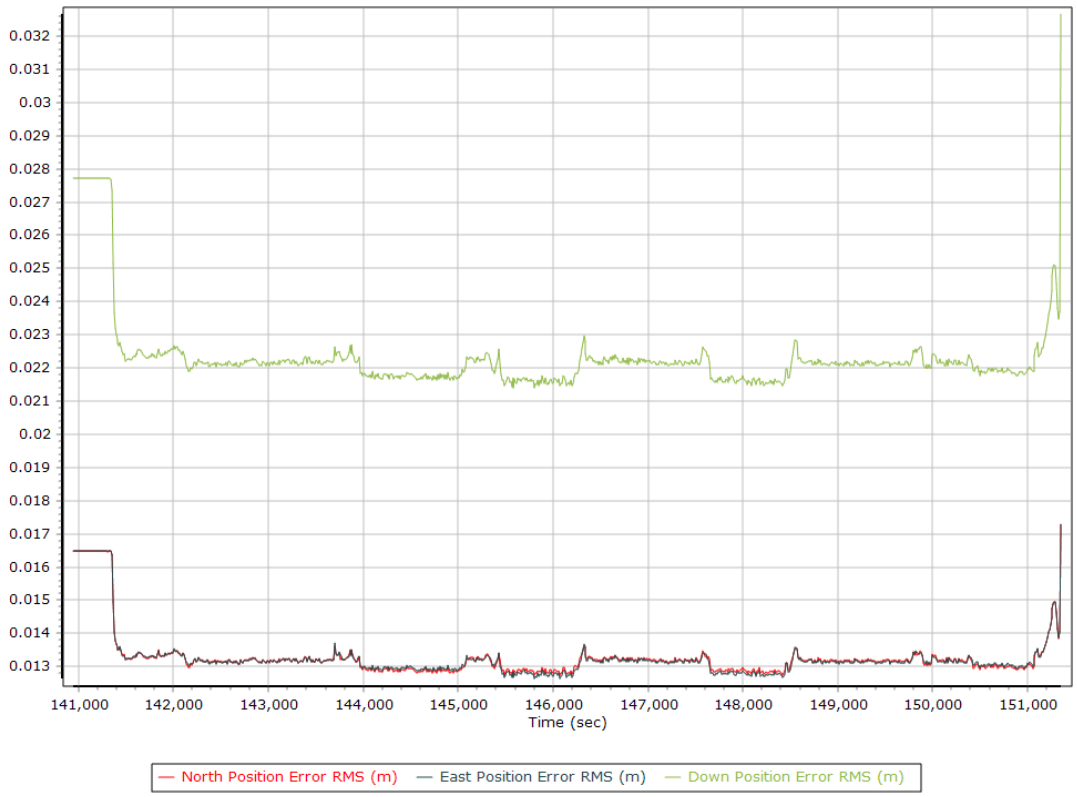


Z Gyro Bias (deg/h)

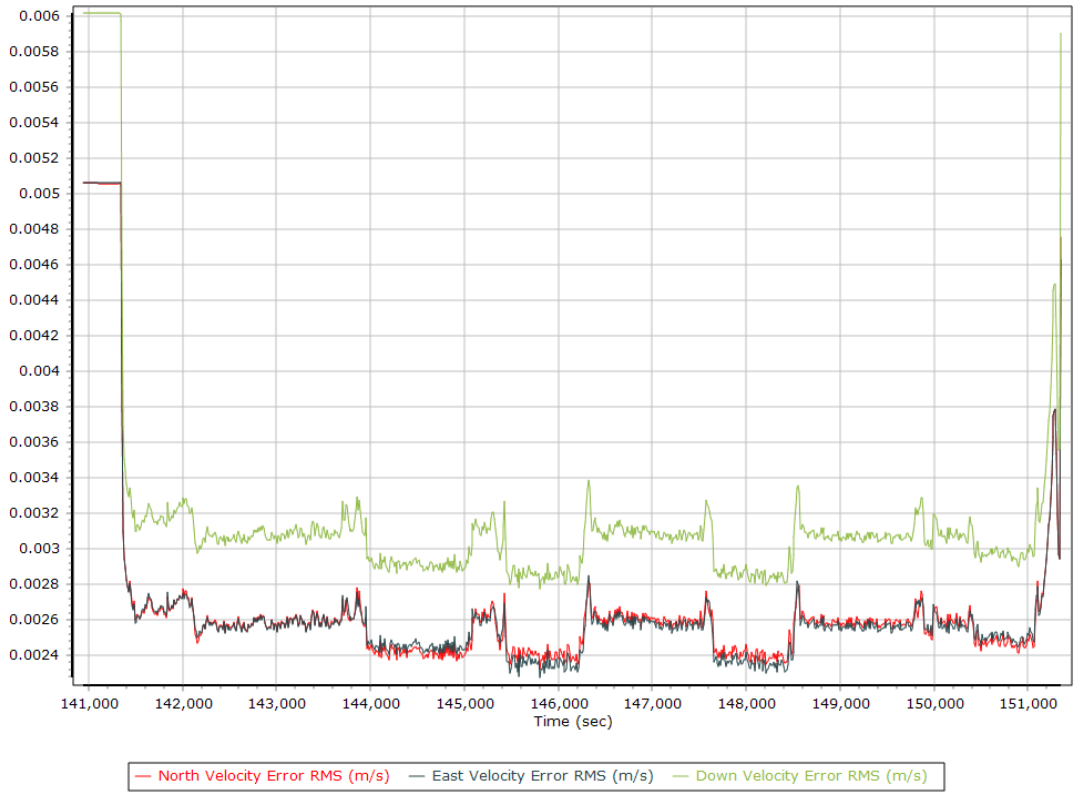


Smoothed Performance Metrics

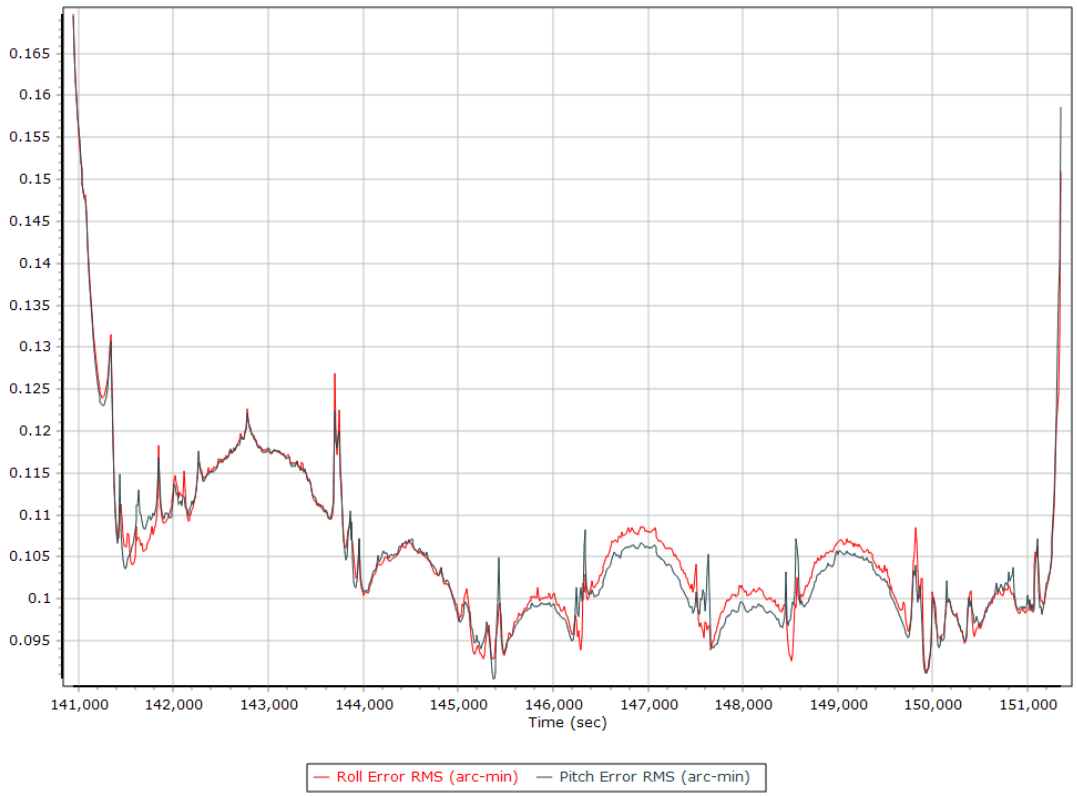
Position Error RMS (m)



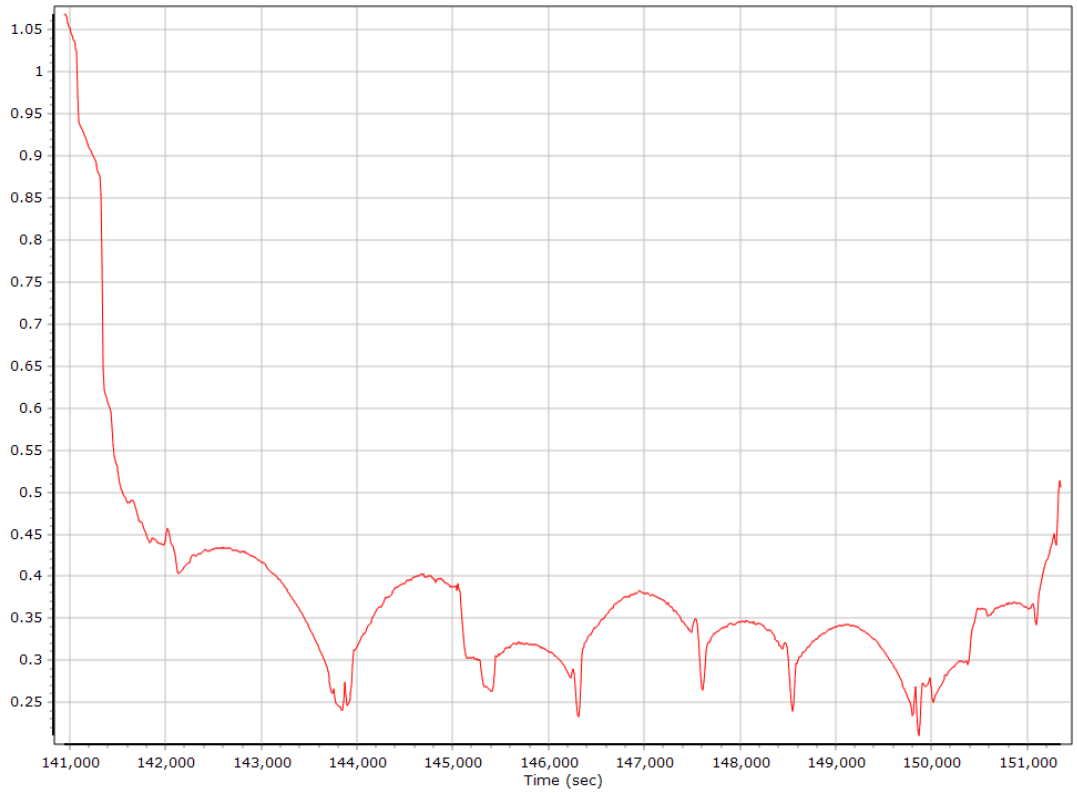
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

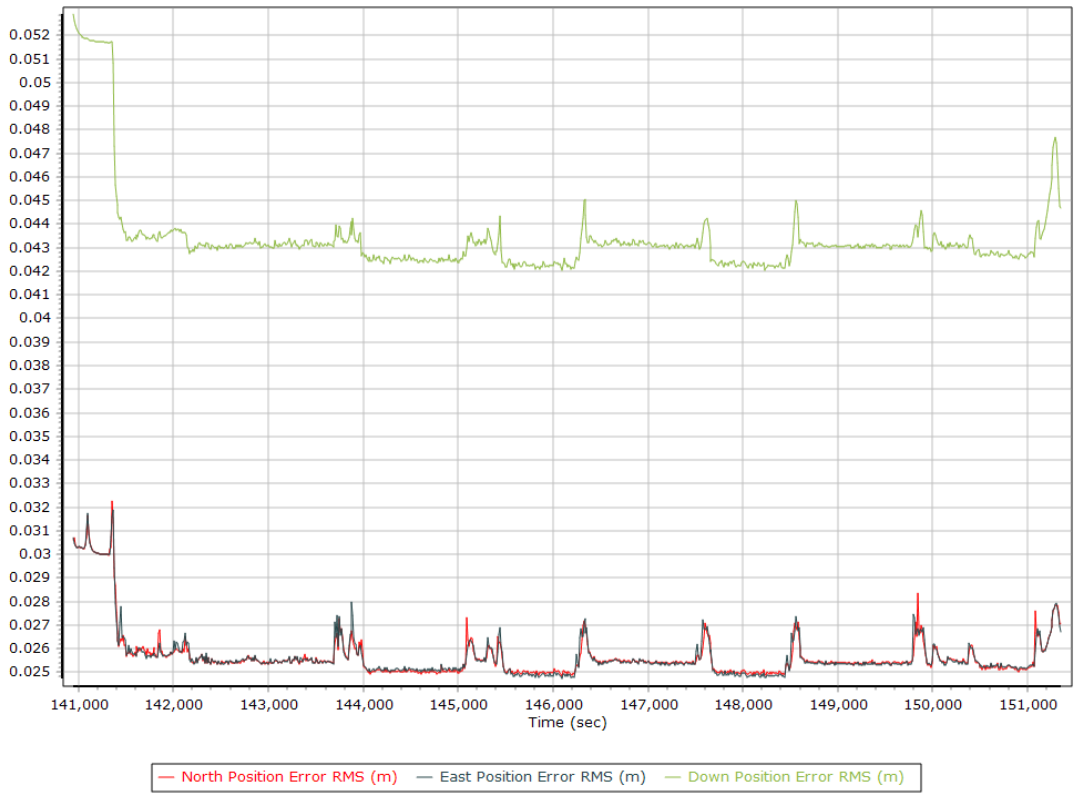


Heading Error RMS (arc-min)

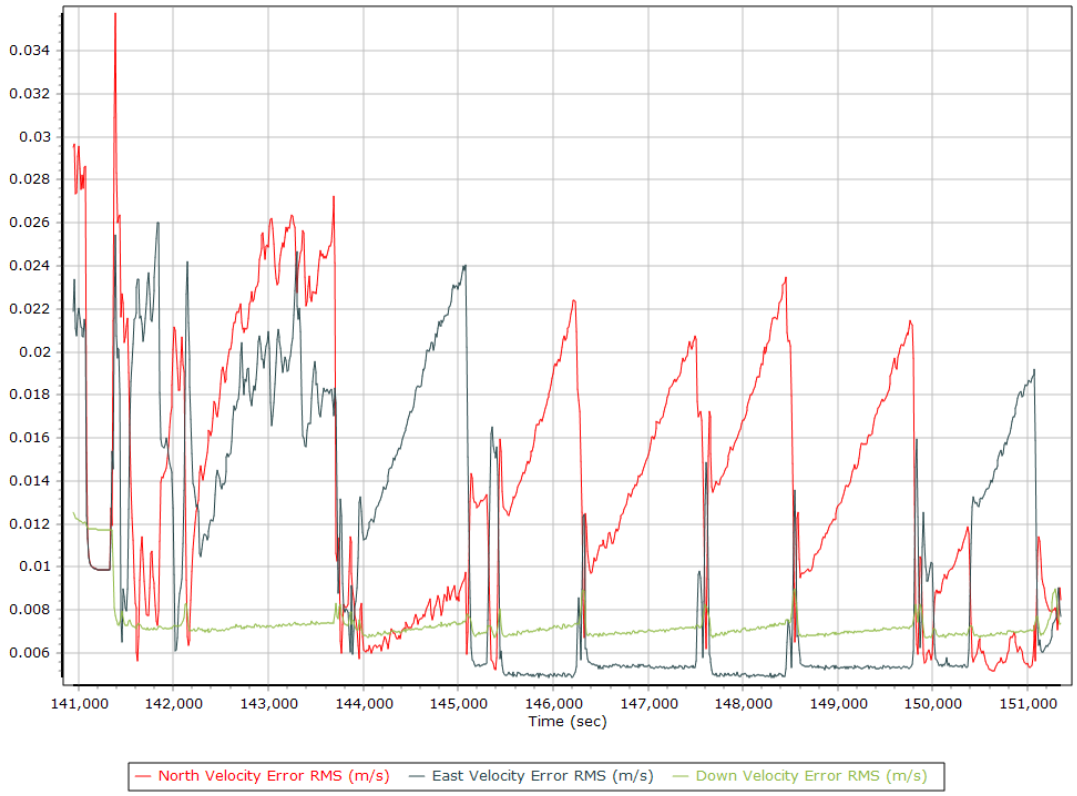


Forward Processed Performance Metrics

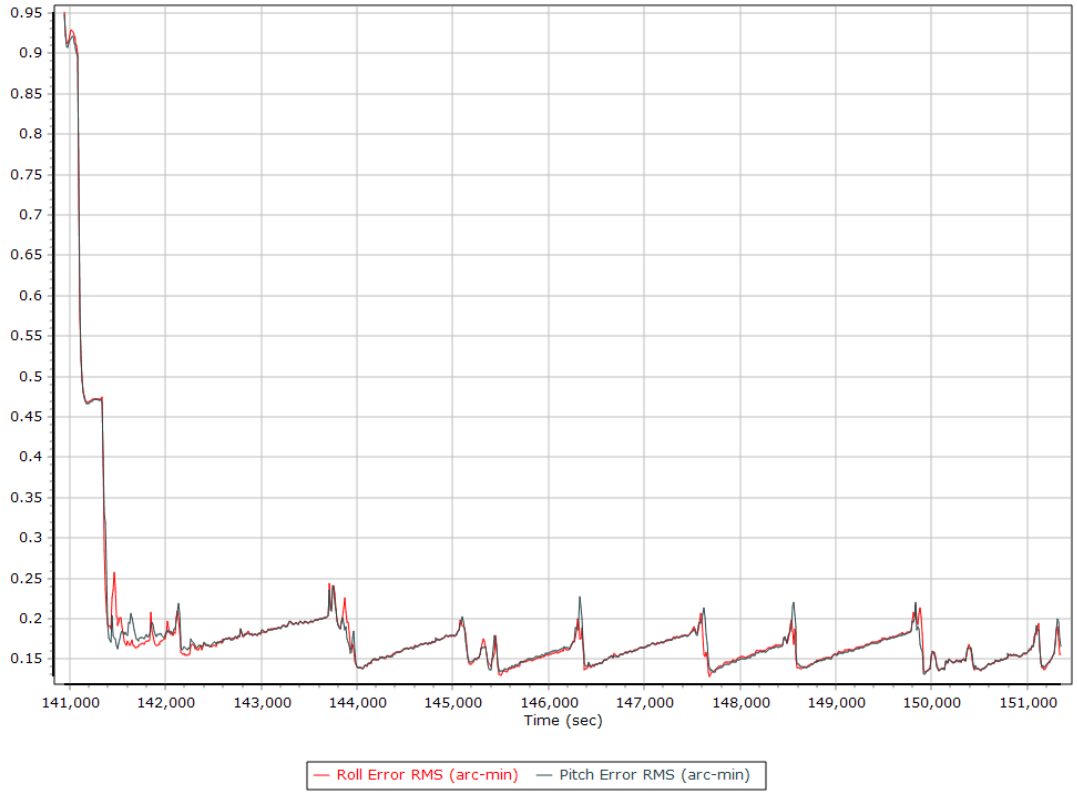
Position Error RMS (m)



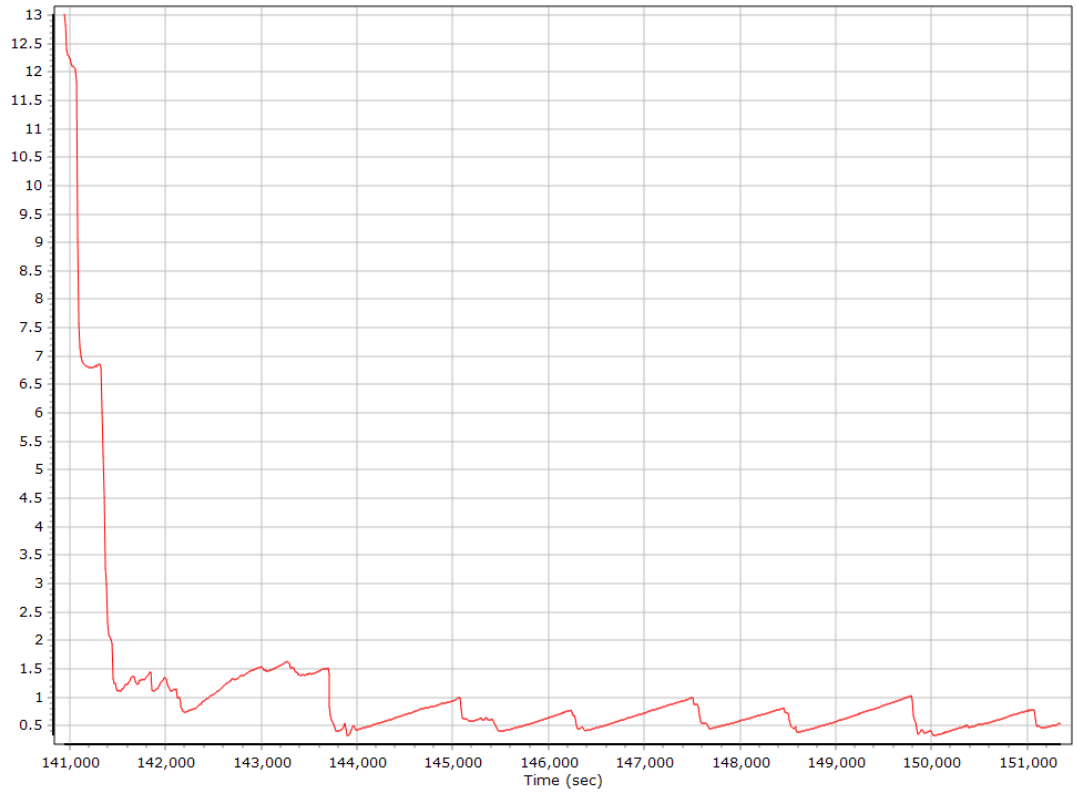
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

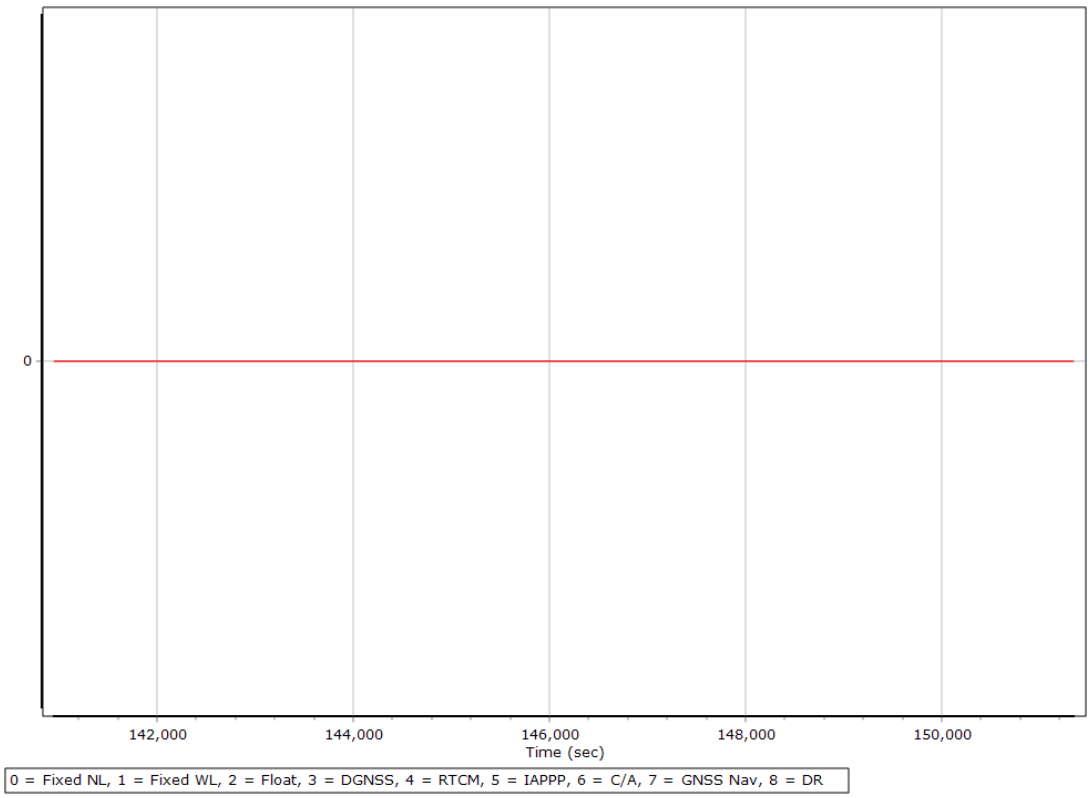


Heading Error RMS (arc-min)

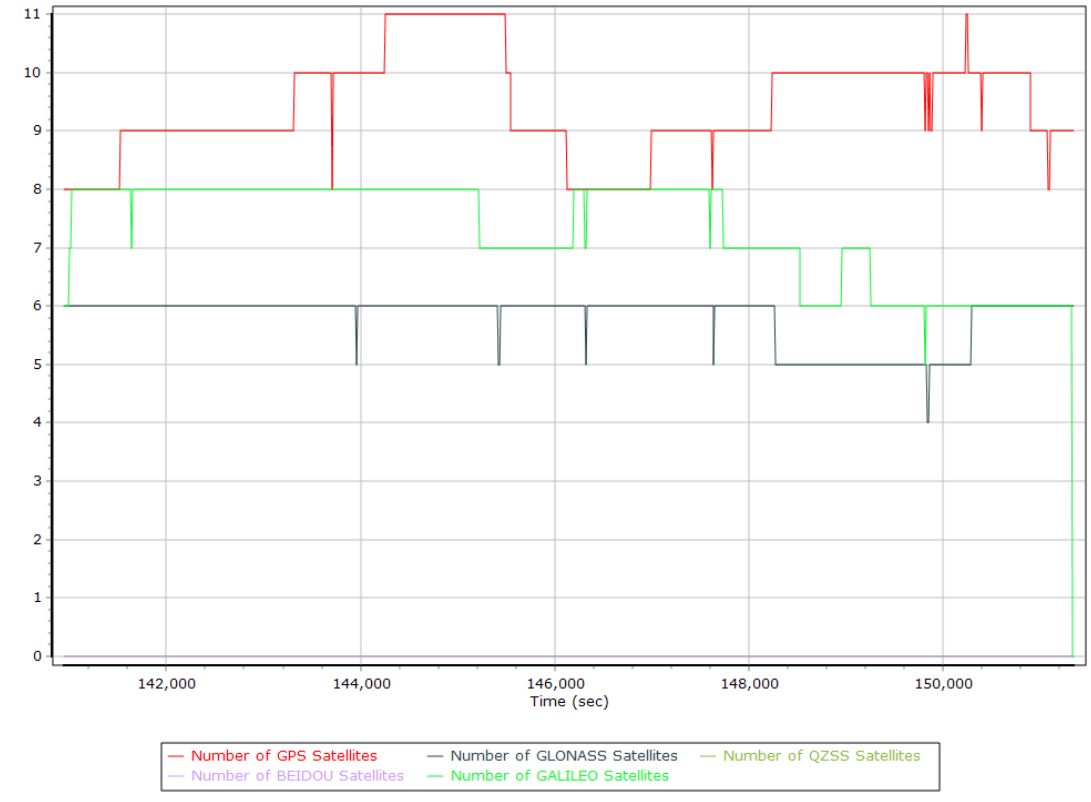


Forward Processed Solution Status

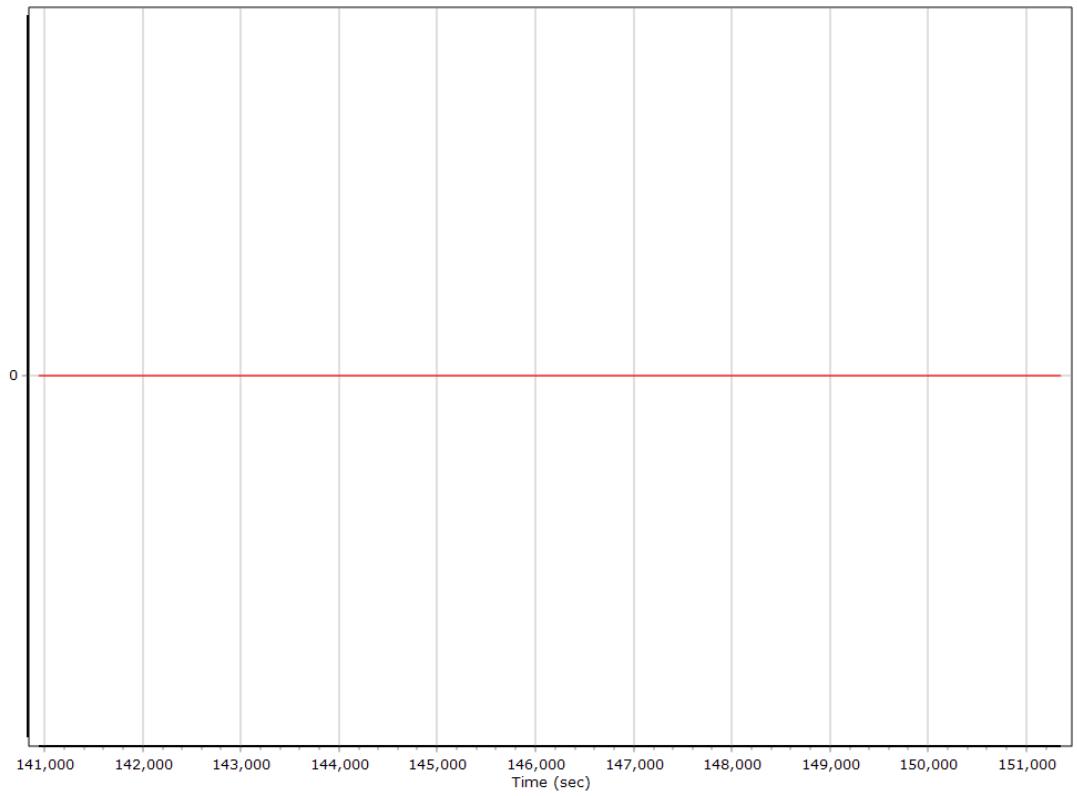
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01052021A_4040
Processing date	2022-01-05 15:26:41
Mission date	2021-01-05 18:34:08
Mission duration	04:53:11.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210105_183349_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0050.21g	GLONASS Broadcast Ephemeris
Ephm0050.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01052021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210105_183349_INS-GPS_1.raw		
Last raw data file	210105_183349_INS-GPS_1.raw		
Start GPS week	2139		
Start time	239629.860 (1/5/2021 6:33:49 PM)		
End time	257220.972 (1/5/2021 11:27:00 PM)		
Start of fine alignment	239653.068 (1/5/2021 6:34:13 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

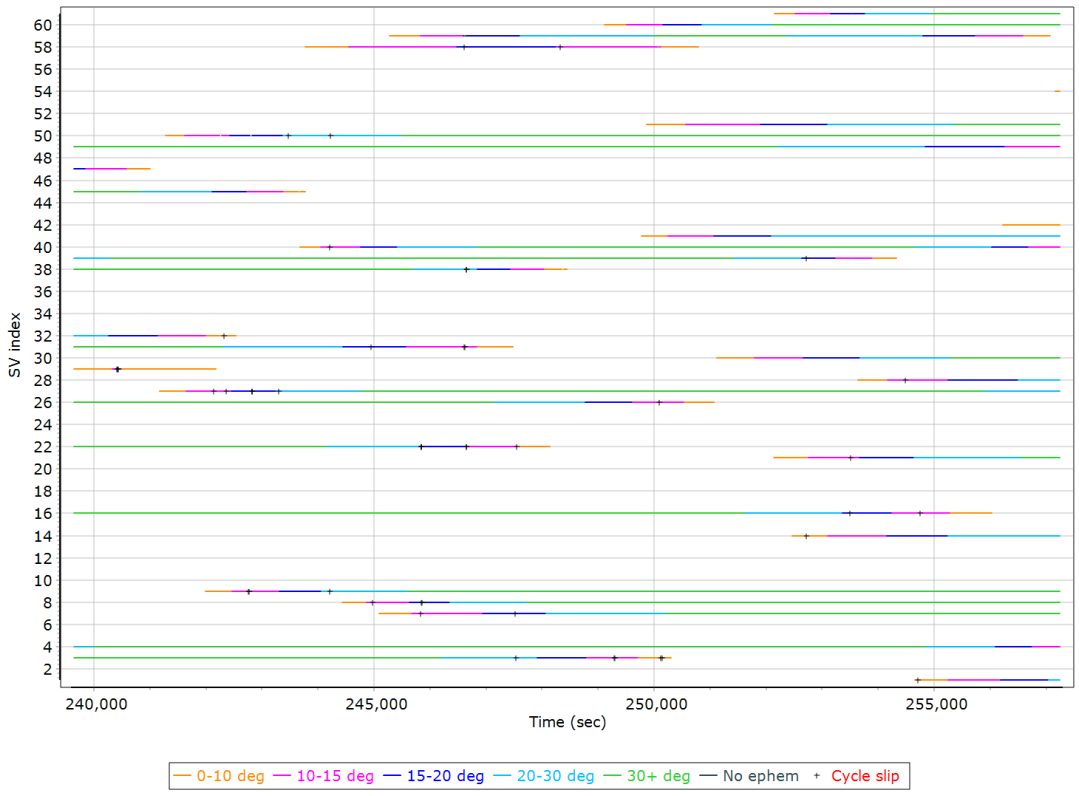
Rover Data QC

Raw IMU Import QC Summary

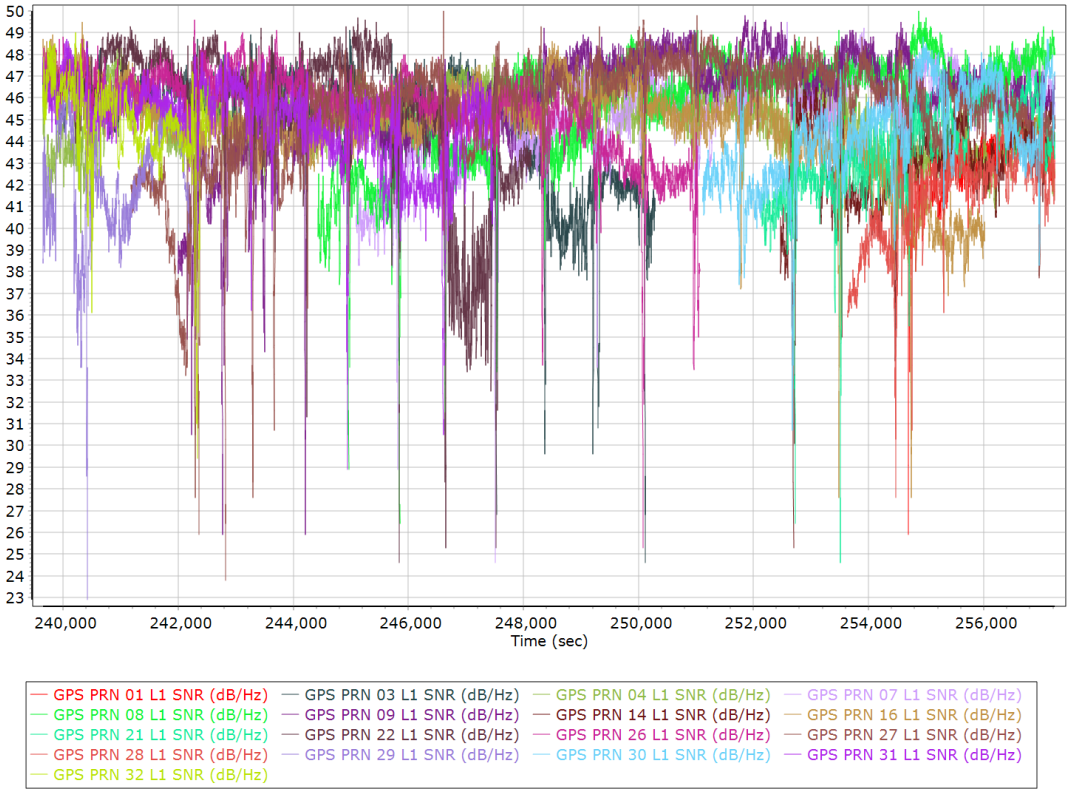
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01052021A_4040.log
IMU Records Processed	3517802
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

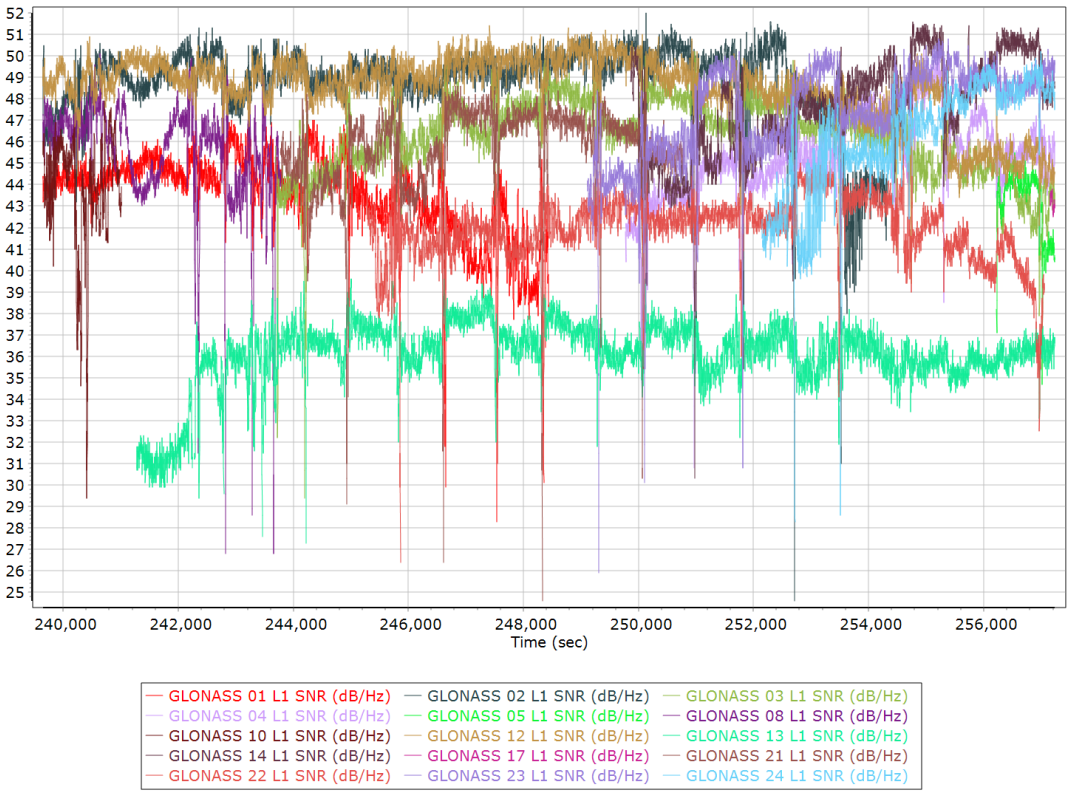
GPS/GLONASS L1 Satellite Lock/Elevation



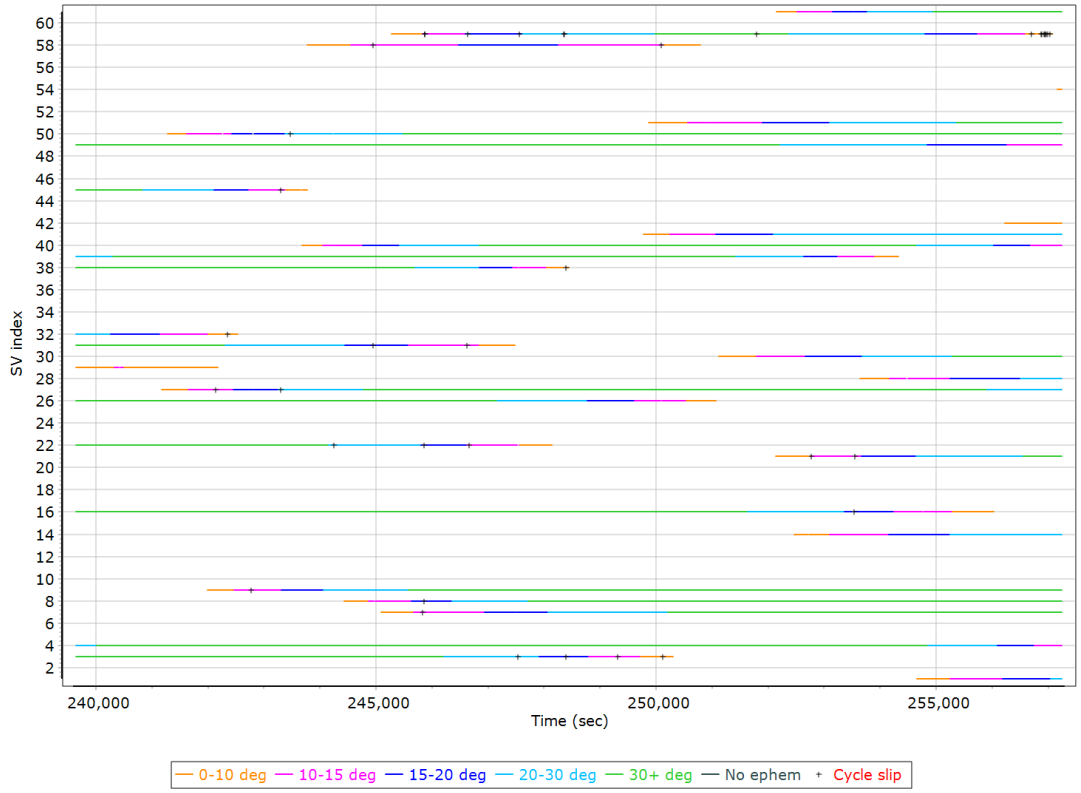
GPS L1 SNR



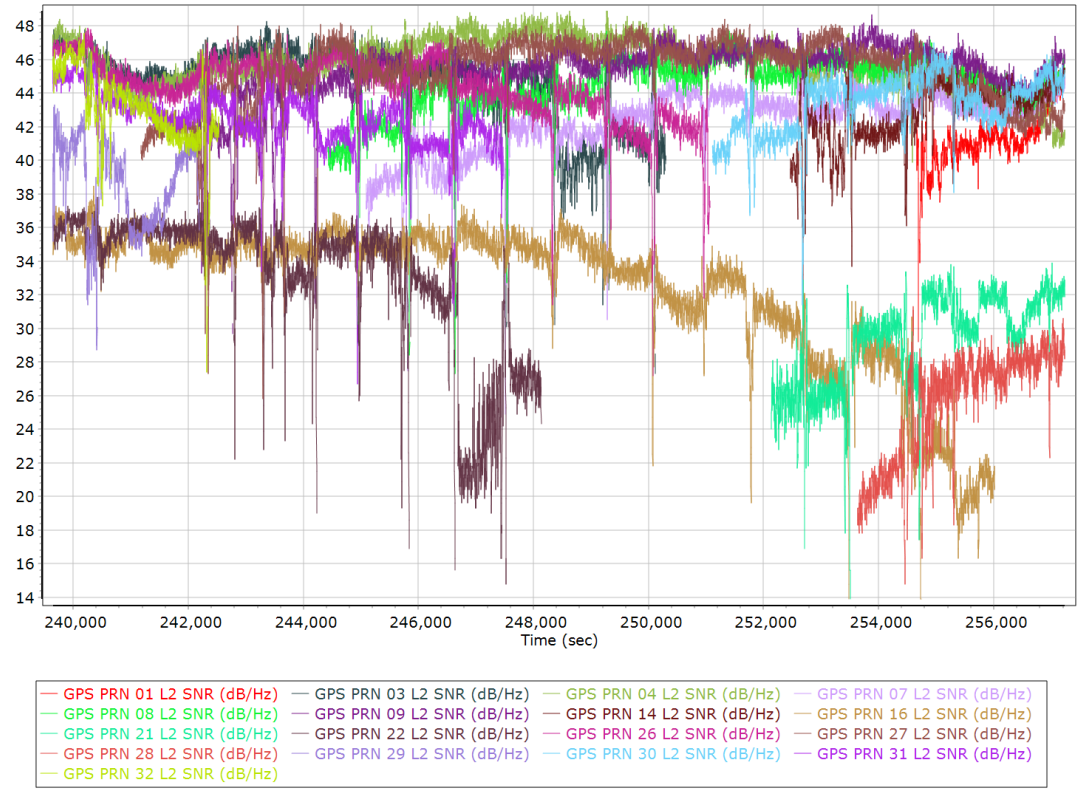
GLONASS L1 SNR



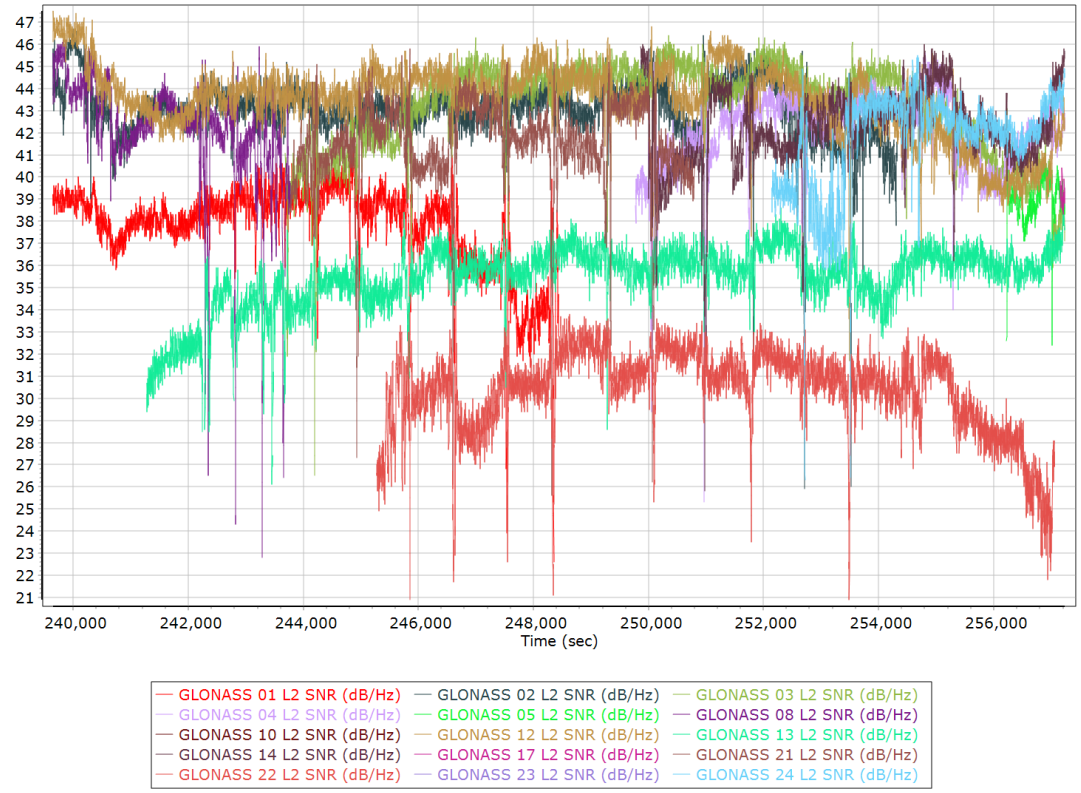
GPS/GLONASS L2 Satellite Lock/Elevation



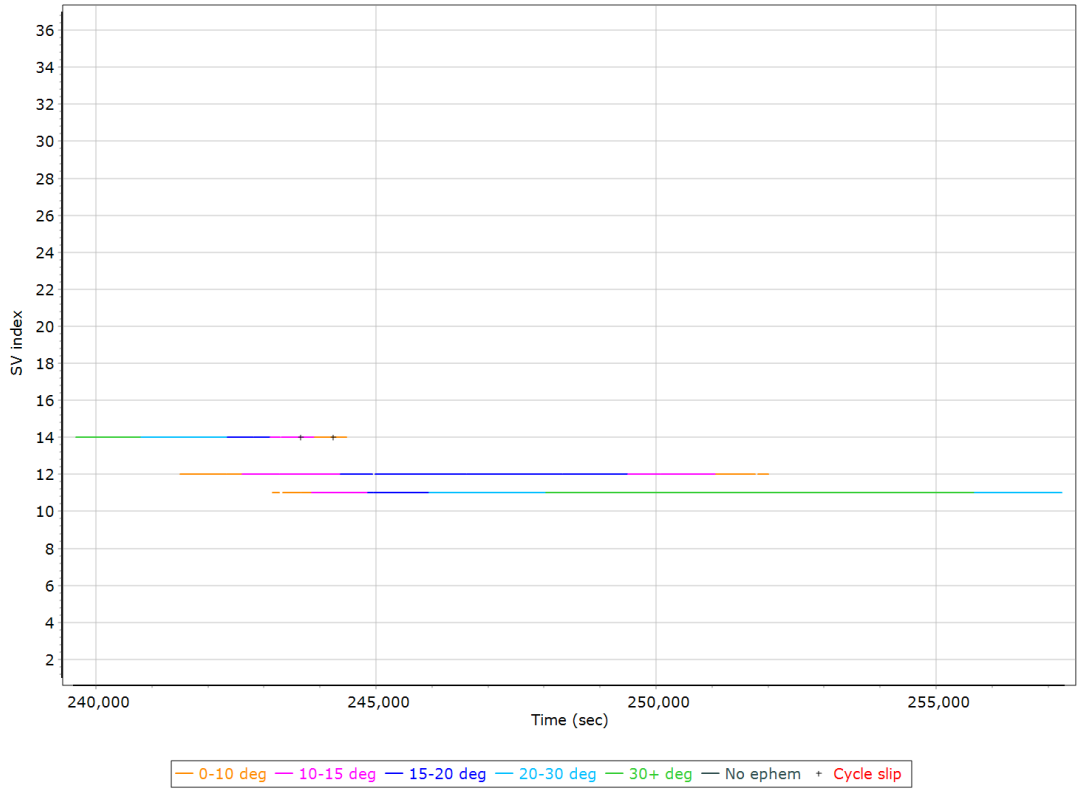
GPS L2 SNR



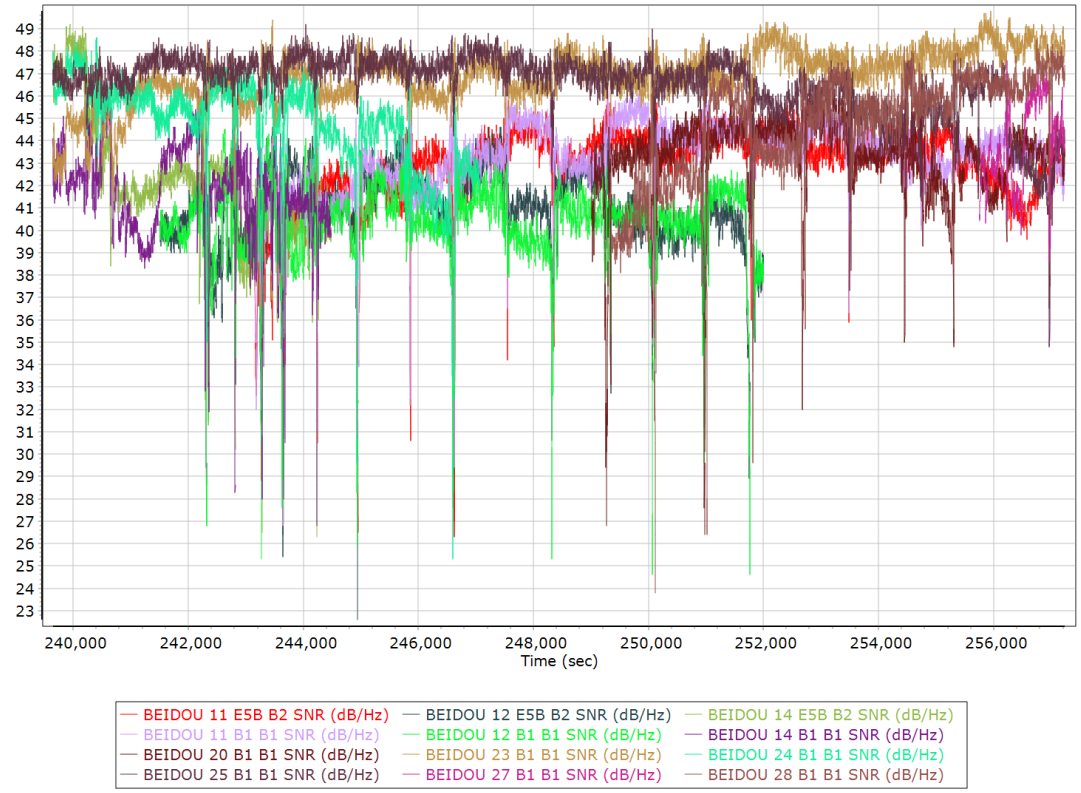
GLONASS L2 SNR



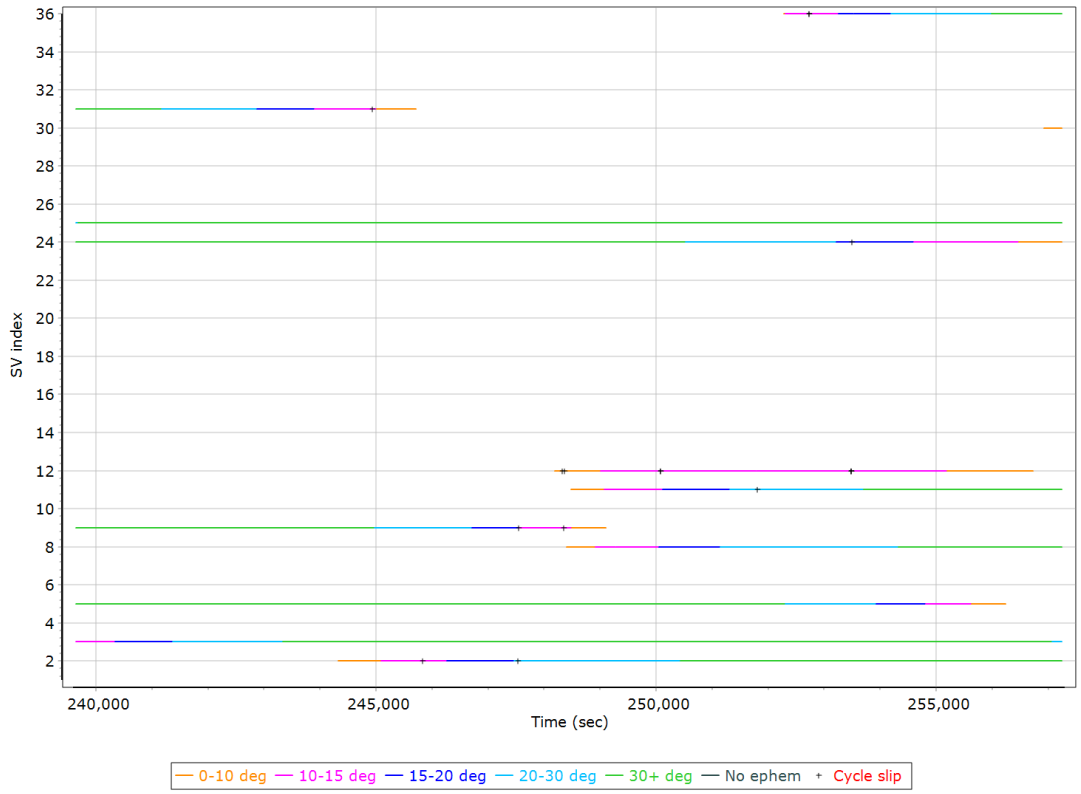
BEIDOU Satellite Lock/Elevation



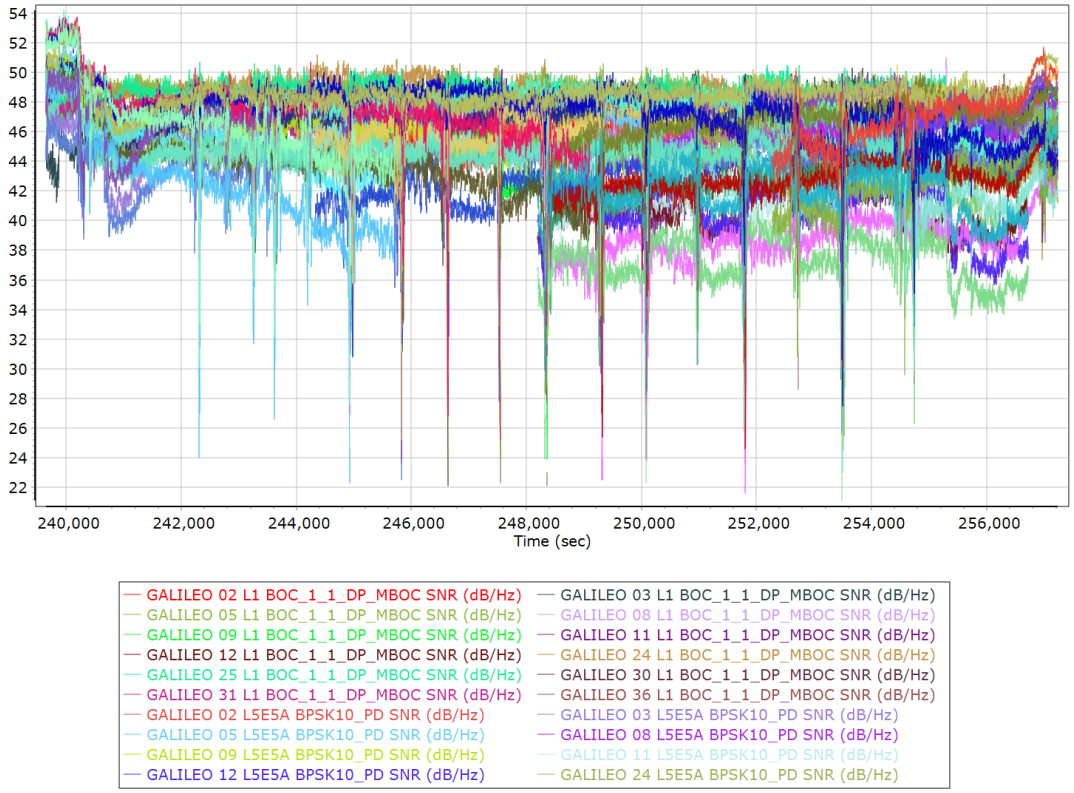
BEIDOU SNR



GALILEO Satellite Lock/Elevation

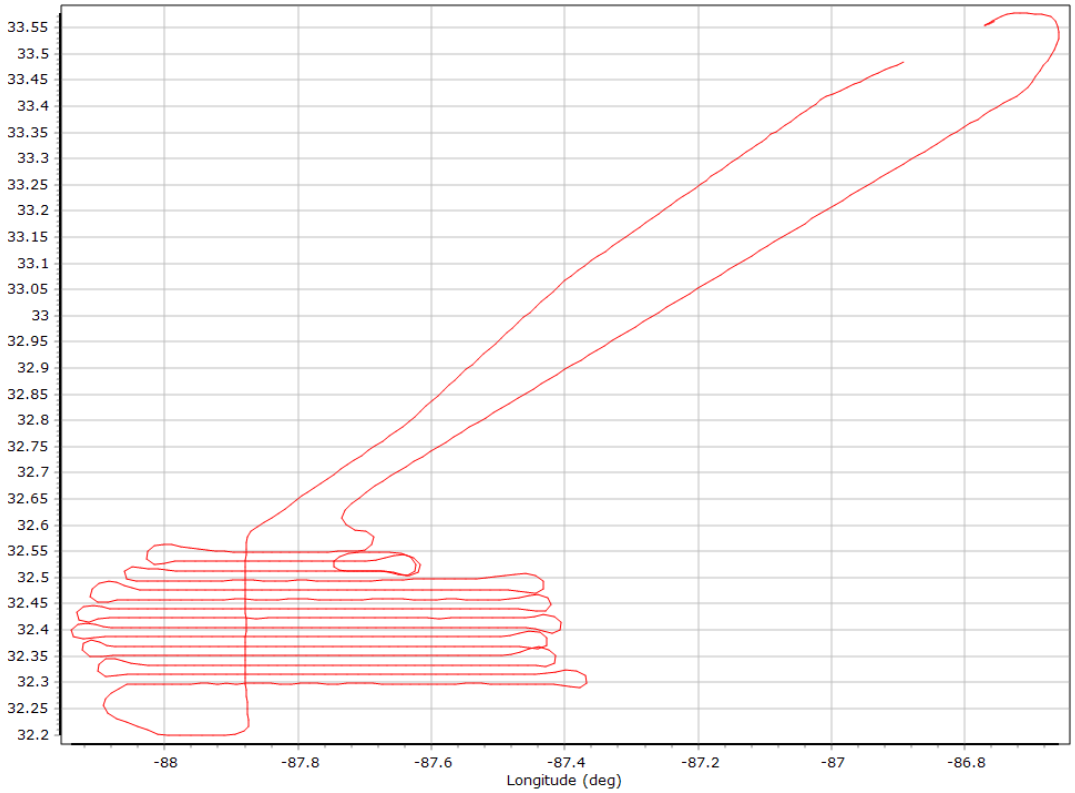


GALILEO SNR

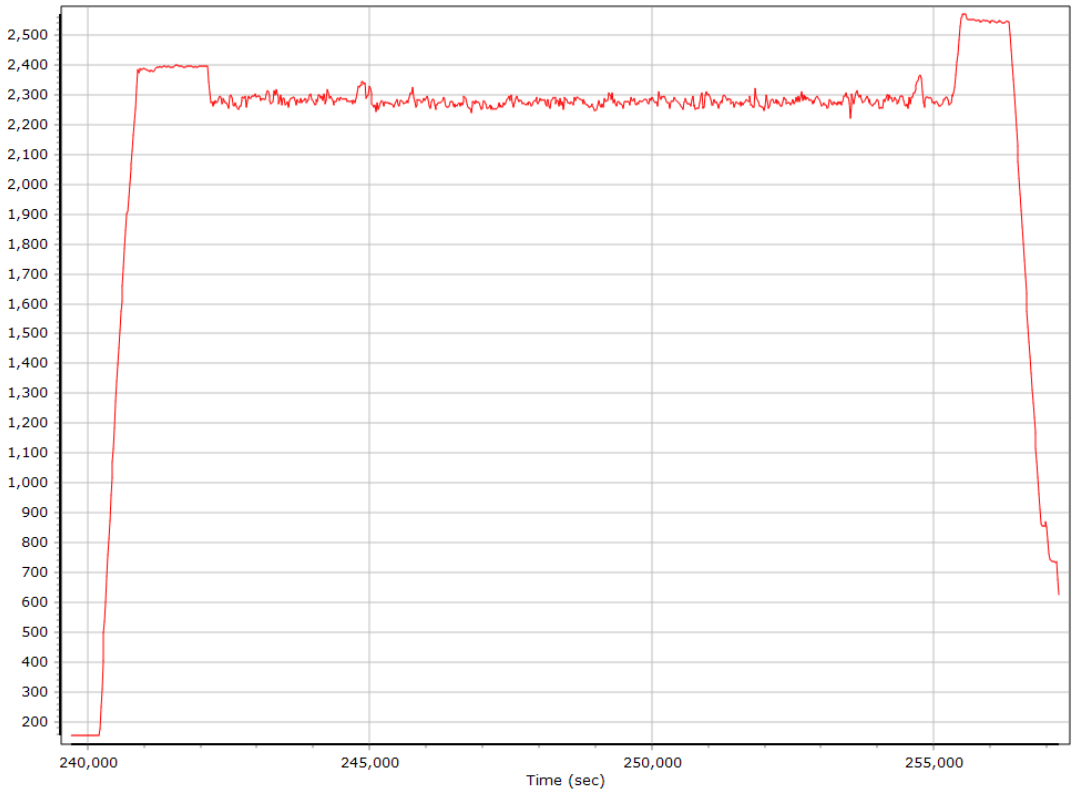

54
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26
24
22
240,000
242,000
244,000
246,000
248,000
250,000
252,000
254,000
256,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 11 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 36 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 11 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

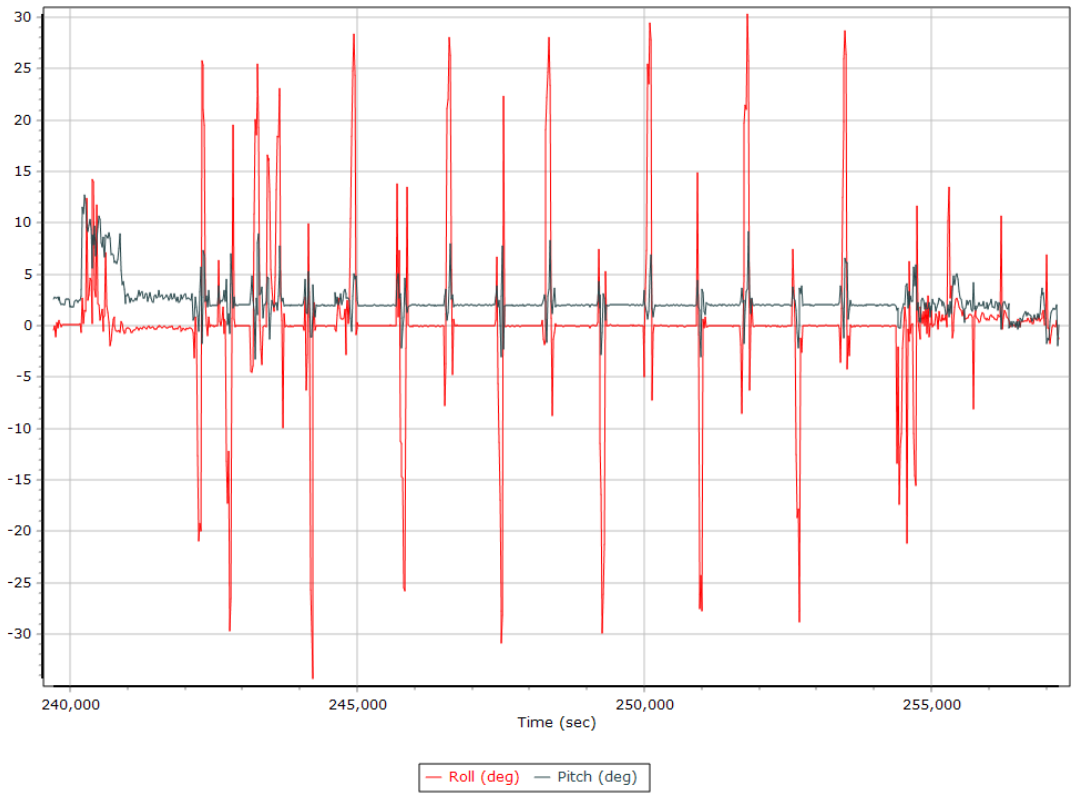
Top View



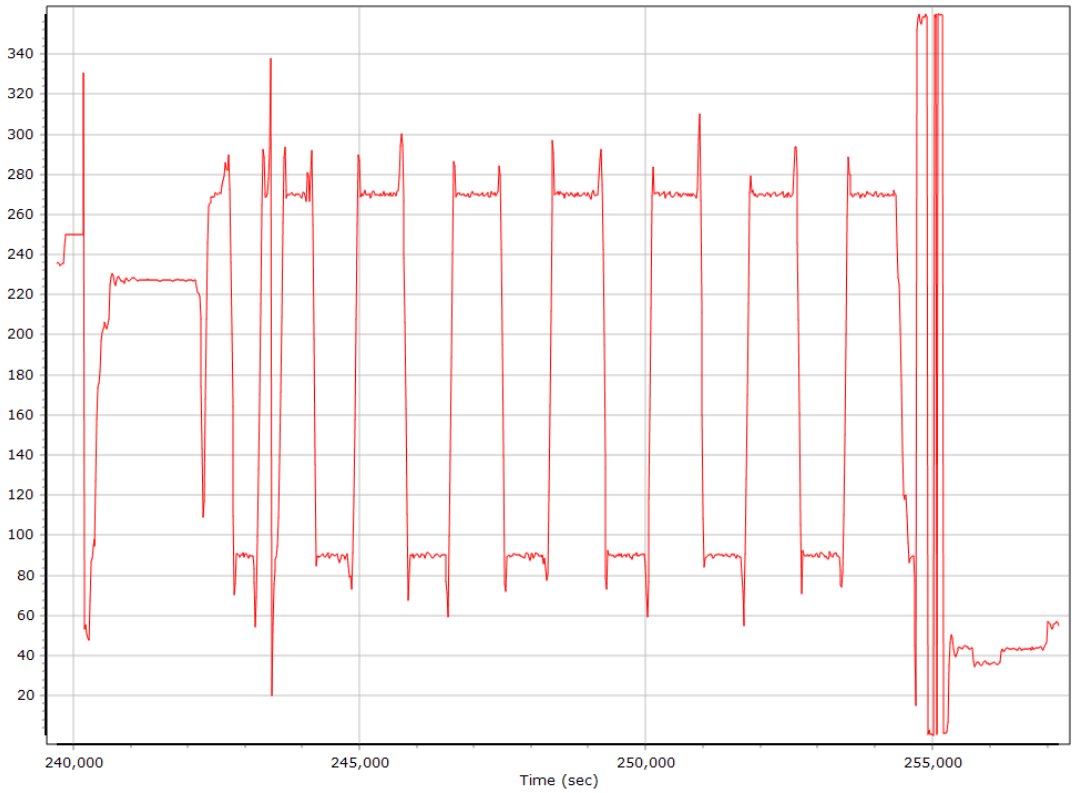
Altitude



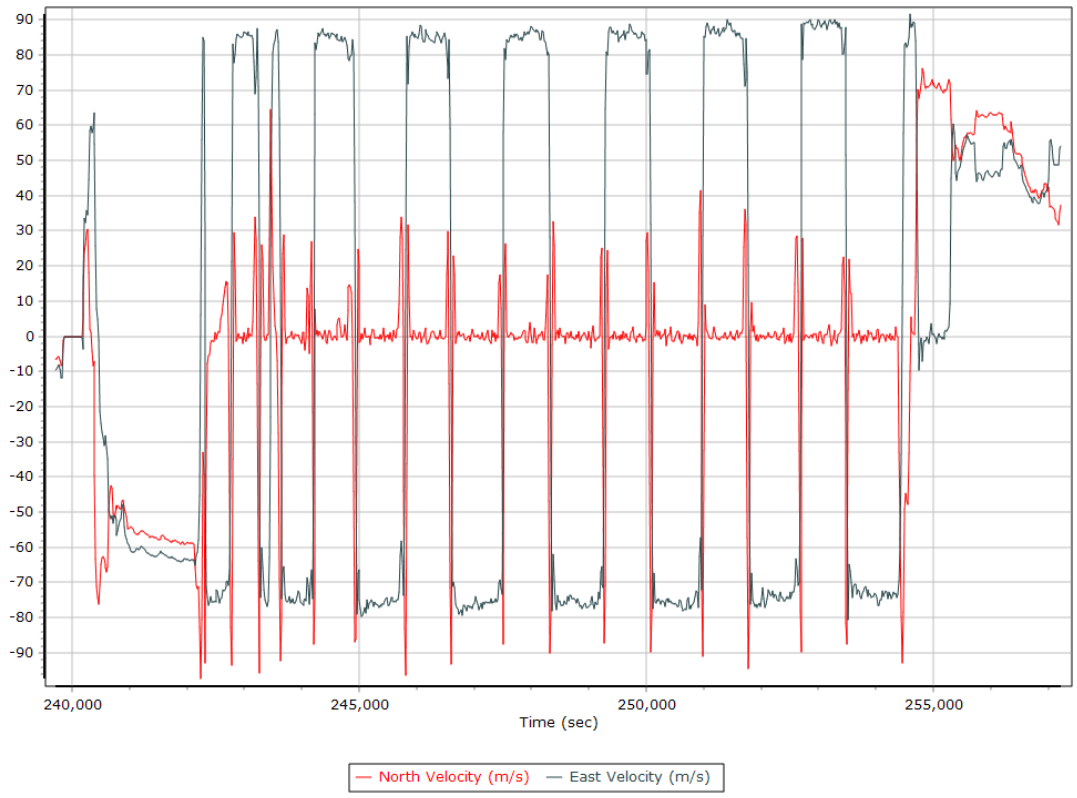
Roll/Pitch



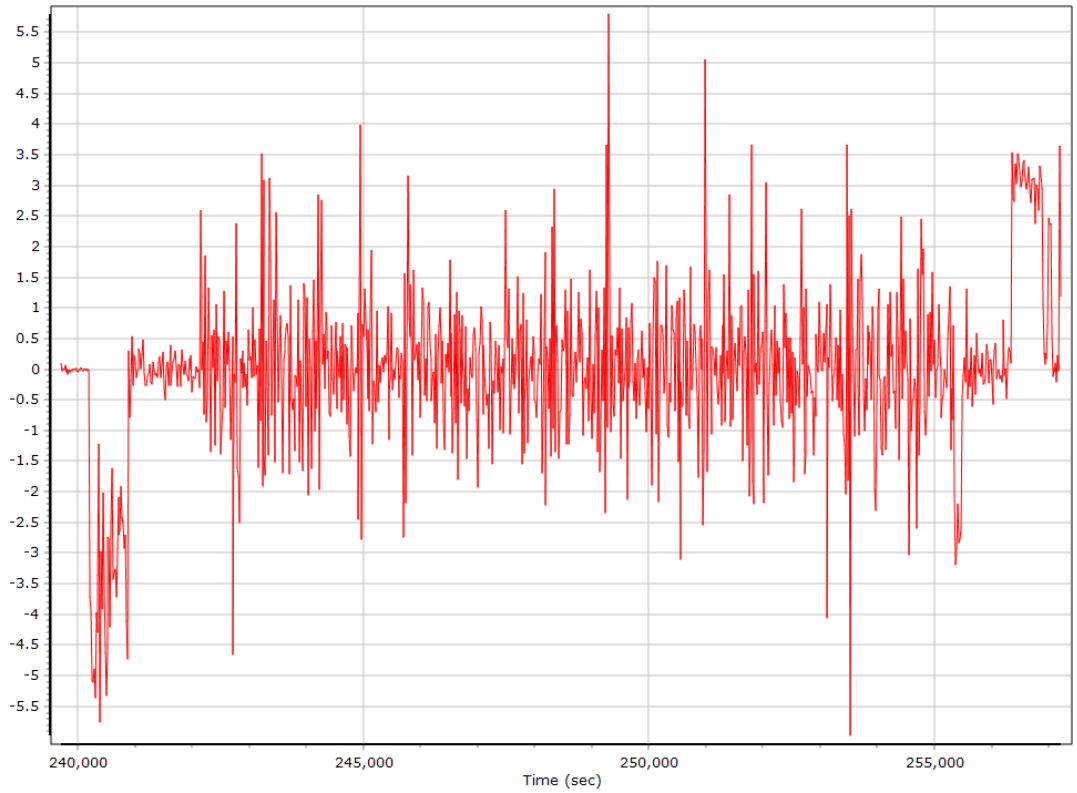
Heading



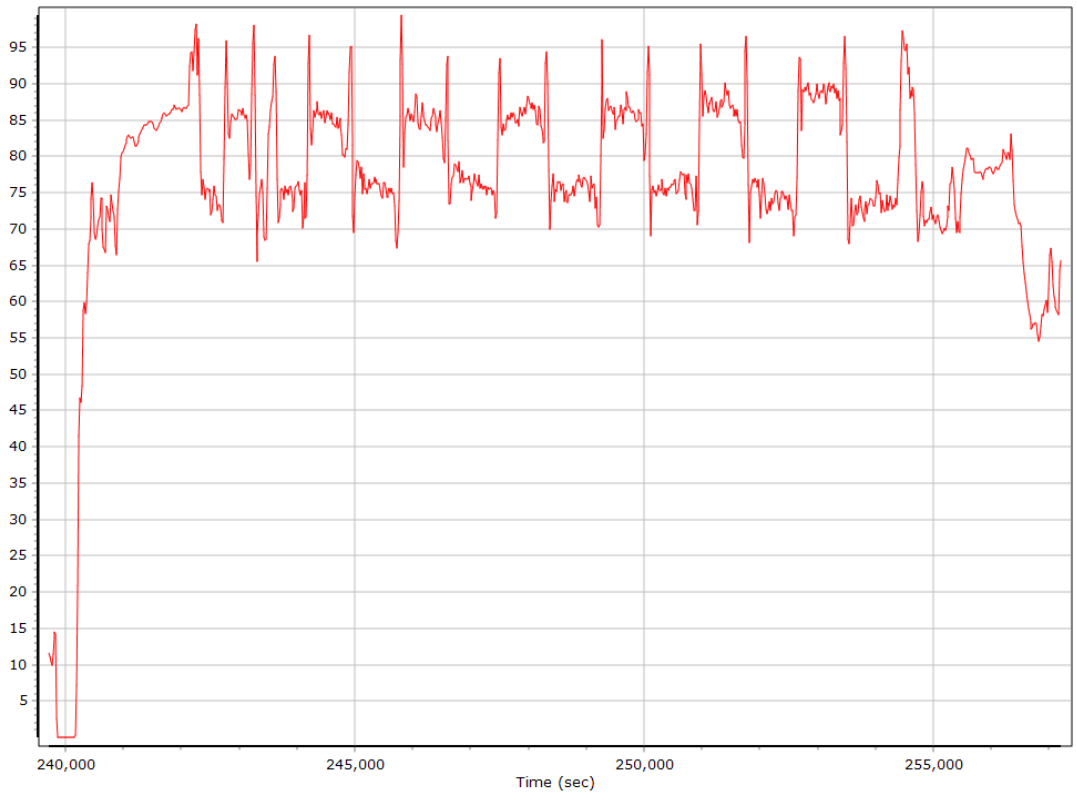
North/East Velocity



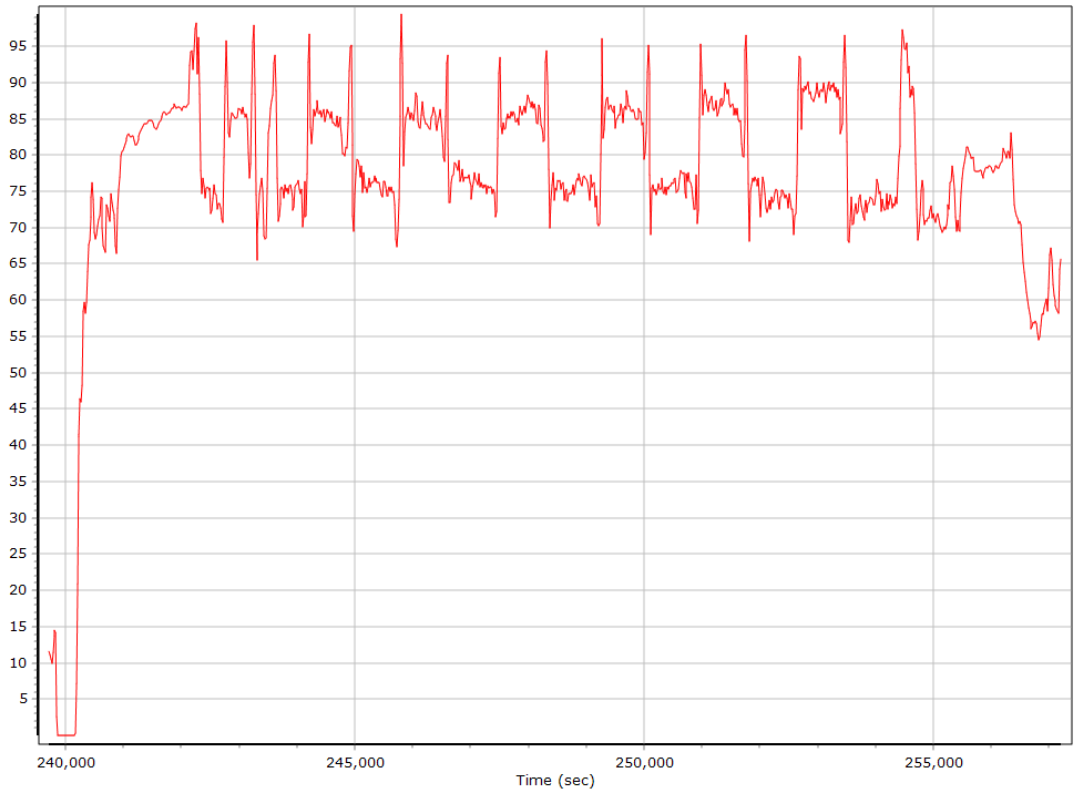
Down Velocity



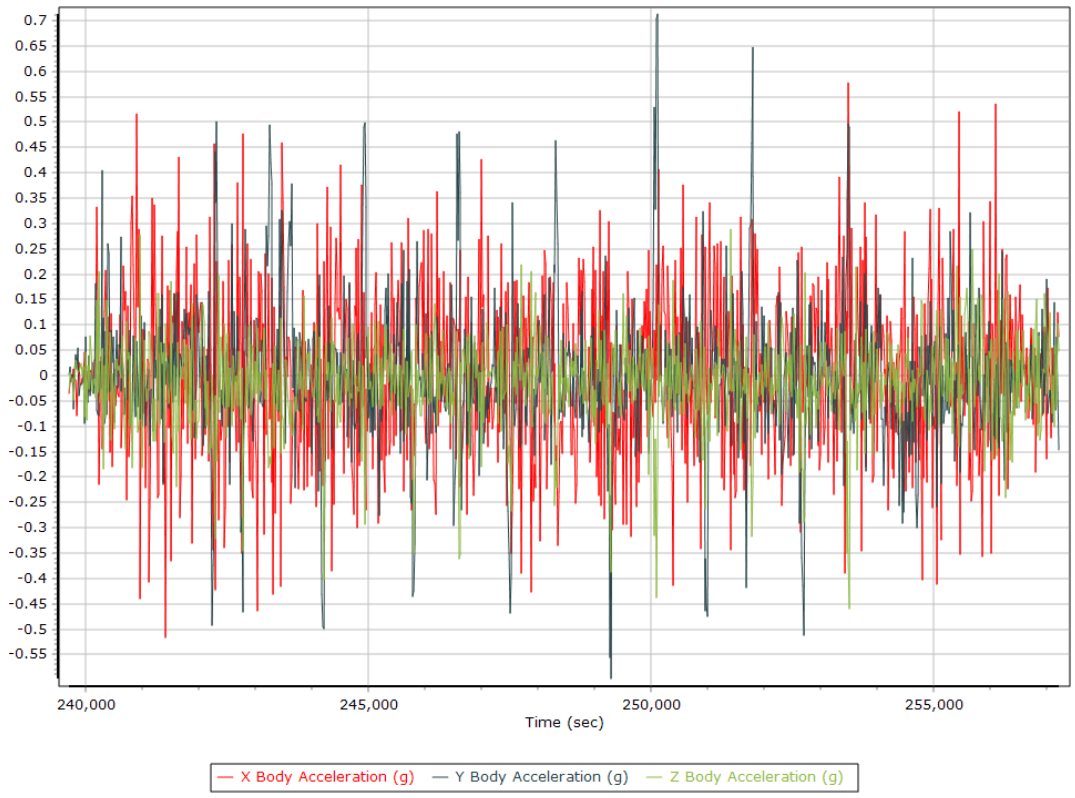
Total Speed



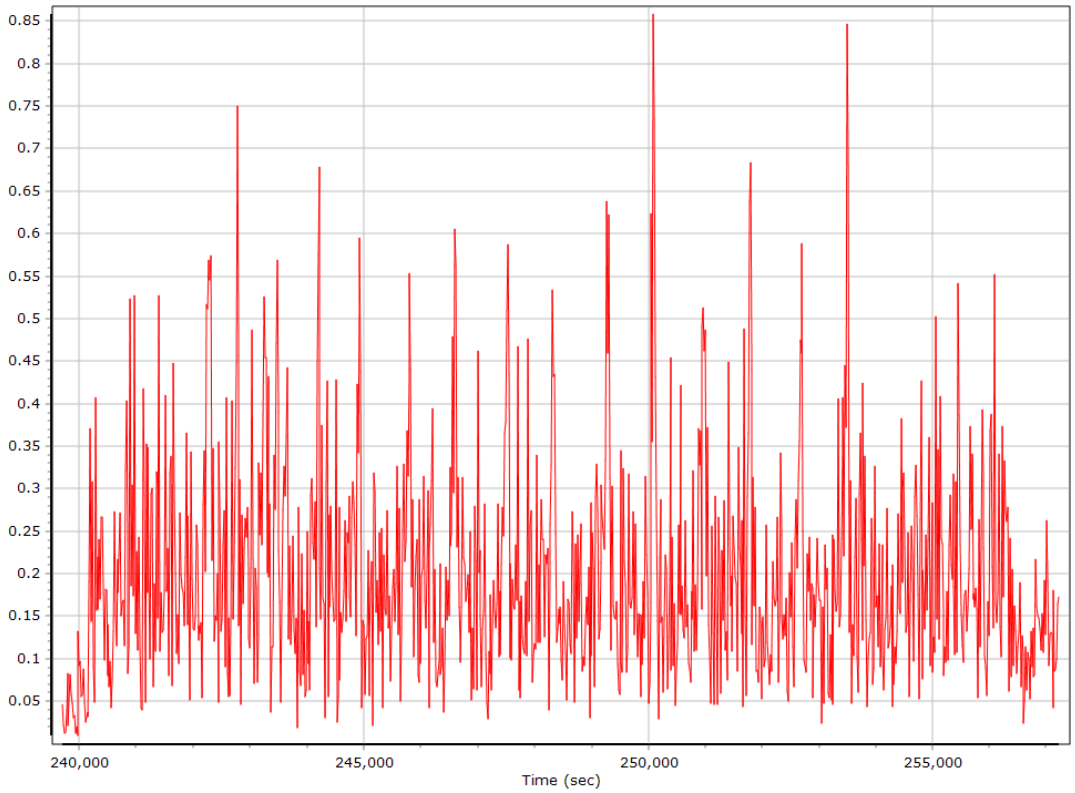
Ground Speed



Body Acceleration



Total Body Acceleration

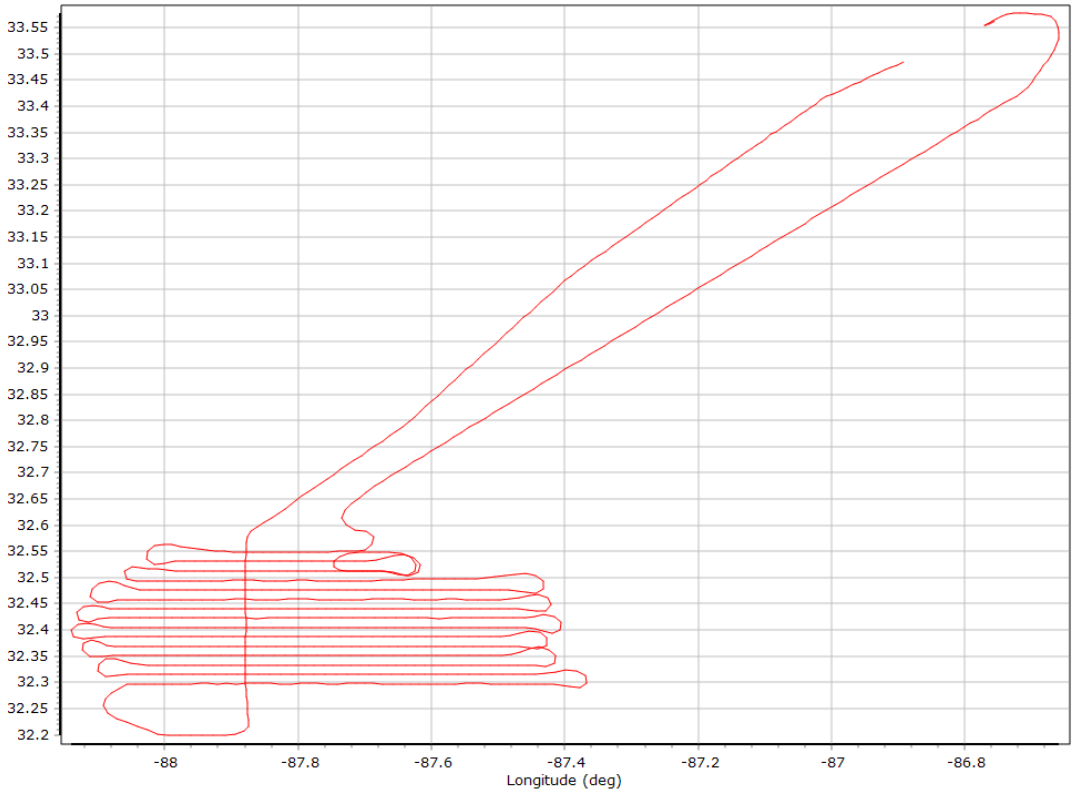


Body Angular Rate

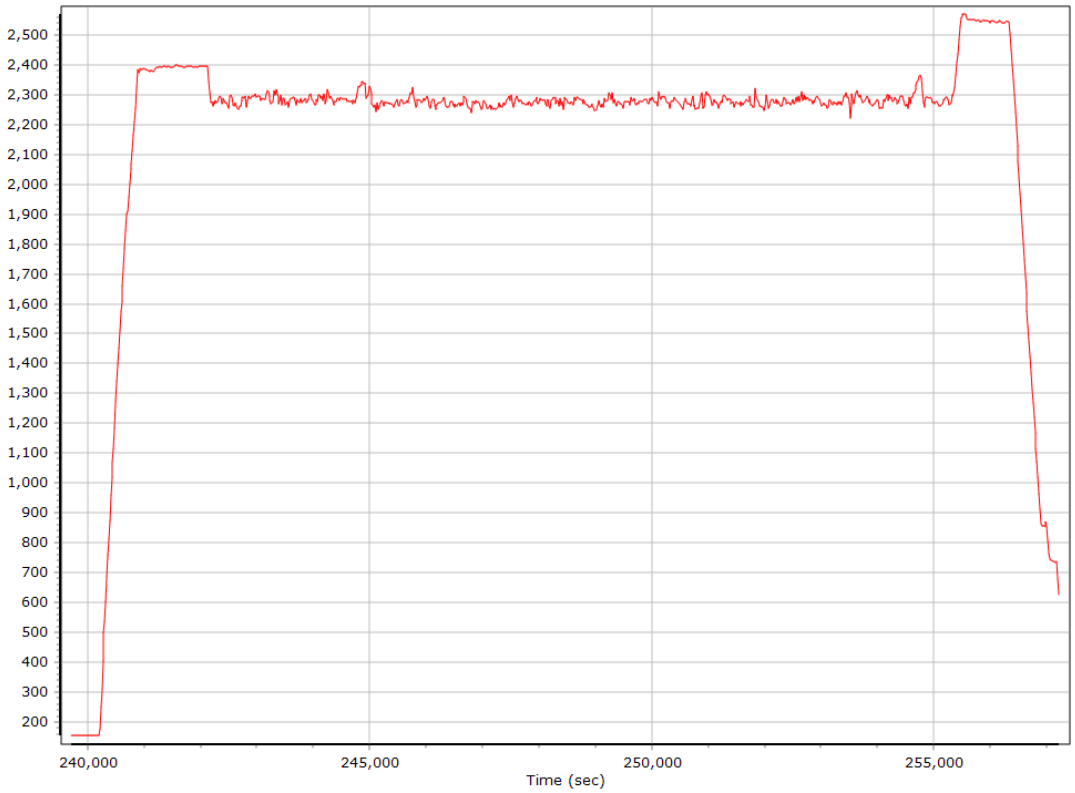


Forward Processed Trajectory Information

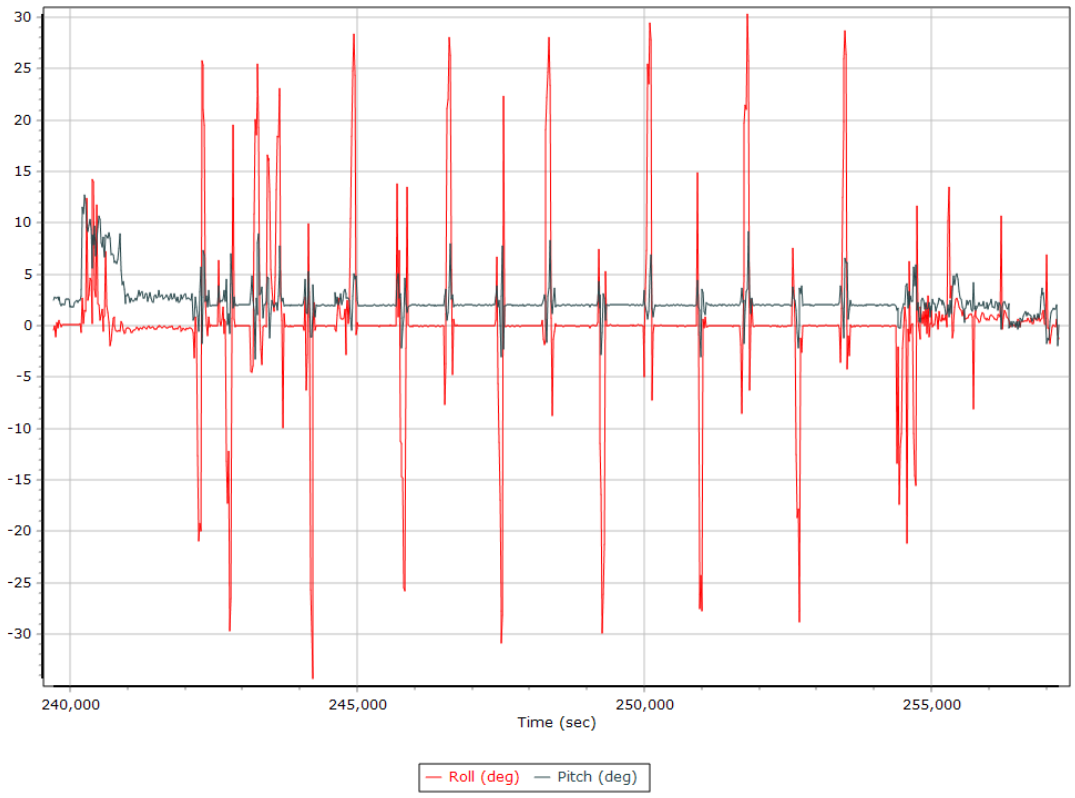
Top View



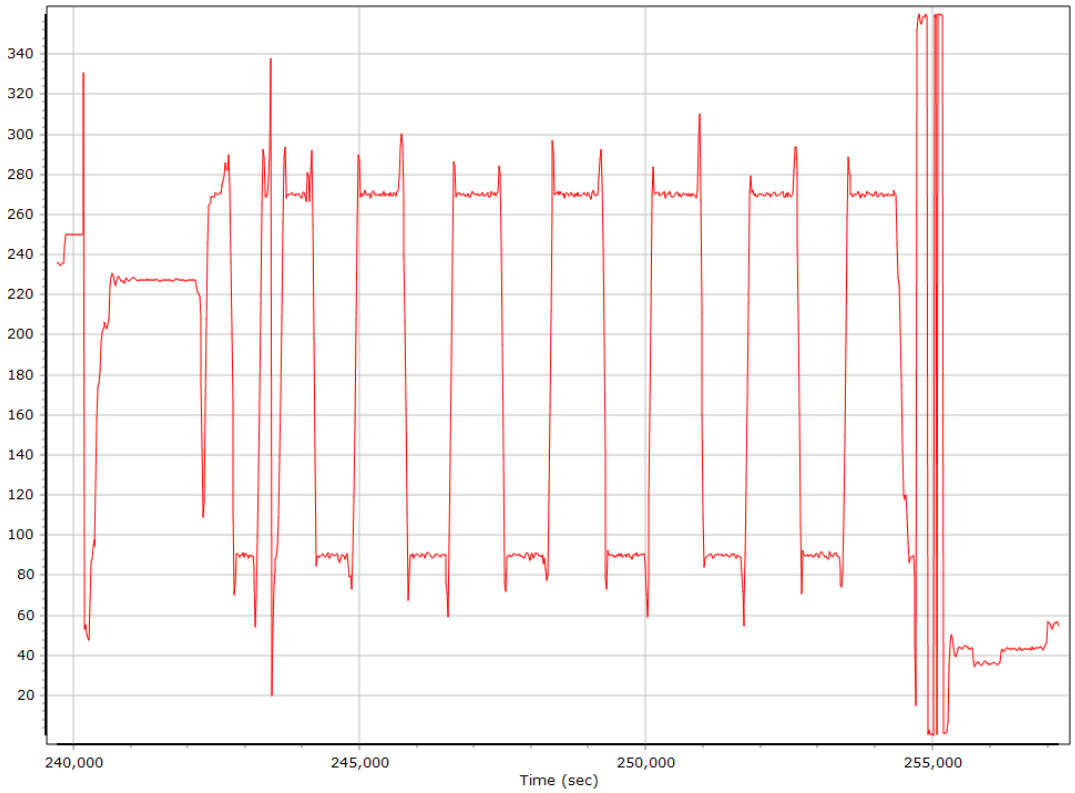
Altitude



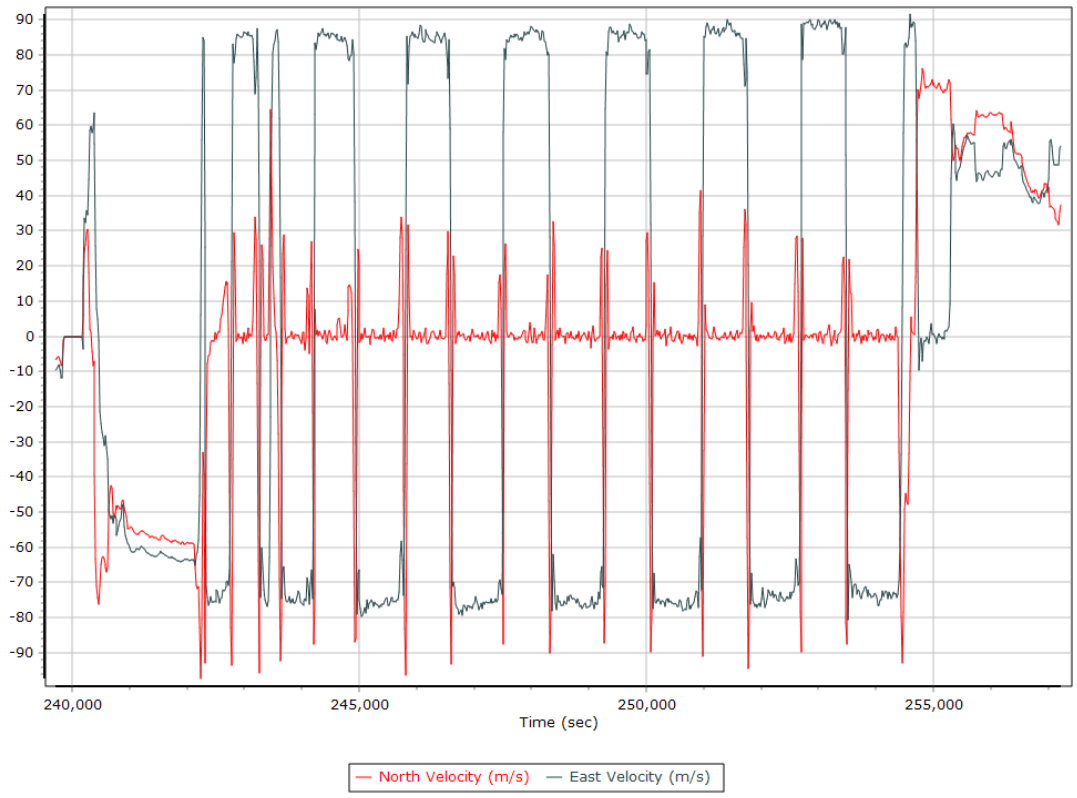
Roll/Pitch



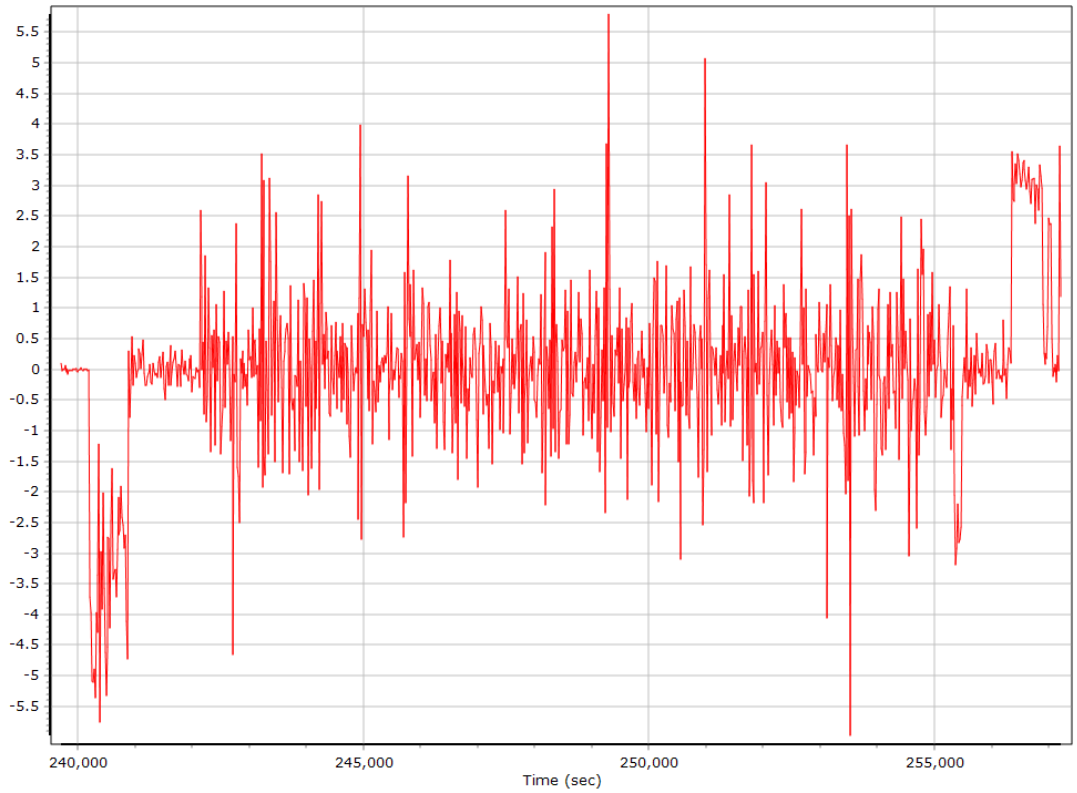
Heading



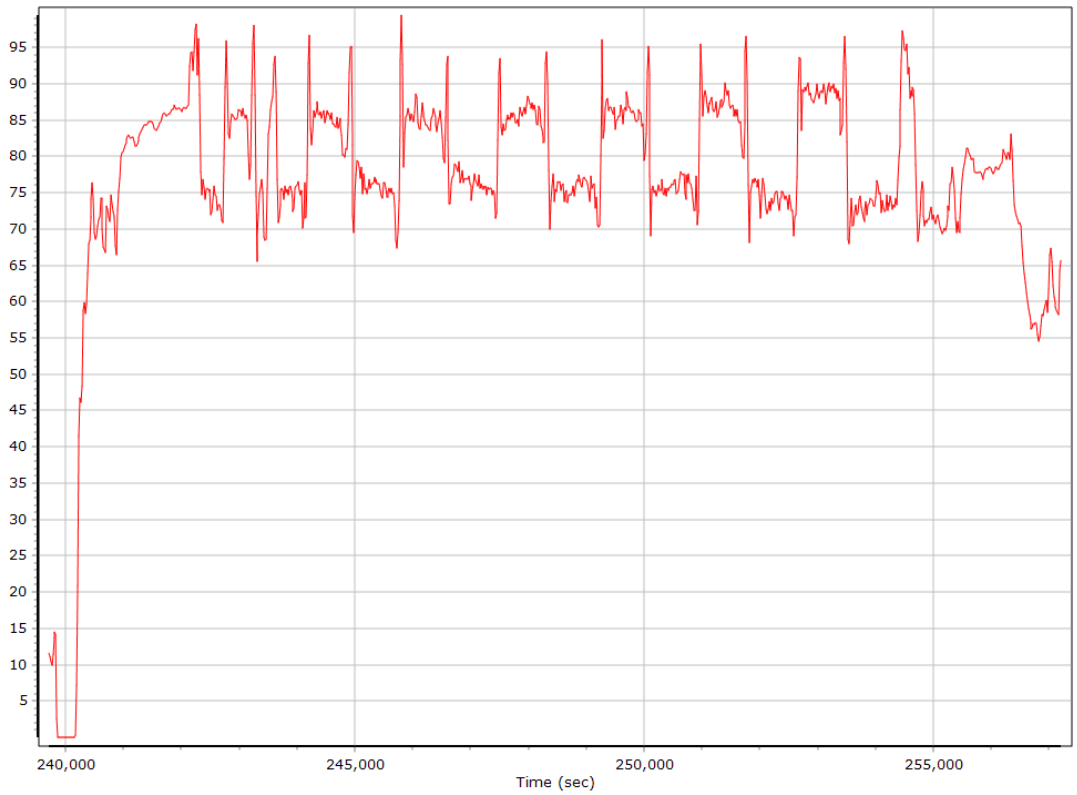
North/East Velocity



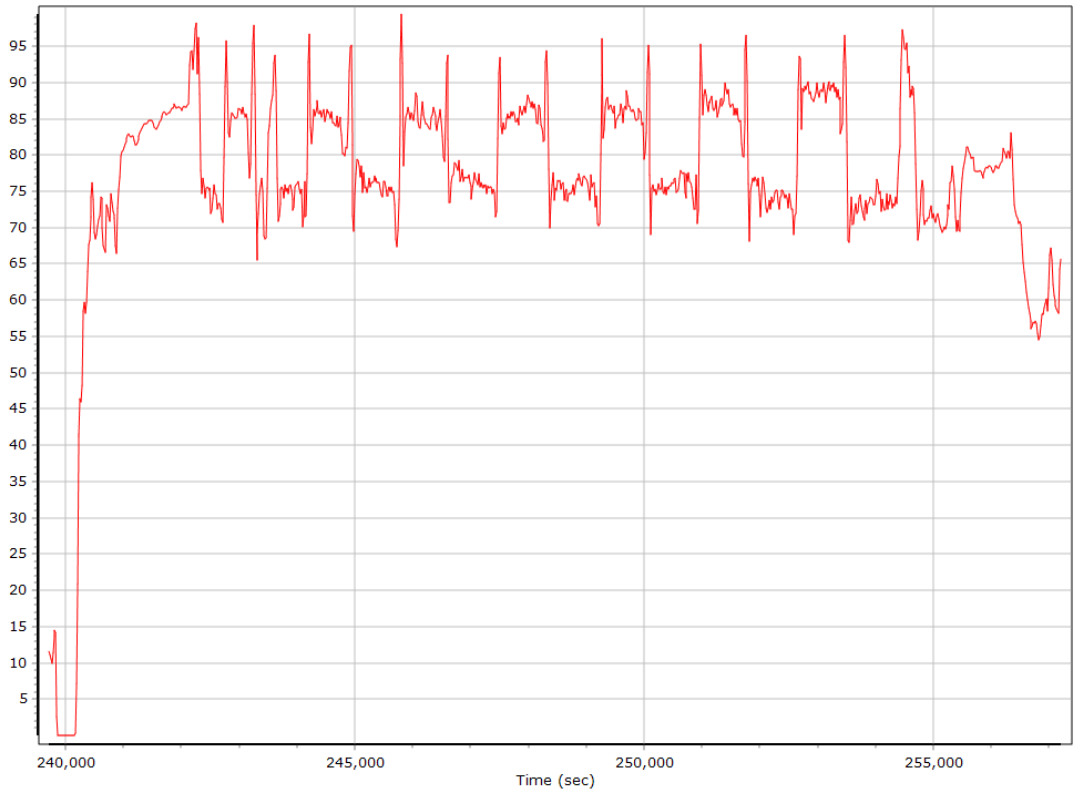
Down Velocity



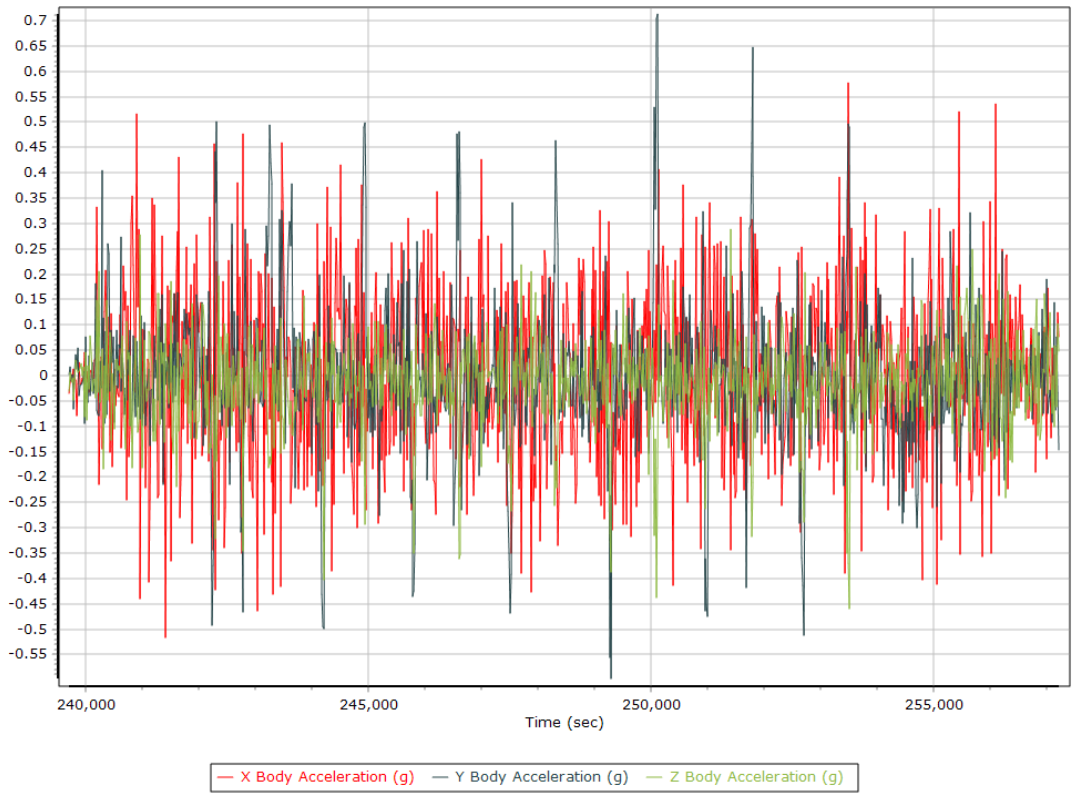
Total Speed



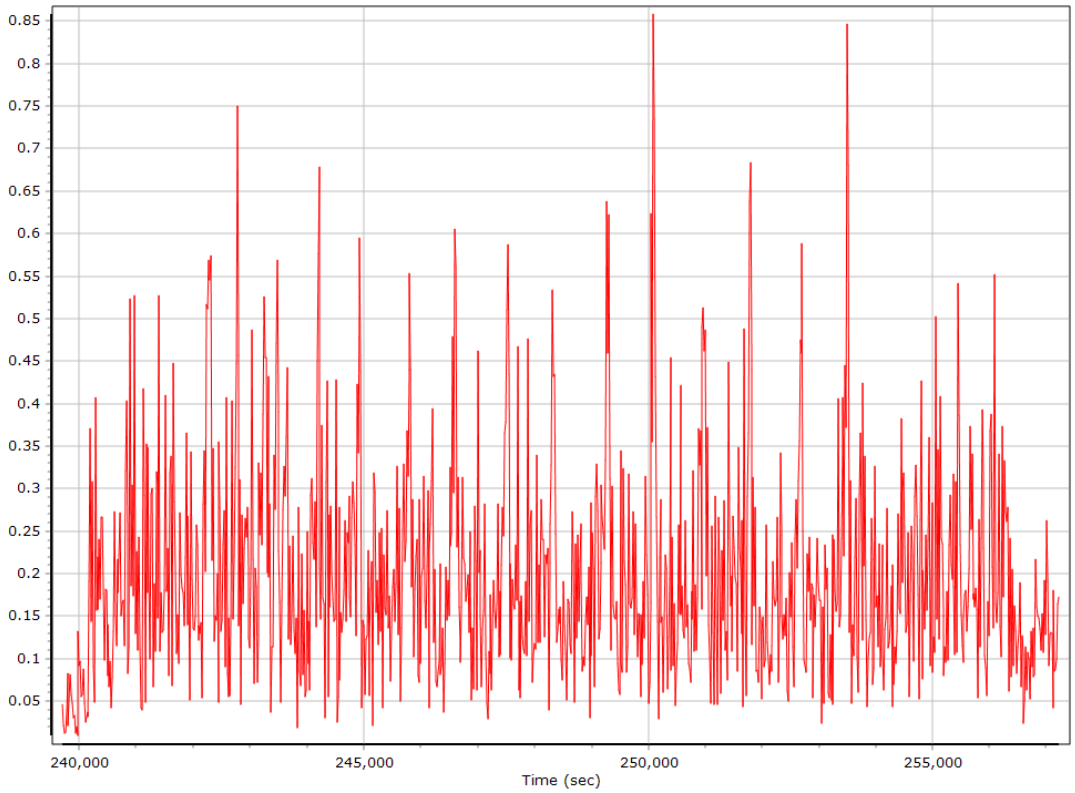
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

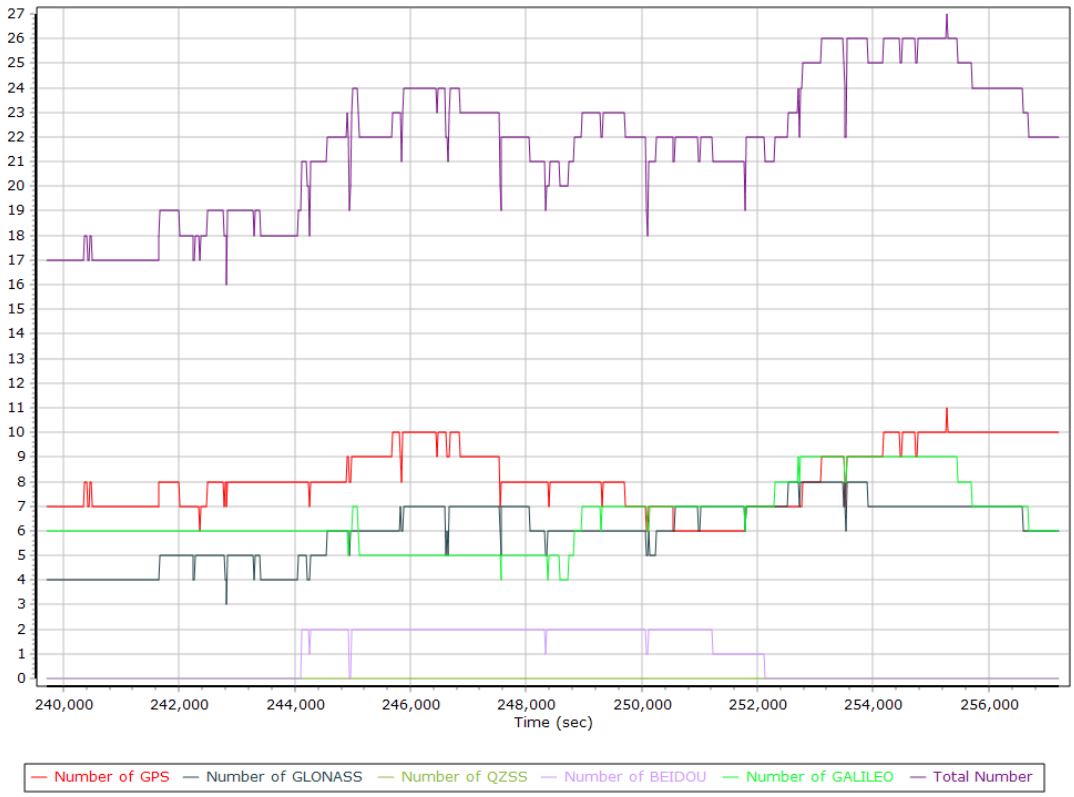


GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	11	8
Number of GLONASS SV	3	8	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	2	1
Number of GALILEO SV	4	9	7
Total number of SV	16	27	22
PDOP	0.99	1.66	1.20
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	17573.00	0.00	0.00
Percentage	100.00	0.00	0.00

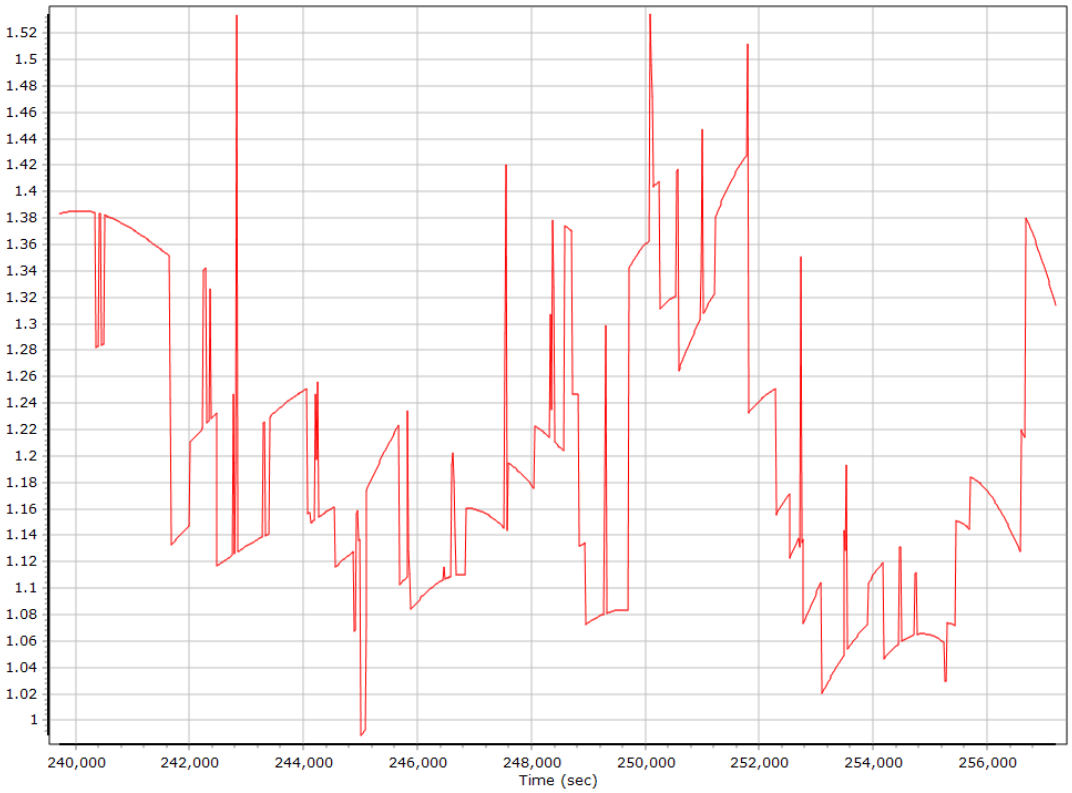
Num SVs in solution



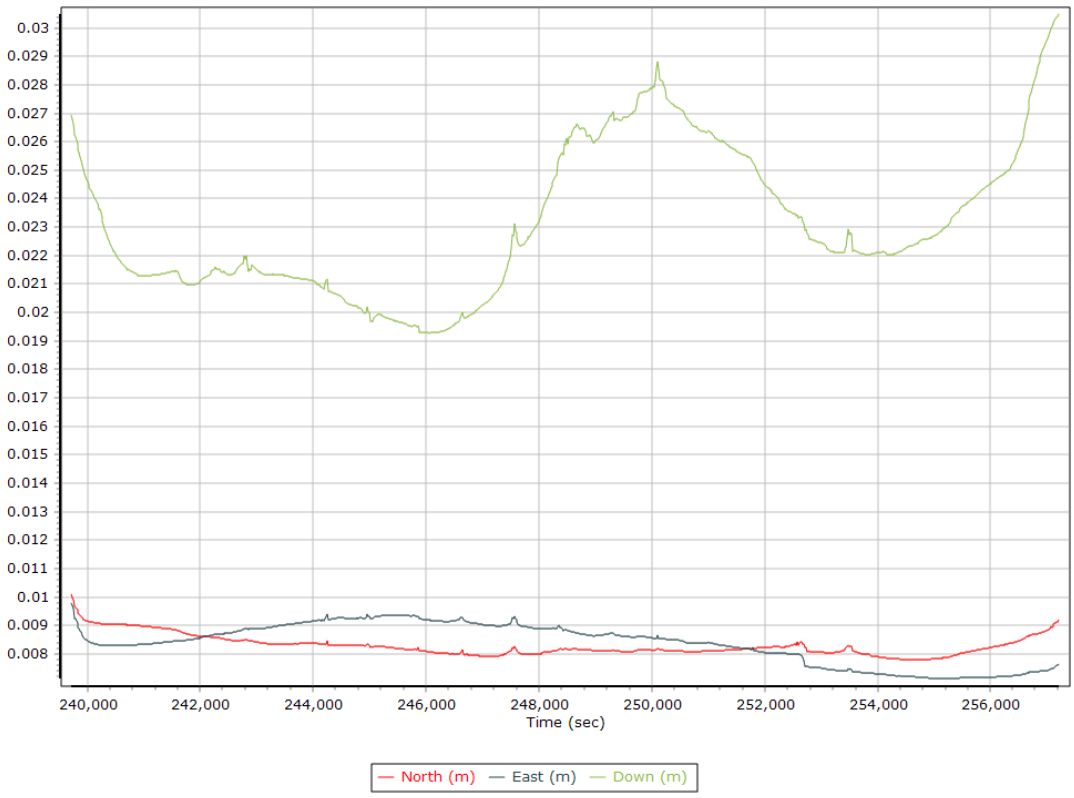
Forward/Reverse Separation



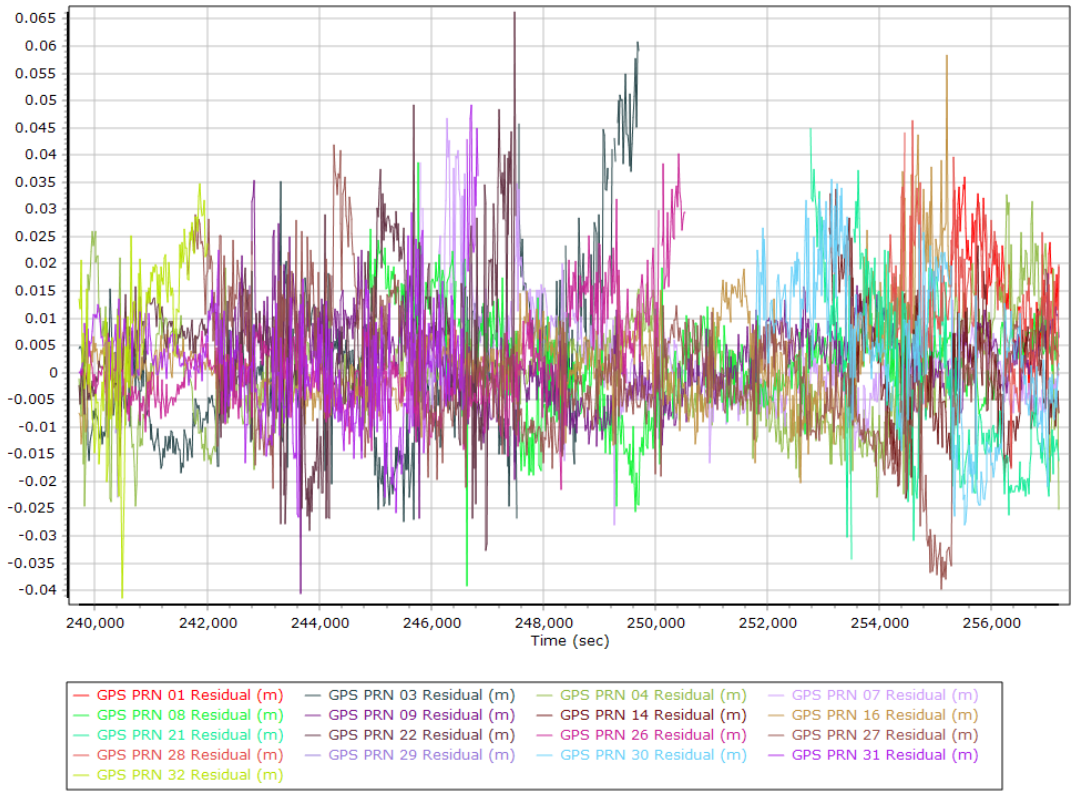
PDOP



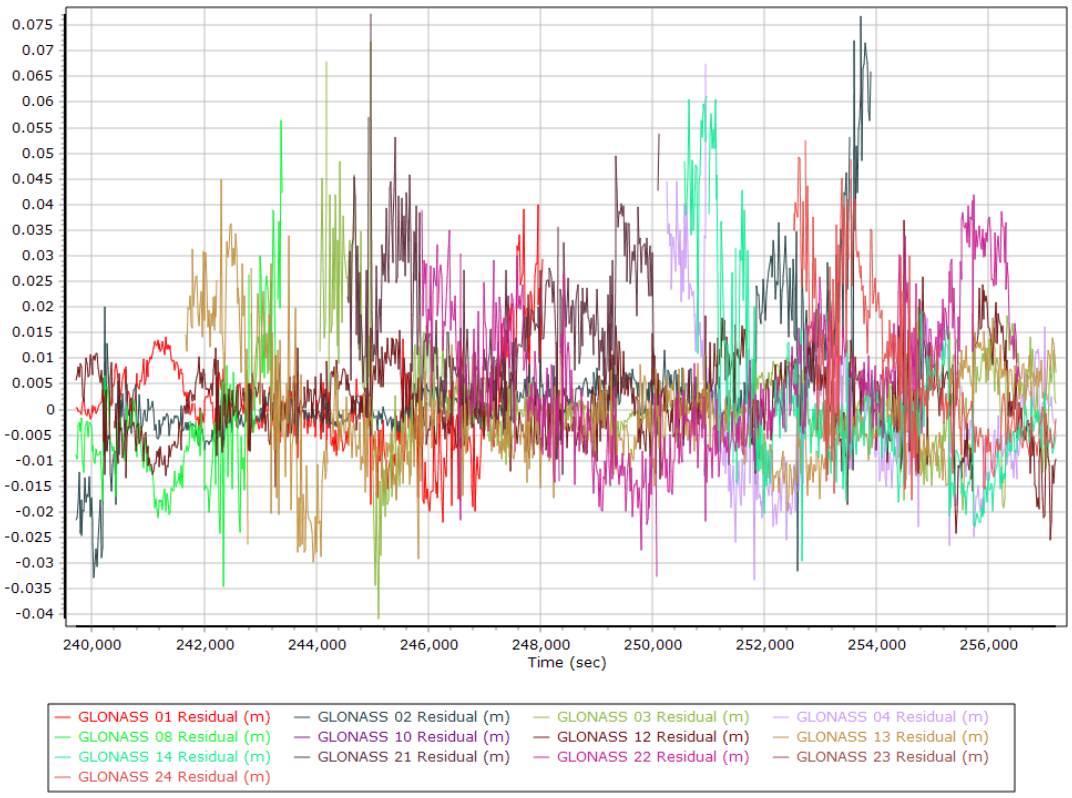
Estimated Position Accuracy



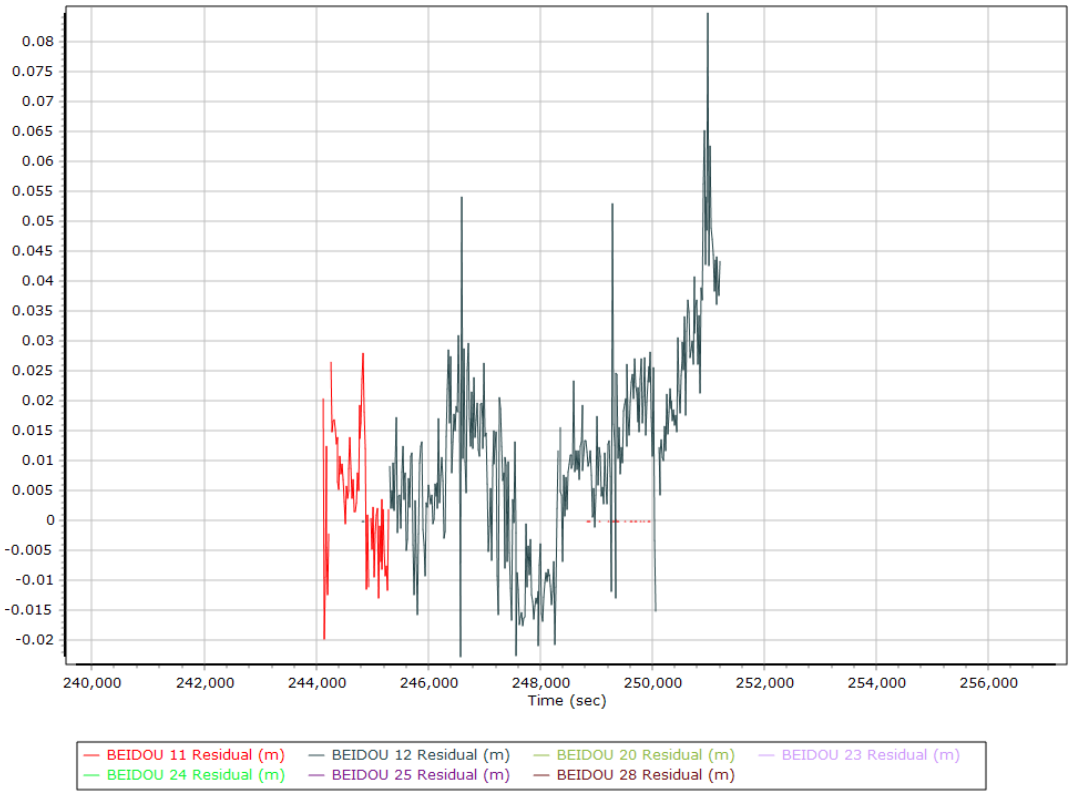
GPS Residuals



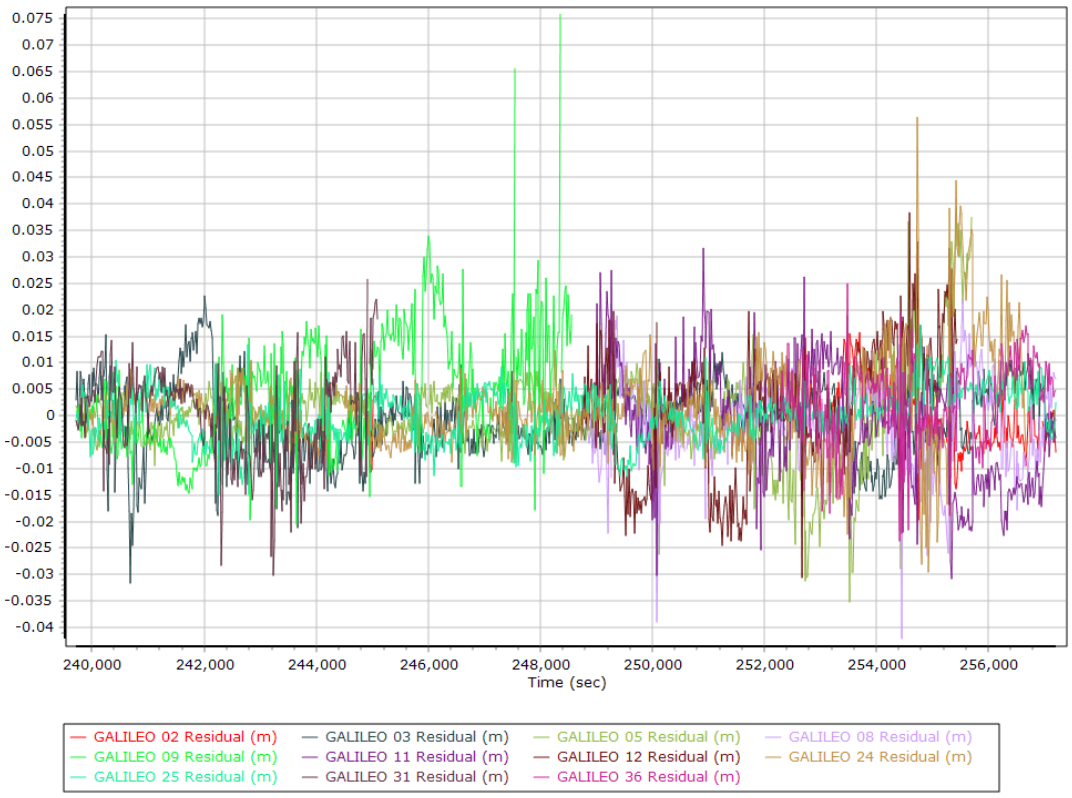
GLONASS Residuals



BEIDOU Residuals



GALILEO Residuals



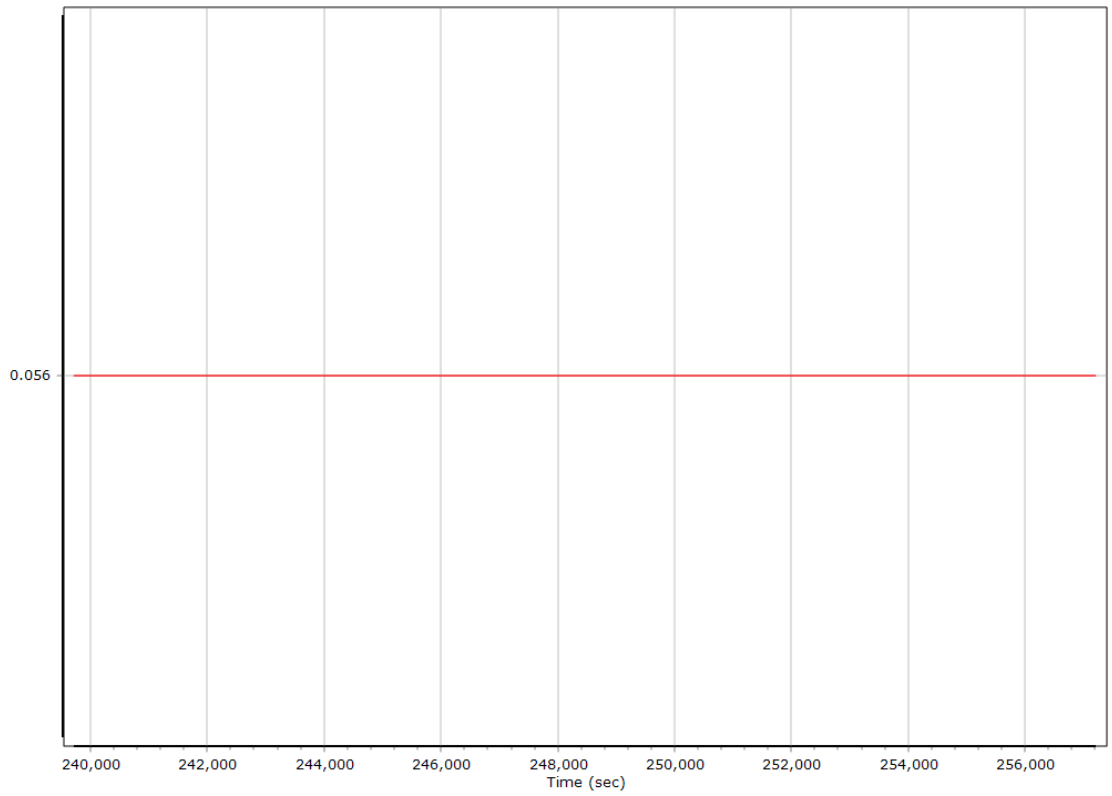
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	239630.000 (1/5/2021 6:33:50 PM)		
Processing end time	257221.000 (1/5/2021 11:27:01 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

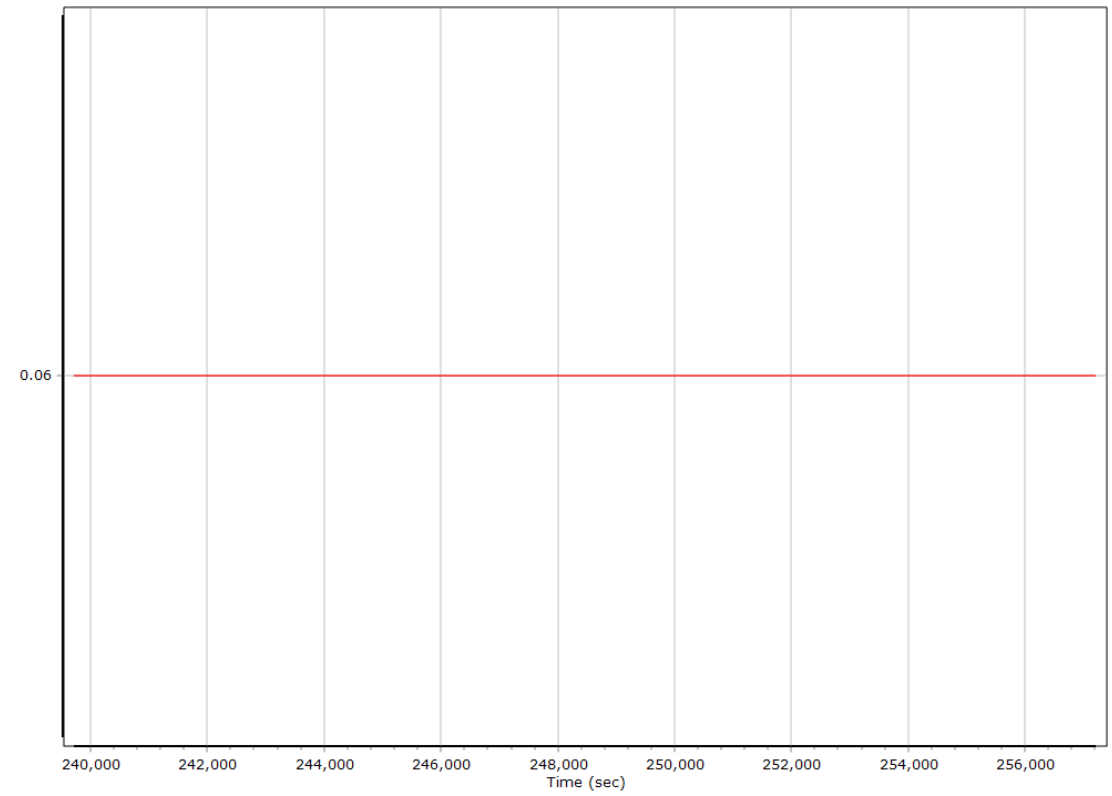
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

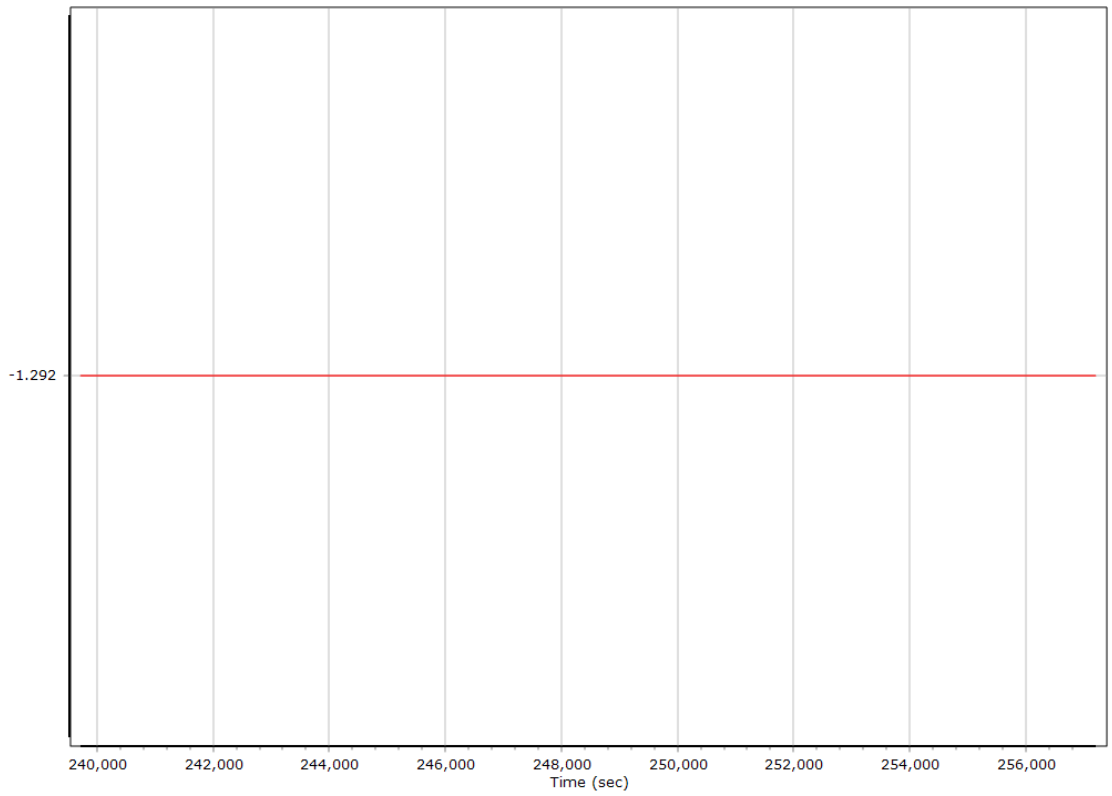
X Reference-Primary GNSS Lever Arm (m)



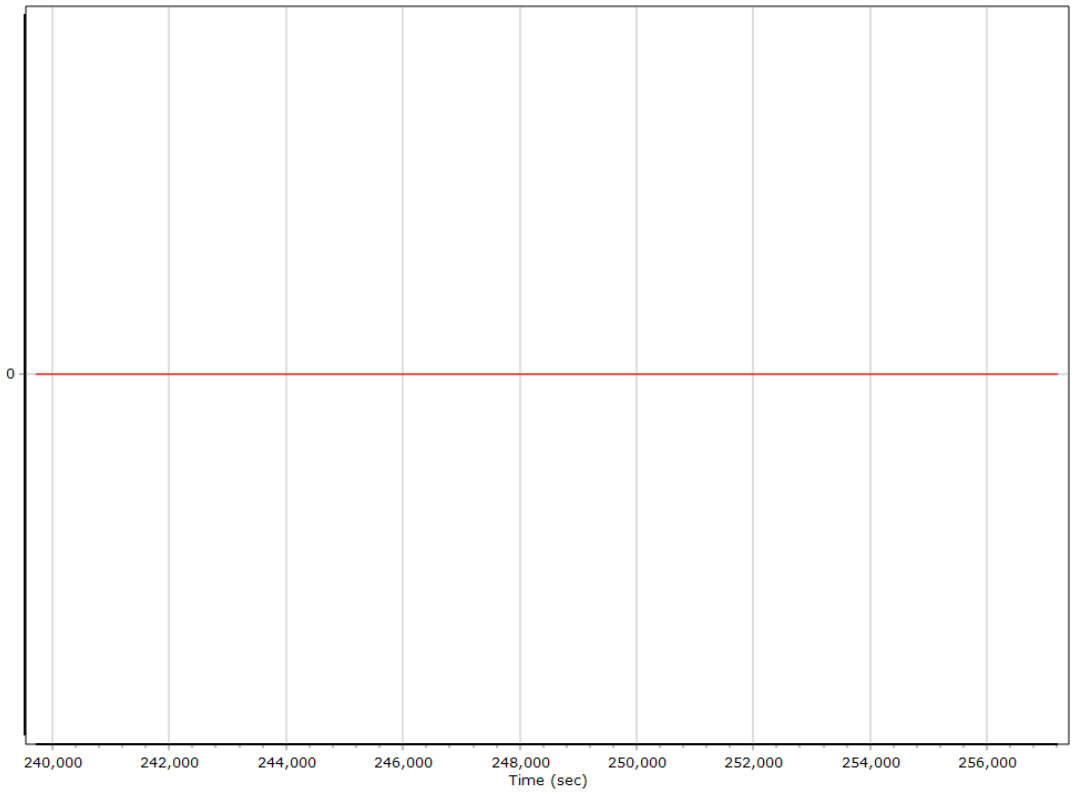
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



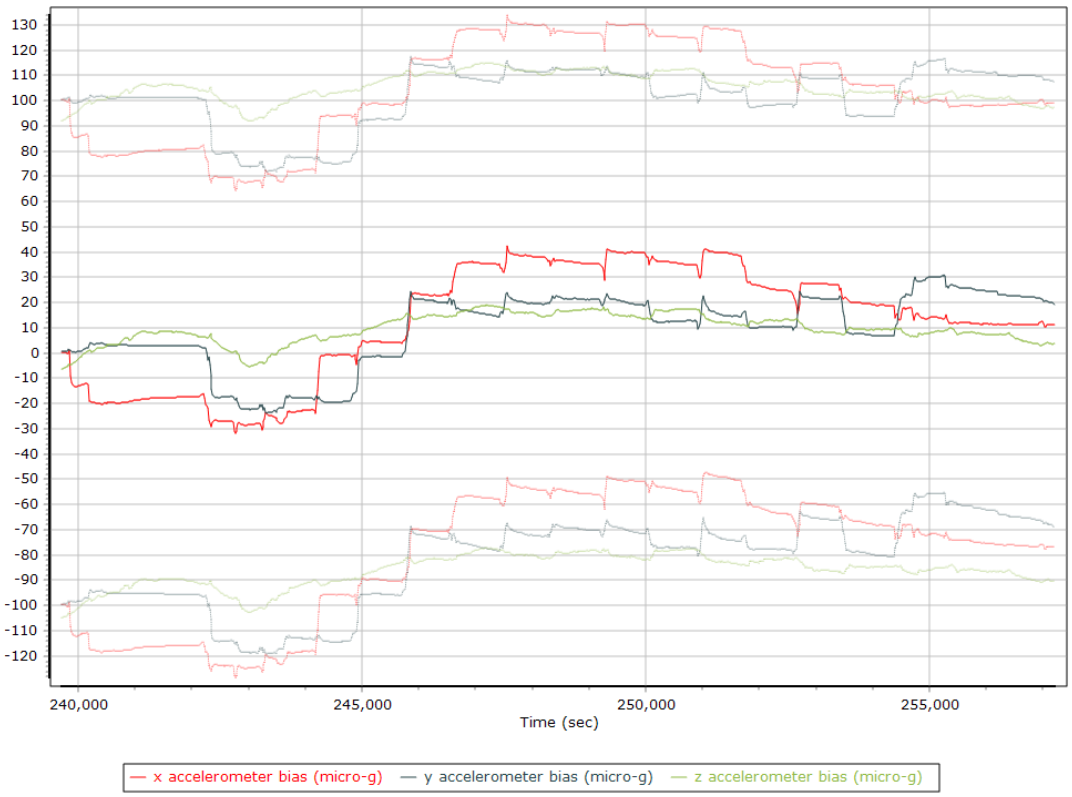
Reference-Primary GNSS Lever Arm Figure of Merit



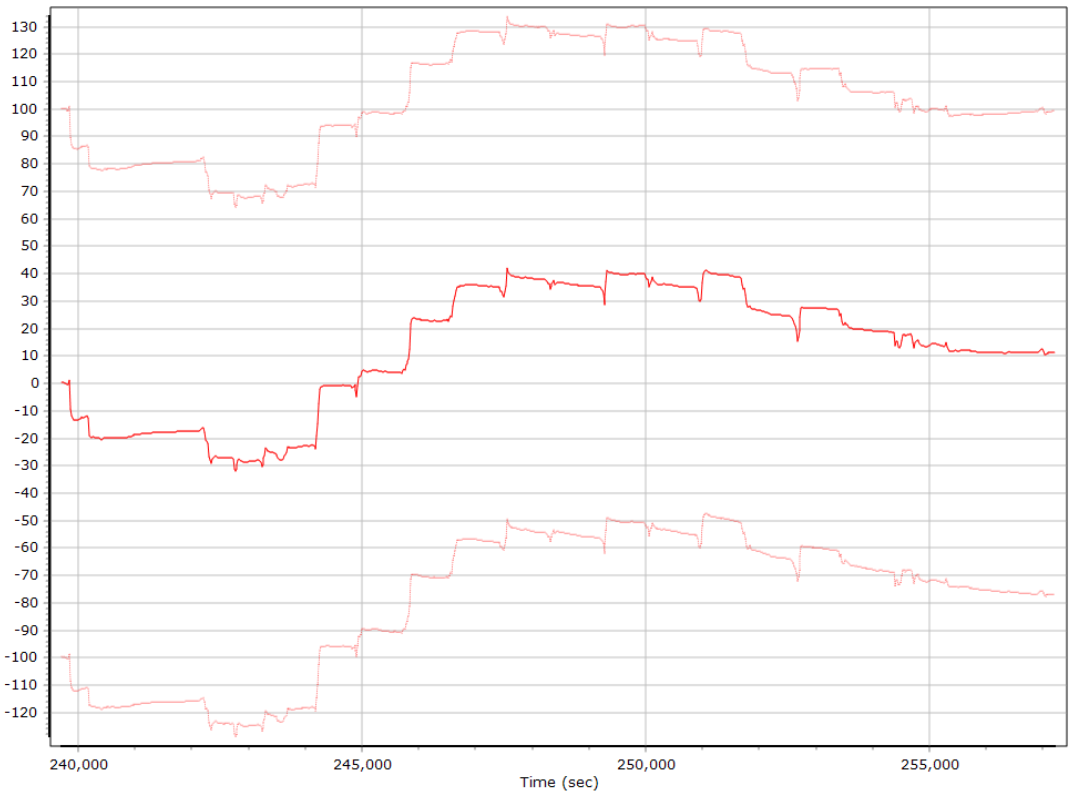
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

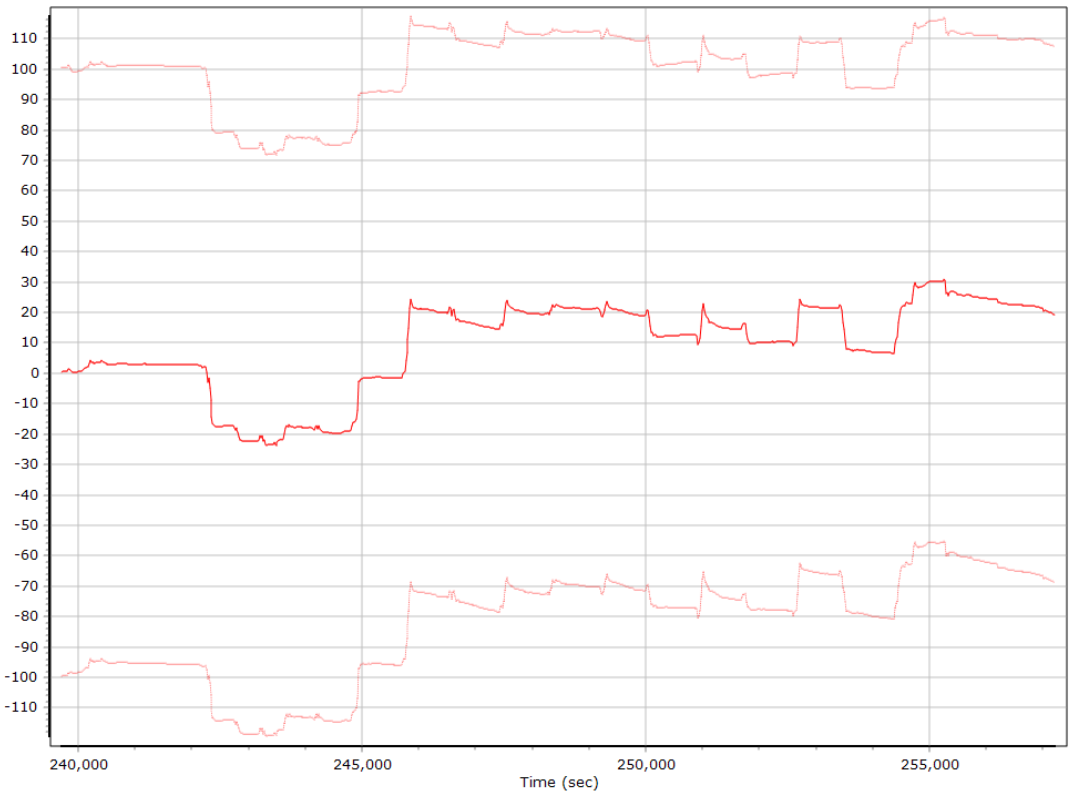
Accelerometer Bias (micro-g)



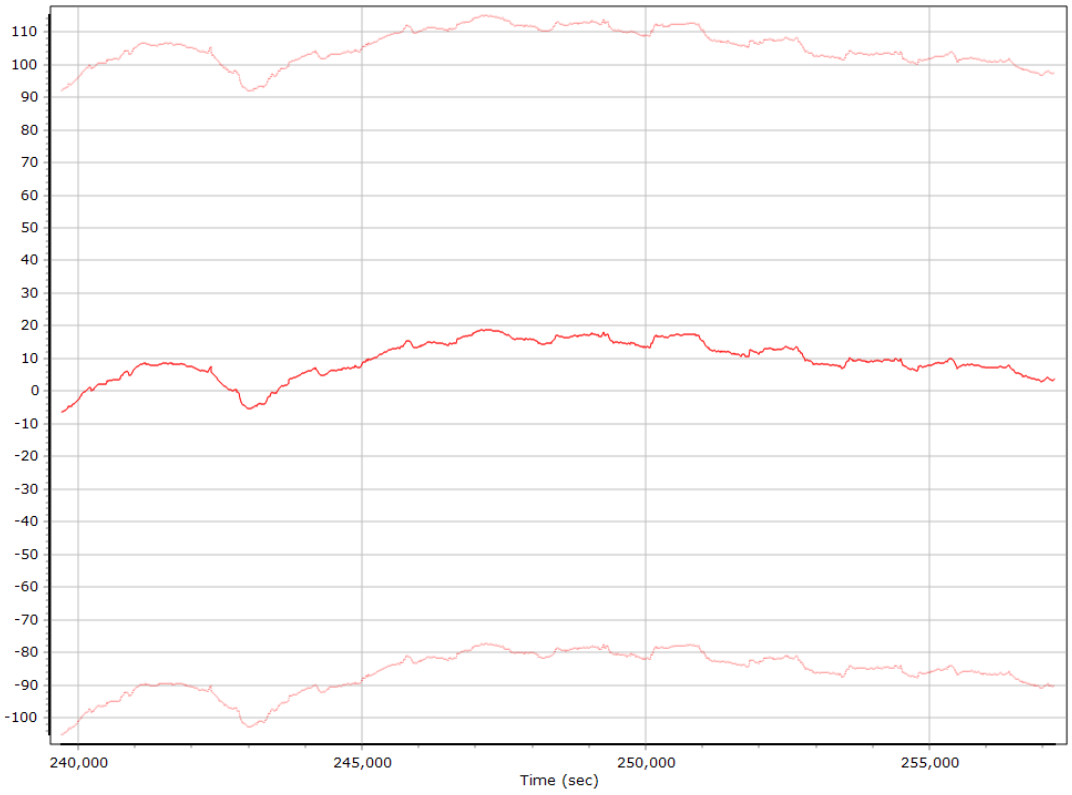
X Accelerometer Bias (micro-g)



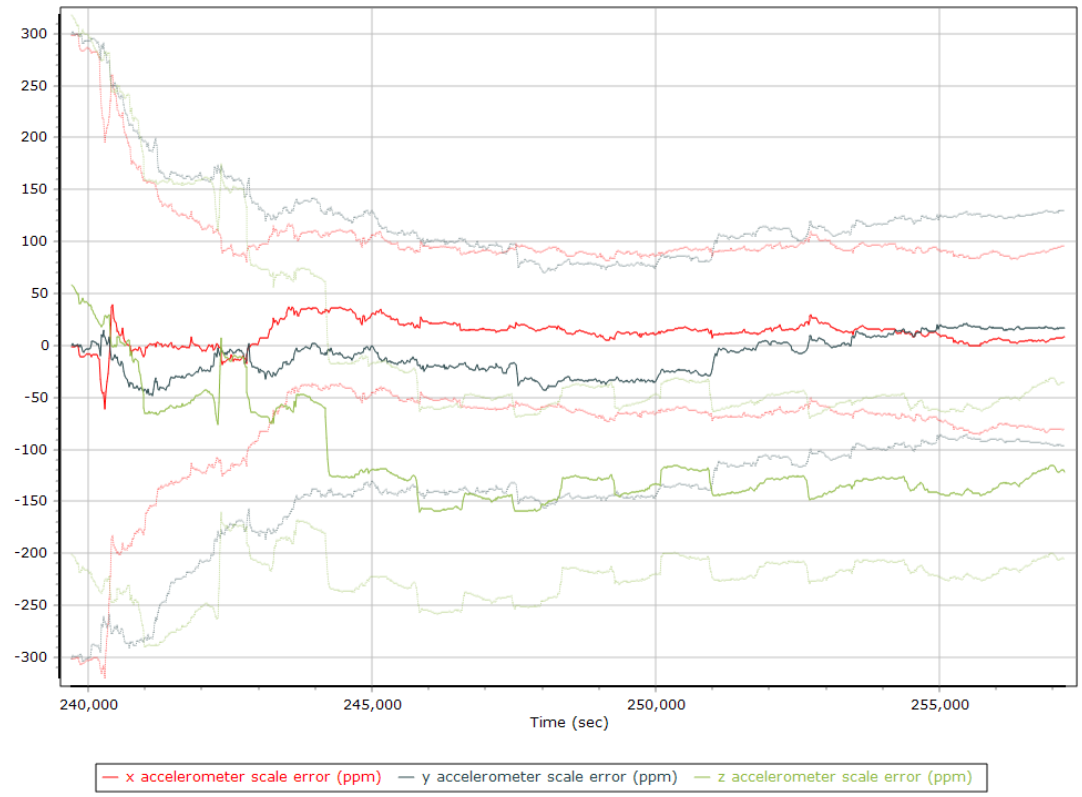
Y Accelerometer Bias (micro-g)



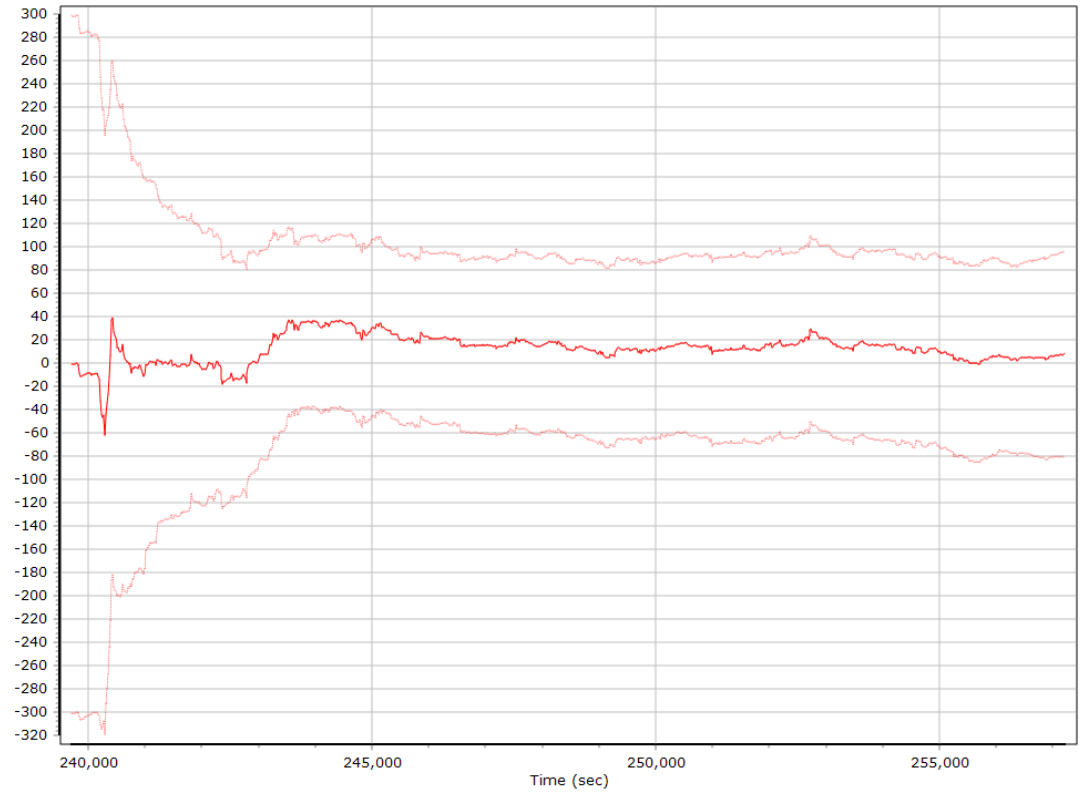
Z Accelerometer Bias (micro-g)



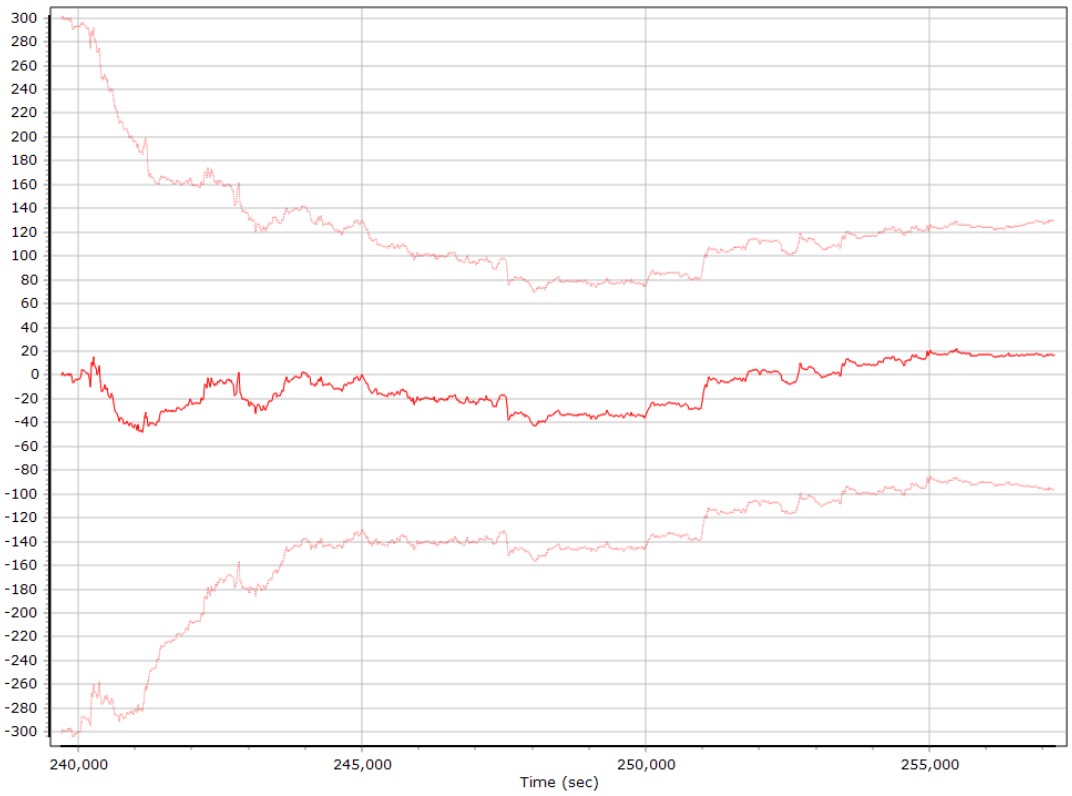
Accelerometer Scale Error (ppm)



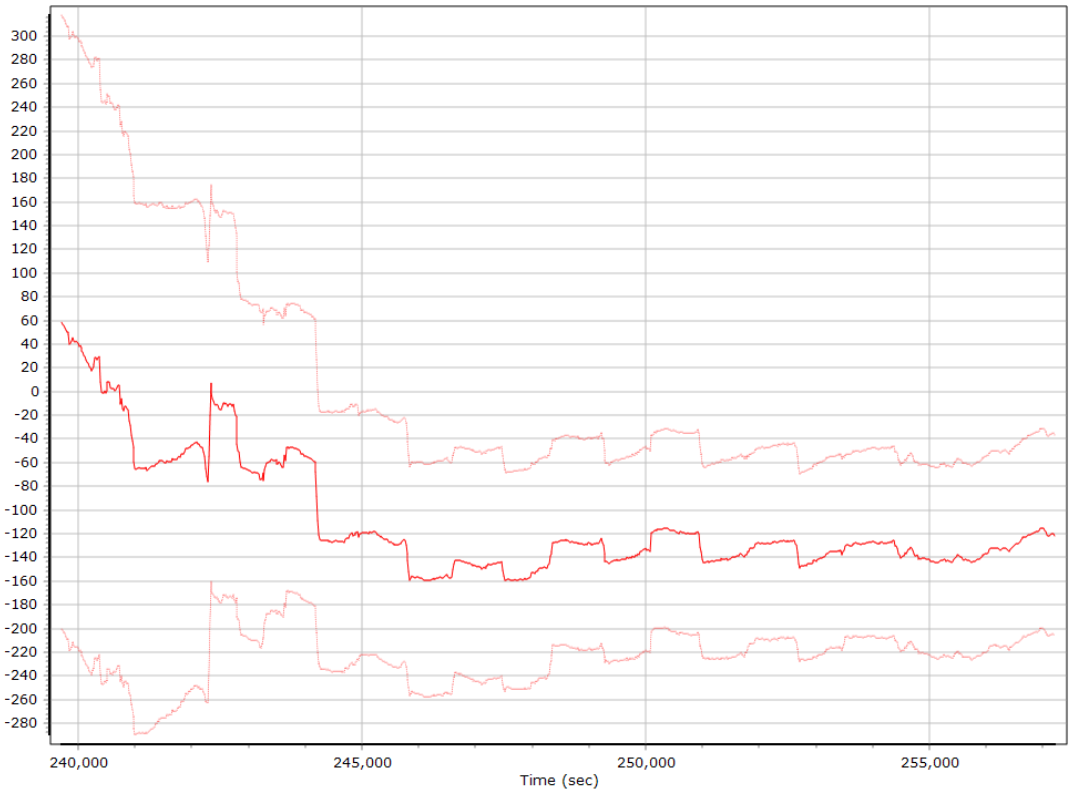
X Accelerometer Scale Error (ppm)



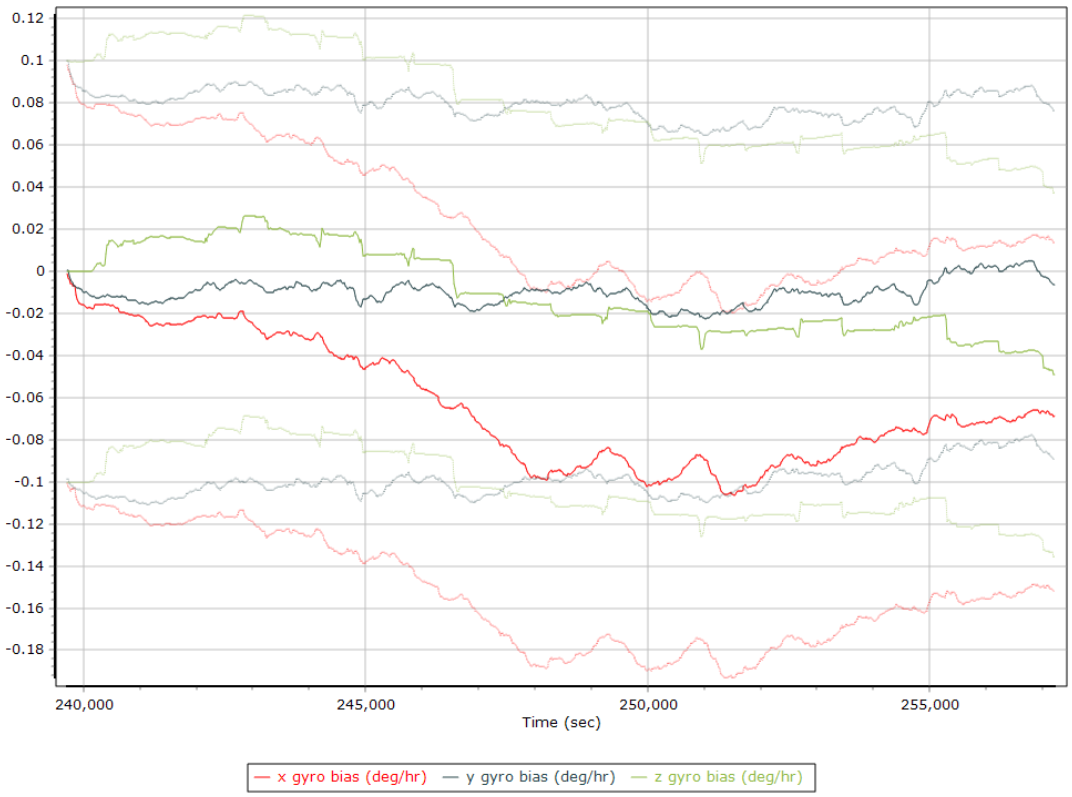
Y Accelerometer Scale Error (ppm)



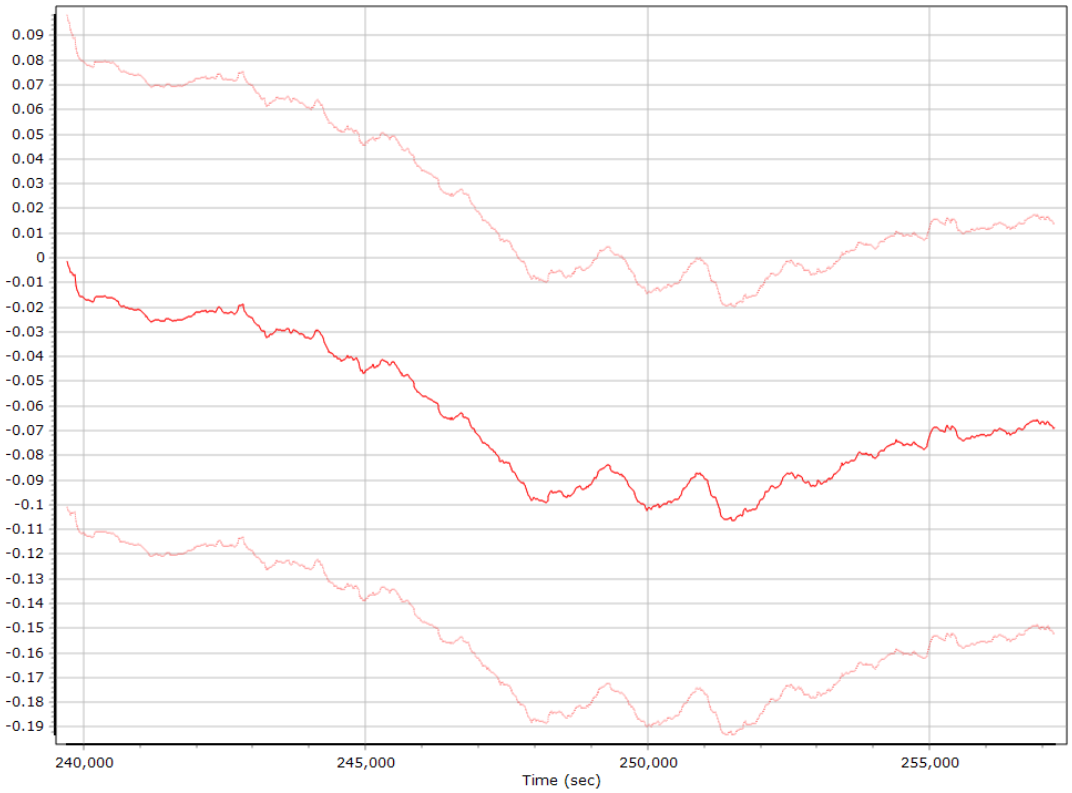
Z Accelerometer Scale Error (ppm)



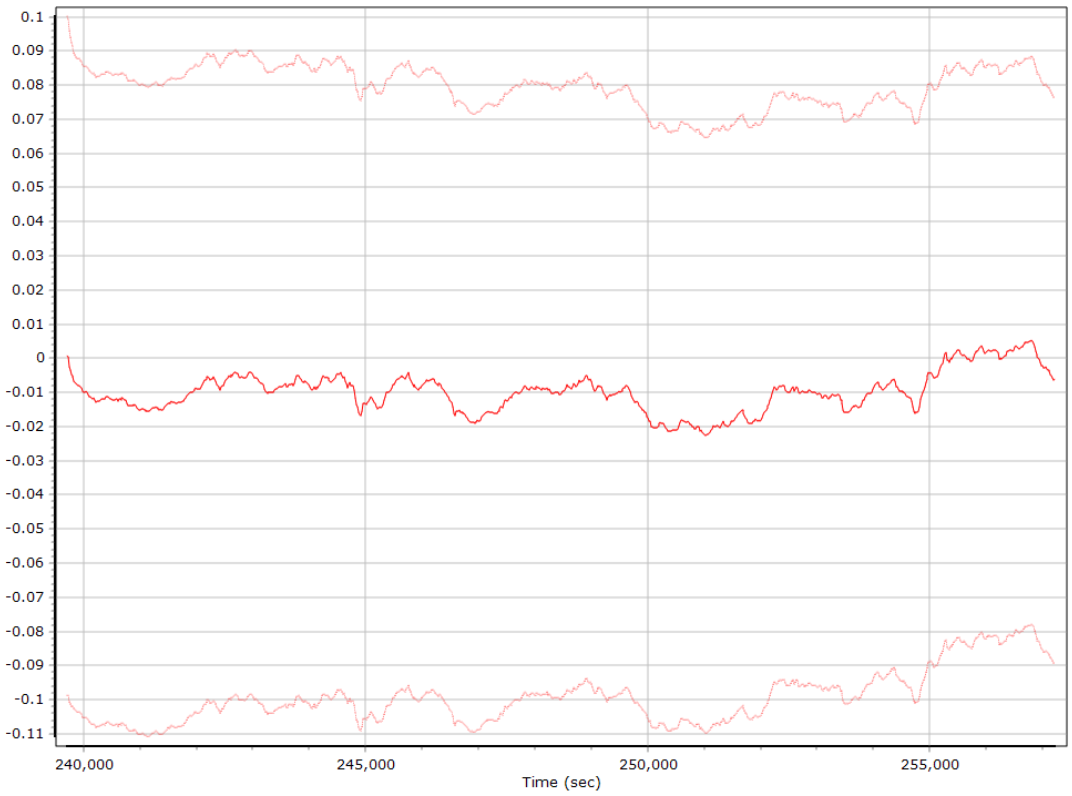
Gyro Bias (deg/h)



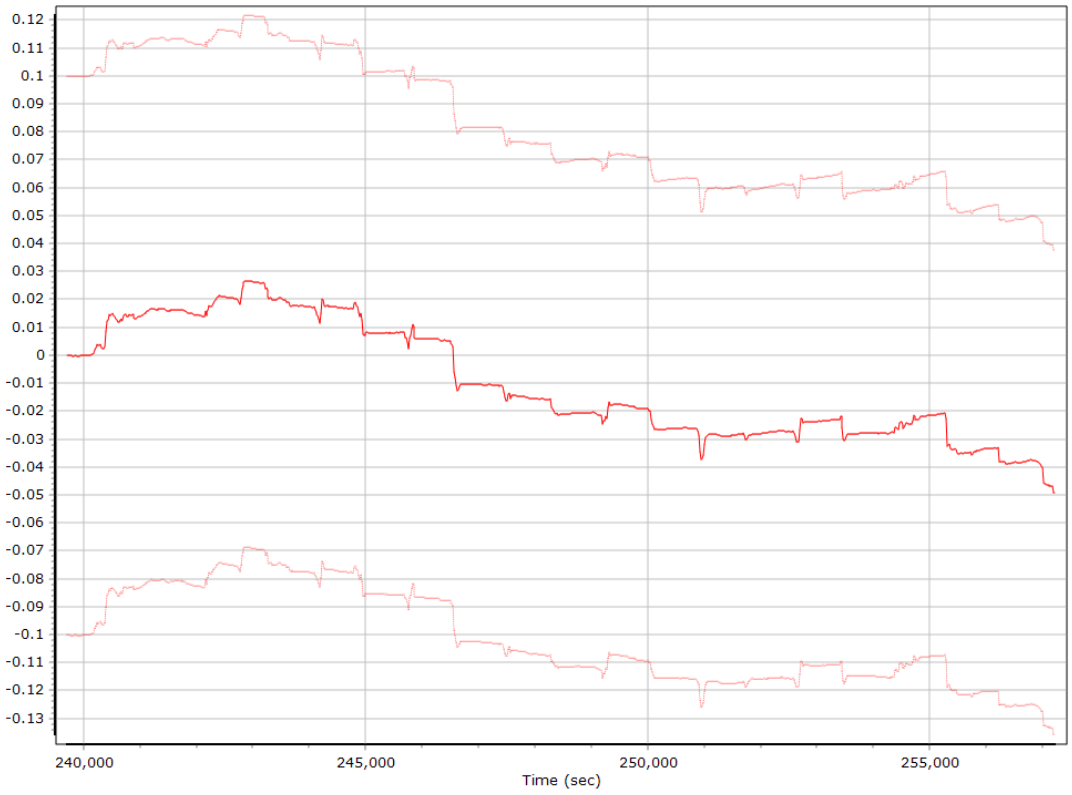
X Gyro Bias (deg/h)



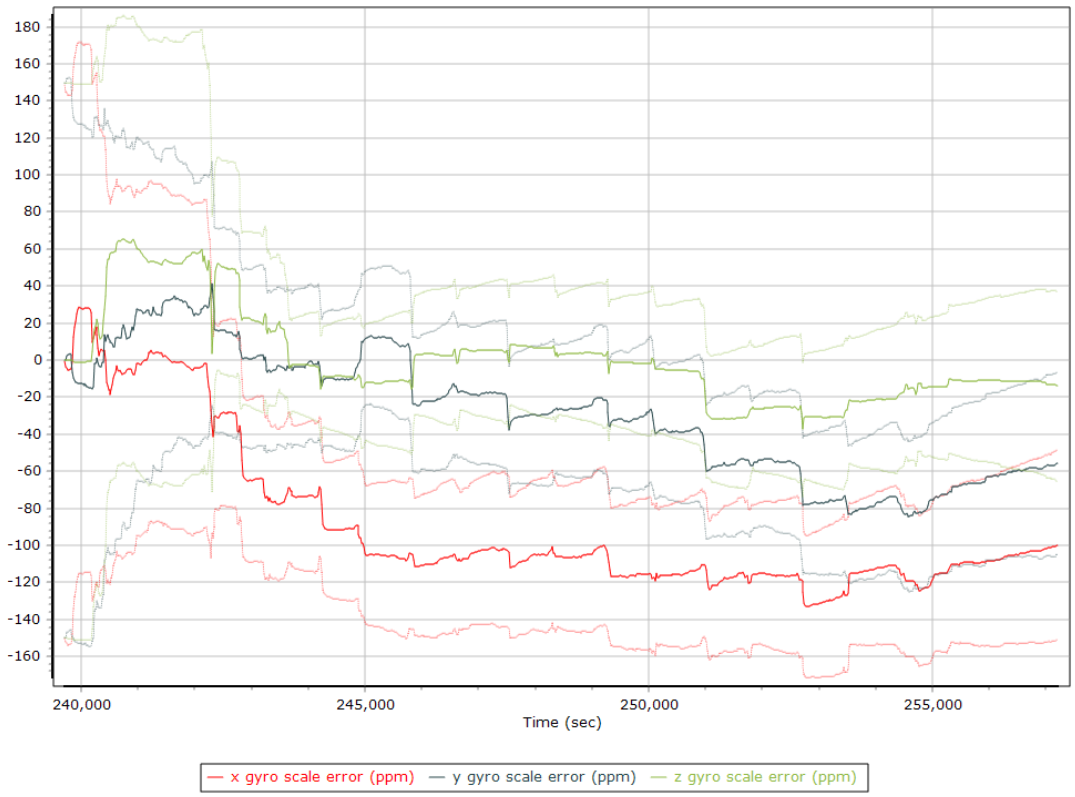
Y Gyro Bias (deg/h)



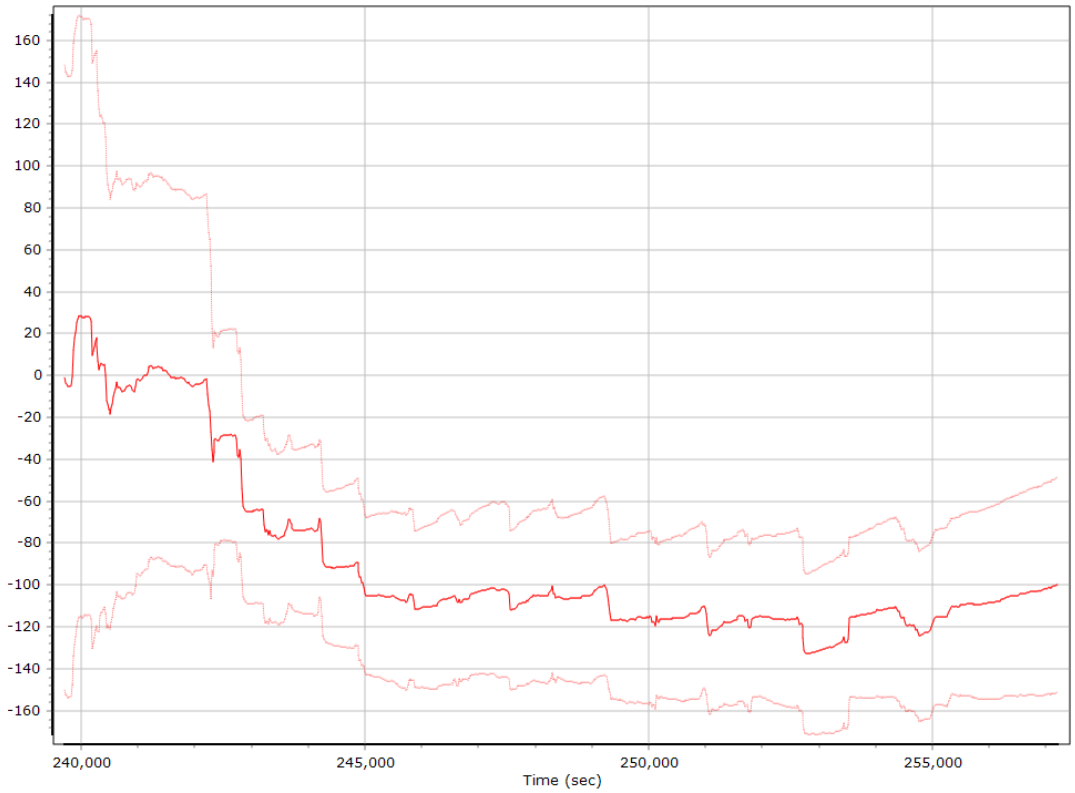
Z Gyro Bias (deg/h)



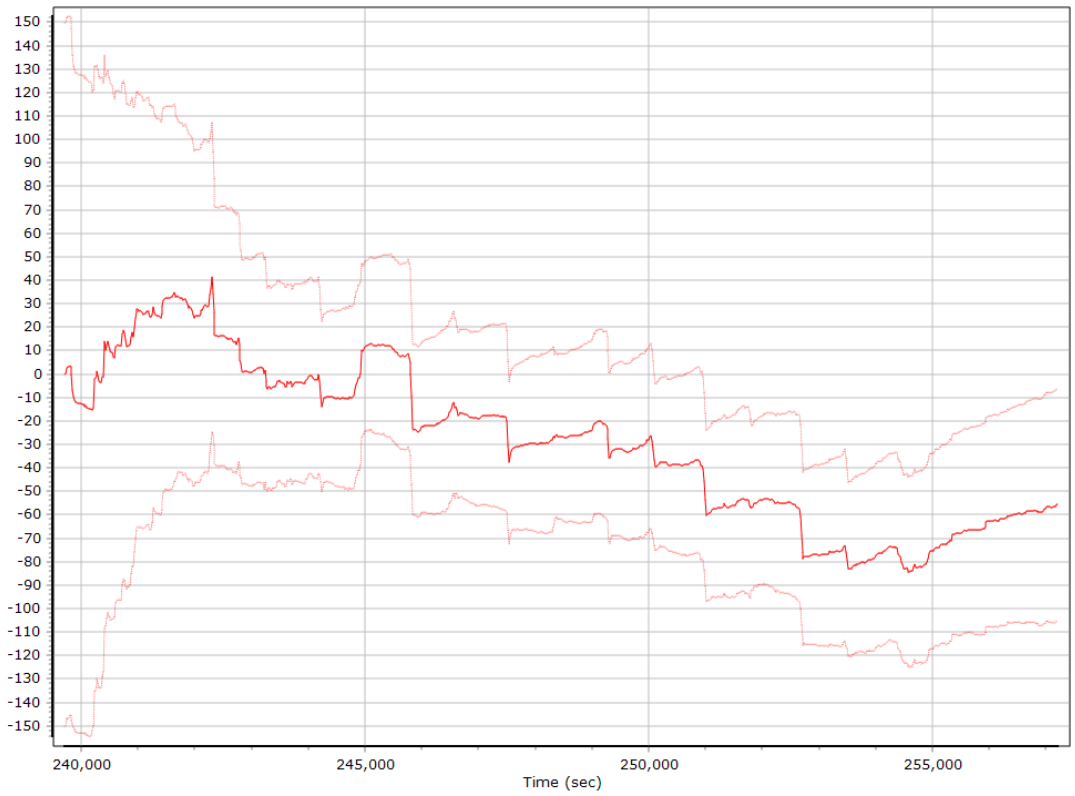
Gyro Scale Error (ppm)



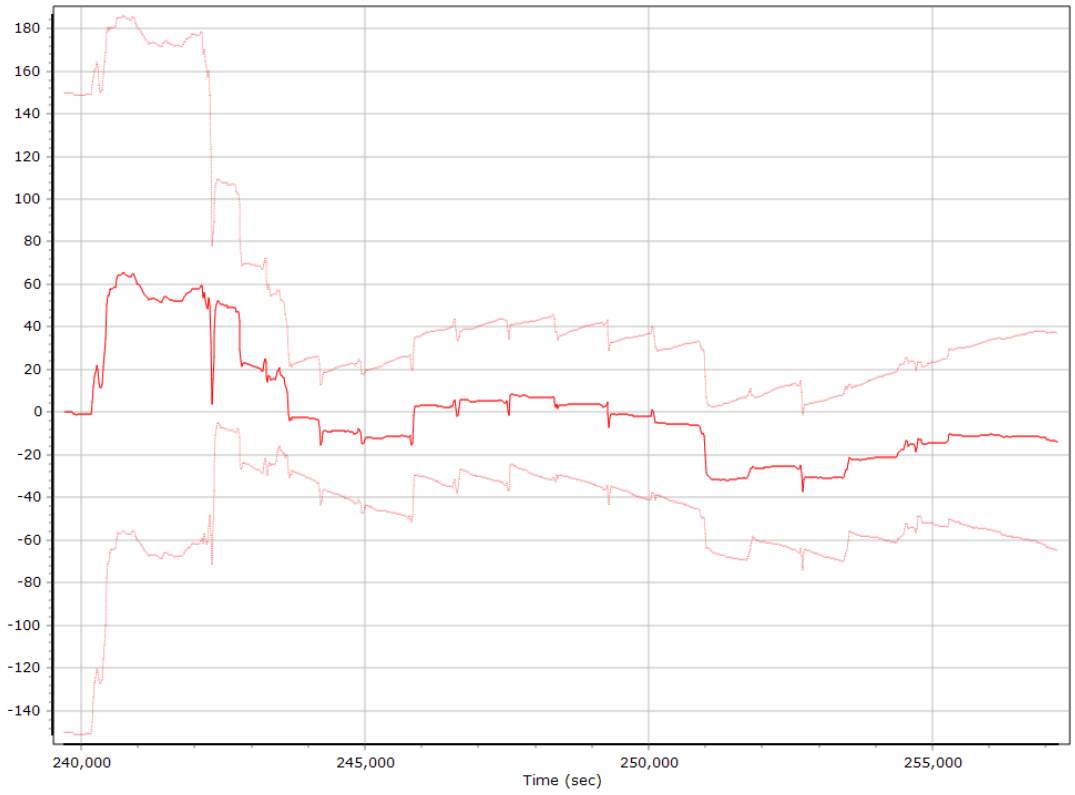
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

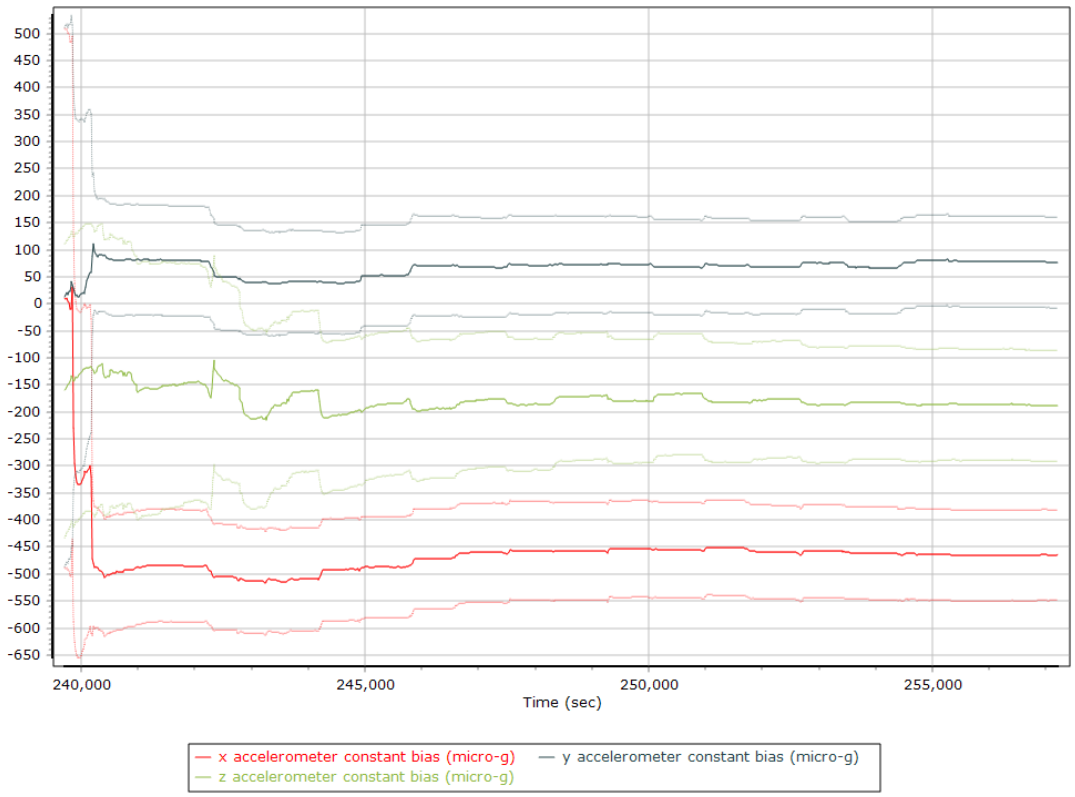


Z Gyro Scale Error (ppm)

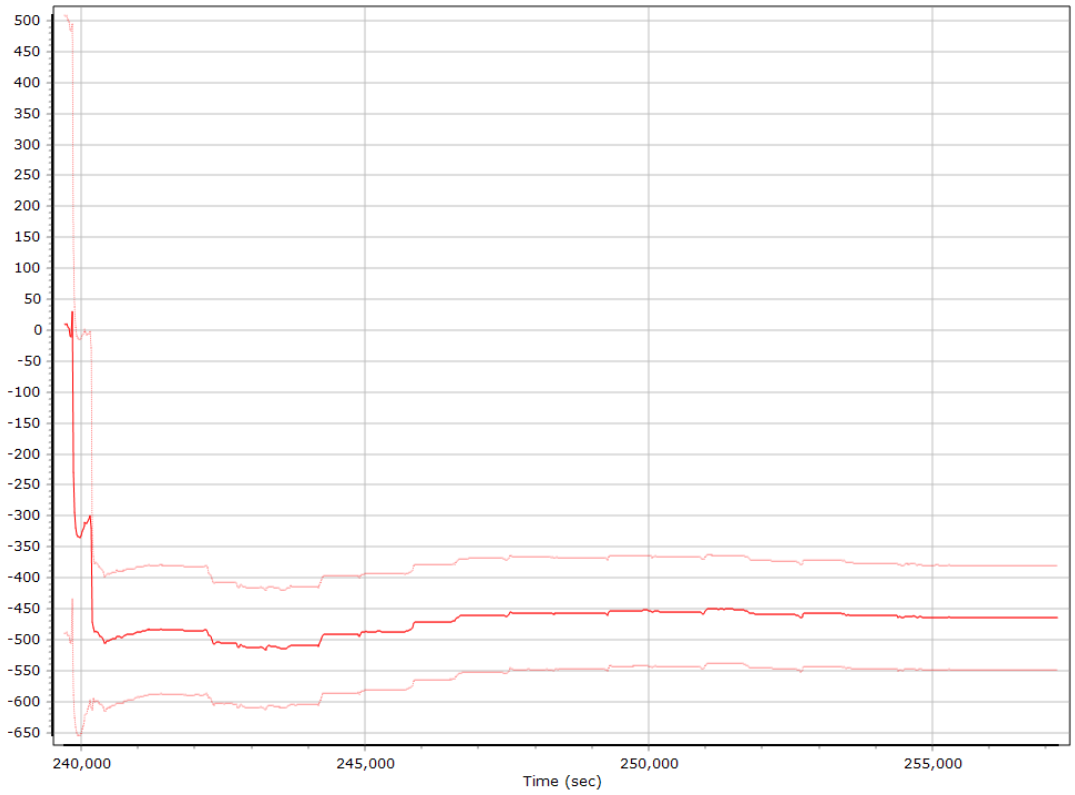


Forward Processed Estimated Constant Errors, Reference Frame

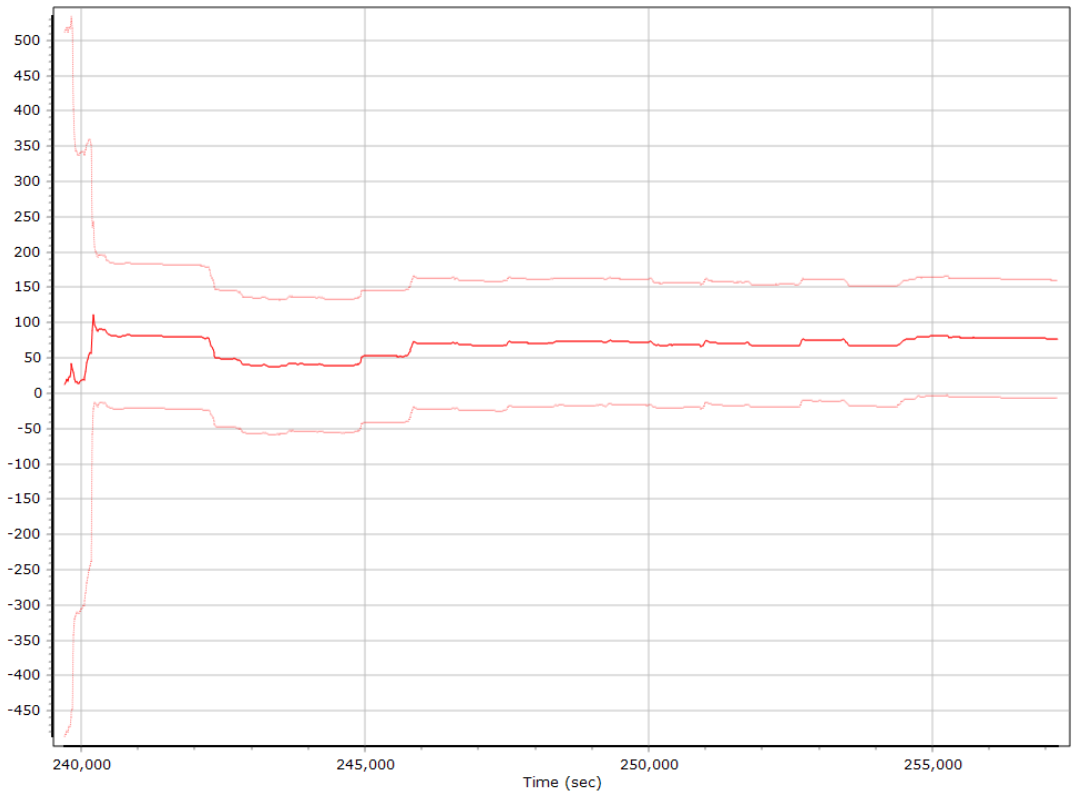
Accelerometer Bias (micro-g)



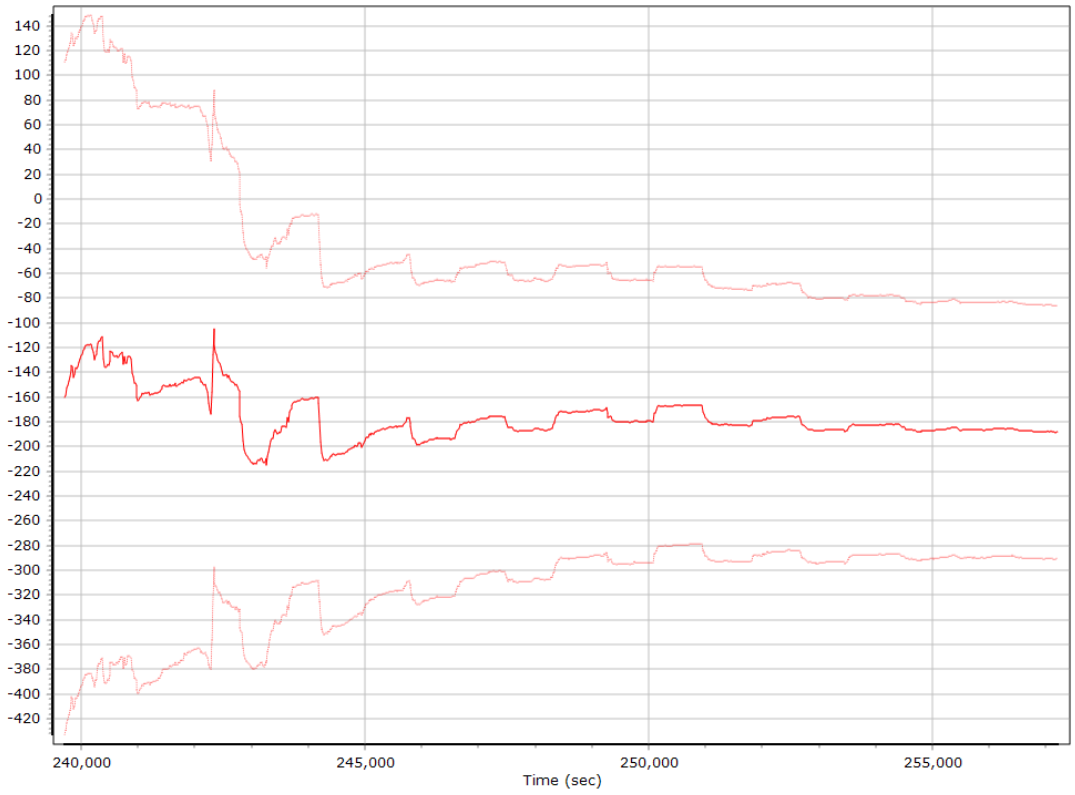
X Accelerometer Bias (micro-g)



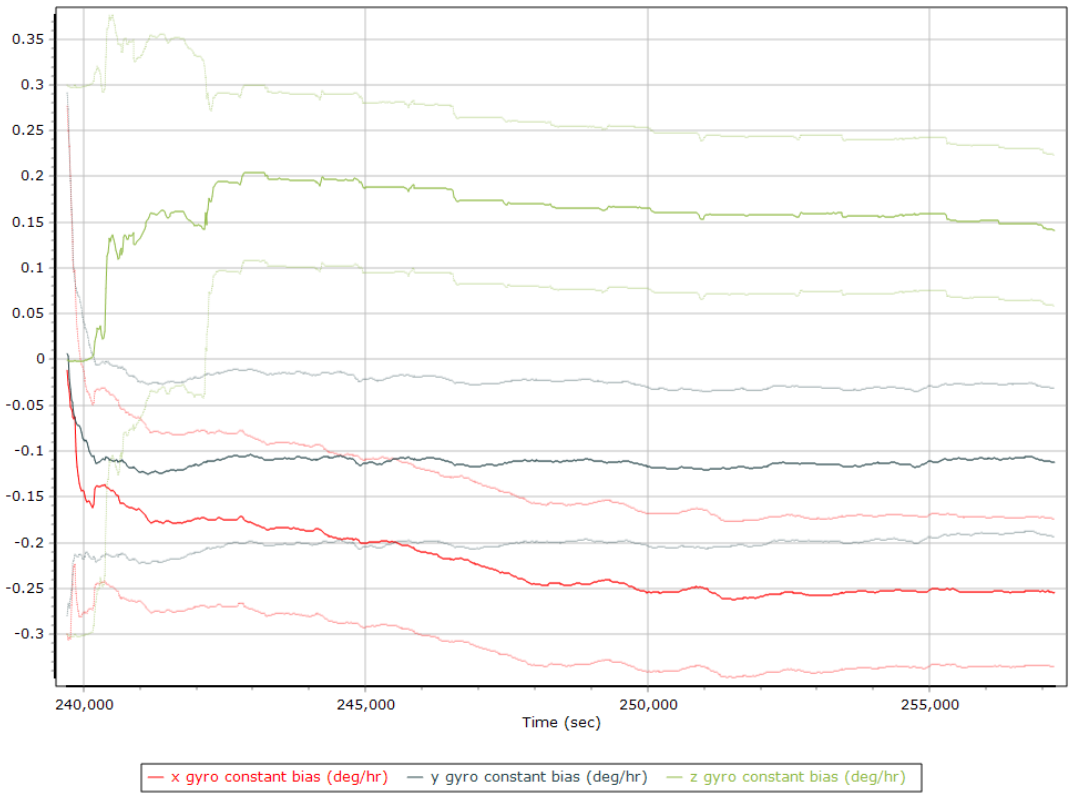
Y Accelerometer Bias (micro-g)



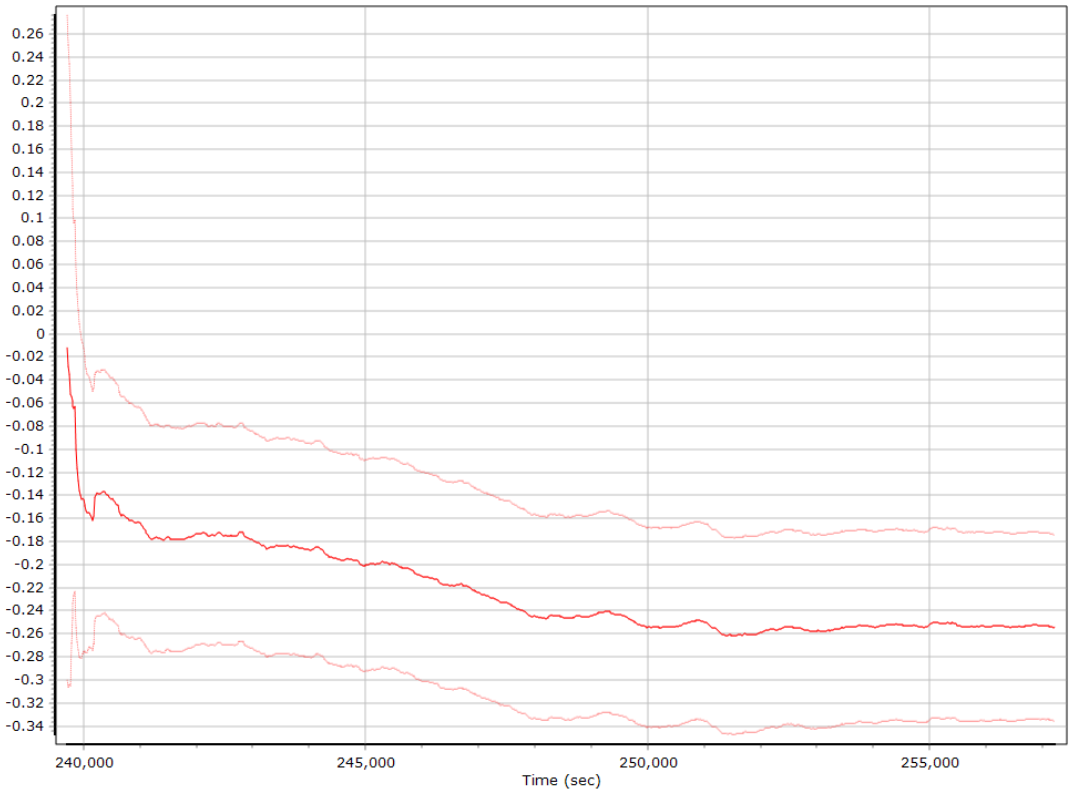
Z Accelerometer Bias (micro-g)



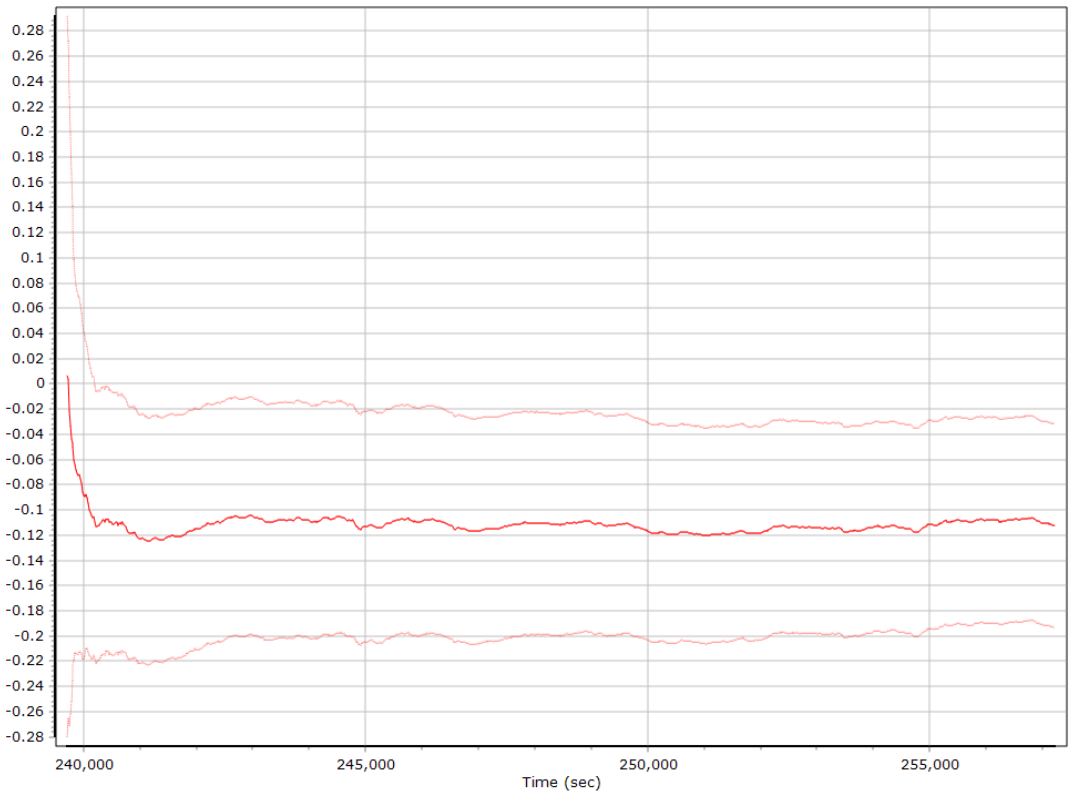
Gyro Bias (deg/h)



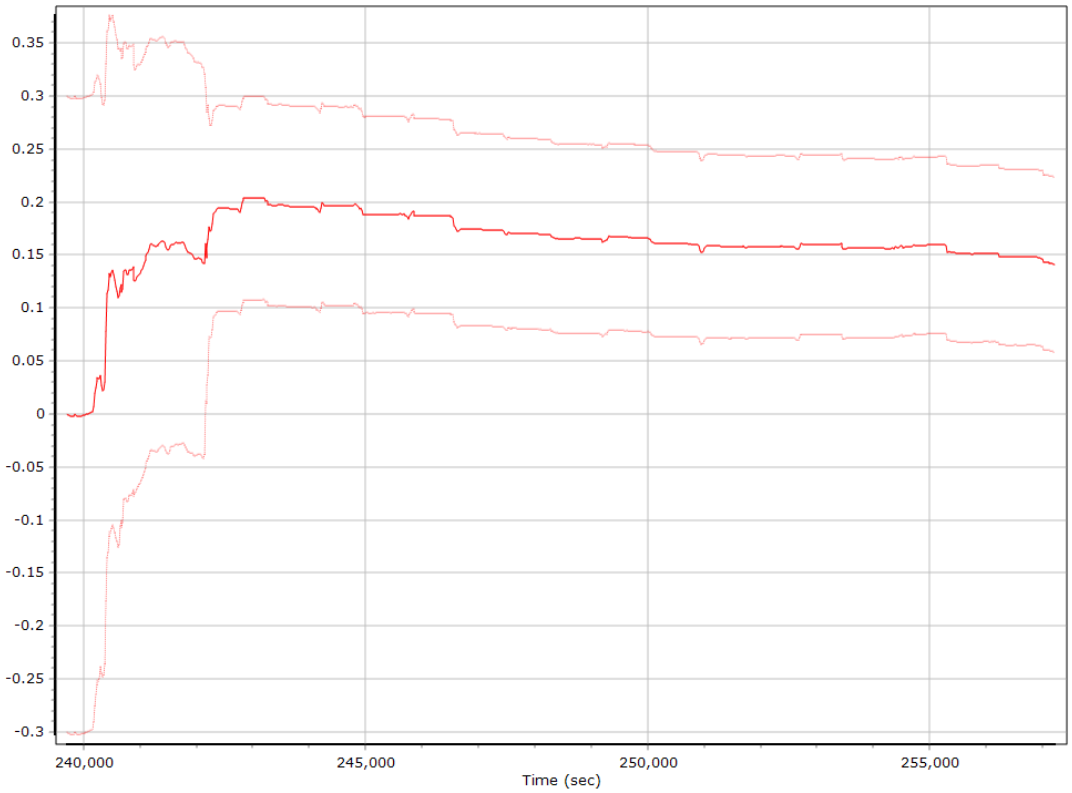
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

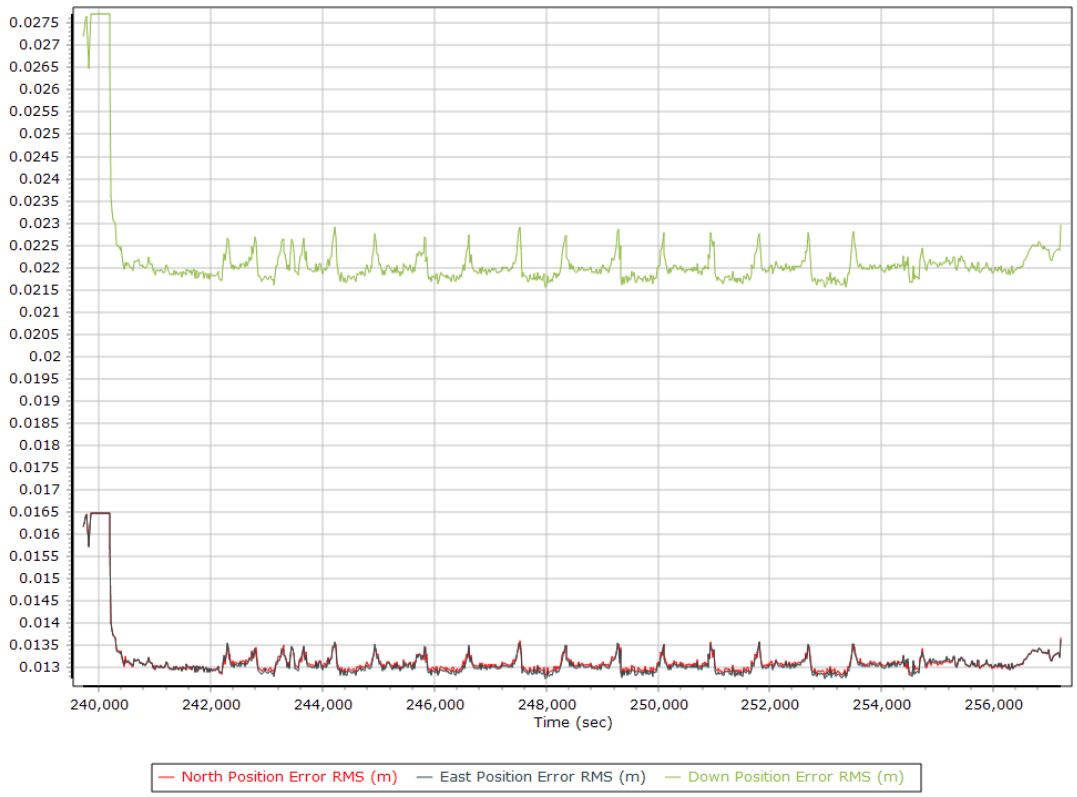


Z Gyro Bias (deg/h)

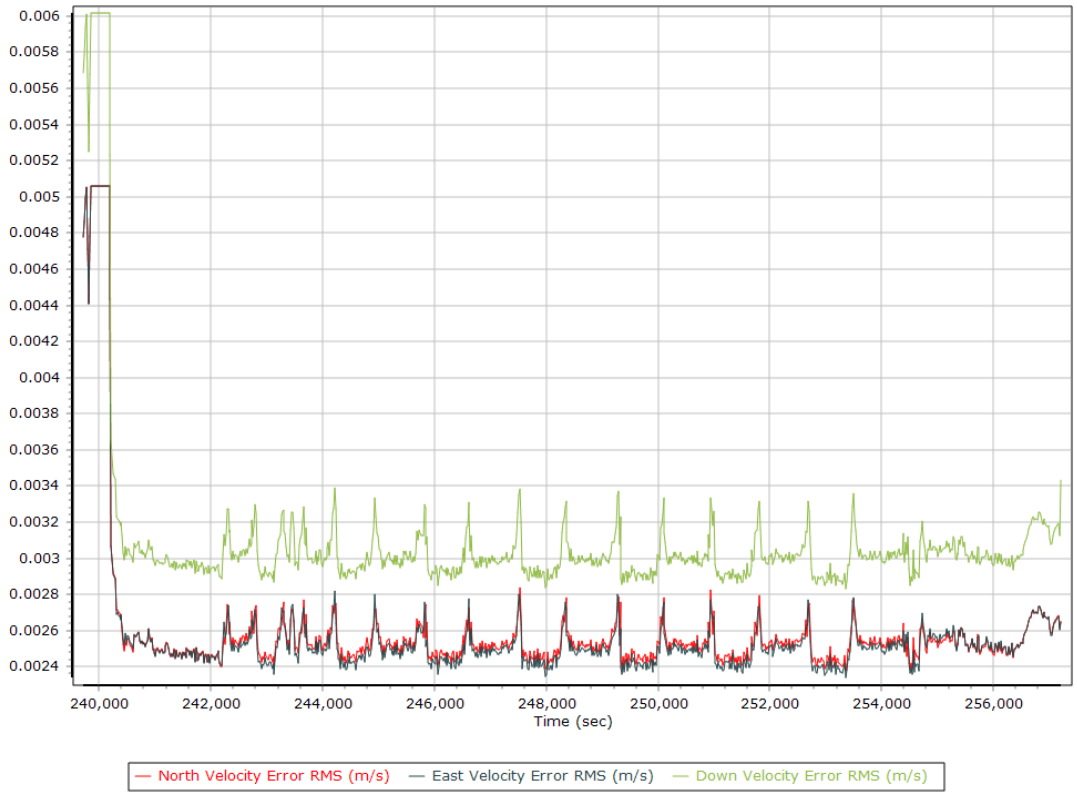


Smoothed Performance Metrics

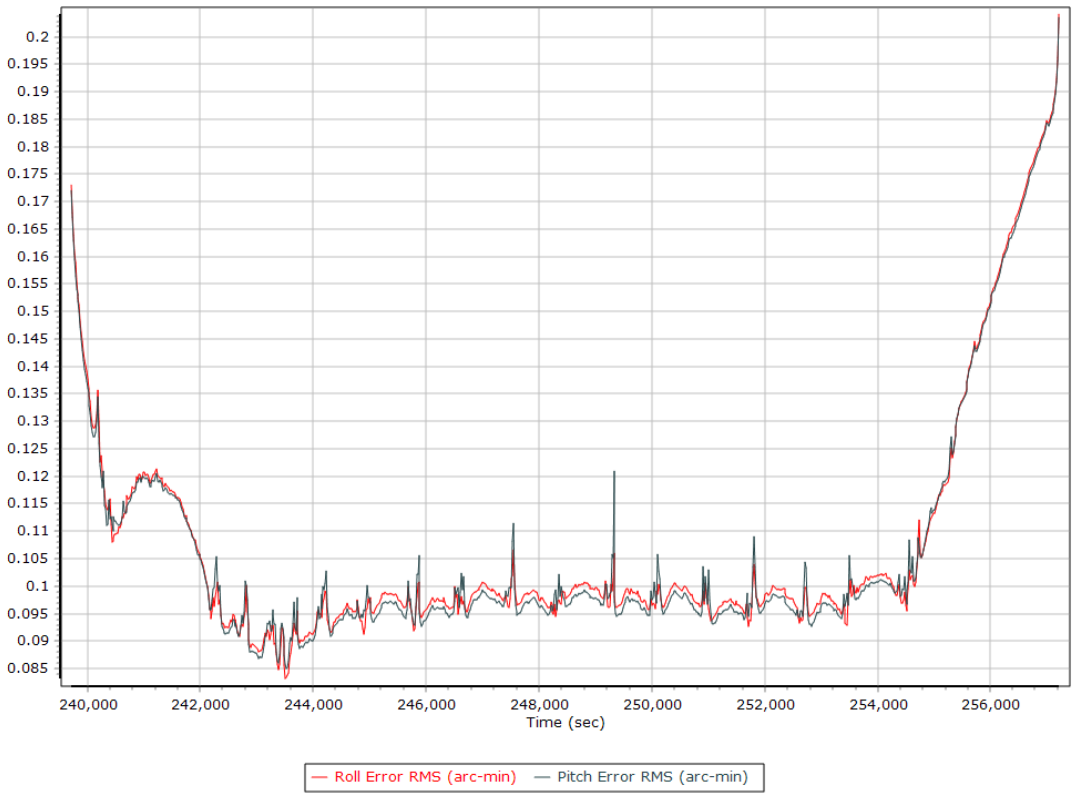
Position Error RMS (m)



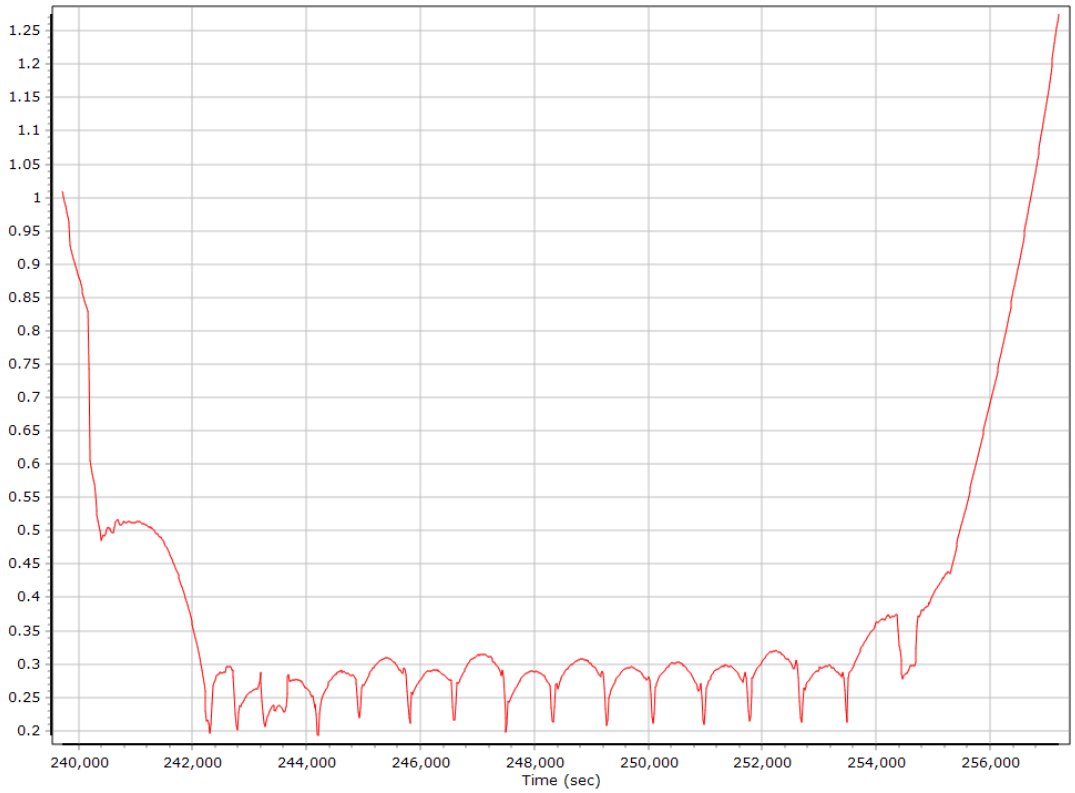
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

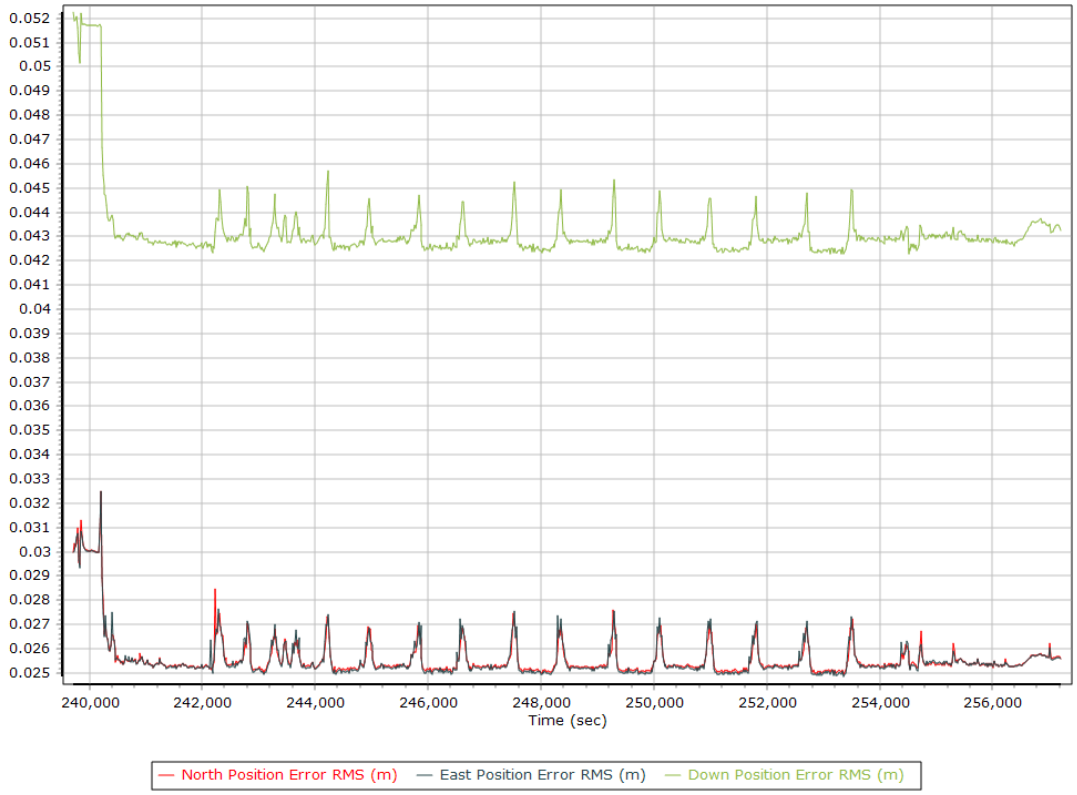


Heading Error RMS (arc-min)

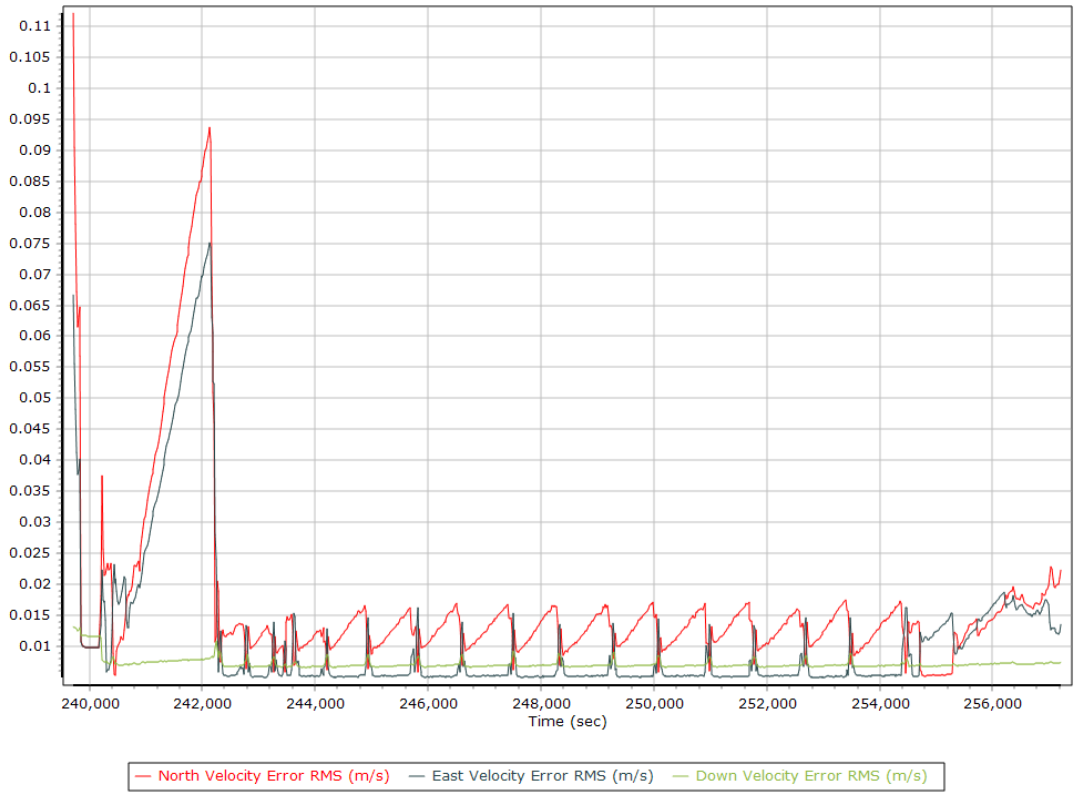


Forward Processed Performance Metrics

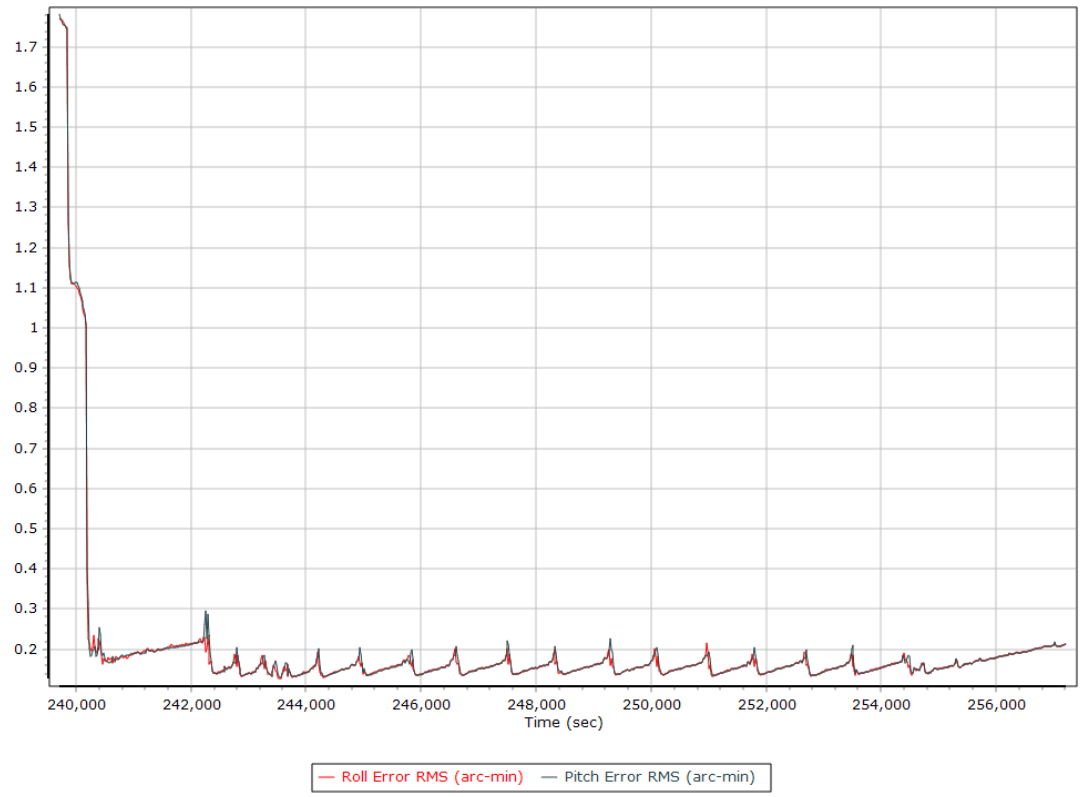
Position Error RMS (m)



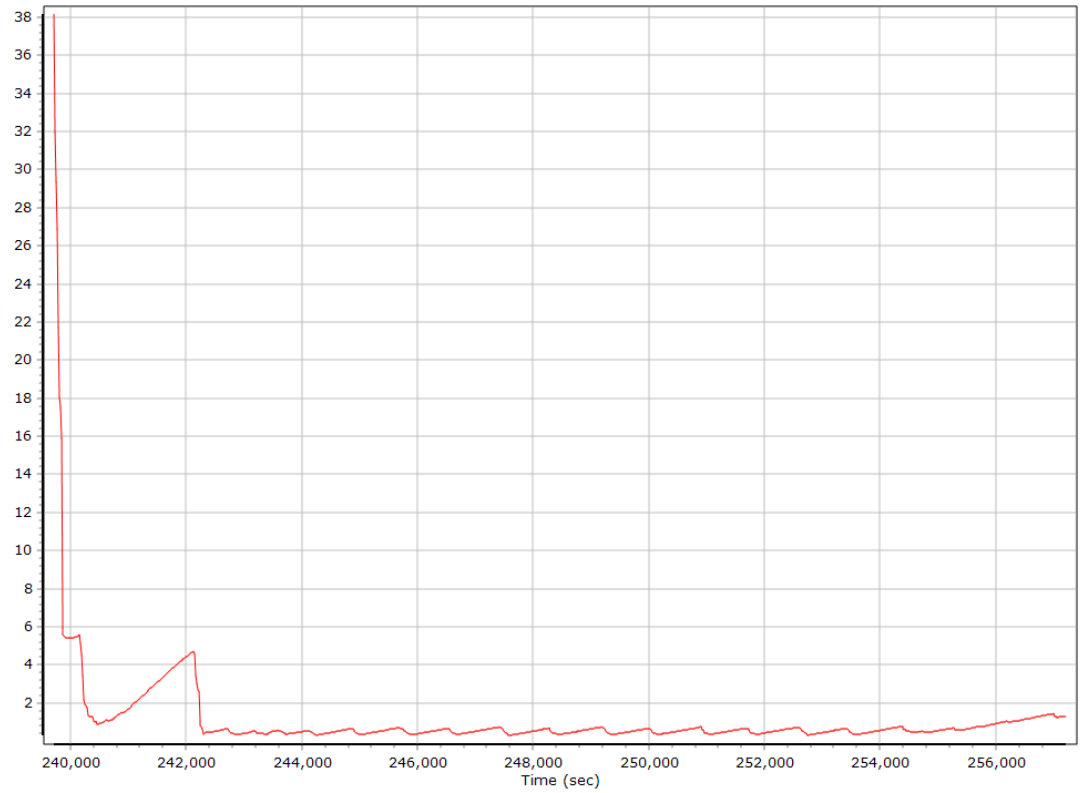
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

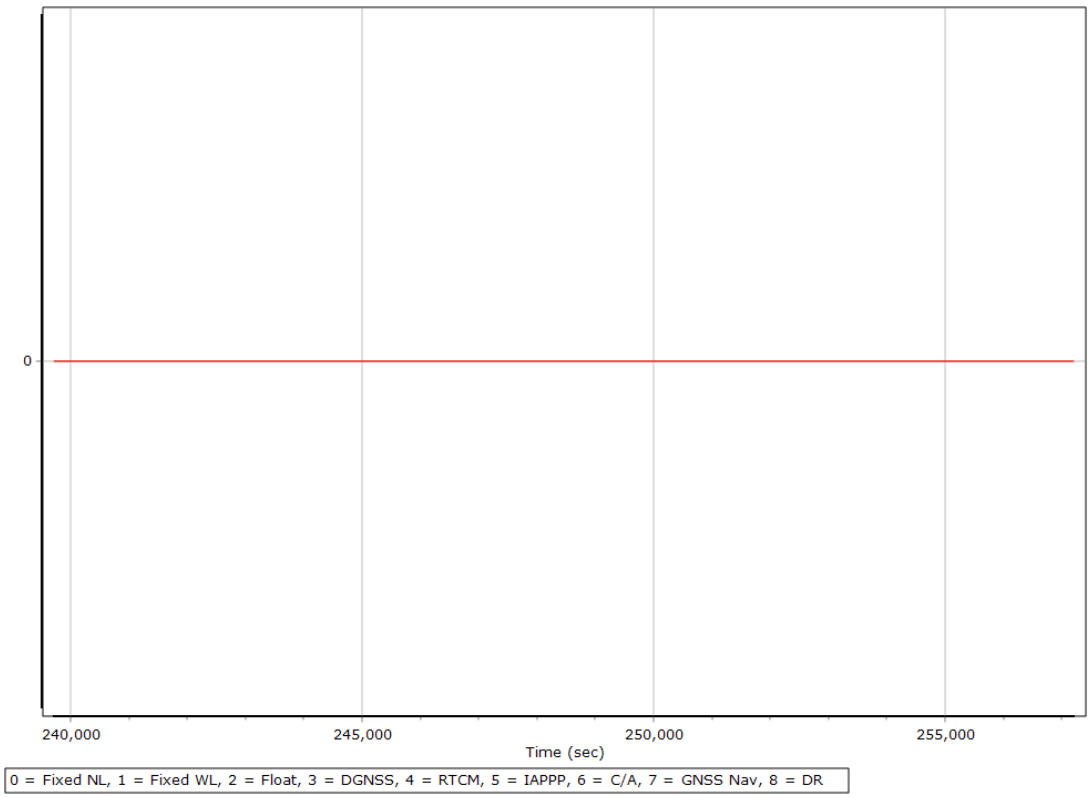


Heading Error RMS (arc-min)

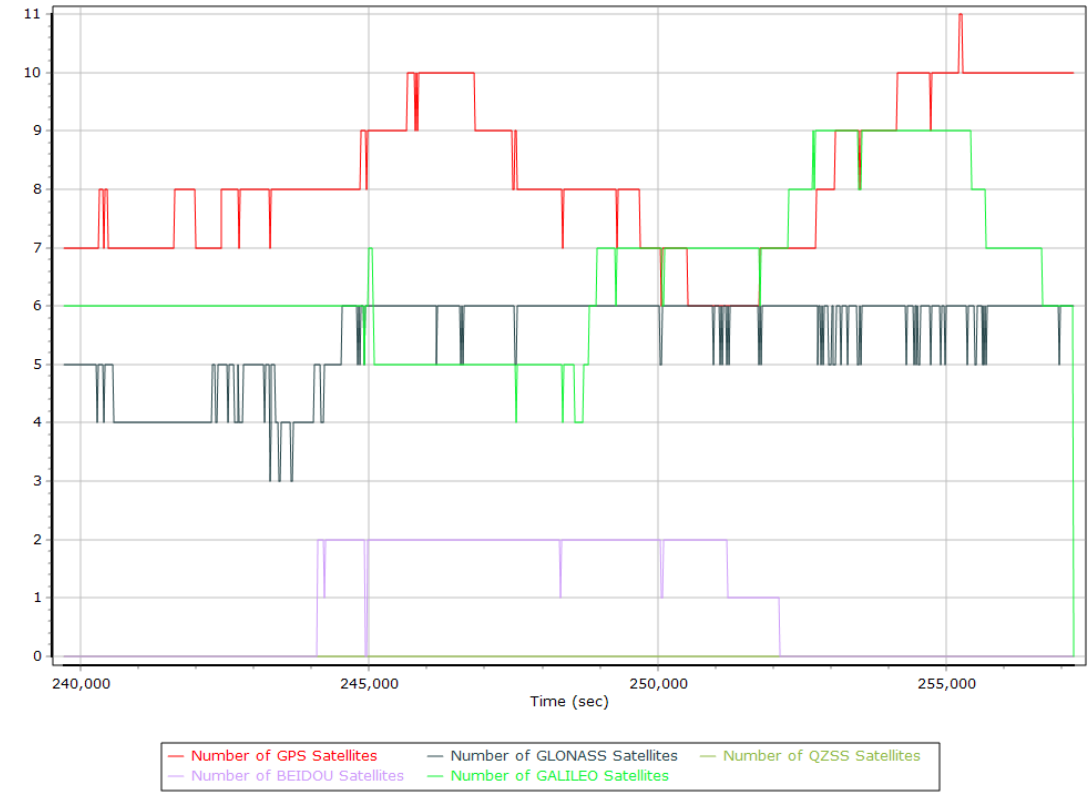


Forward Processed Solution Status

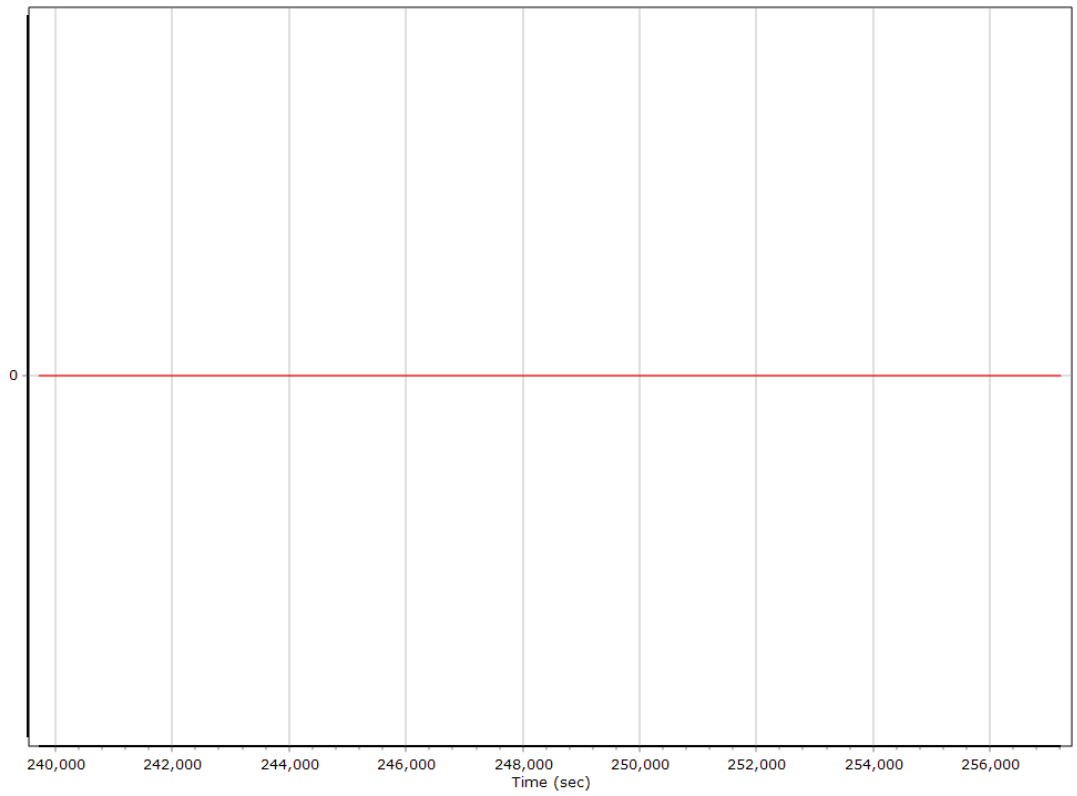
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01062021A_4040
Processing date	2022-01-05 15:28:53
Mission date	2021-01-06 15:01:24
Mission duration	05:10:40.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210106_150105_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0060.21g	GLONASS Broadcast Ephemeris
Ephm0060.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01062021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210106_150105_INS-GPS_1.raw		
Last raw data file	210106_150105_INS-GPS_1.raw		
Start GPS week	2139		
Start time	313265.148 (1/6/2021 3:01:05 PM)		
End time	331898.411 (1/6/2021 8:11:38 PM)		
Start of fine alignment	313482.487 (1/6/2021 3:04:42 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

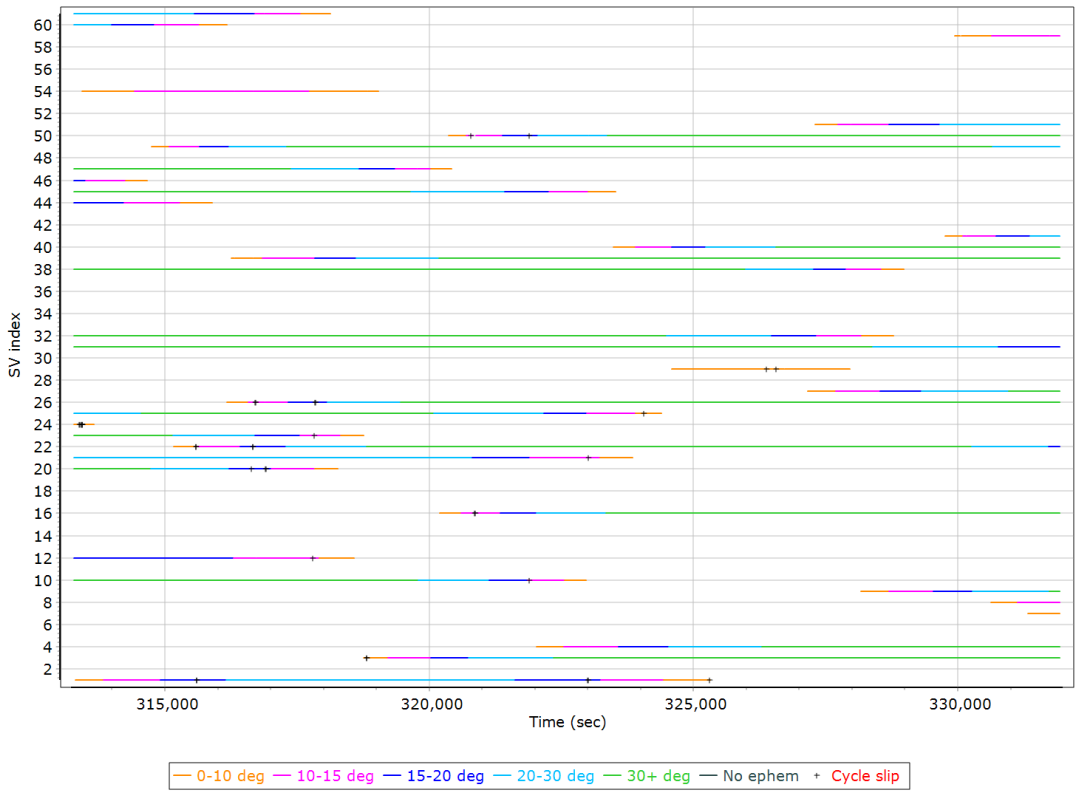
Rover Data QC

Raw IMU Import QC Summary

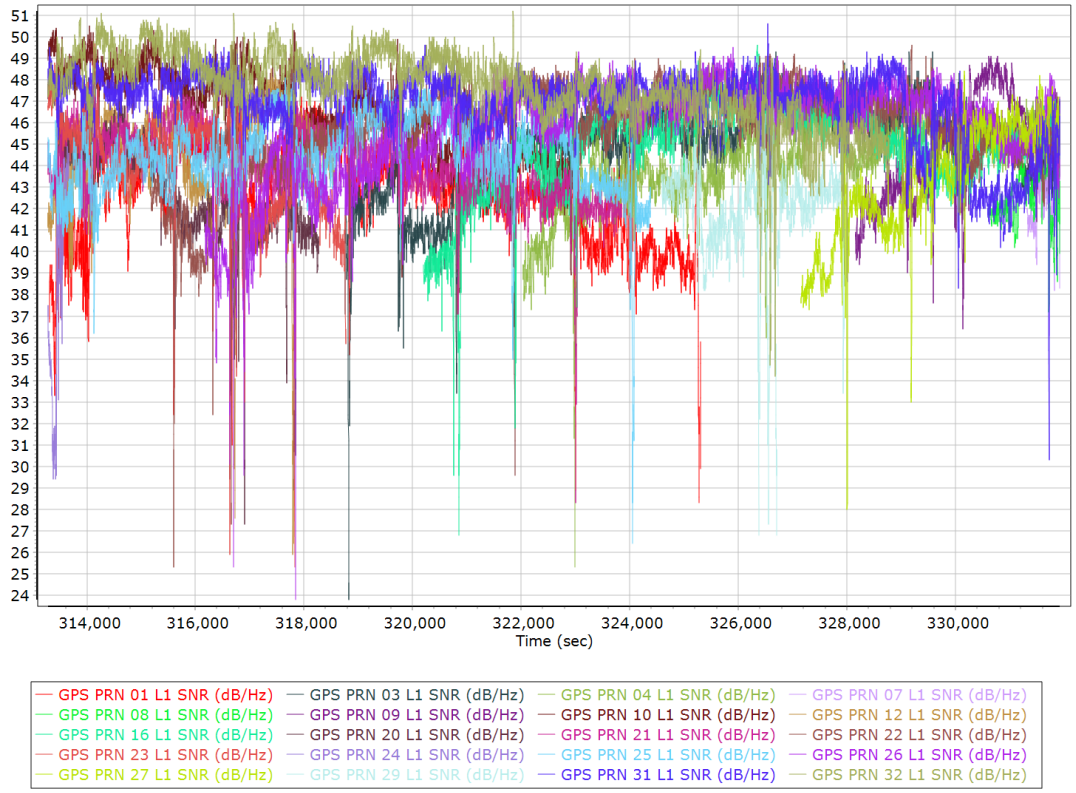
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01062021A_4040.log
IMU Records Processed	3727630
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

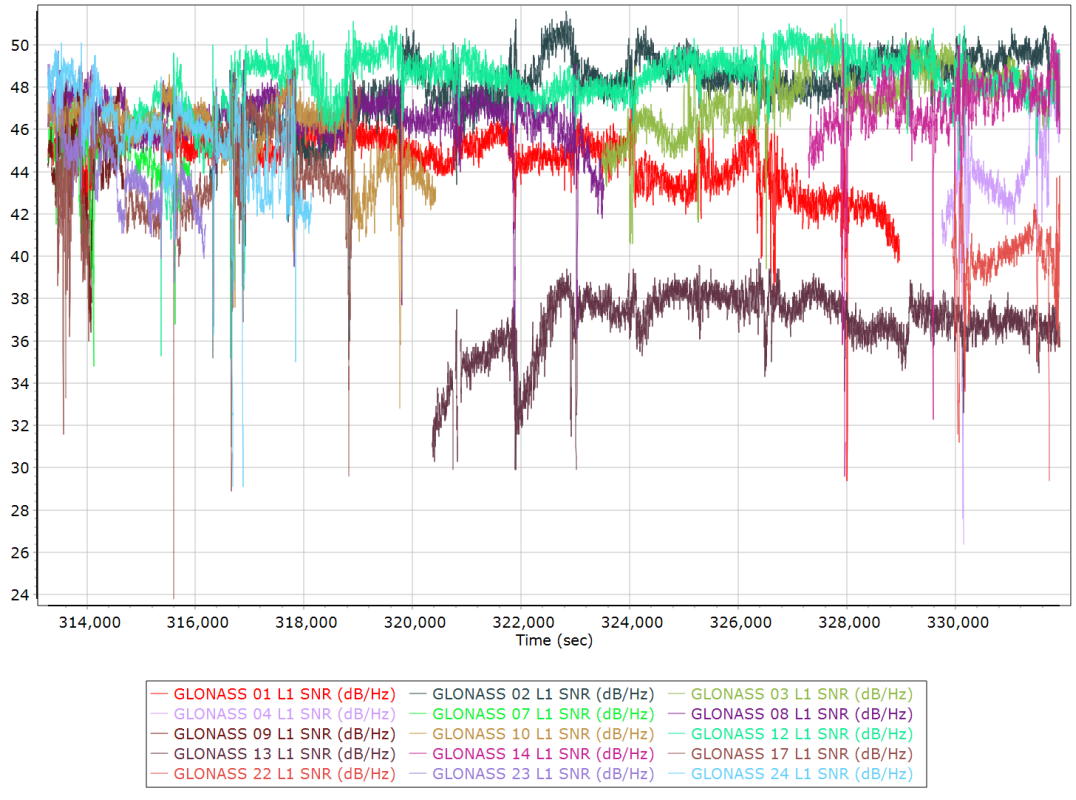
GPS/GLONASS L1 Satellite Lock/Elevation



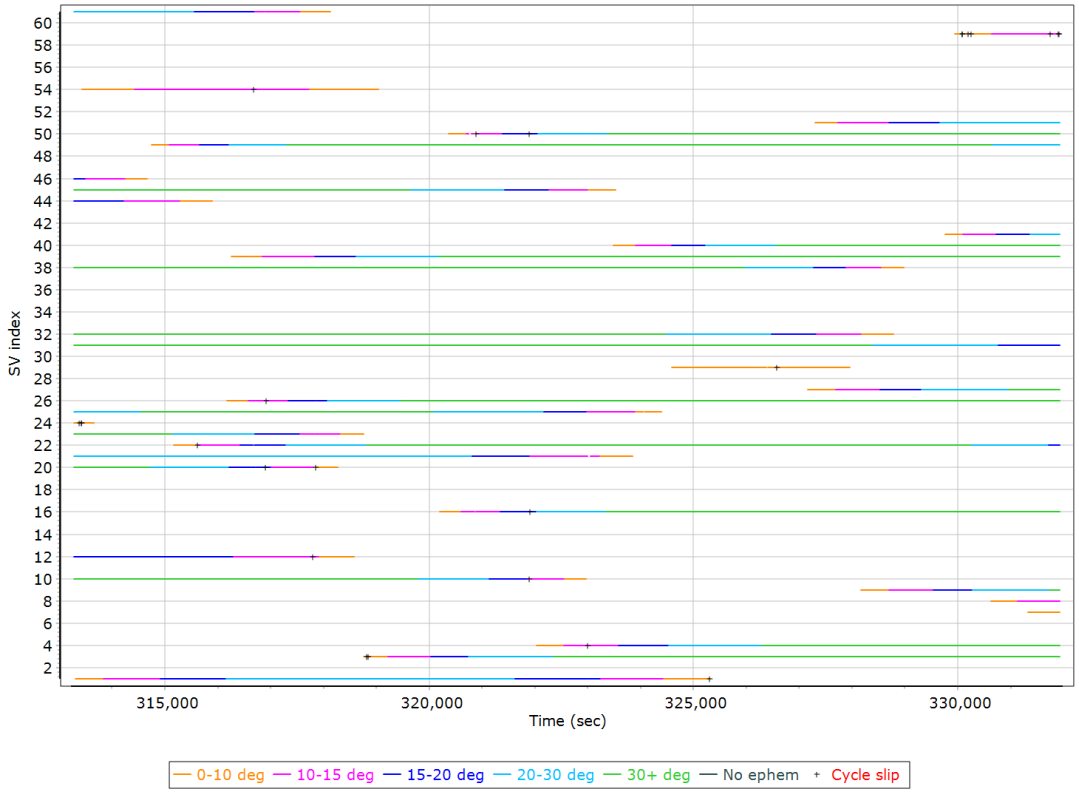
GPS L1 SNR



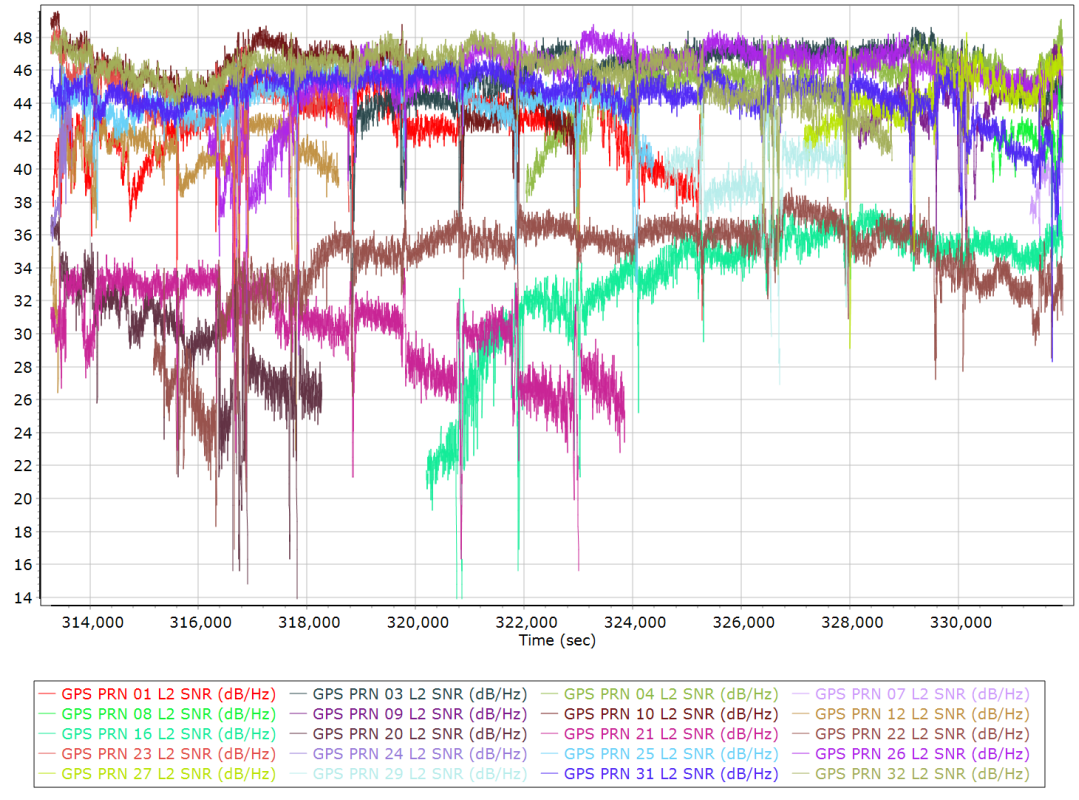
GLONASS L1 SNR



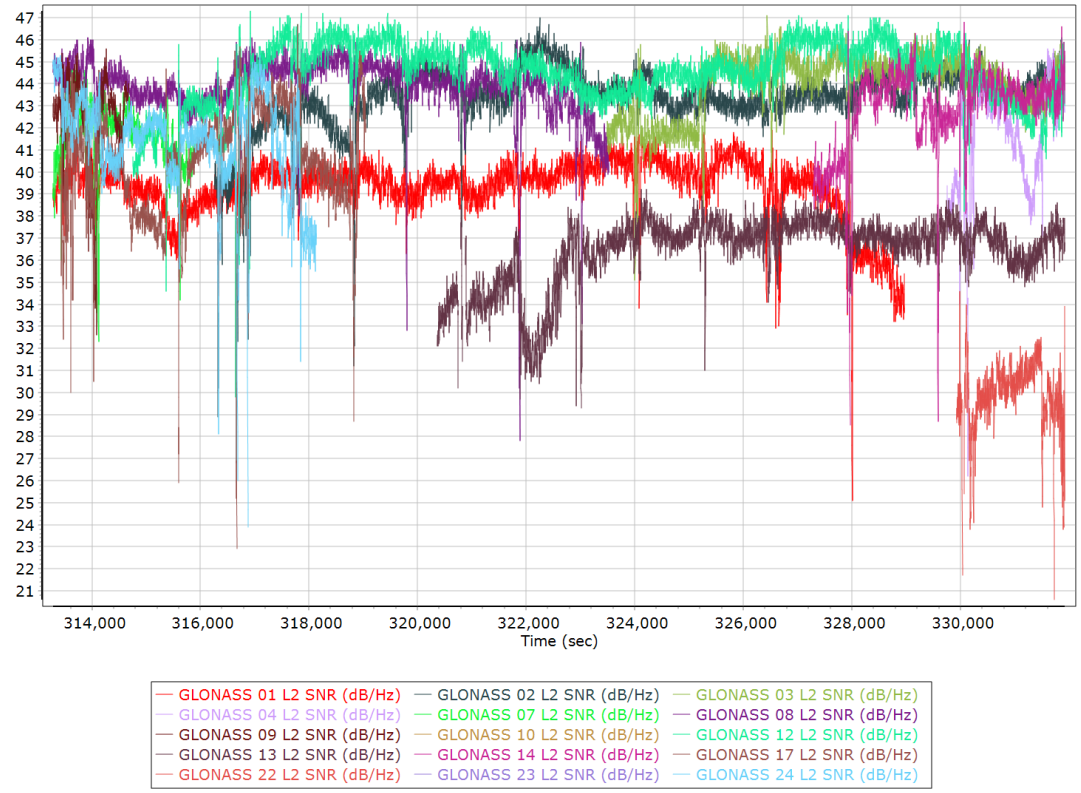
GPS/GLONASS L2 Satellite Lock/Elevation



GPS L2 SNR



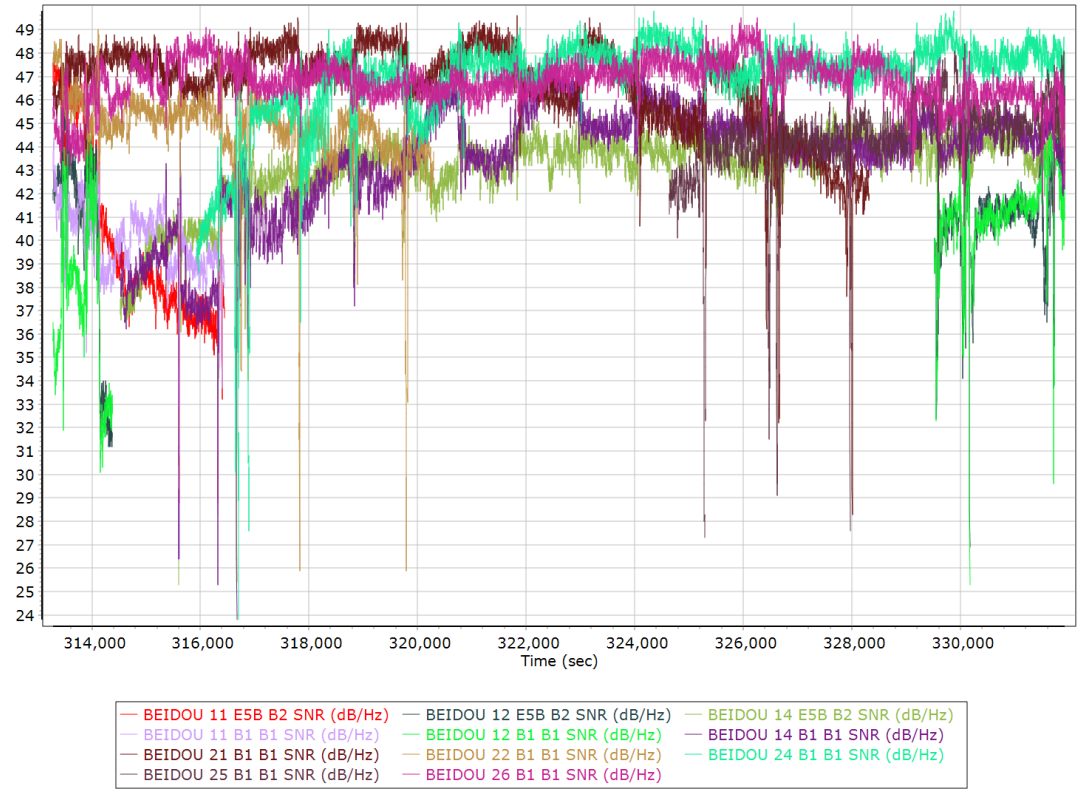
GLONASS L2 SNR



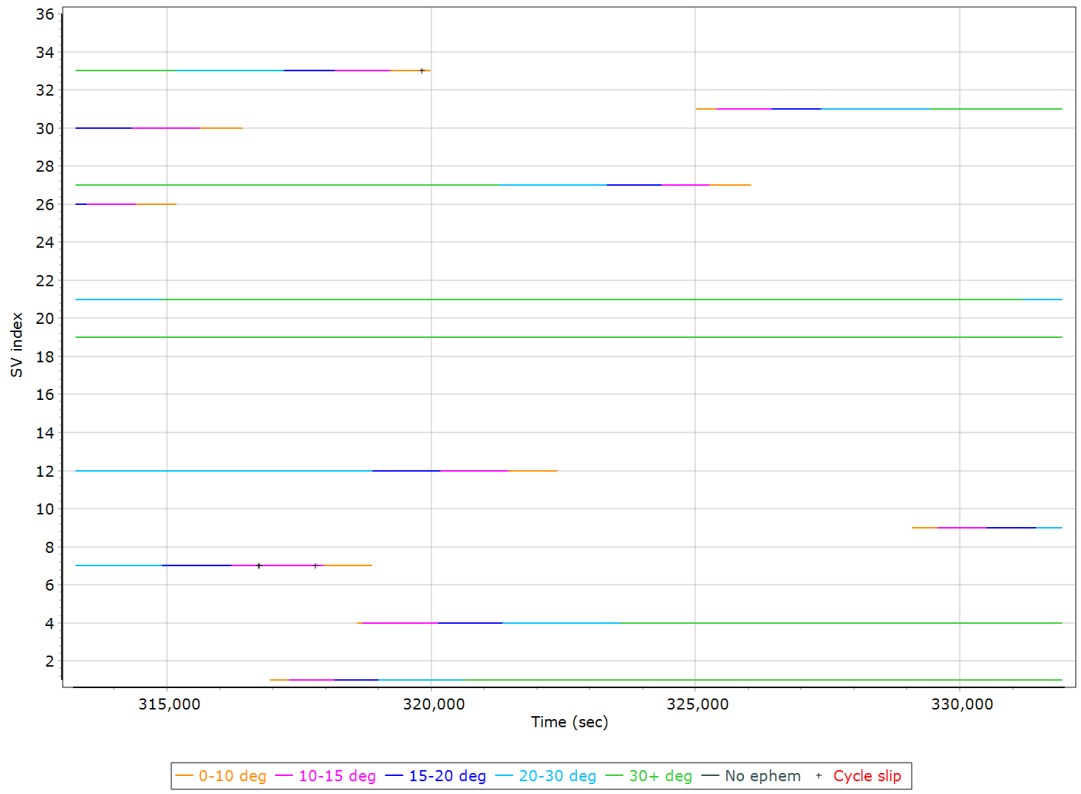
BEIDOU Satellite Lock/Elevation



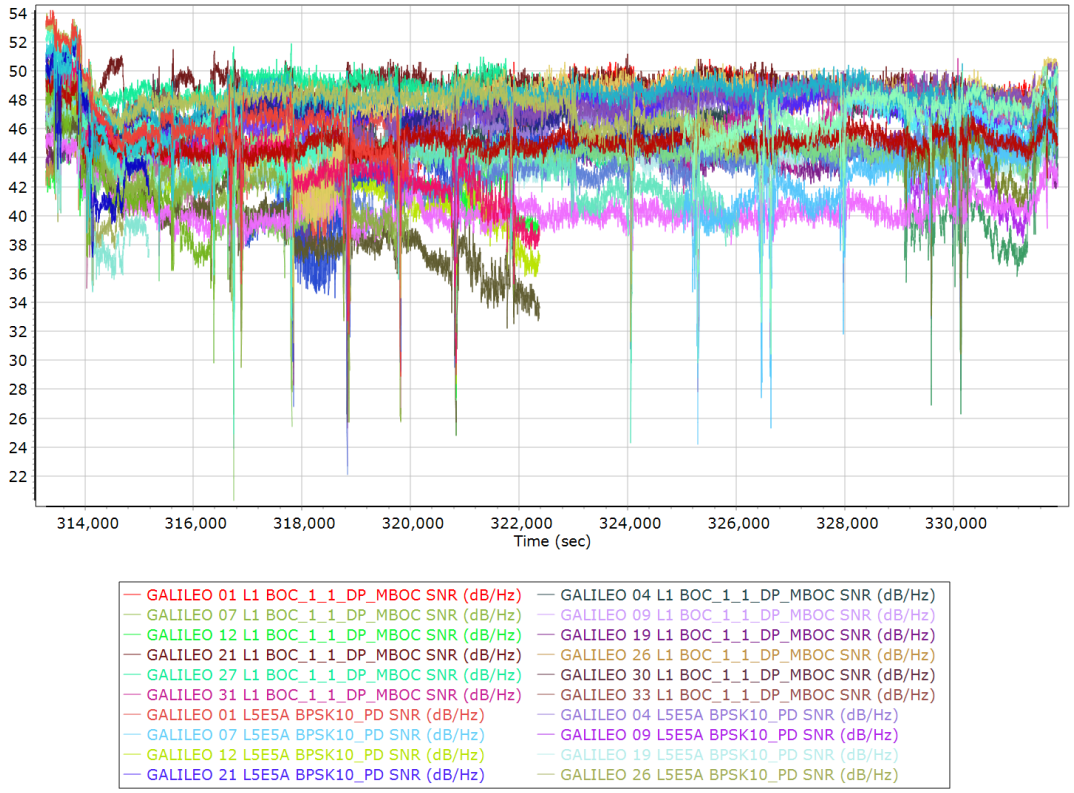
BEIDOU SNR



GALILEO Satellite Lock/Elevation

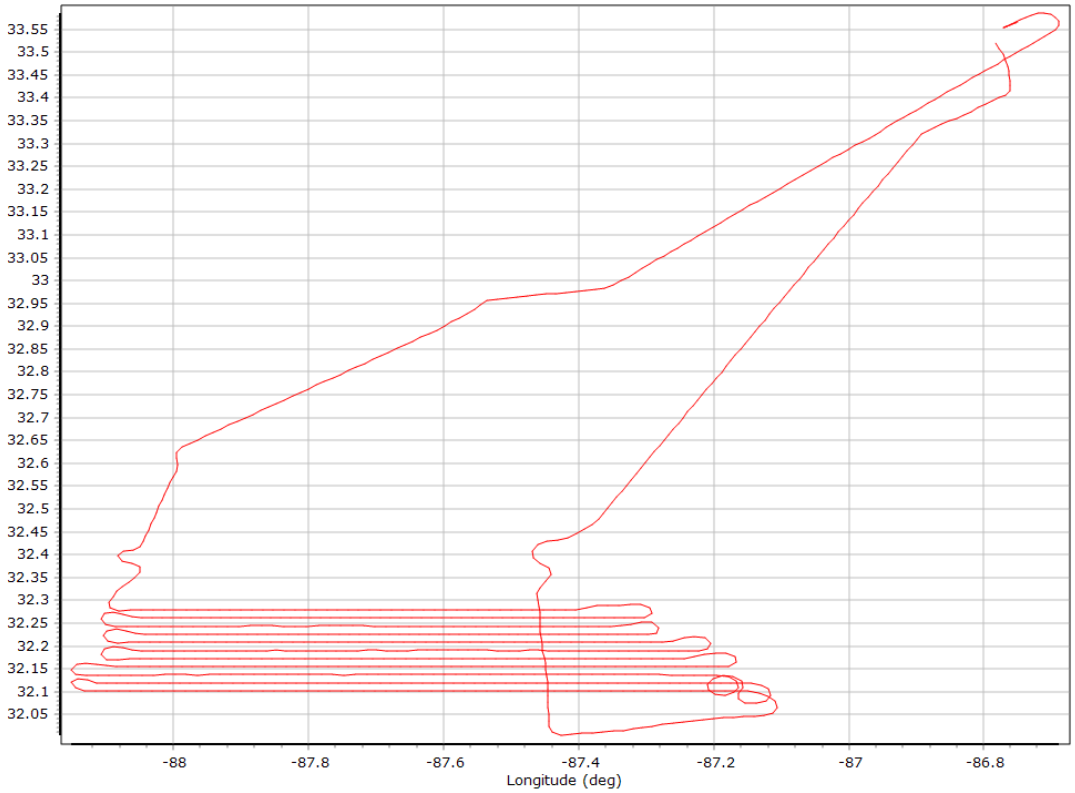


GALILEO SNR


54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
314,000
316,000
318,000
320,000
322,000
324,000
326,000
328,000
330,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

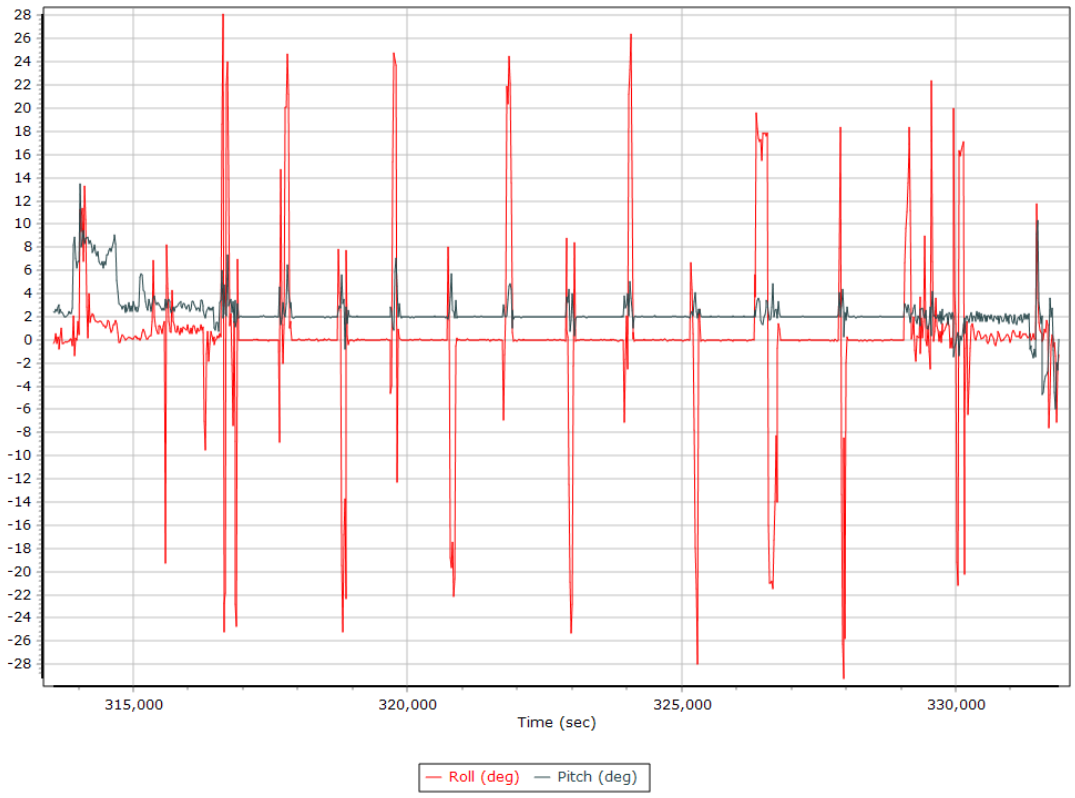
Top View



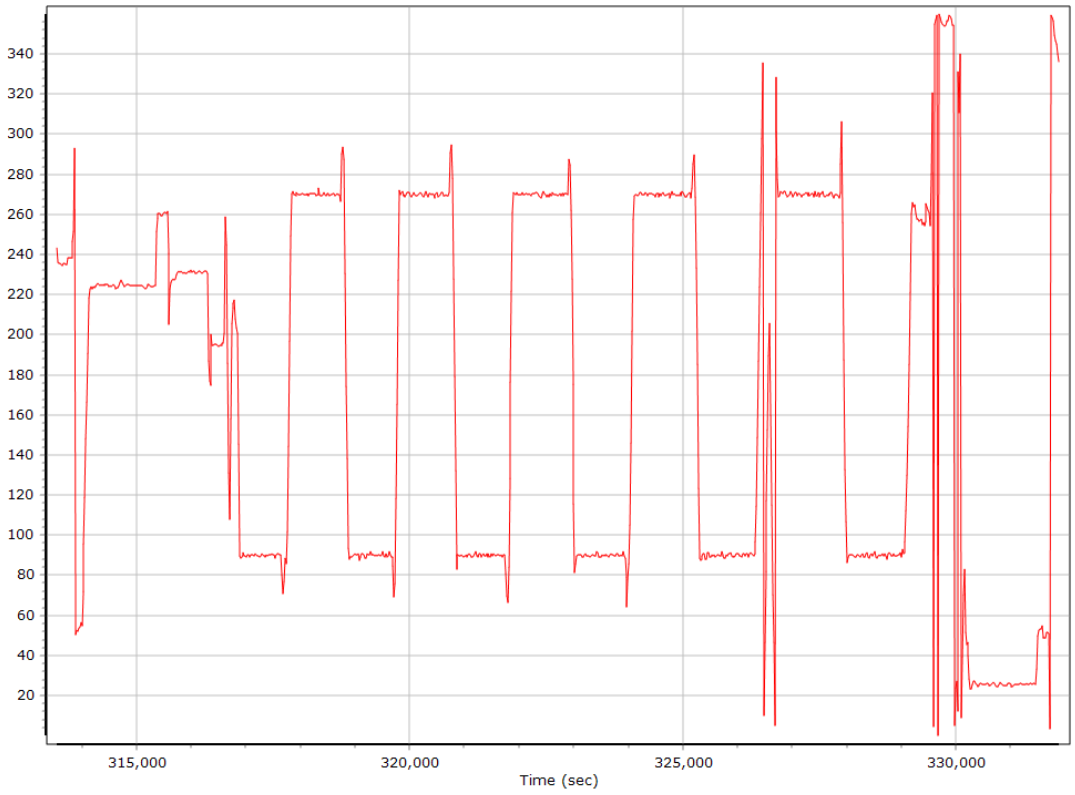
Altitude



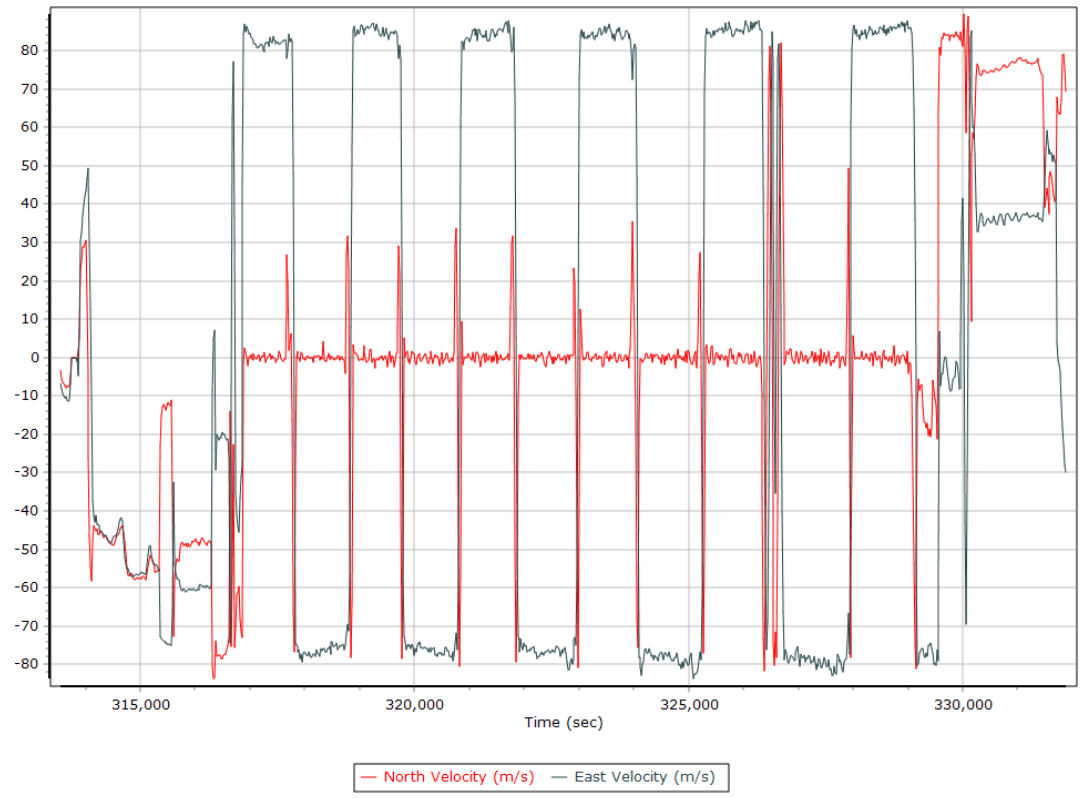
Roll/Pitch



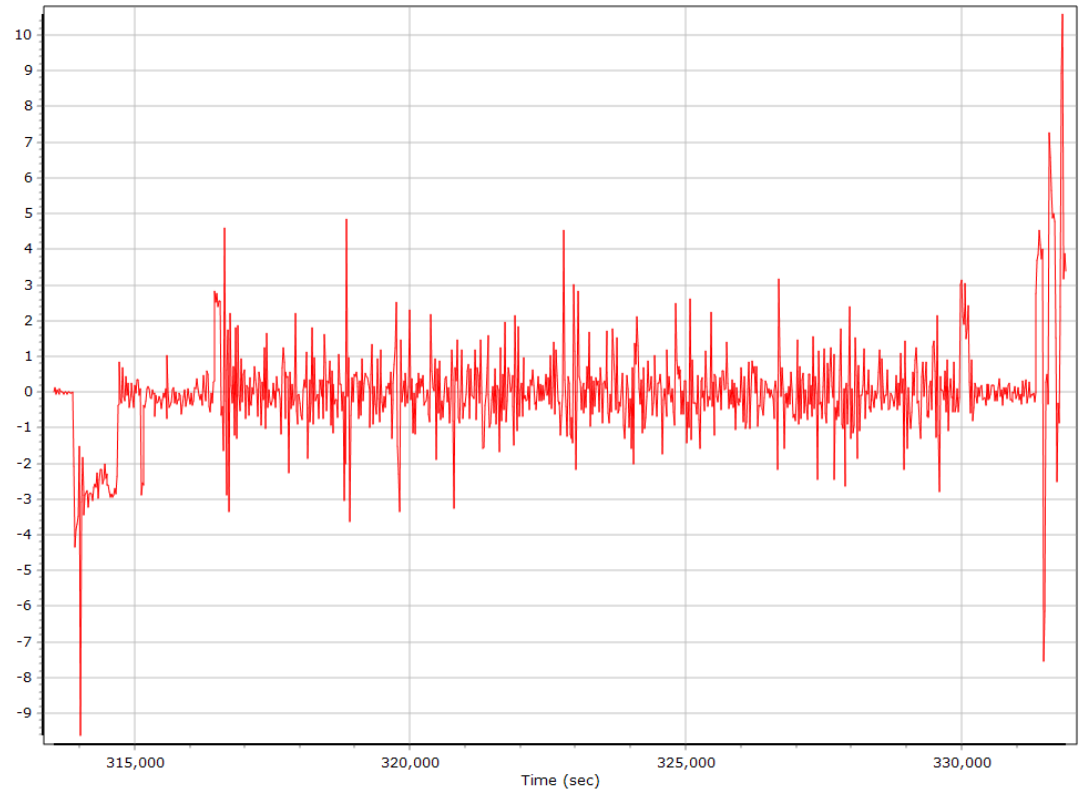
Heading



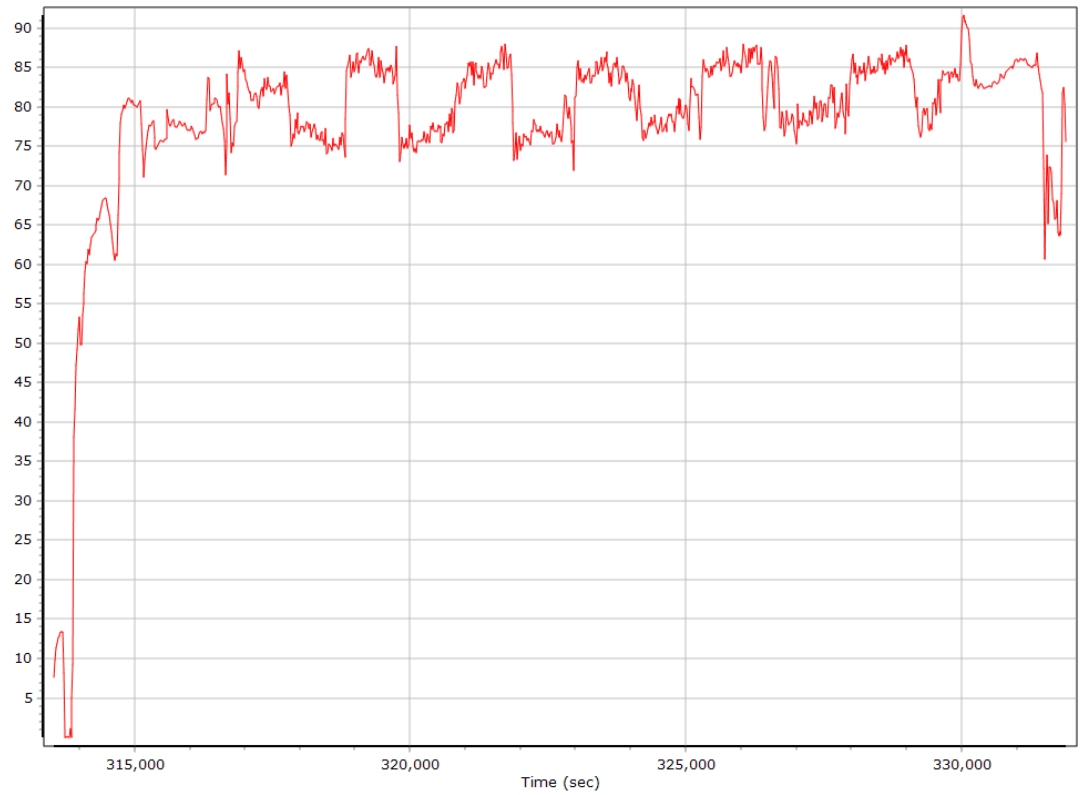
North/East Velocity



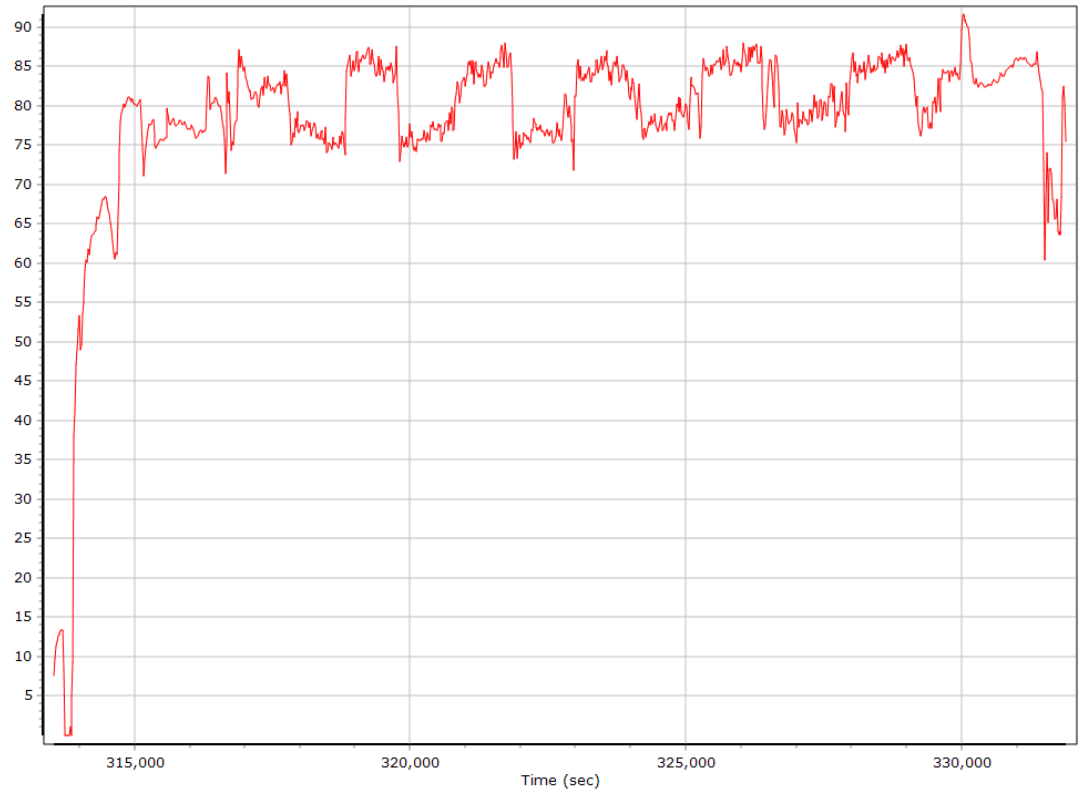
Down Velocity



Total Speed



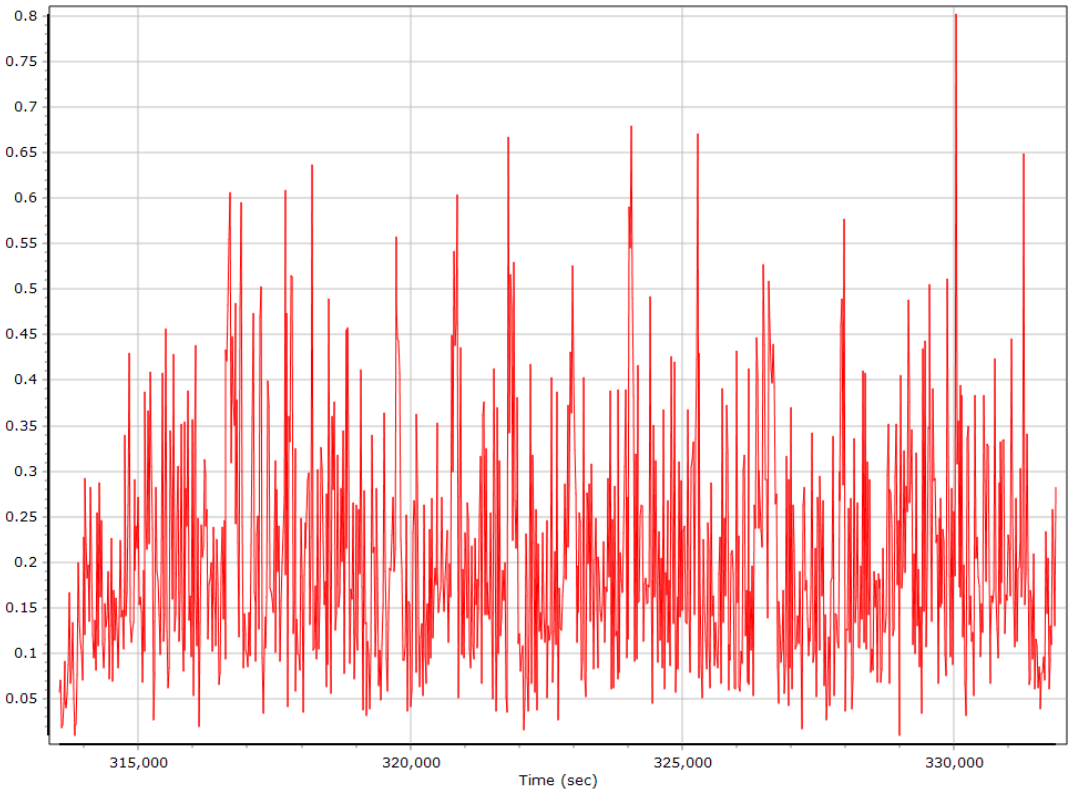
Ground Speed



Body Acceleration



Total Body Acceleration

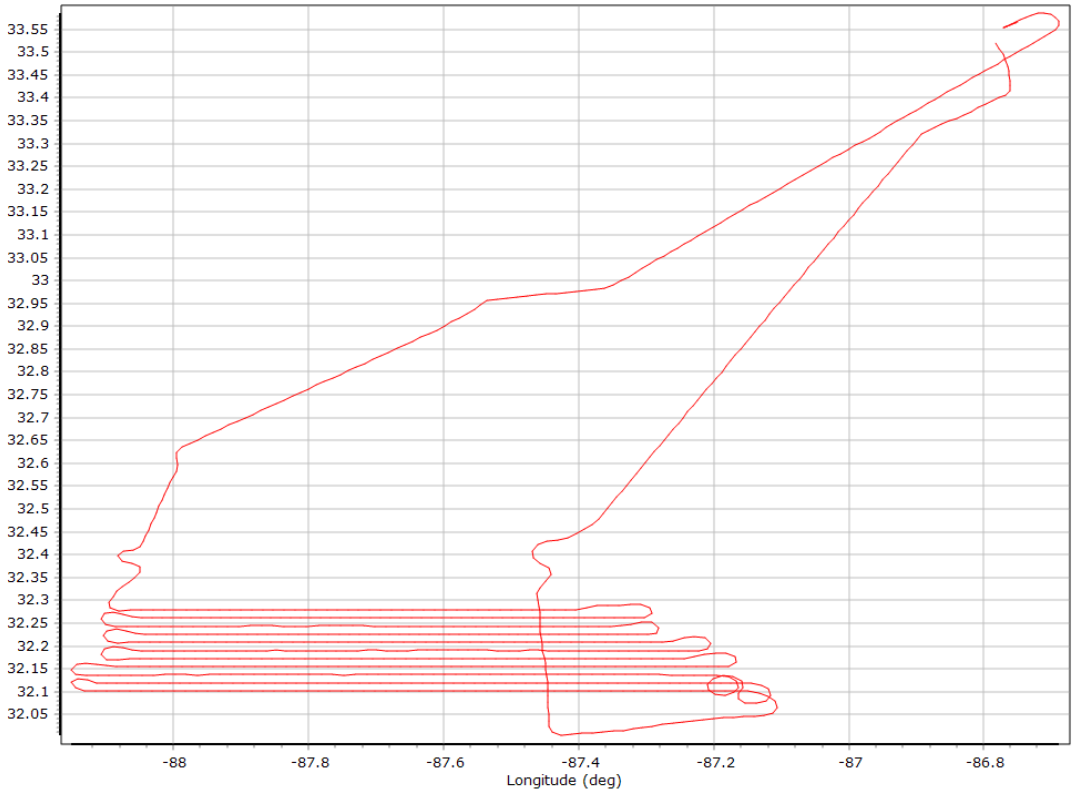


Body Angular Rate



Forward Processed Trajectory Information

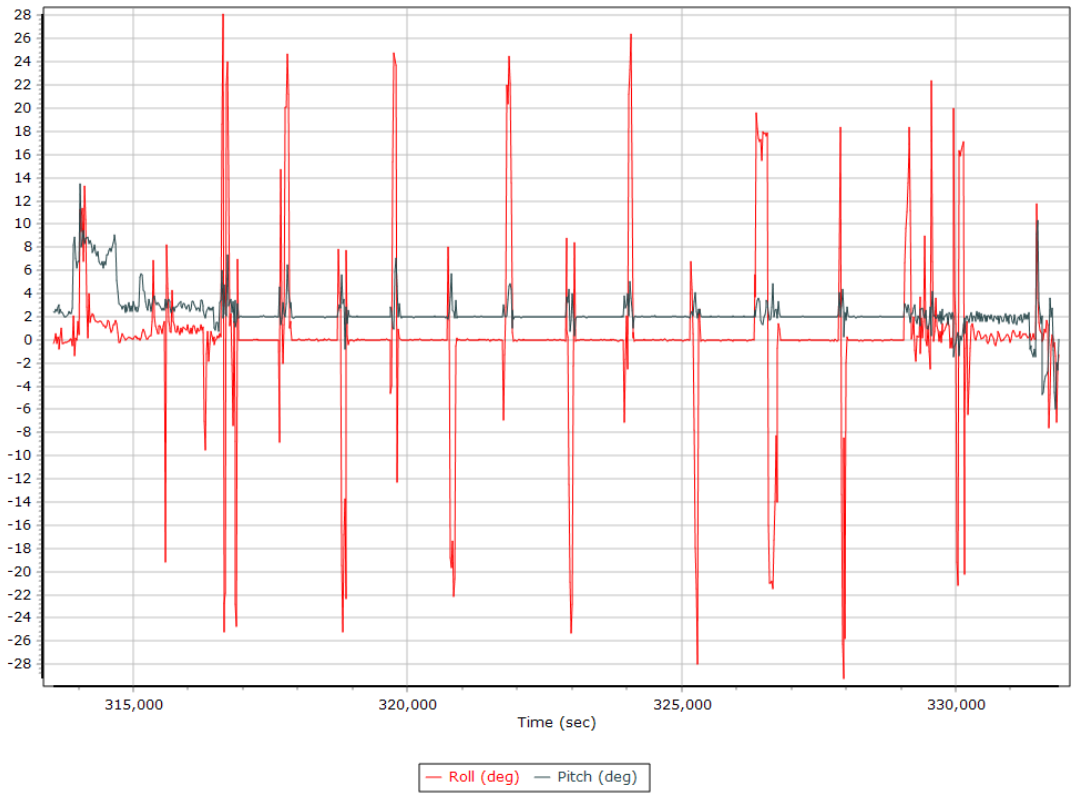
Top View



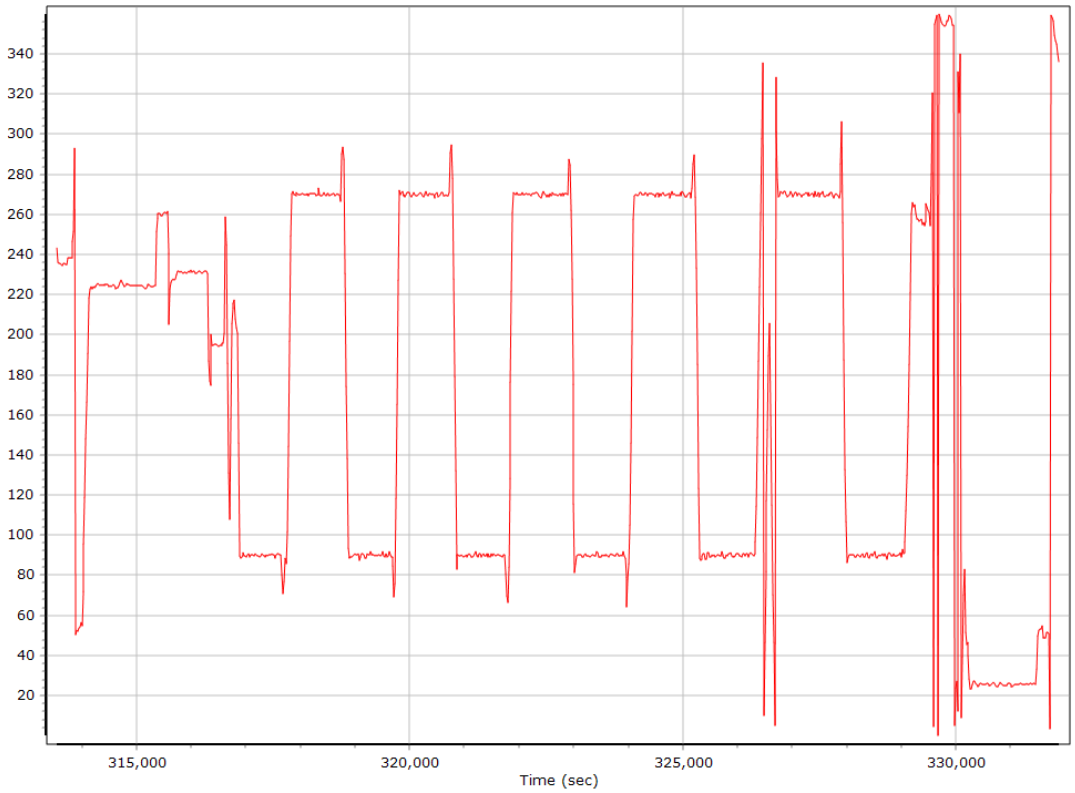
Altitude



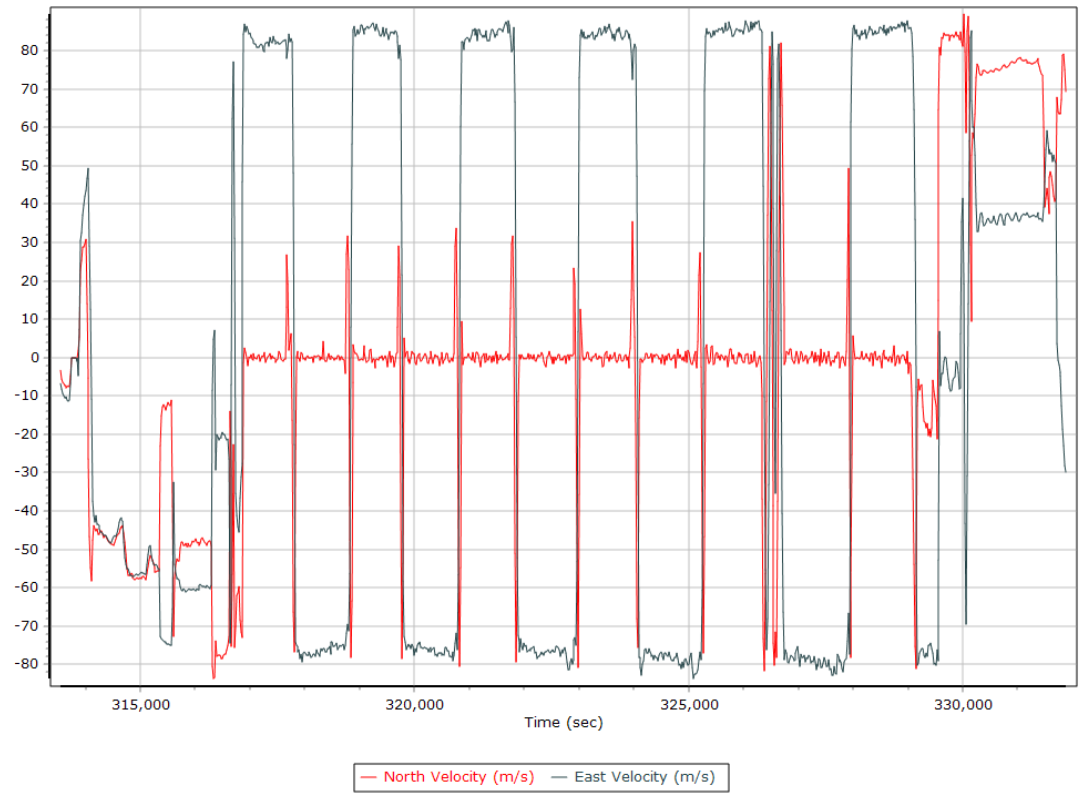
Roll/Pitch



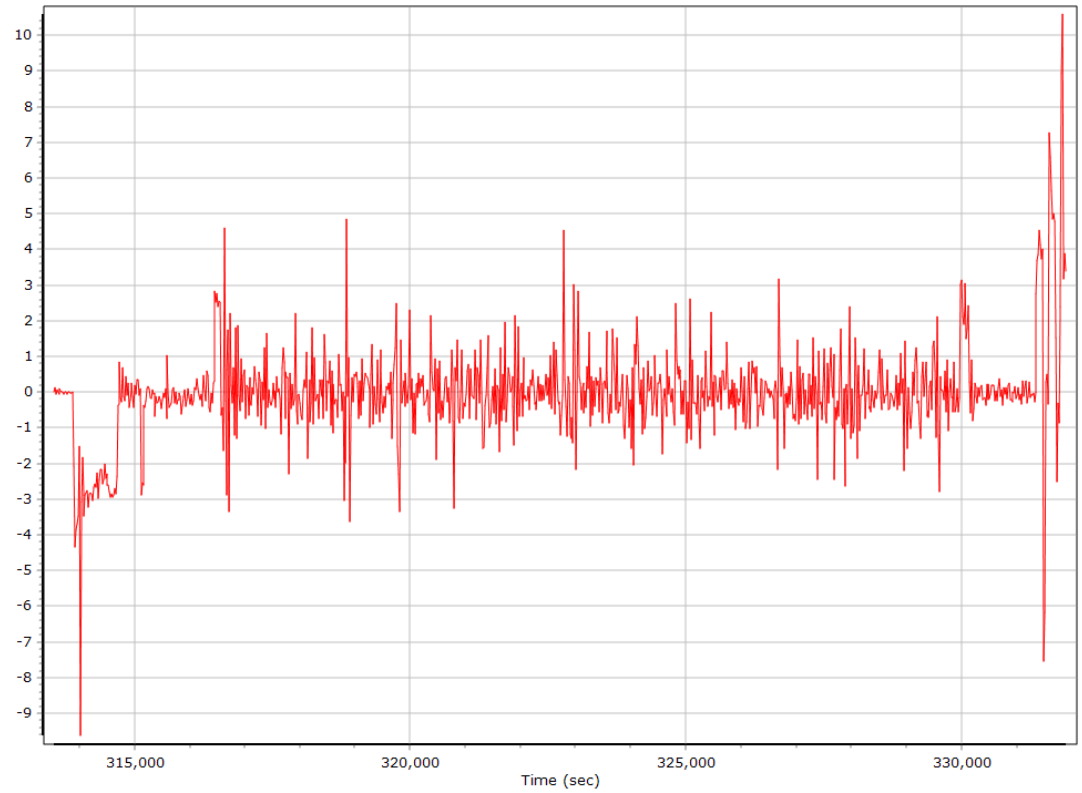
Heading



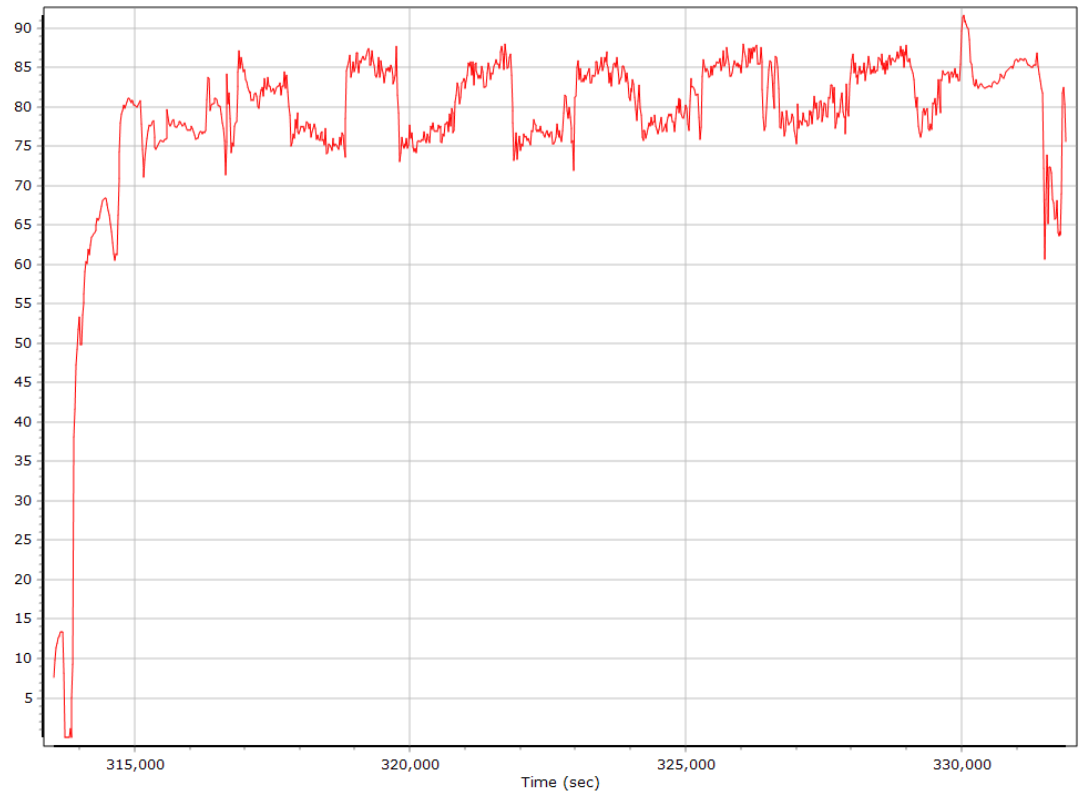
North/East Velocity



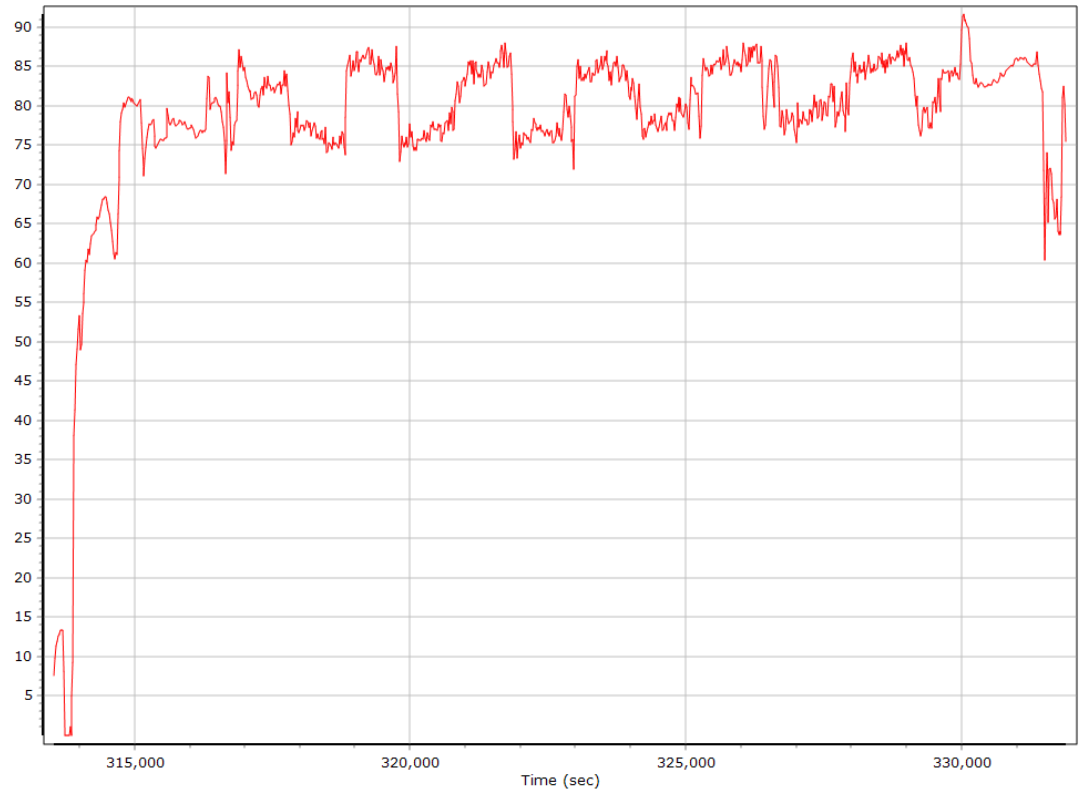
Down Velocity



Total Speed



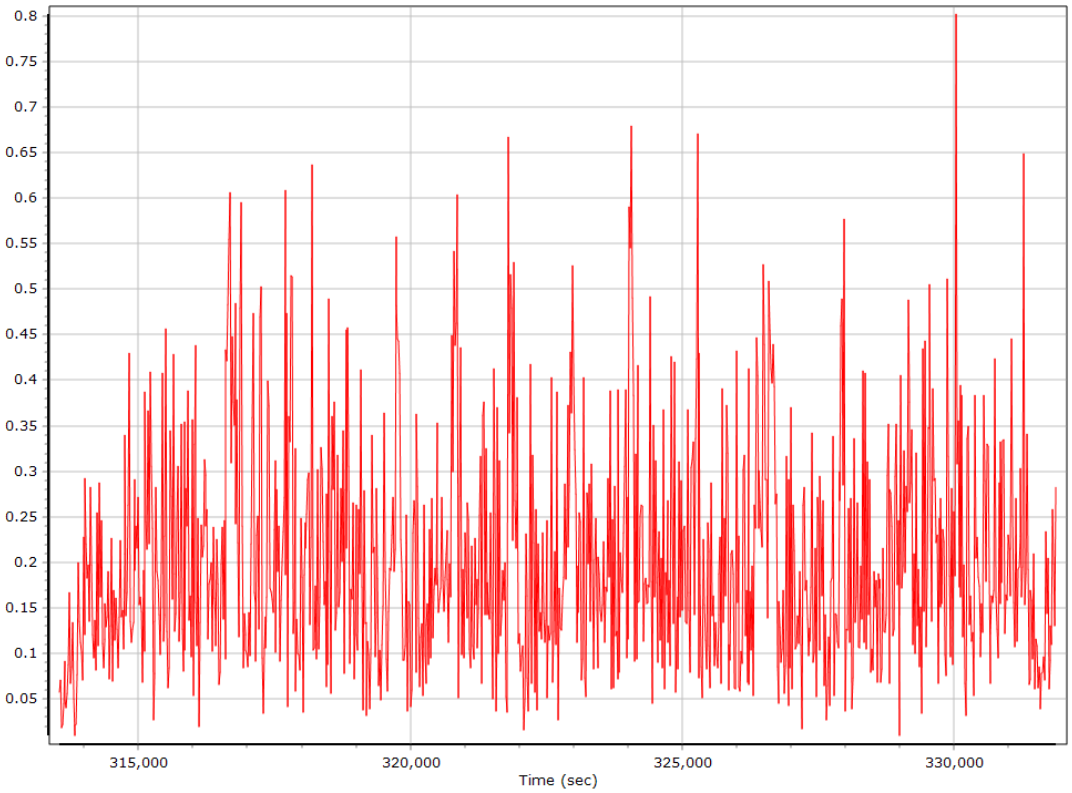
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

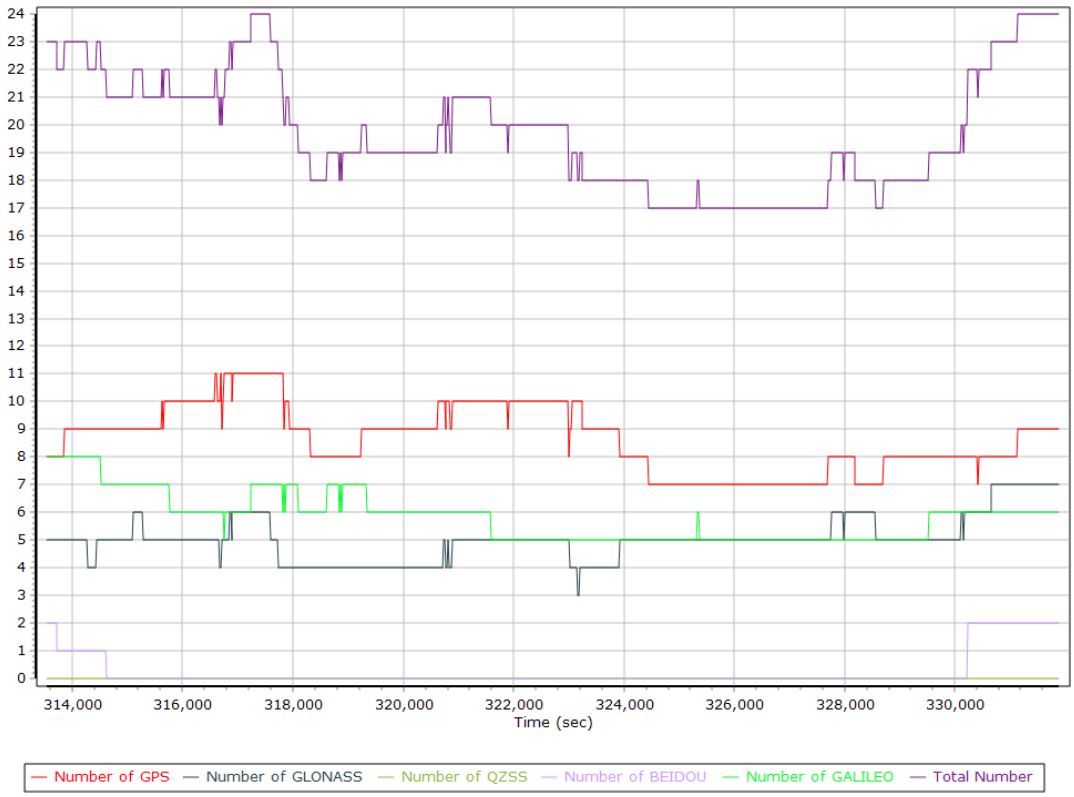


GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	7	11	9
Number of GLONASS SV	3	7	5
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	2	0
Number of GALILEO SV	5	8	6
Total number of SV	16	24	20
PDOP	1.00	1.51	1.24
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	18597.00	0.00	0.00
Percentage	100.00	0.00	0.00

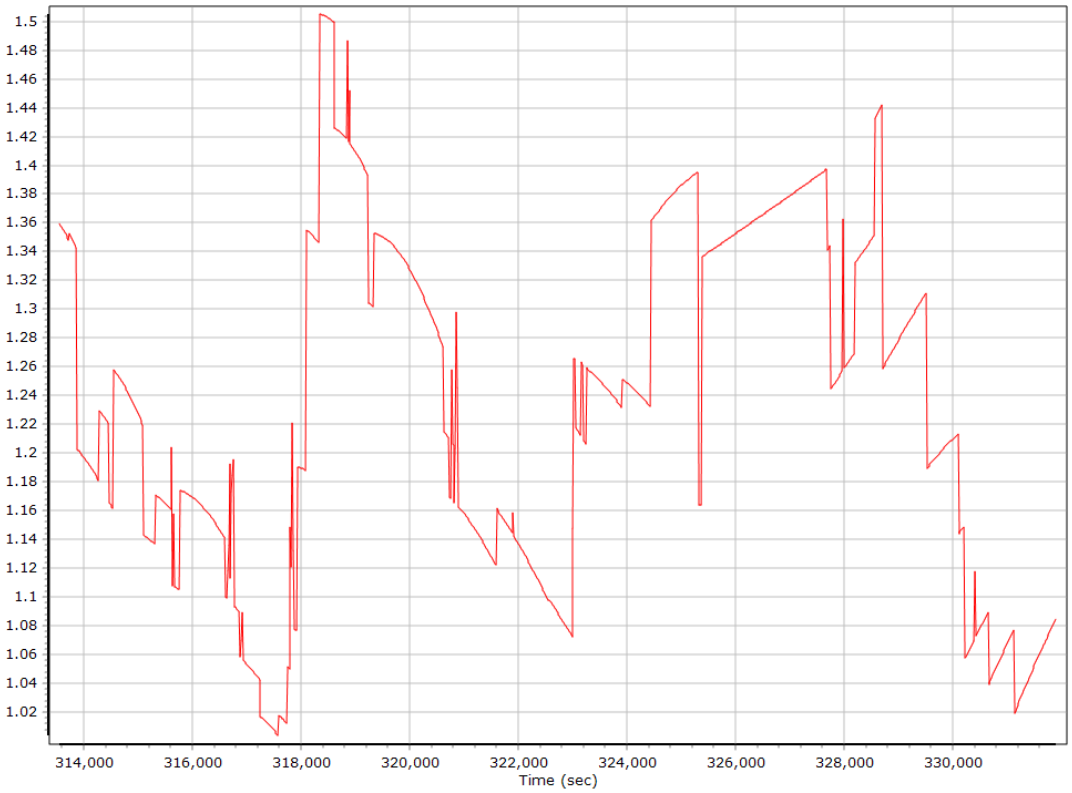
Num SVs in solution



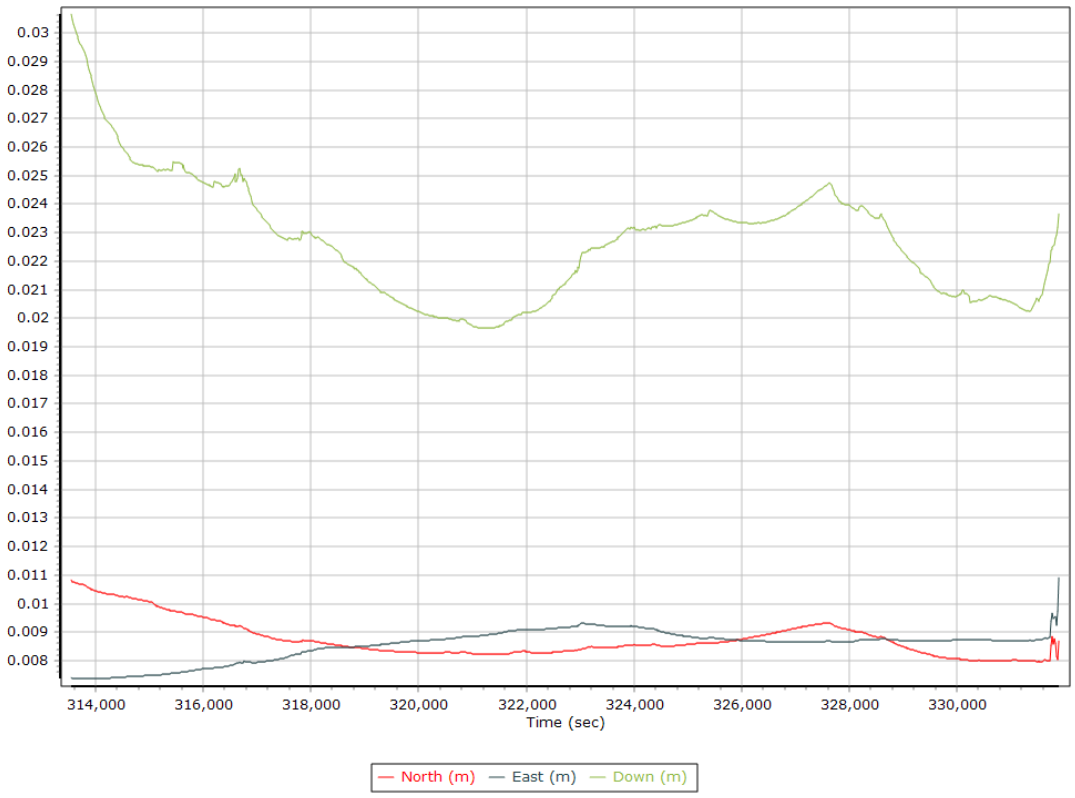
Forward/Reverse Separation



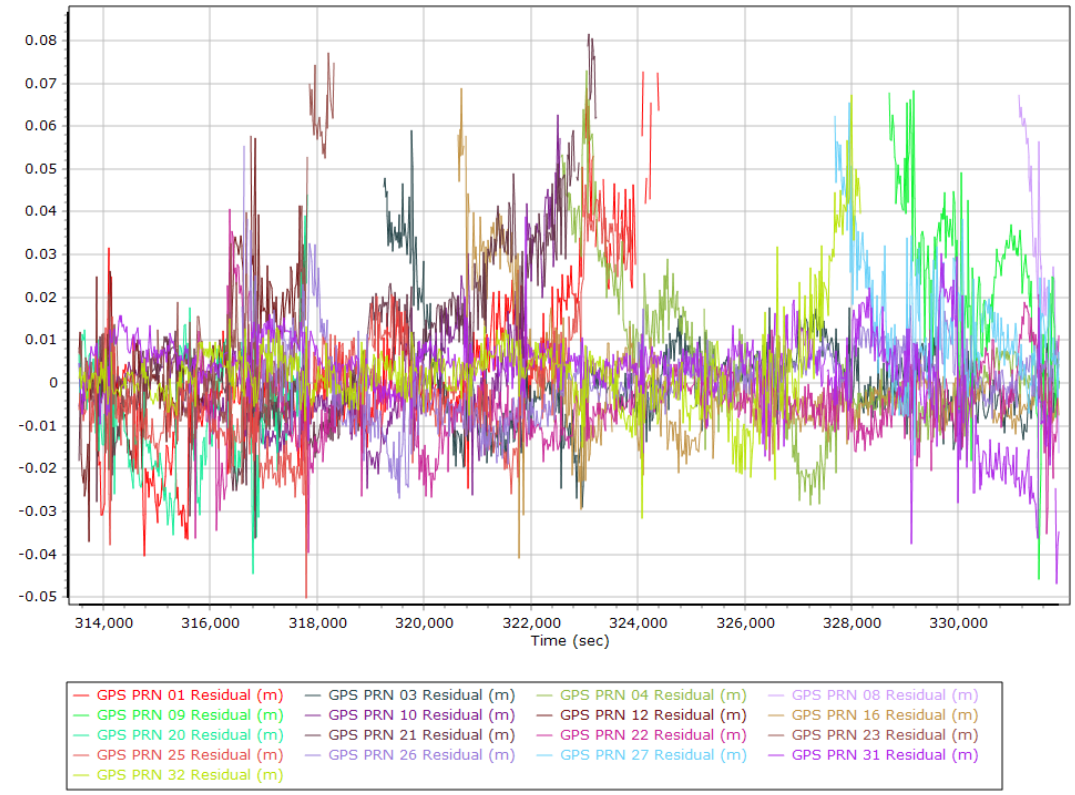
PDOP



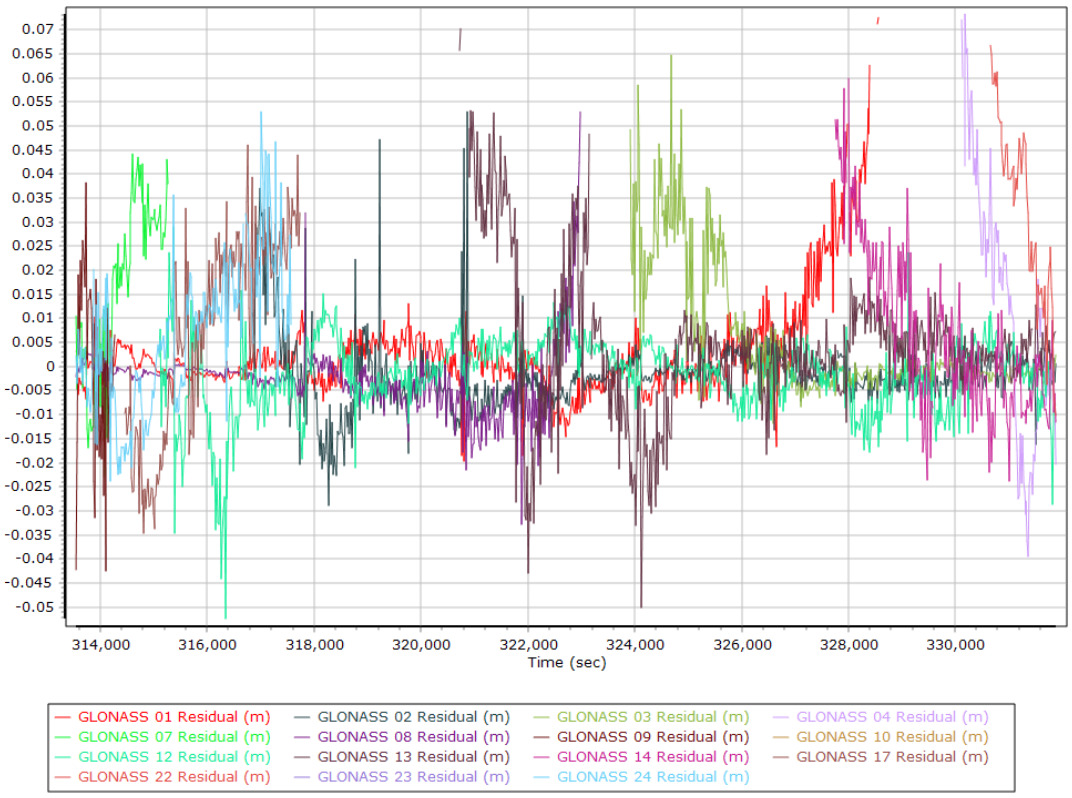
Estimated Position Accuracy



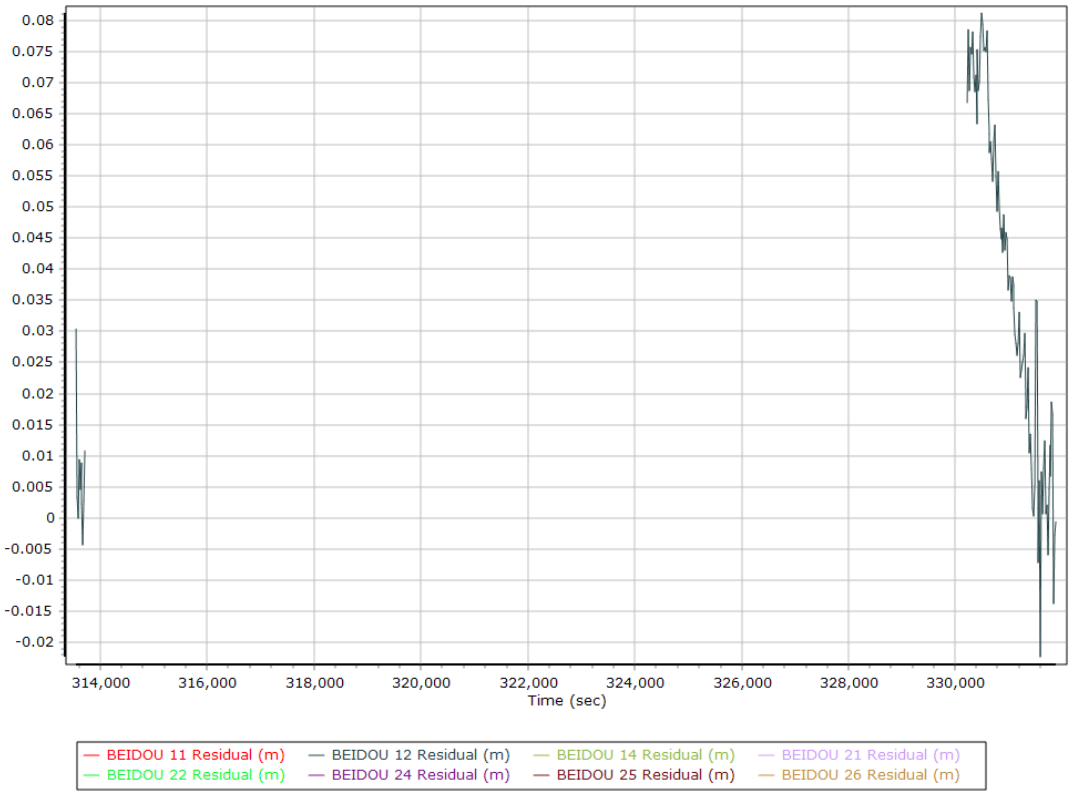
GPS Residuals



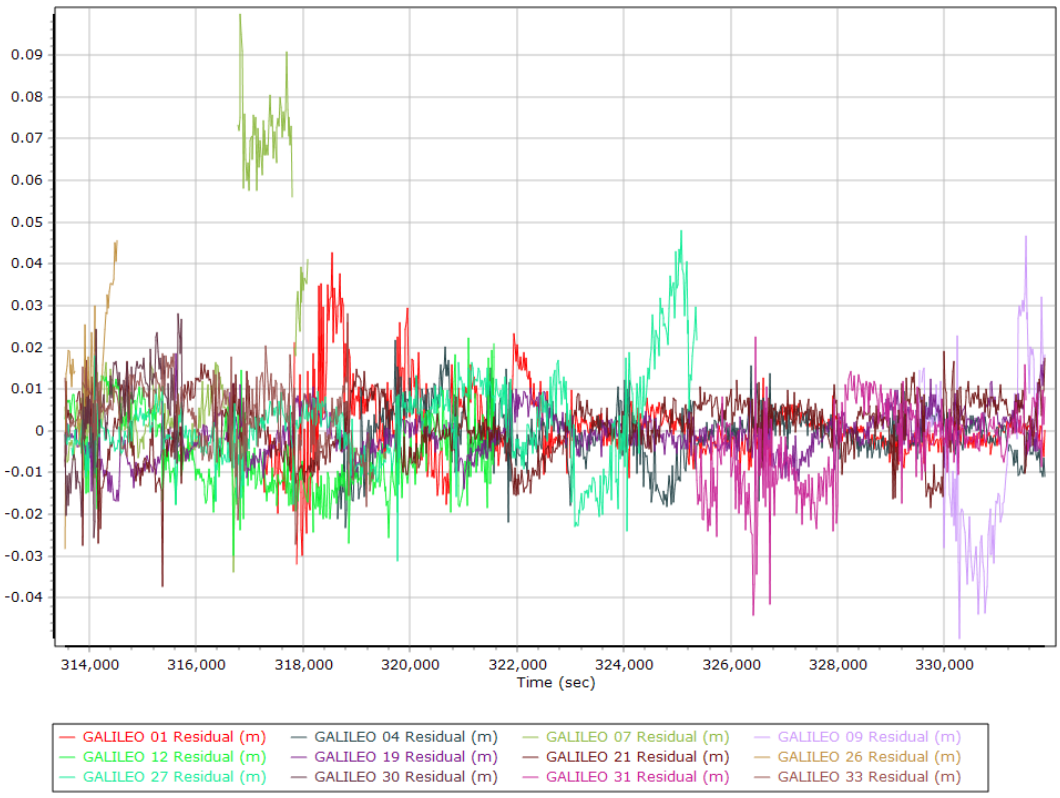
GLONASS Residuals



BEIDOU Residuals



GALILEO Residuals



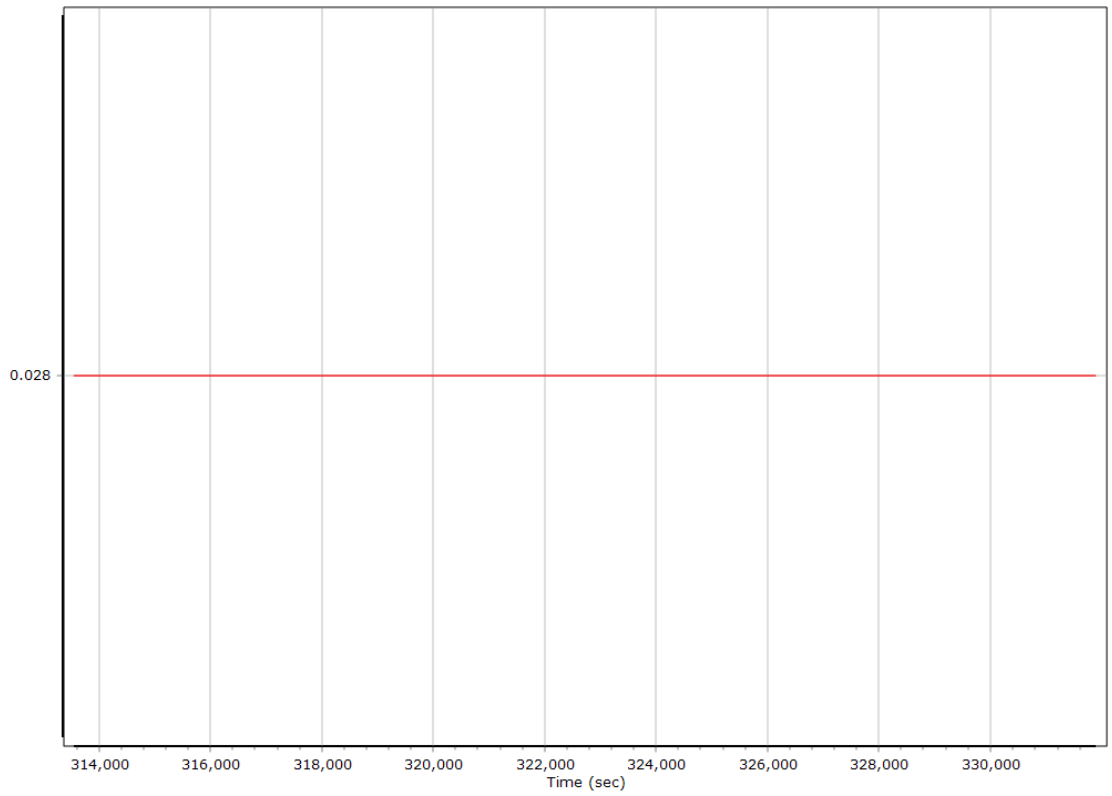
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	313266.000 (1/6/2021 3:01:06 PM)		
Processing end time	331906.000 (1/6/2021 8:11:46 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.028	0.016	-1.310
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

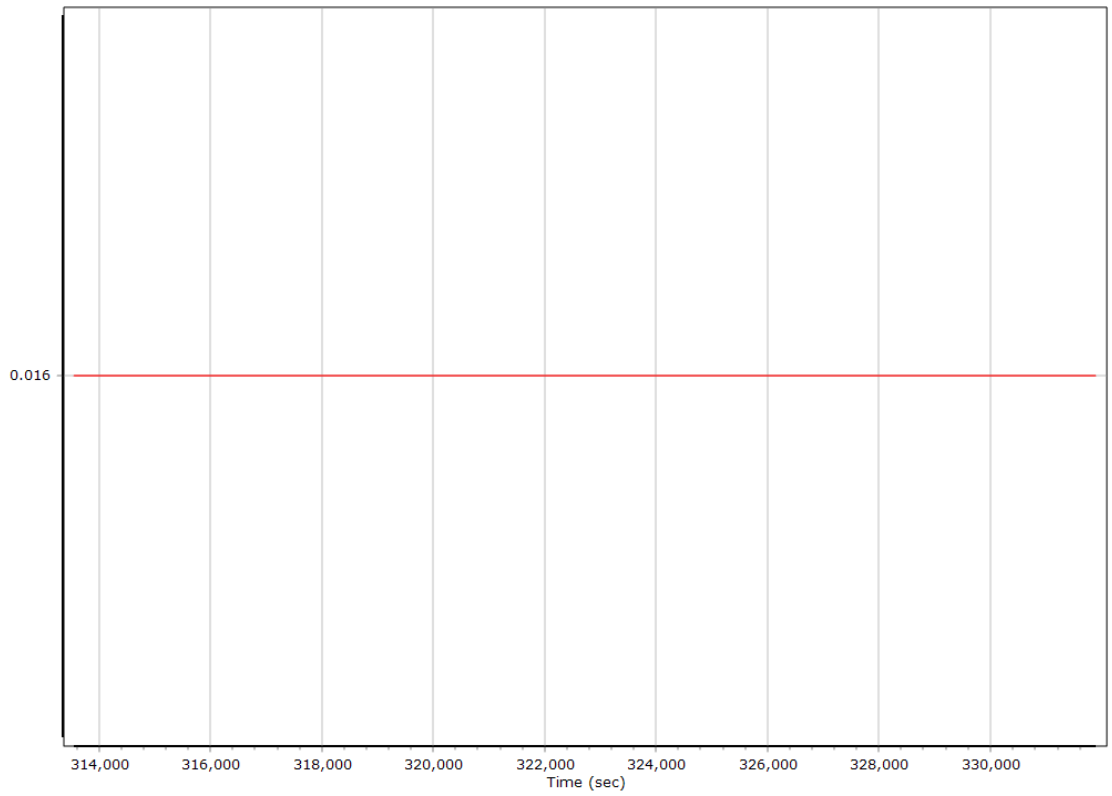
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

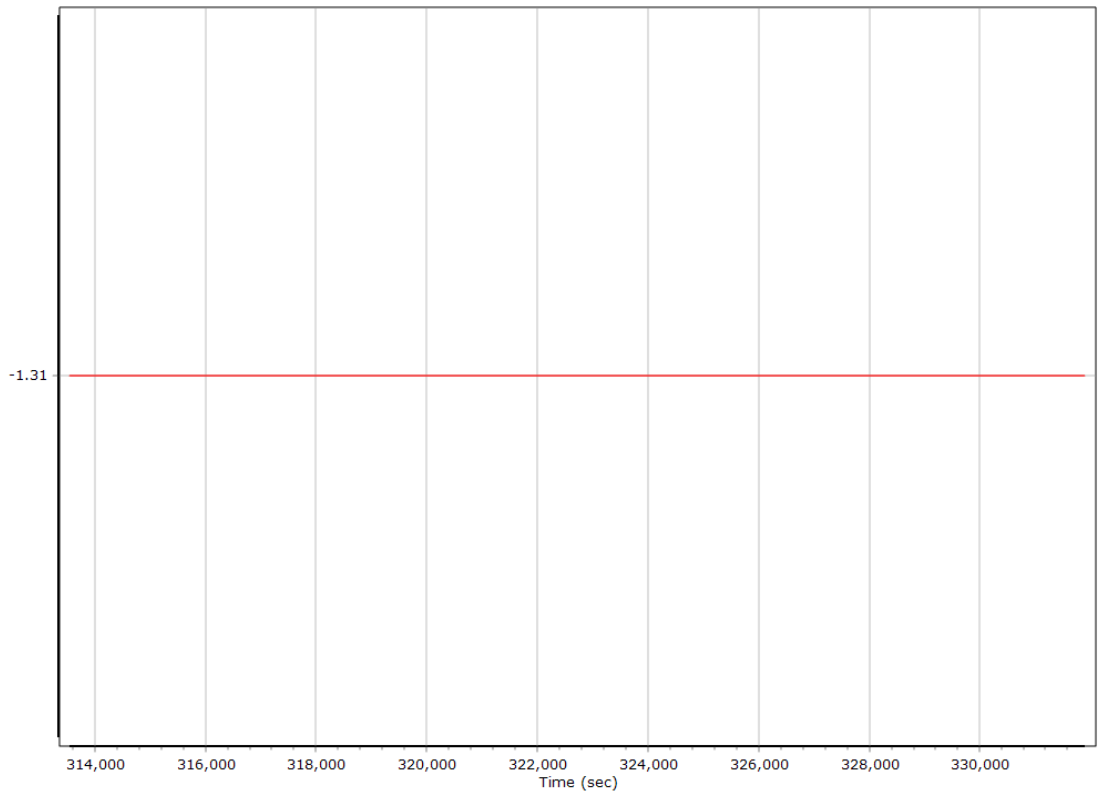
X Reference-Primary GNSS Lever Arm (m)



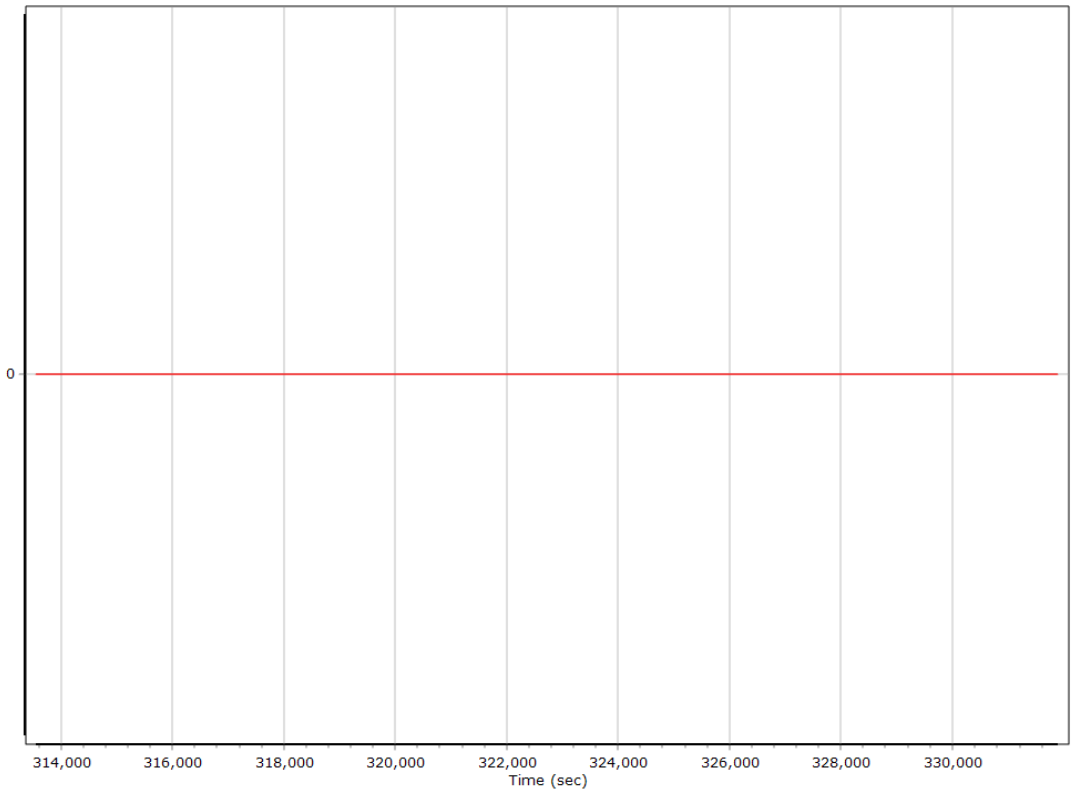
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



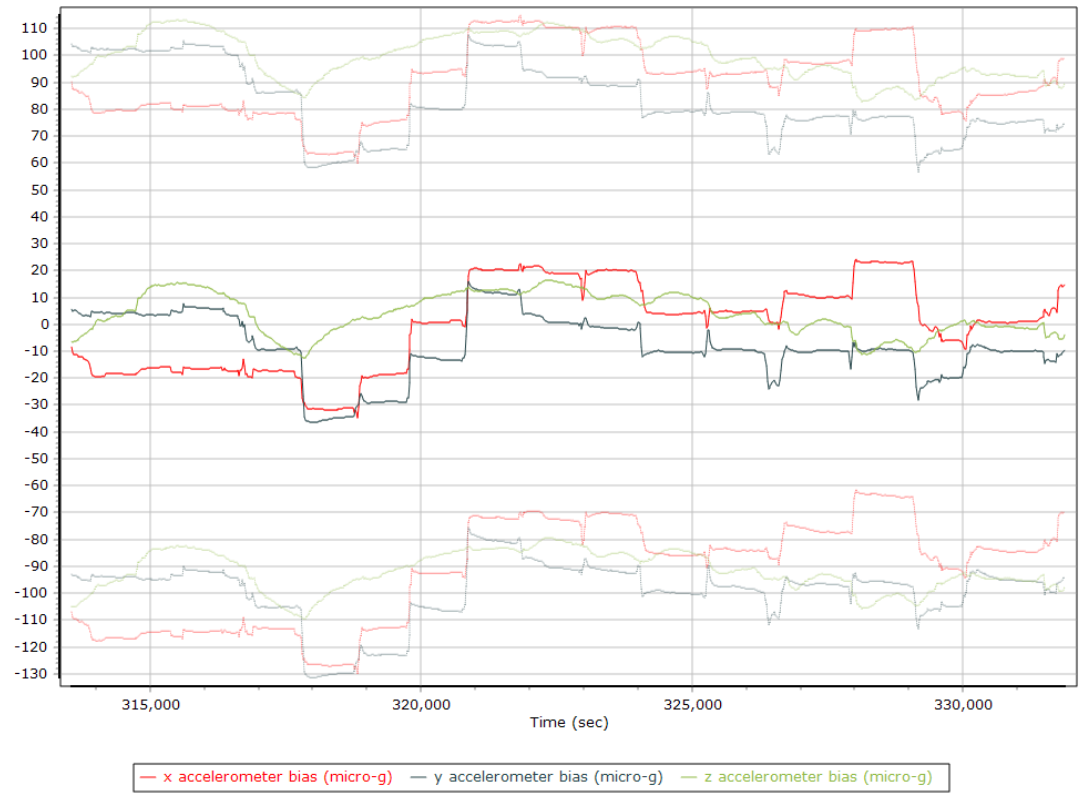
Reference-Primary GNSS Lever Arm Figure of Merit



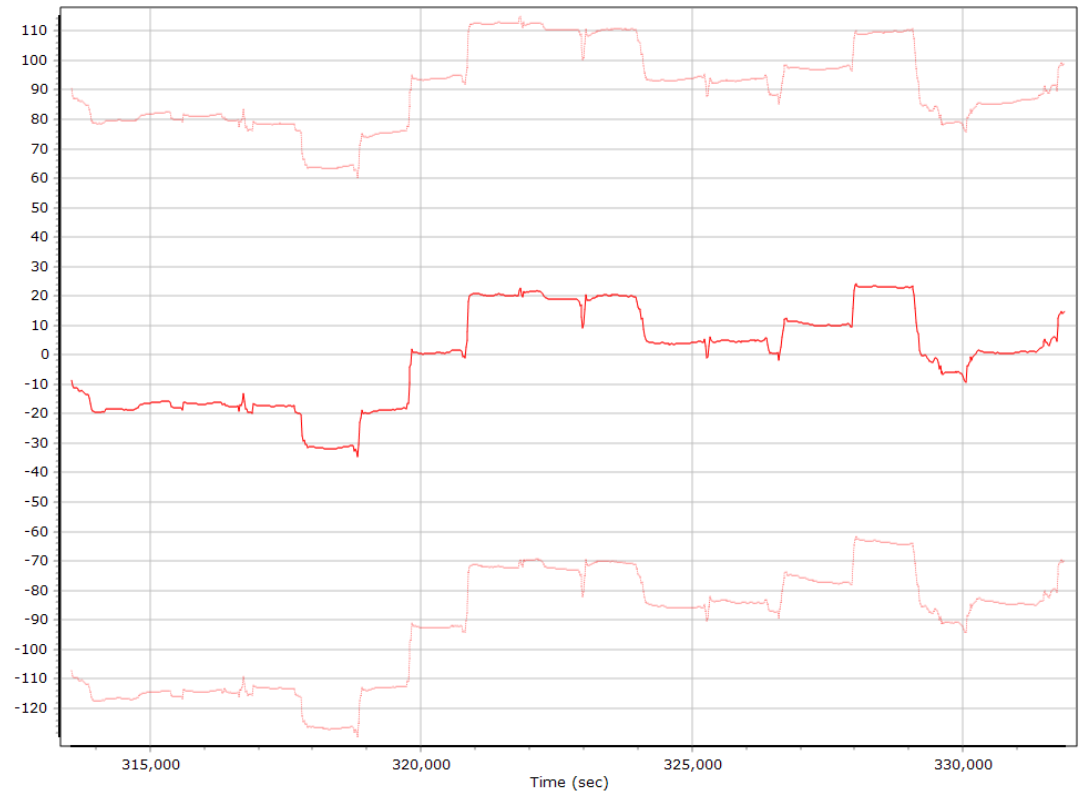
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

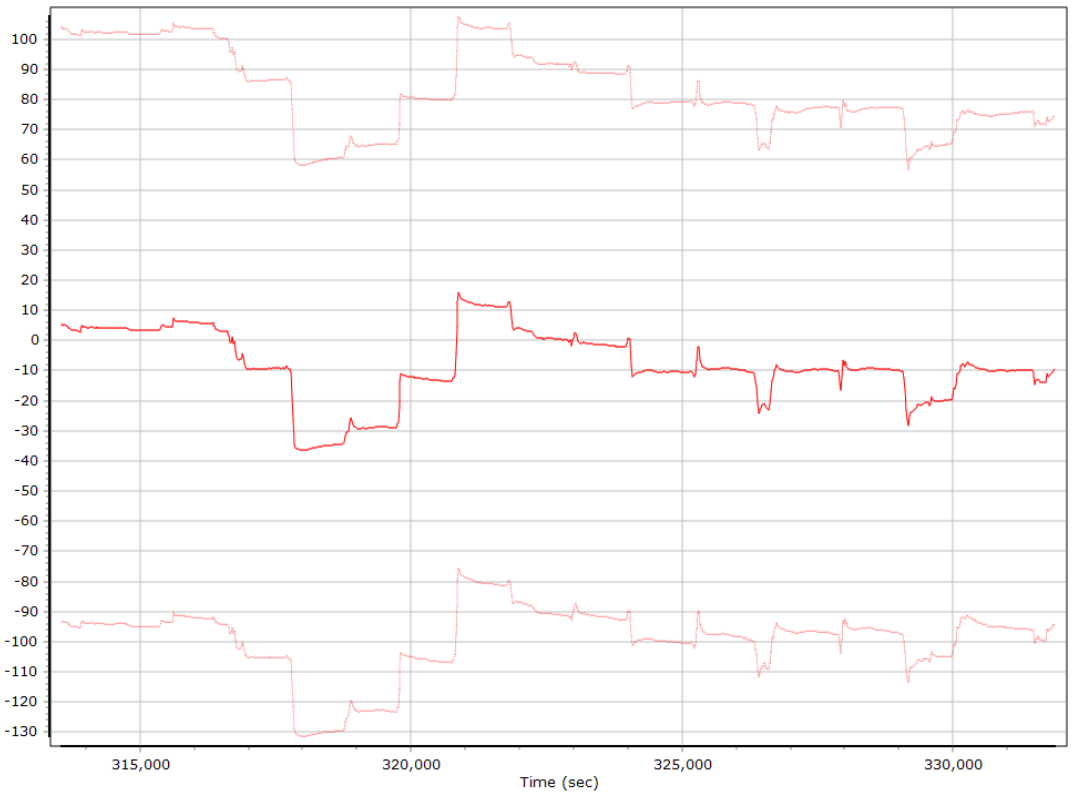
Accelerometer Bias (micro-g)



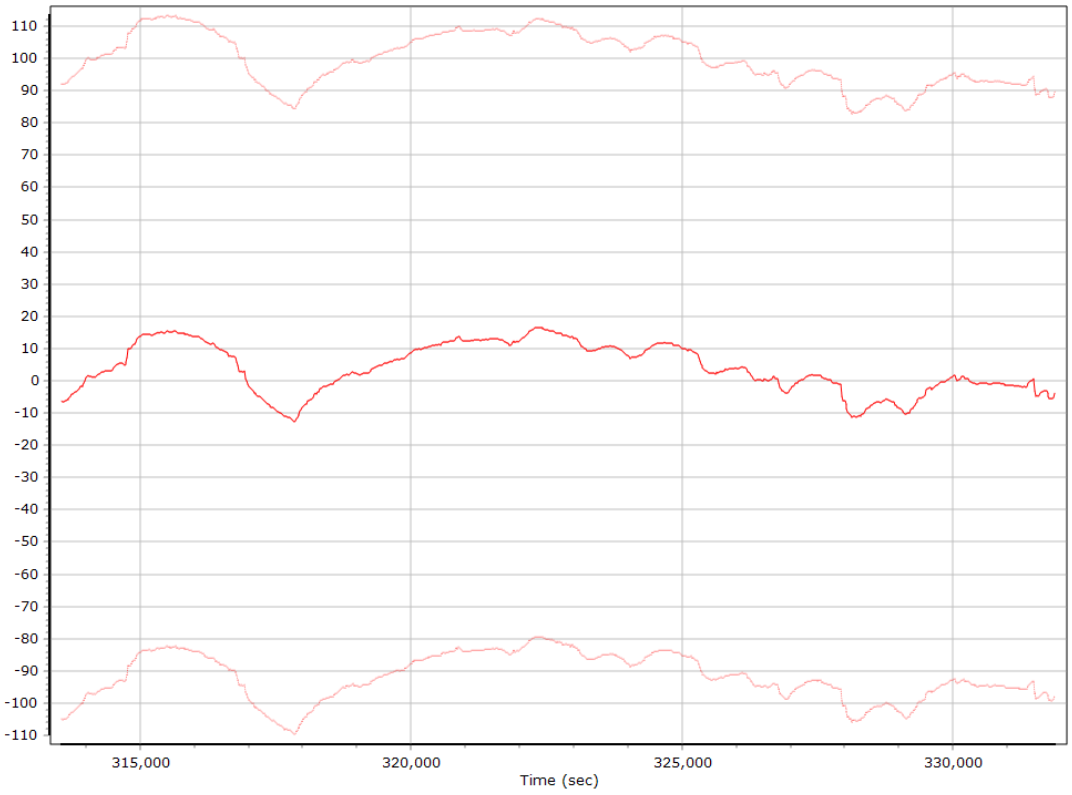
X Accelerometer Bias (micro-g)



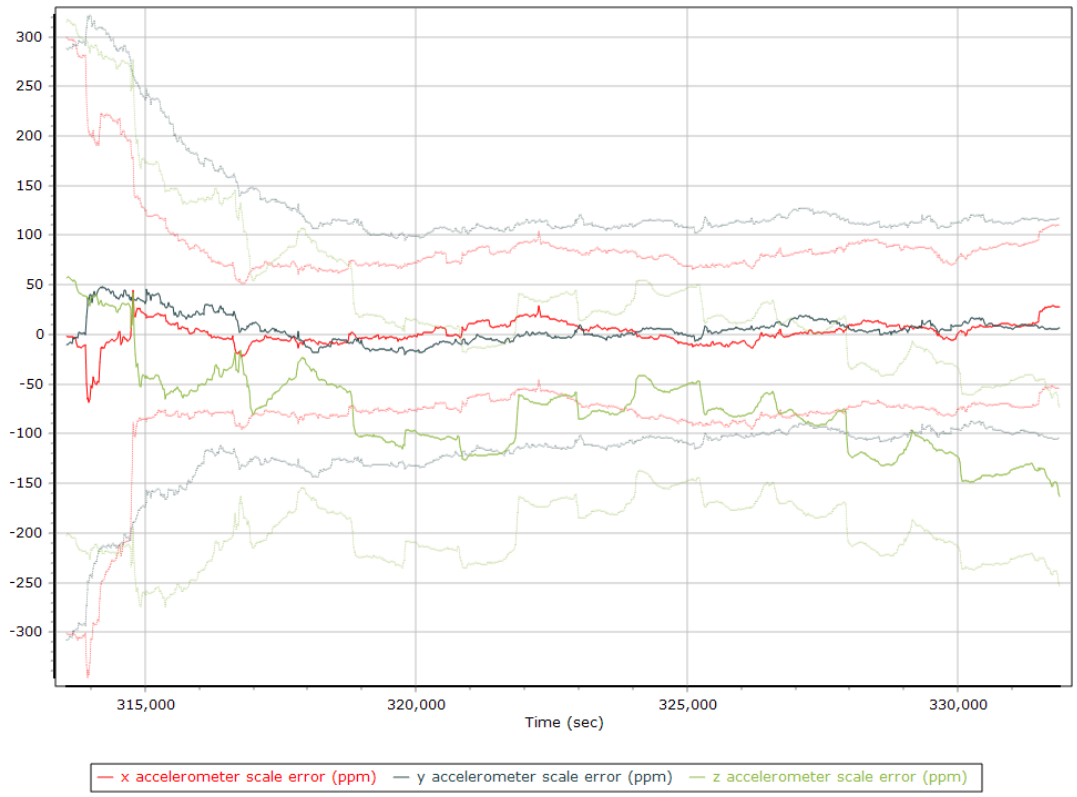
Y Accelerometer Bias (micro-g)



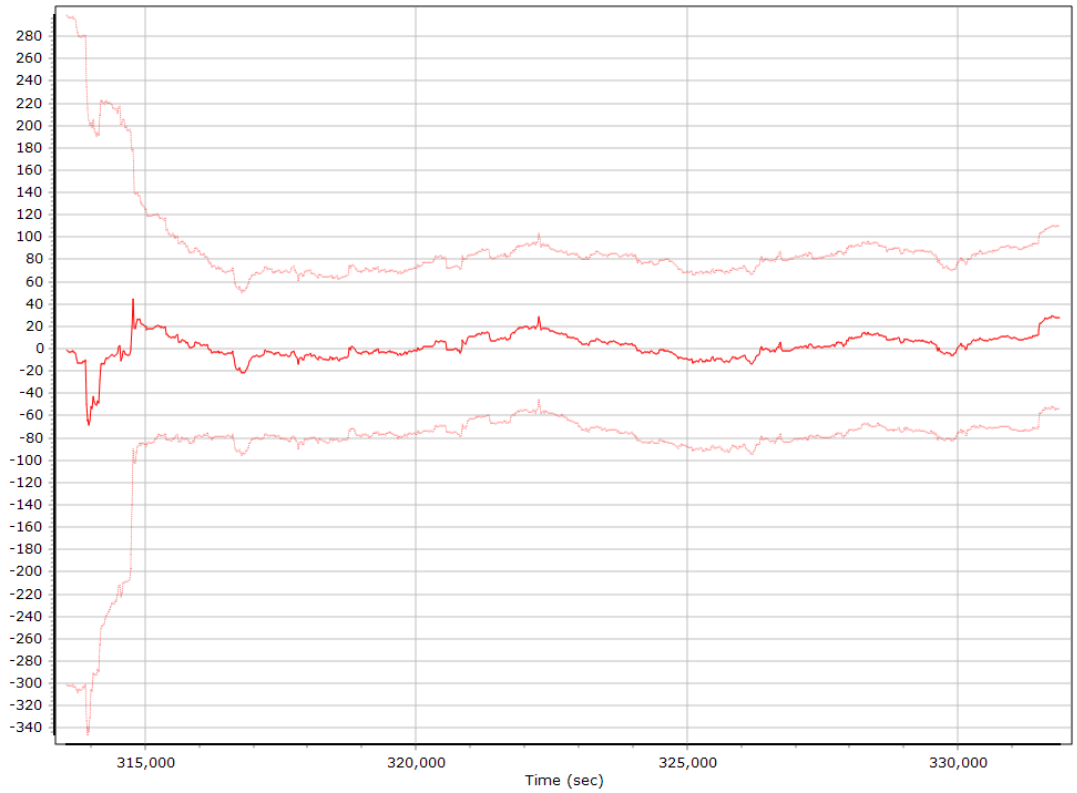
Z Accelerometer Bias (micro-g)



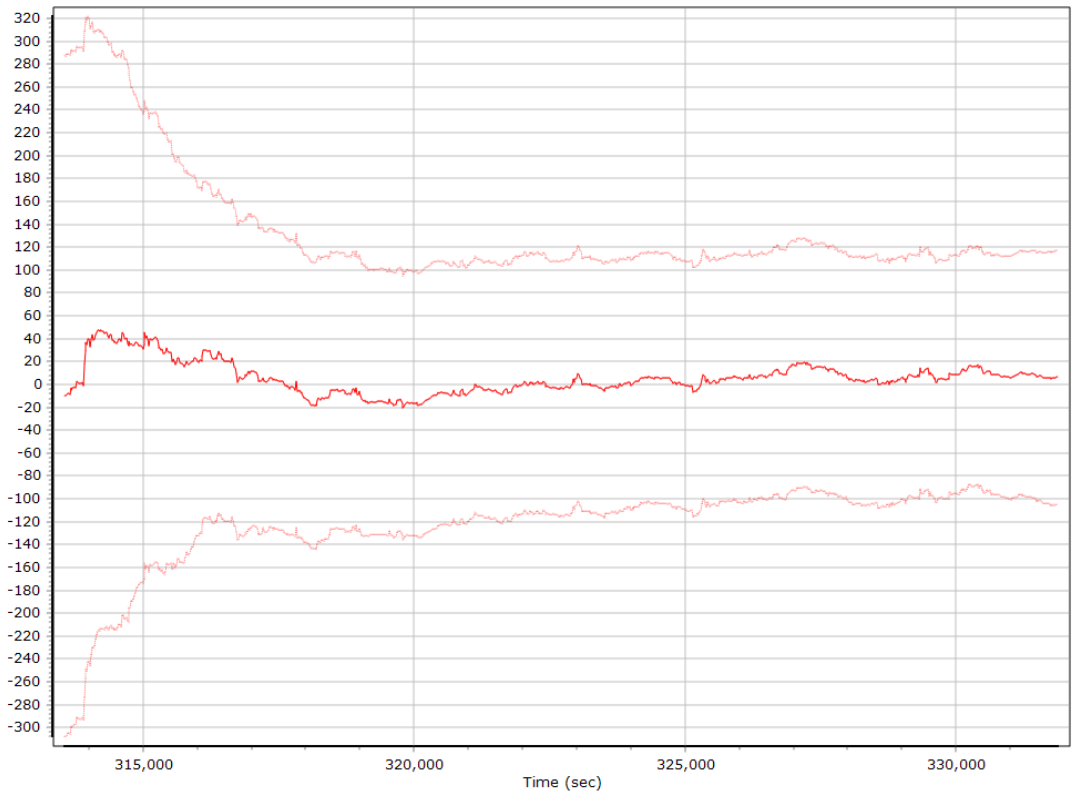
Accelerometer Scale Error (ppm)



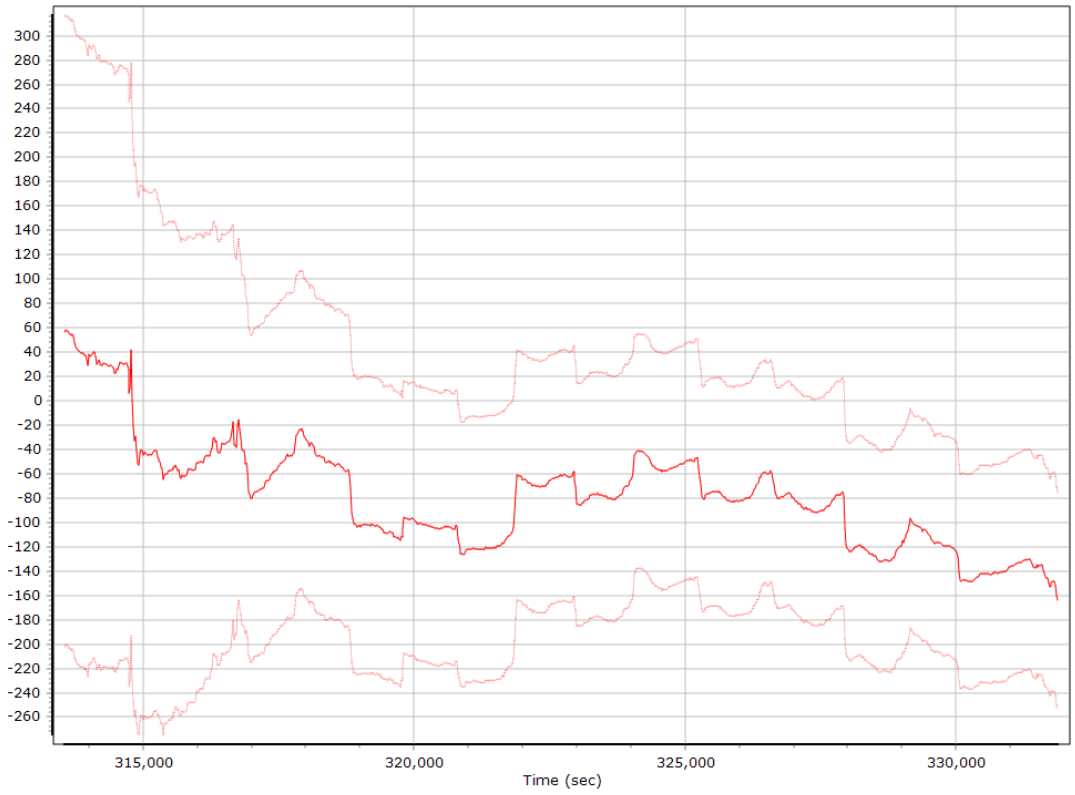
X Accelerometer Scale Error (ppm)



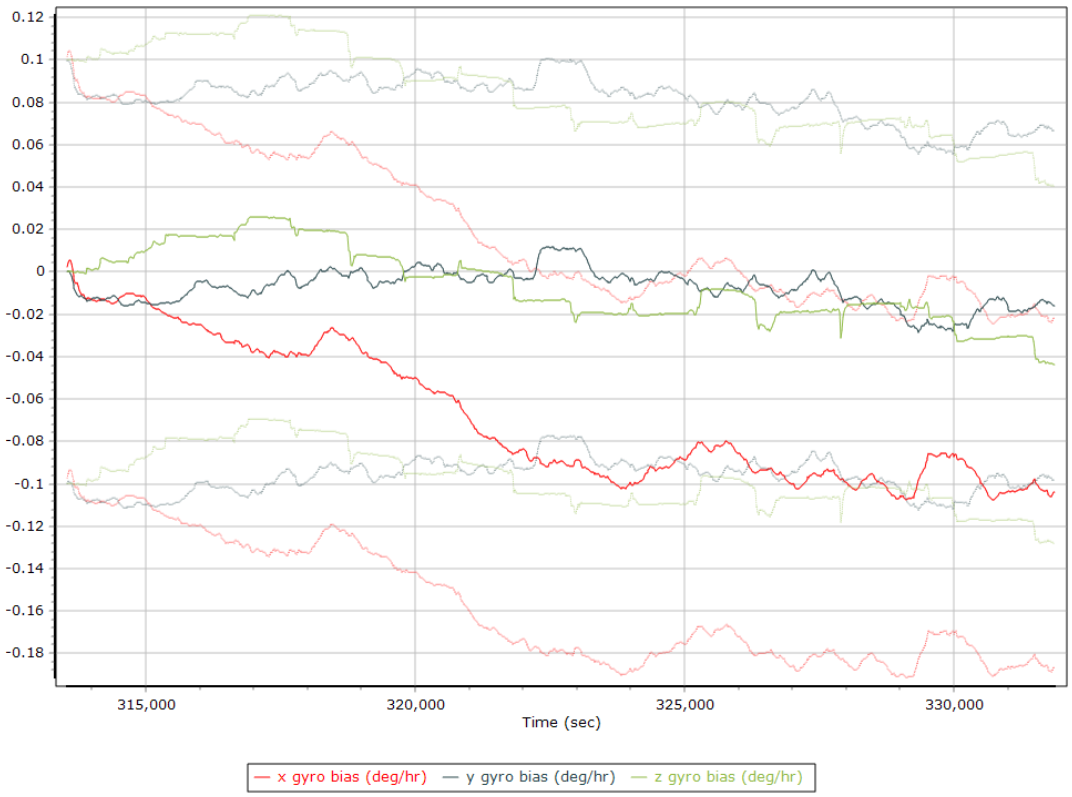
Y Accelerometer Scale Error (ppm)



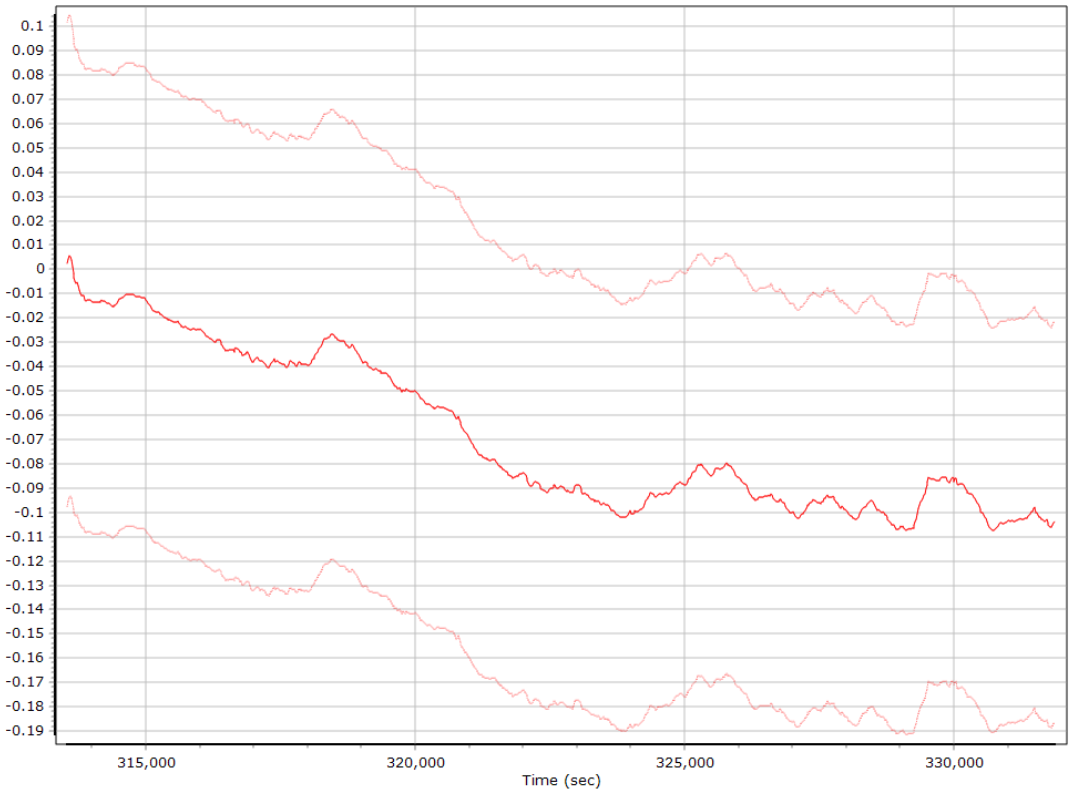
Z Accelerometer Scale Error (ppm)



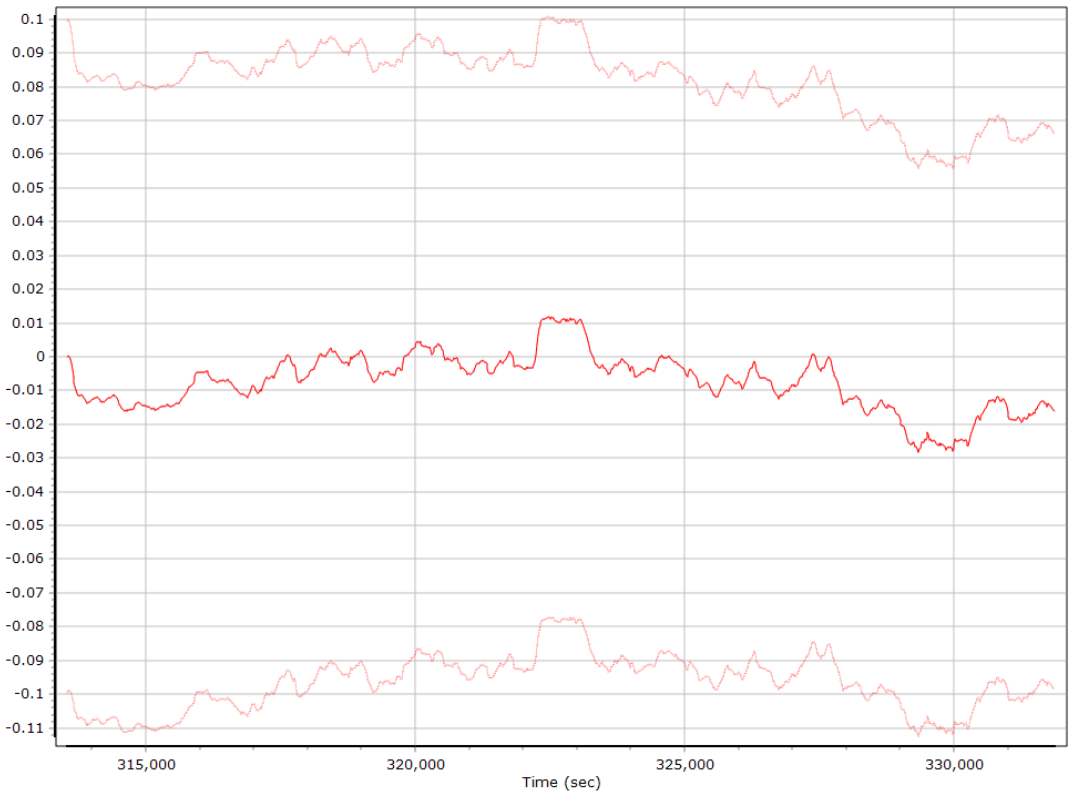
Gyro Bias (deg/h)



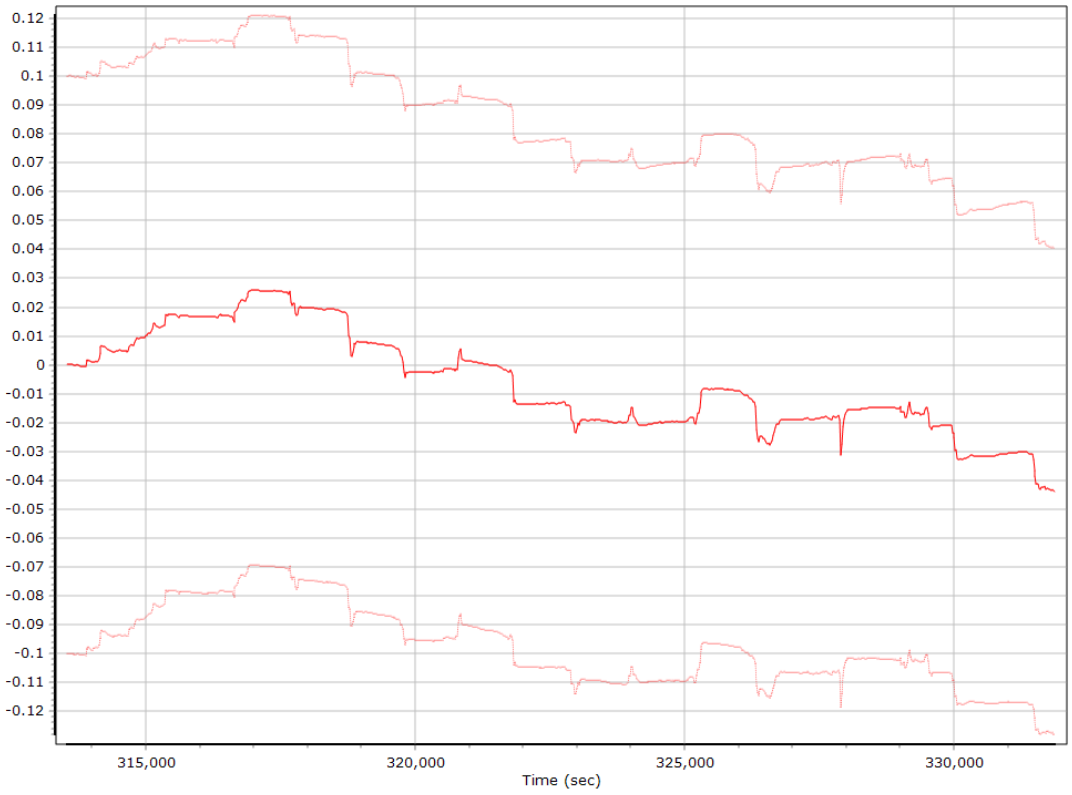
X Gyro Bias (deg/h)



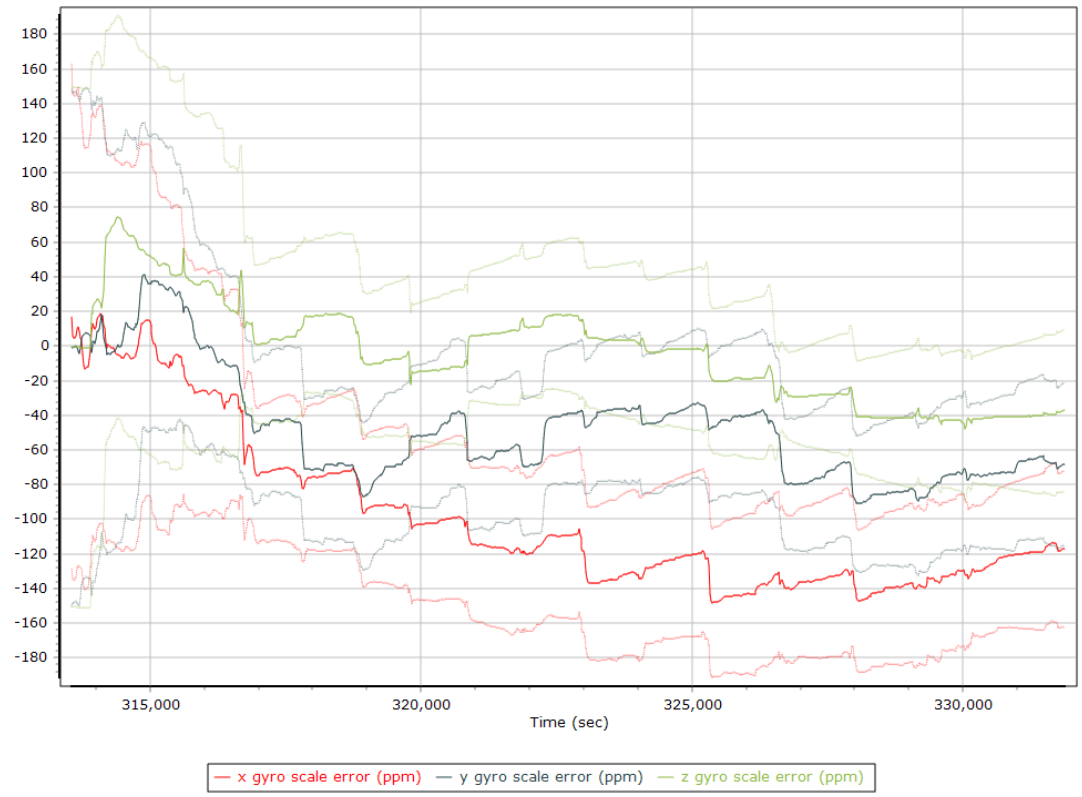
Y Gyro Bias (deg/h)



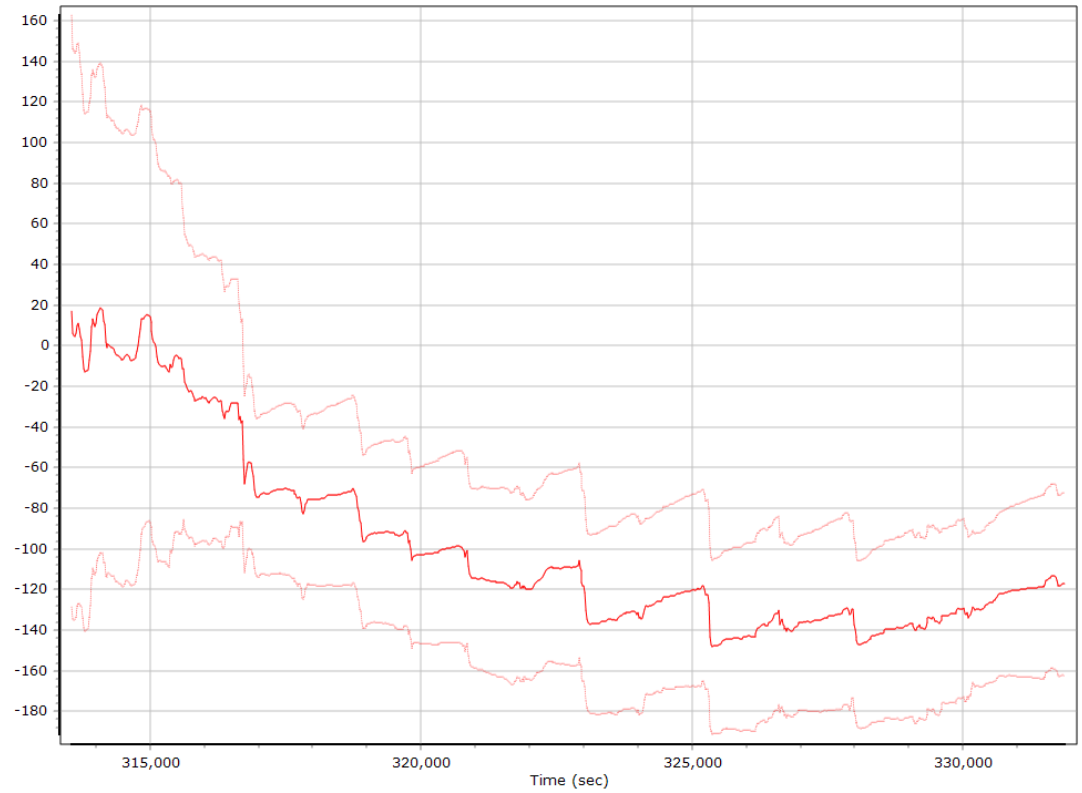
Z Gyro Bias (deg/h)



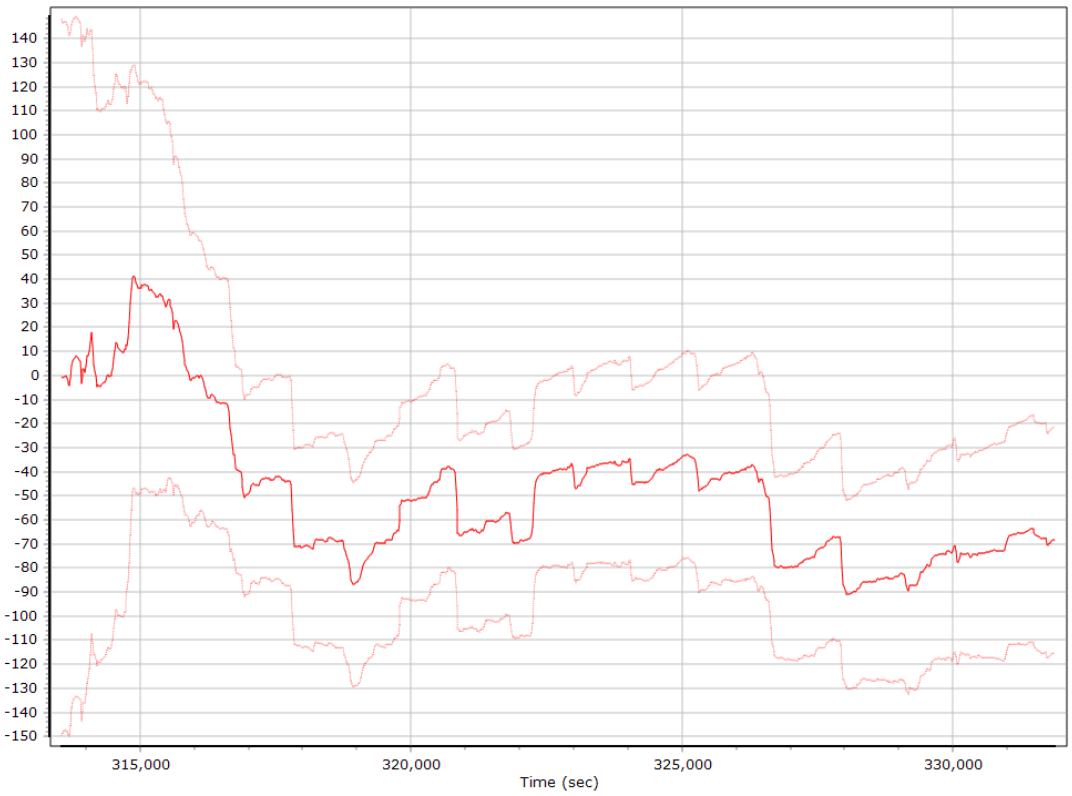
Gyro Scale Error (ppm)



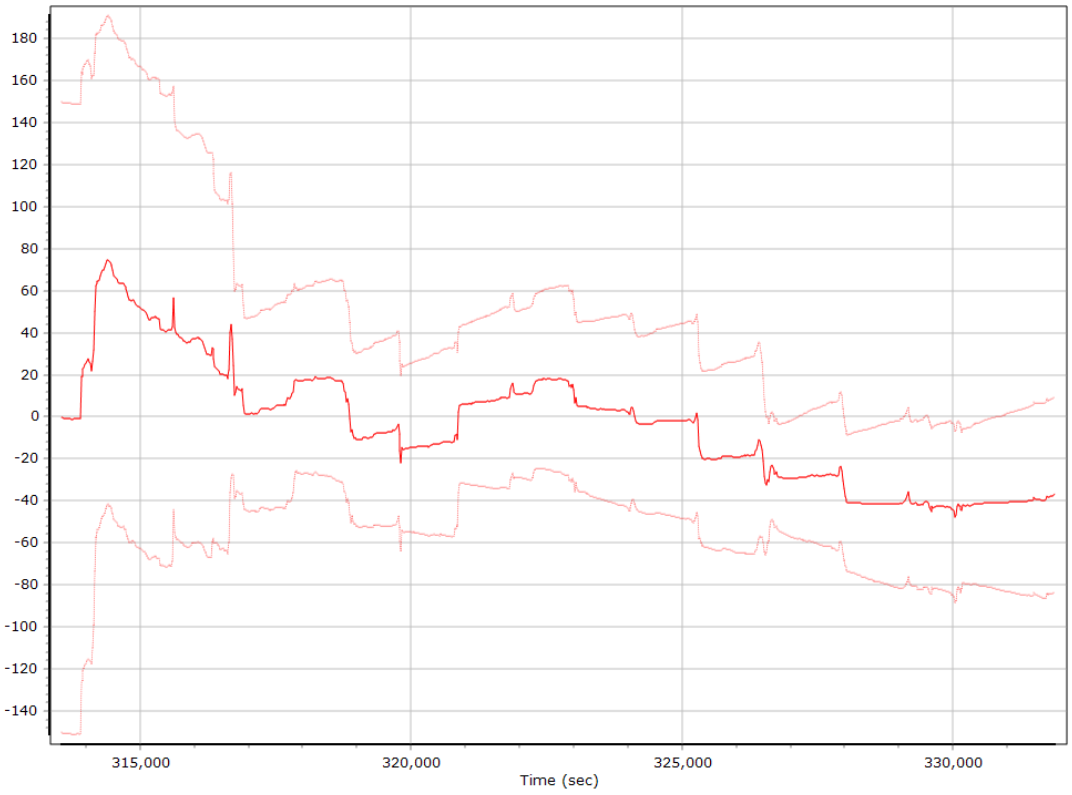
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

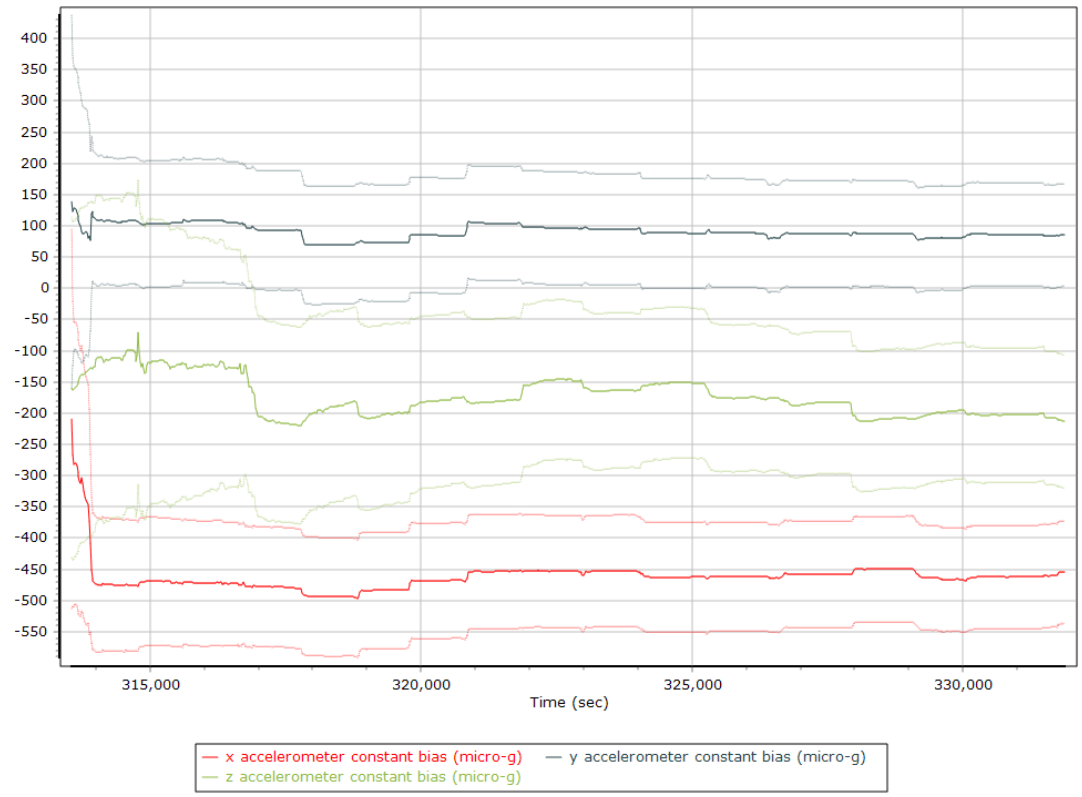


Z Gyro Scale Error (ppm)

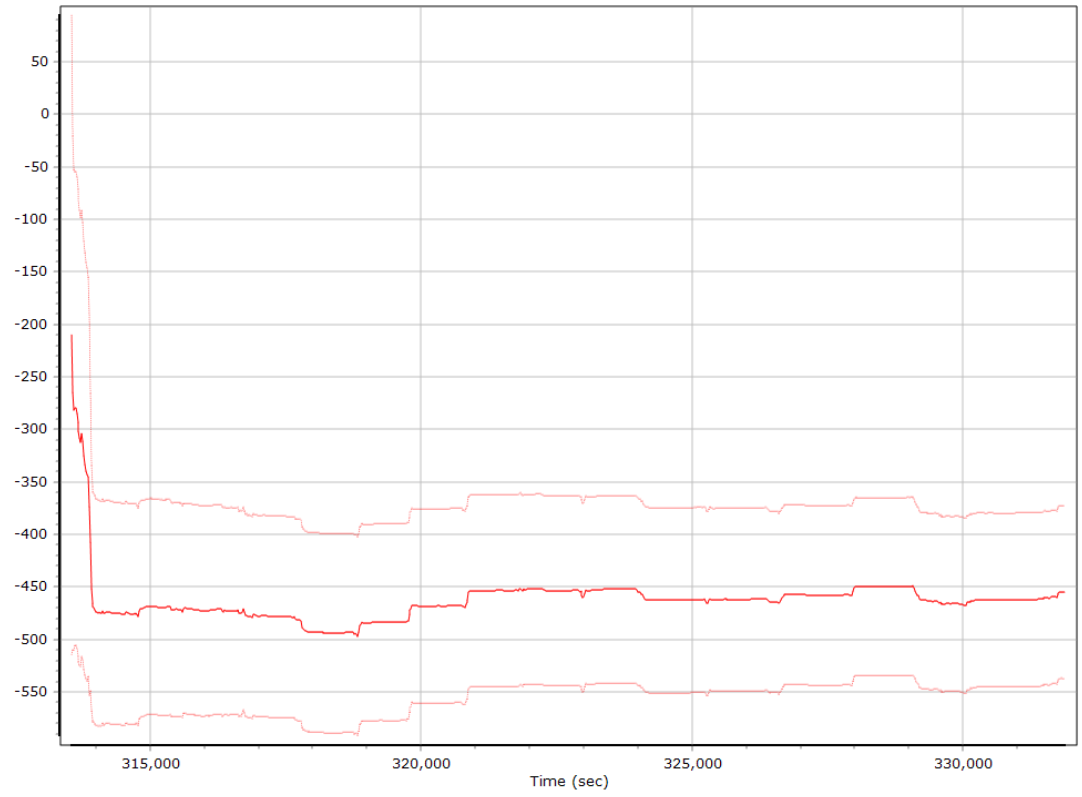


Forward Processed Estimated Constant Errors, Reference Frame

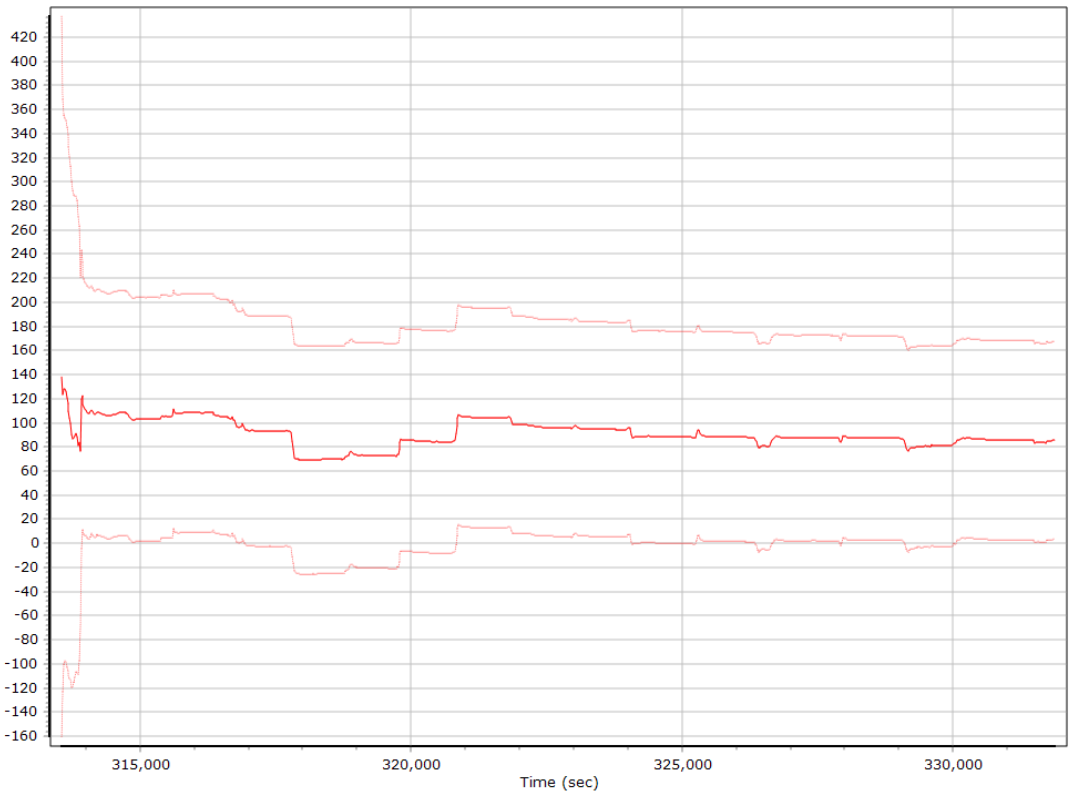
Accelerometer Bias (micro-g)



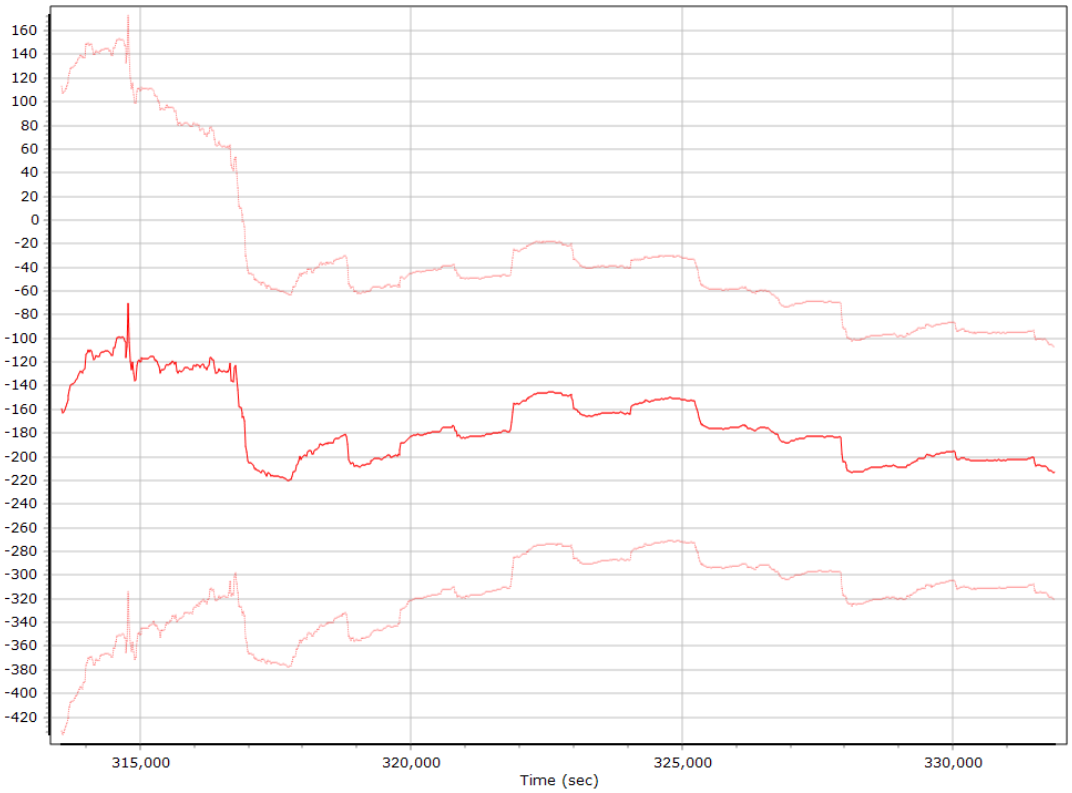
X Accelerometer Bias (micro-g)



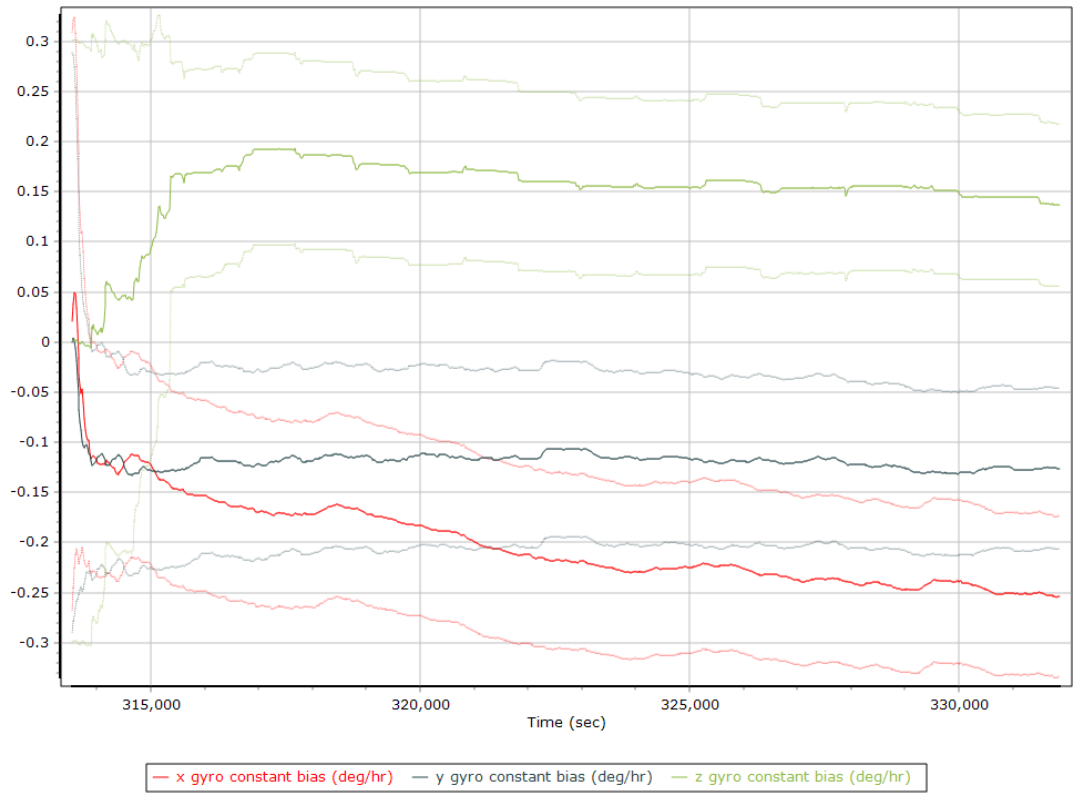
Y Accelerometer Bias (micro-g)



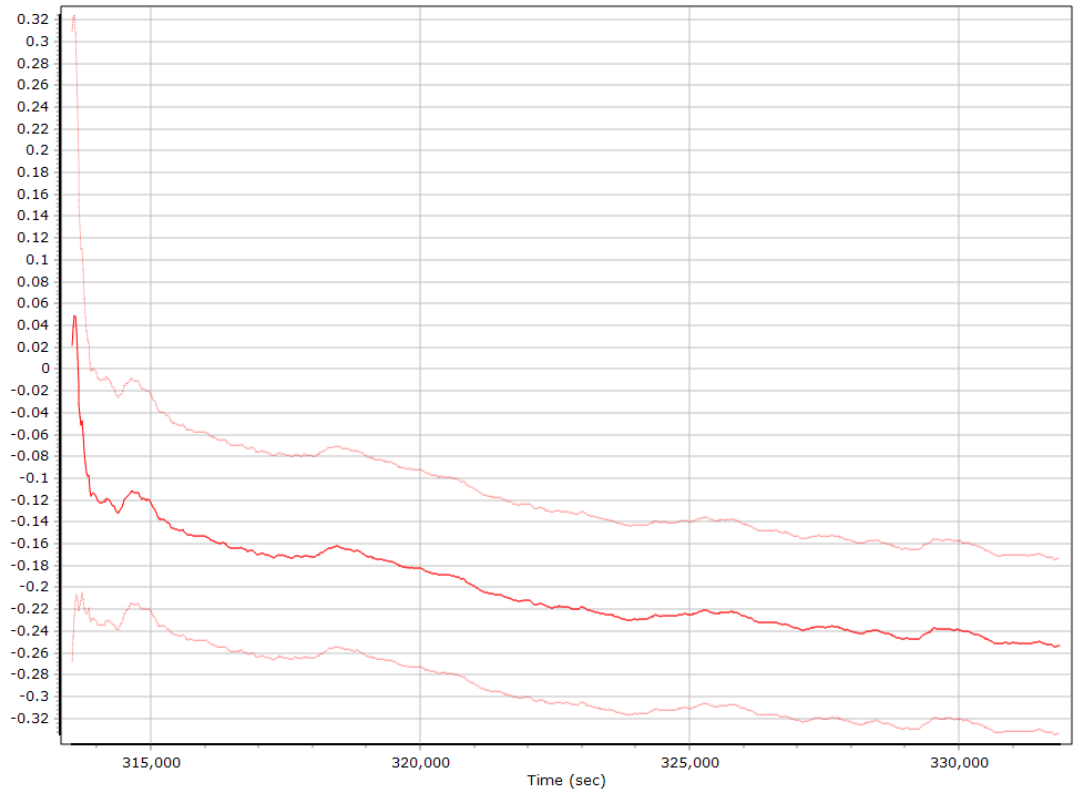
Z Accelerometer Bias (micro-g)



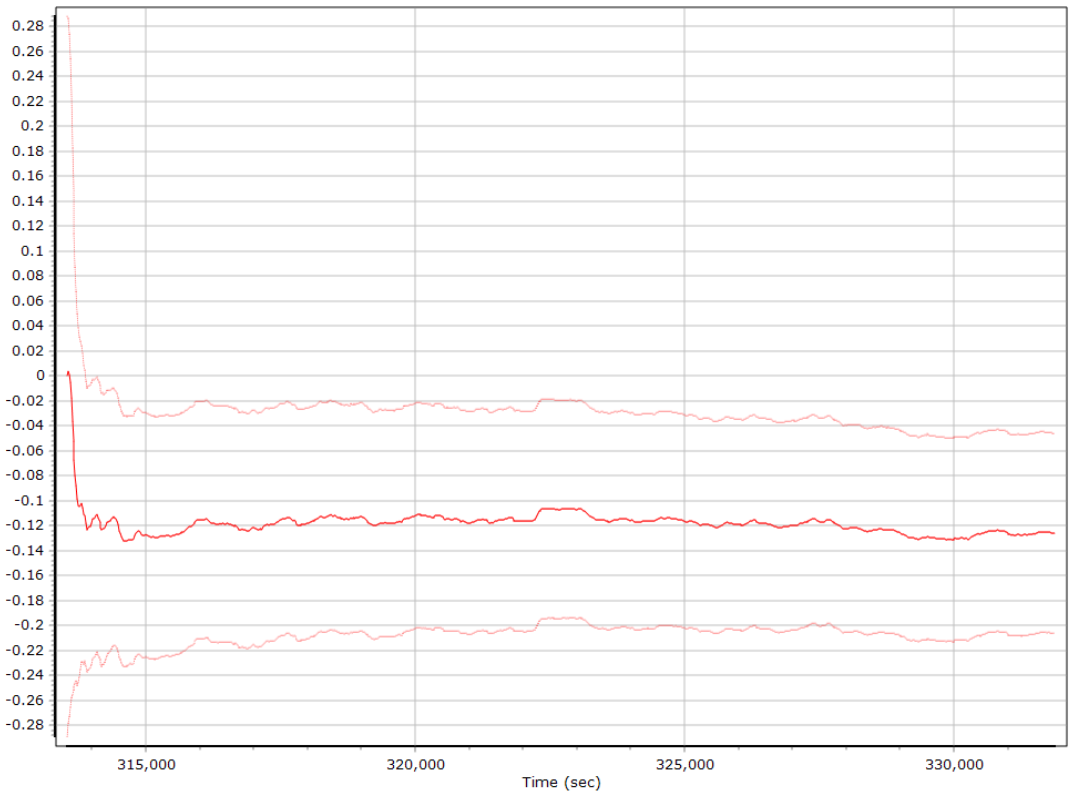
Gyro Bias (deg/h)



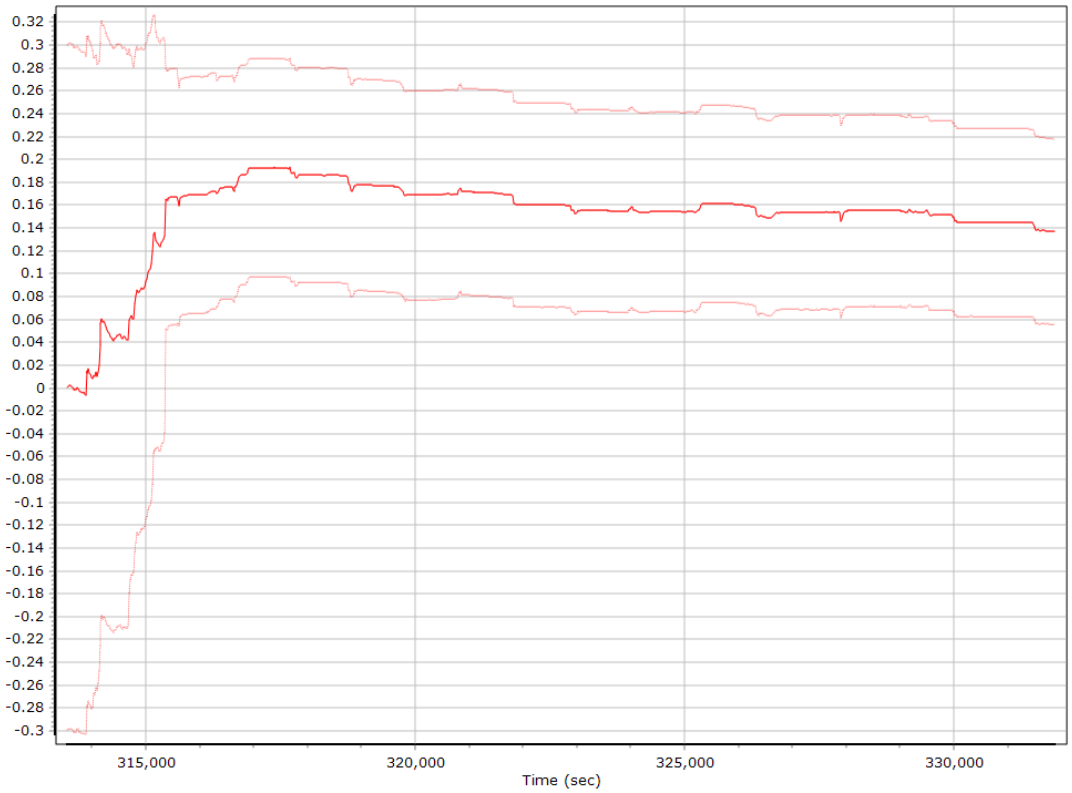
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

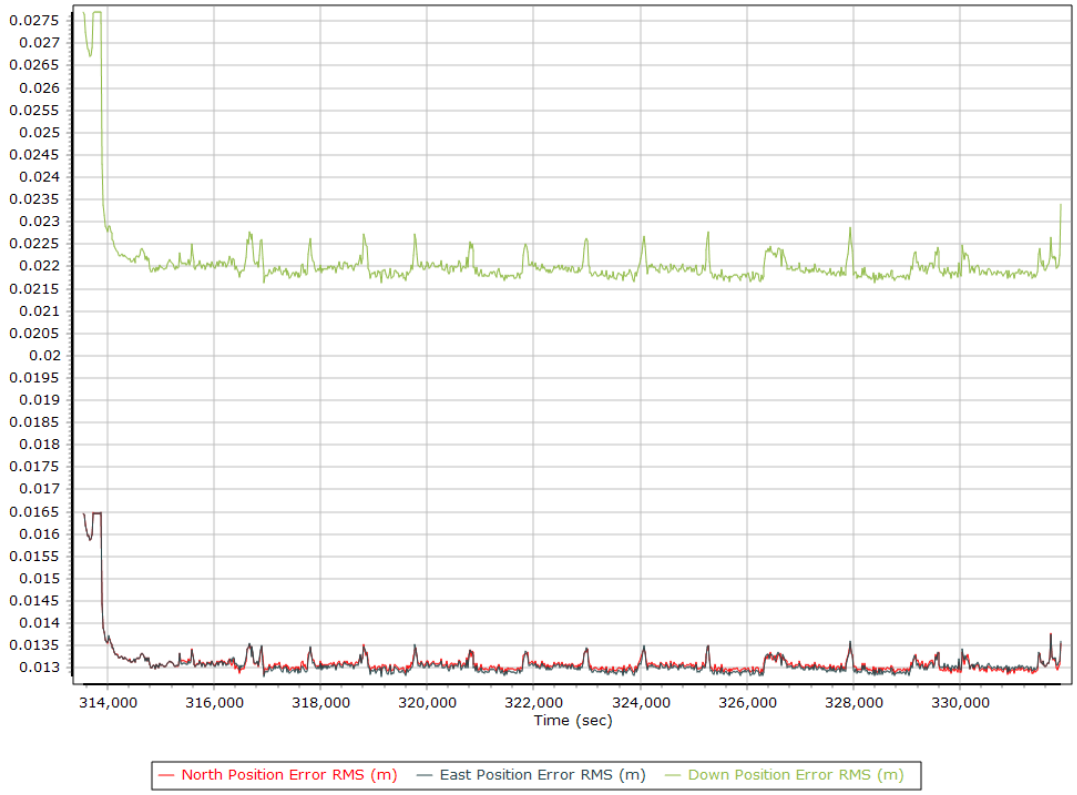


Z Gyro Bias (deg/h)

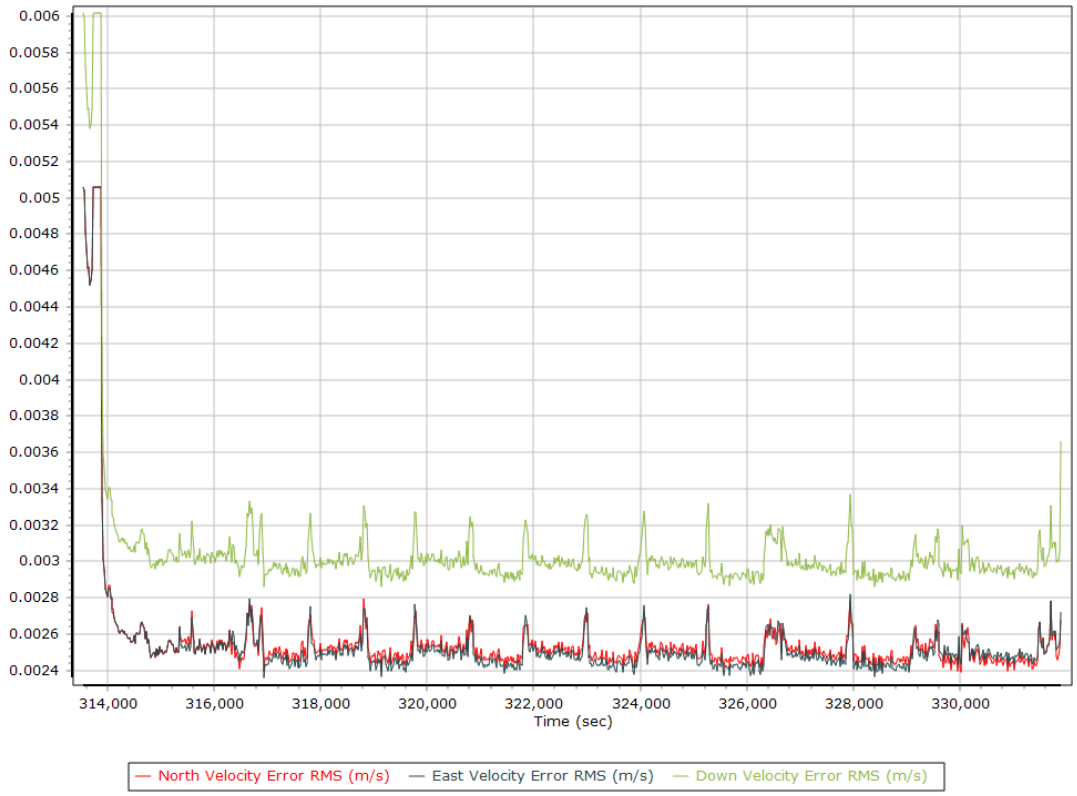


Smoothed Performance Metrics

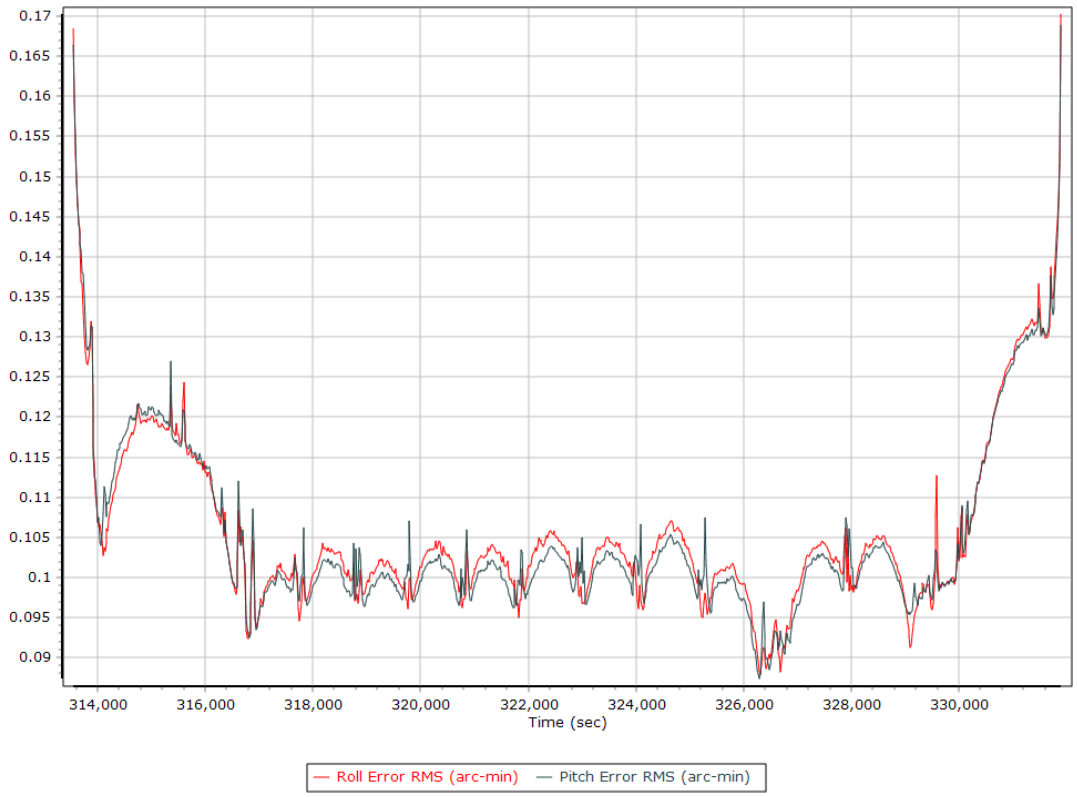
Position Error RMS (m)



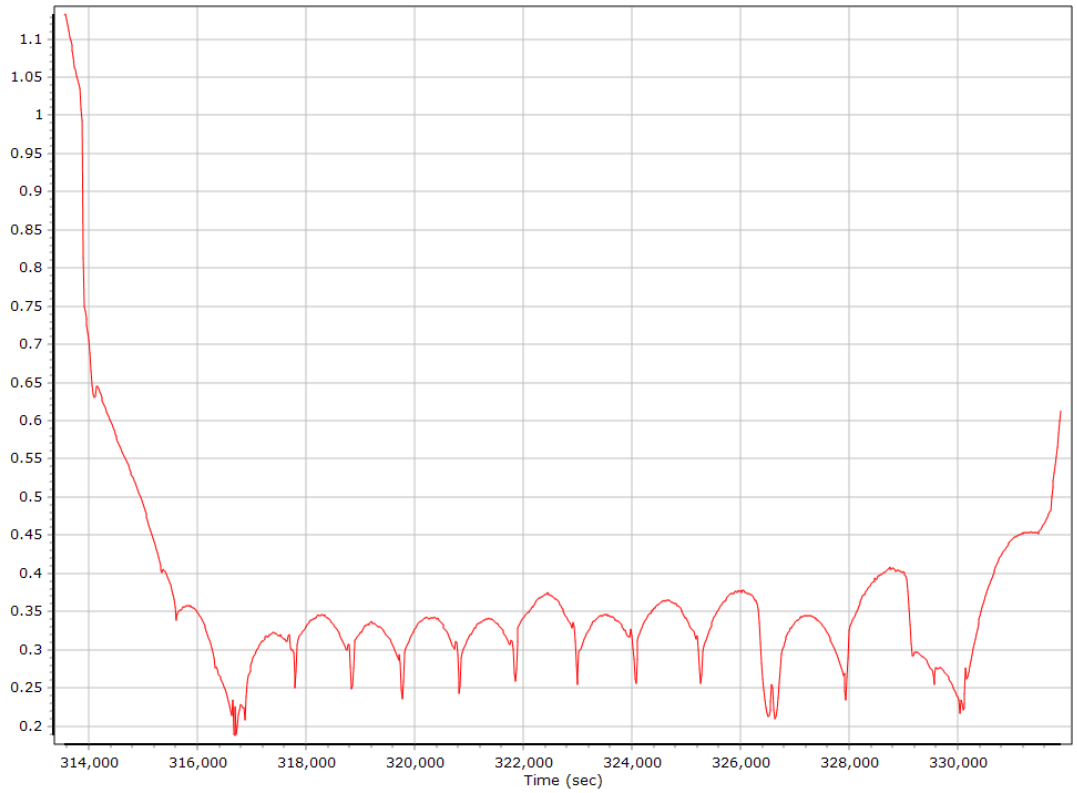
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

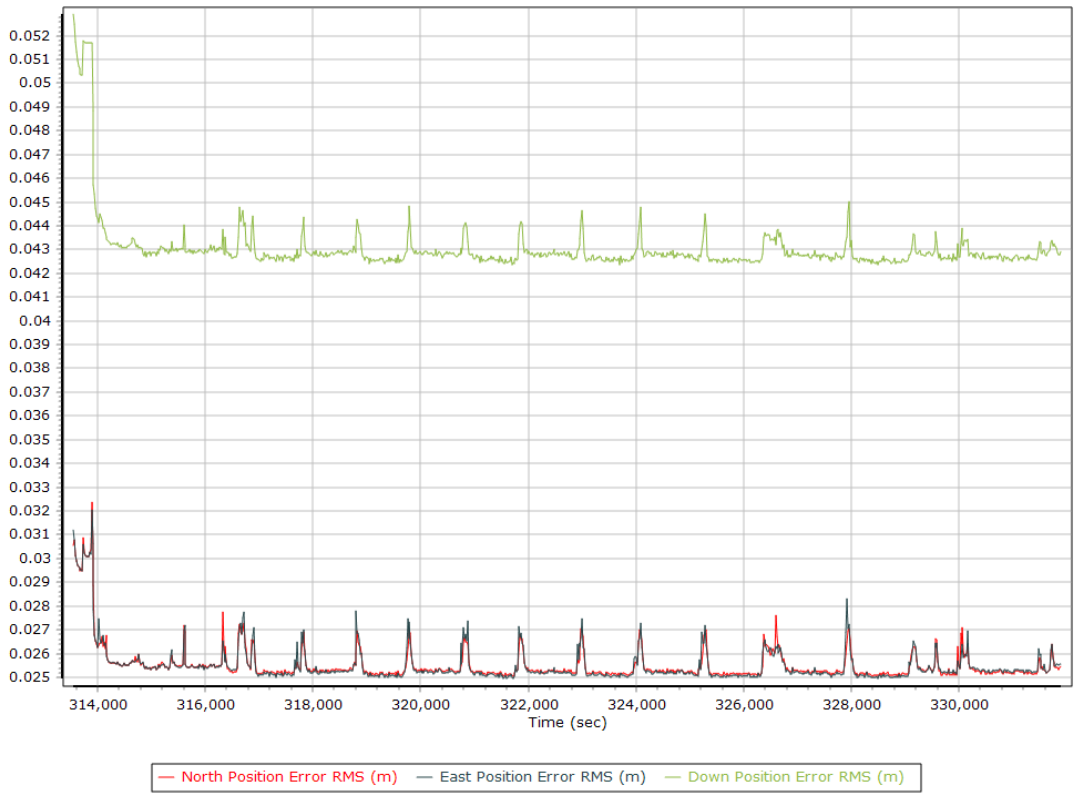


Heading Error RMS (arc-min)

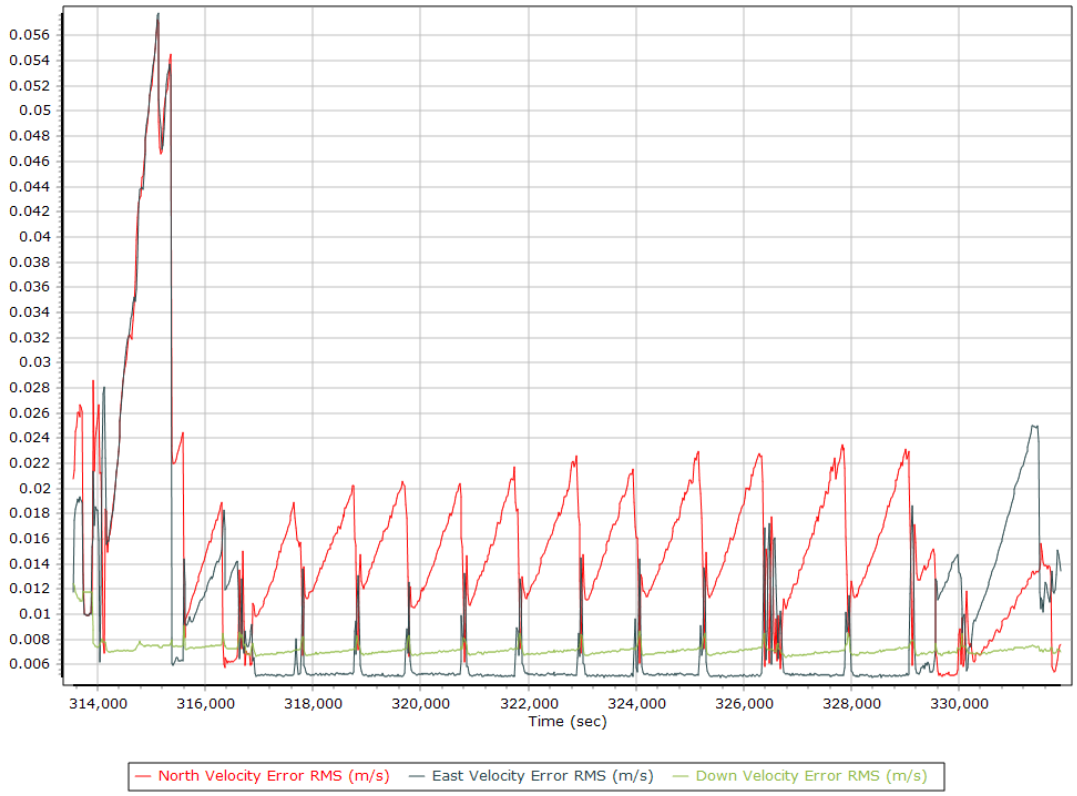


Forward Processed Performance Metrics

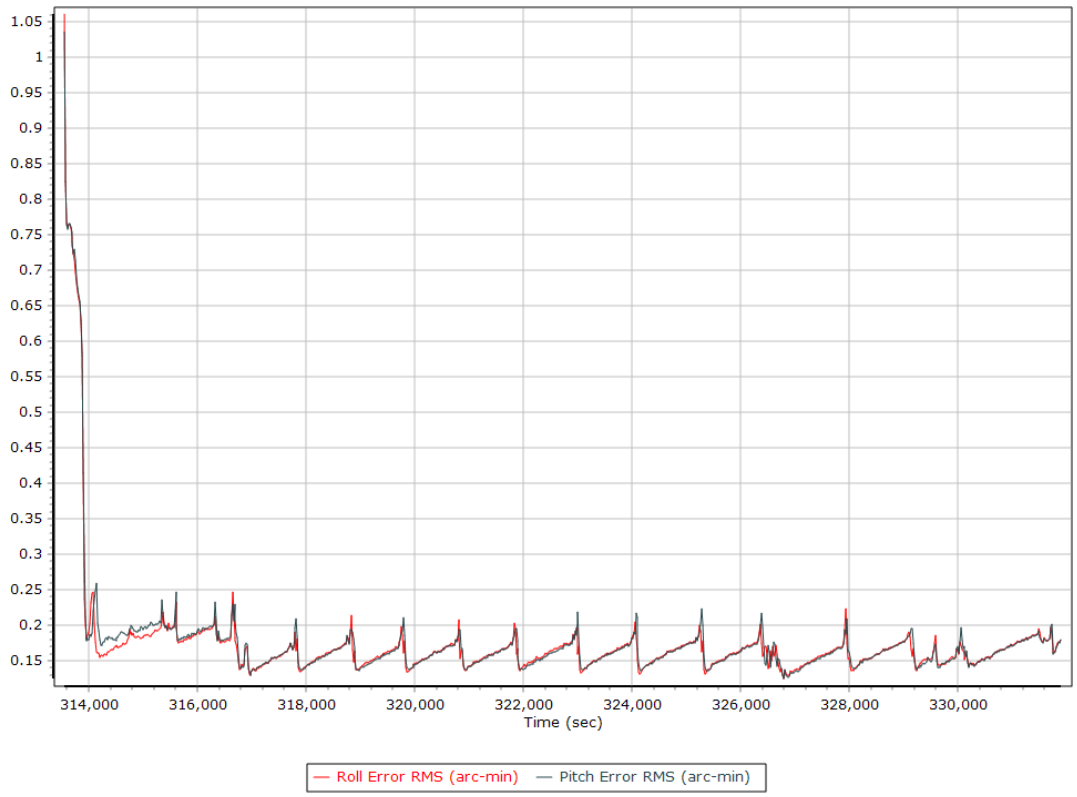
Position Error RMS (m)



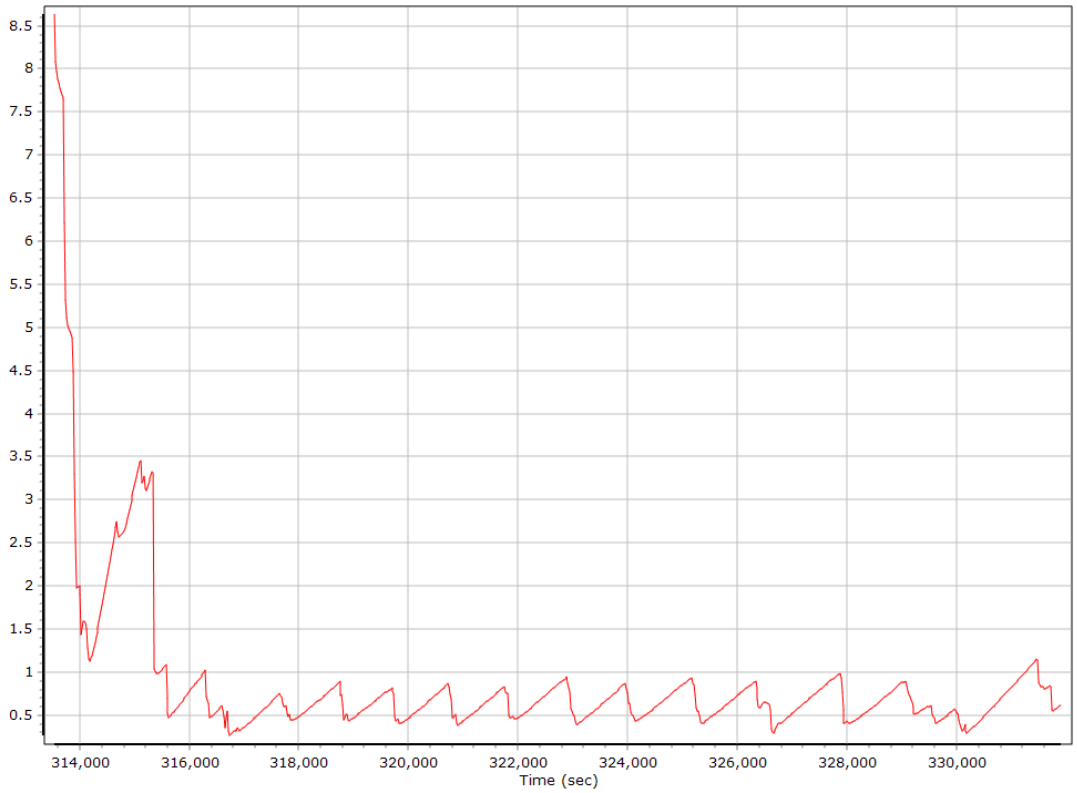
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

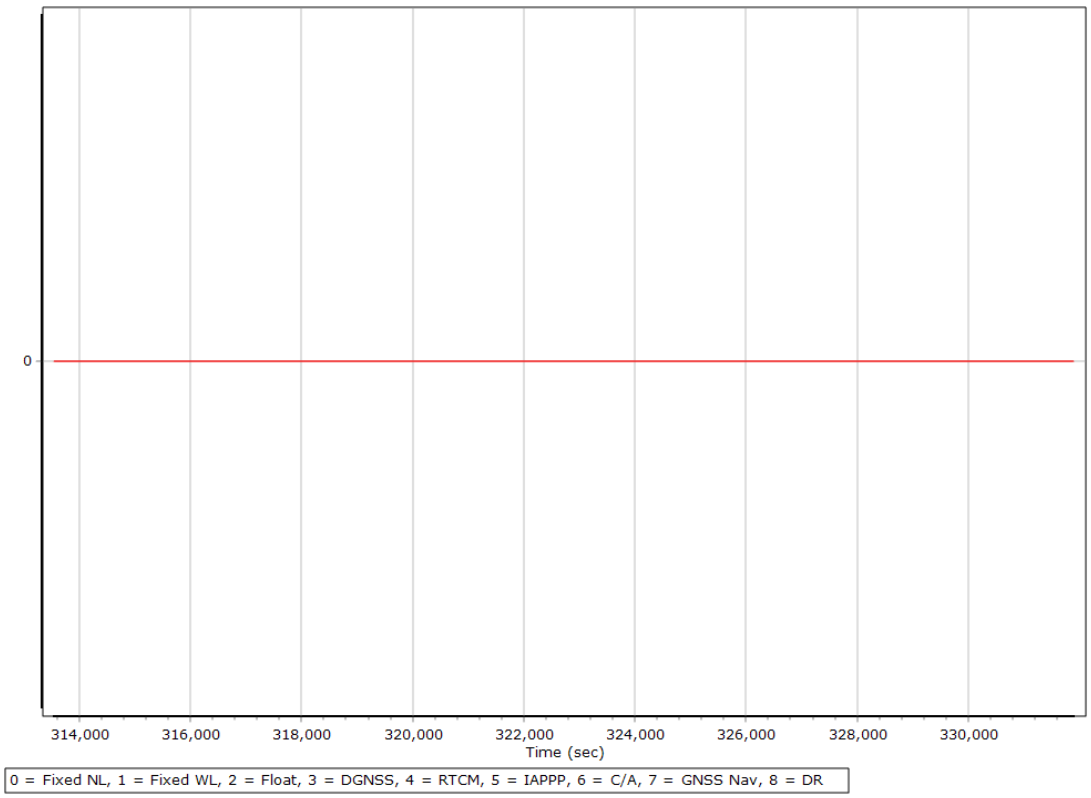


Heading Error RMS (arc-min)

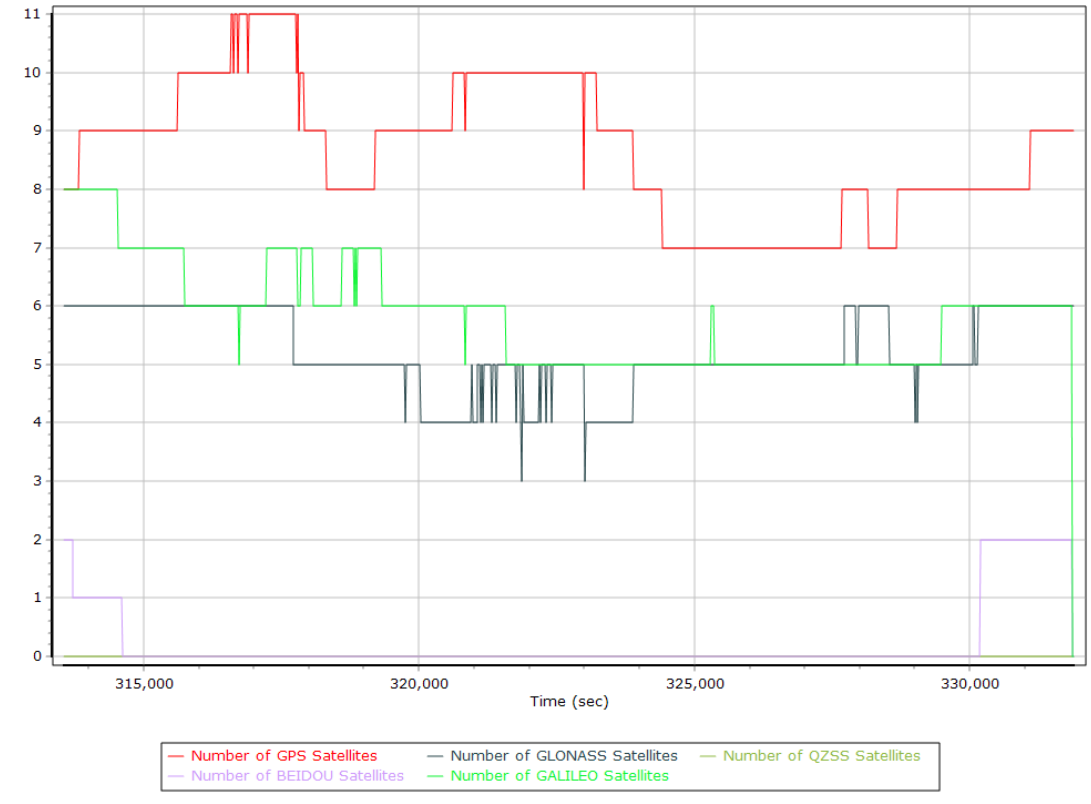


Forward Processed Solution Status

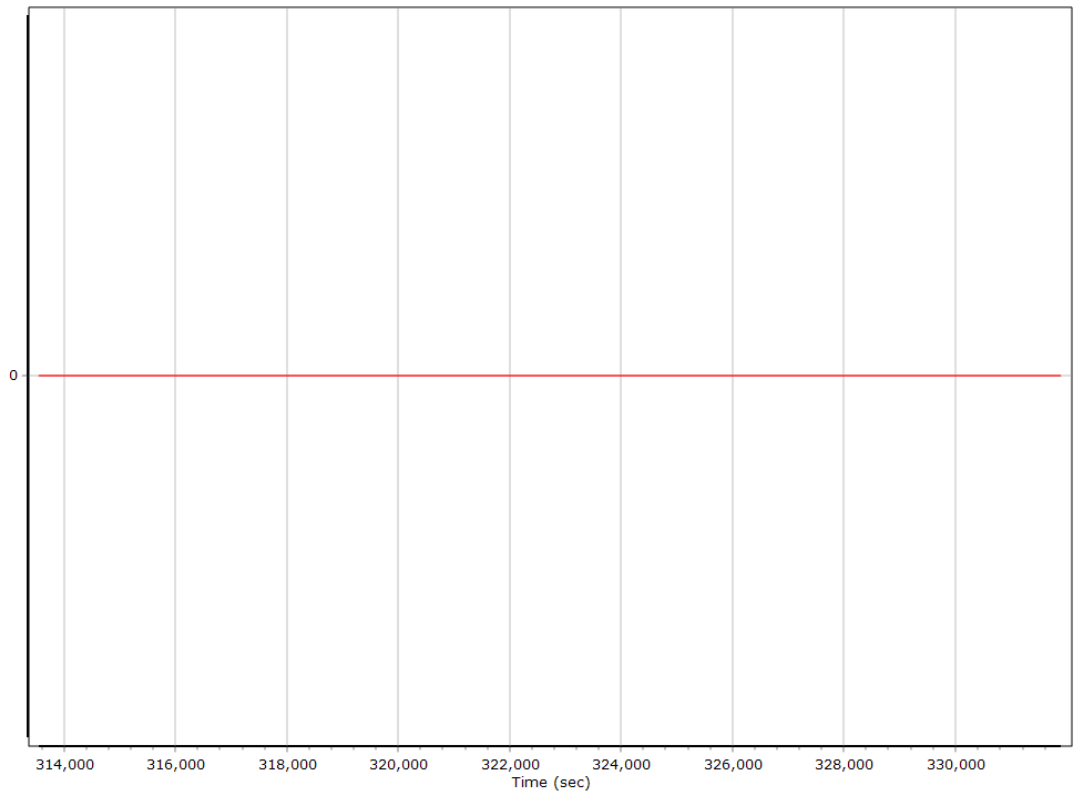
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01162021A_4040
Processing date	2022-01-05 15:31:06
Mission date	2021-01-16 16:02:50
Mission duration	04:52:05.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210116_160231_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0160.21g	GLONASS Broadcast Ephemeris
Ephm0160.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01162021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210116_160231_INS-GPS_1.raw		
Last raw data file	210116_160231_INS-GPS_1.raw		
Start GPS week	2140		
Start time	576151.057 (1/16/2021 4:02:31 PM)		
End time	593677.119 (1/16/2021 8:54:37 PM)		
Start of fine alignment	576180.872 (1/16/2021 4:03:00 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

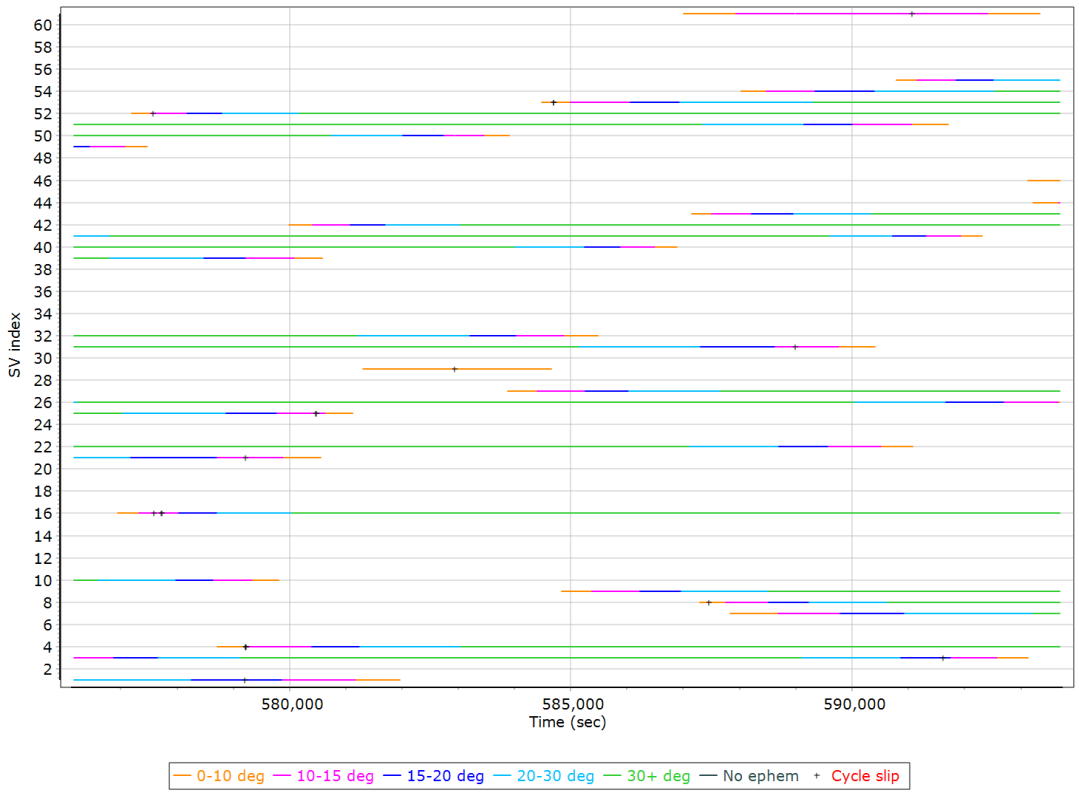
Rover Data QC

Raw IMU Import QC Summary

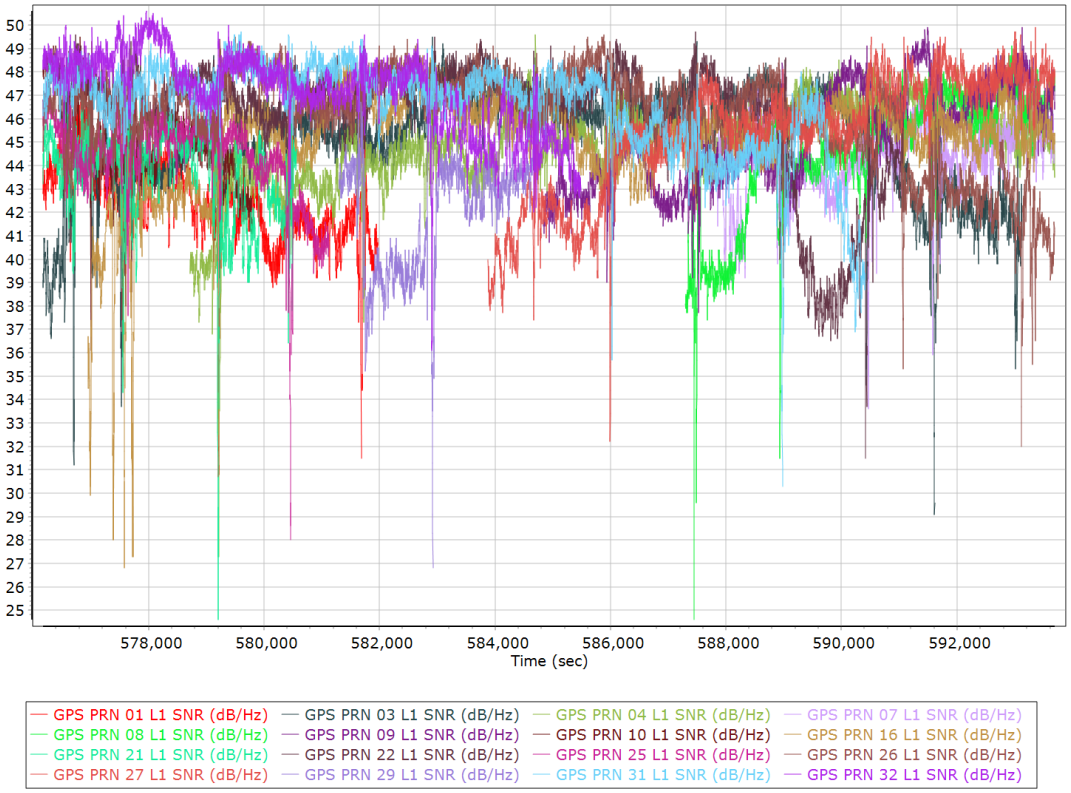
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01162021A_4040.log
IMU Records Processed	3504628
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

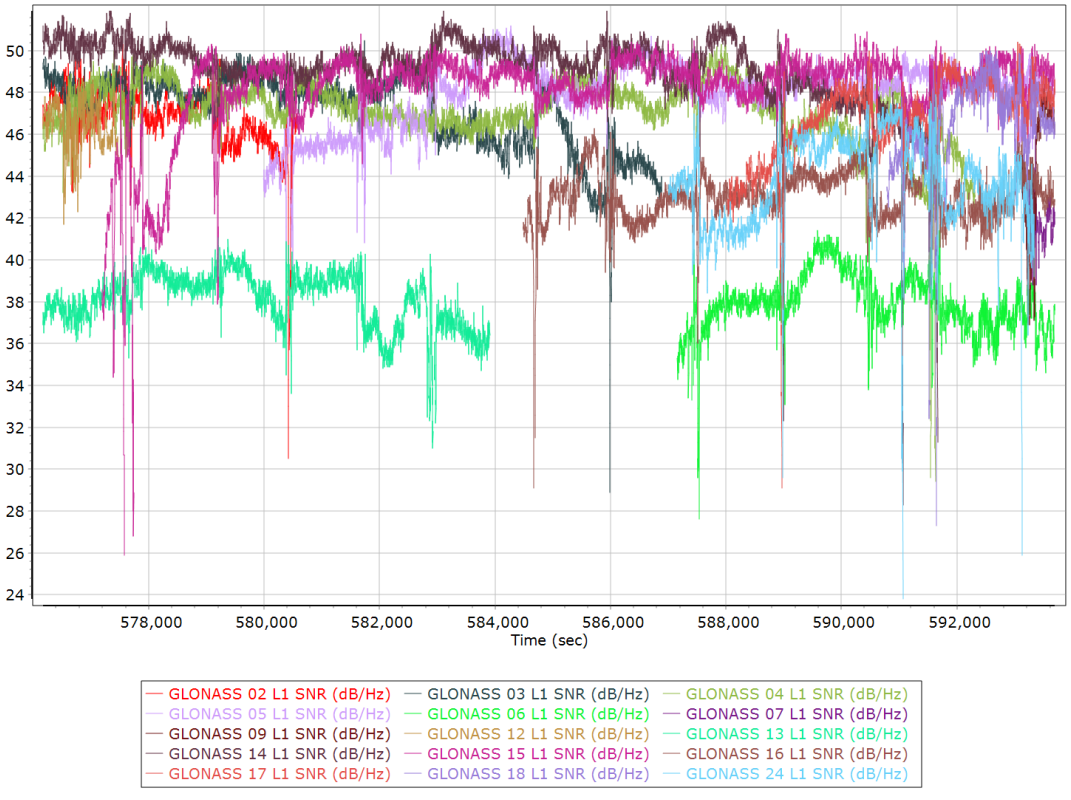
GPS/GLONASS L1 Satellite Lock/Elevation



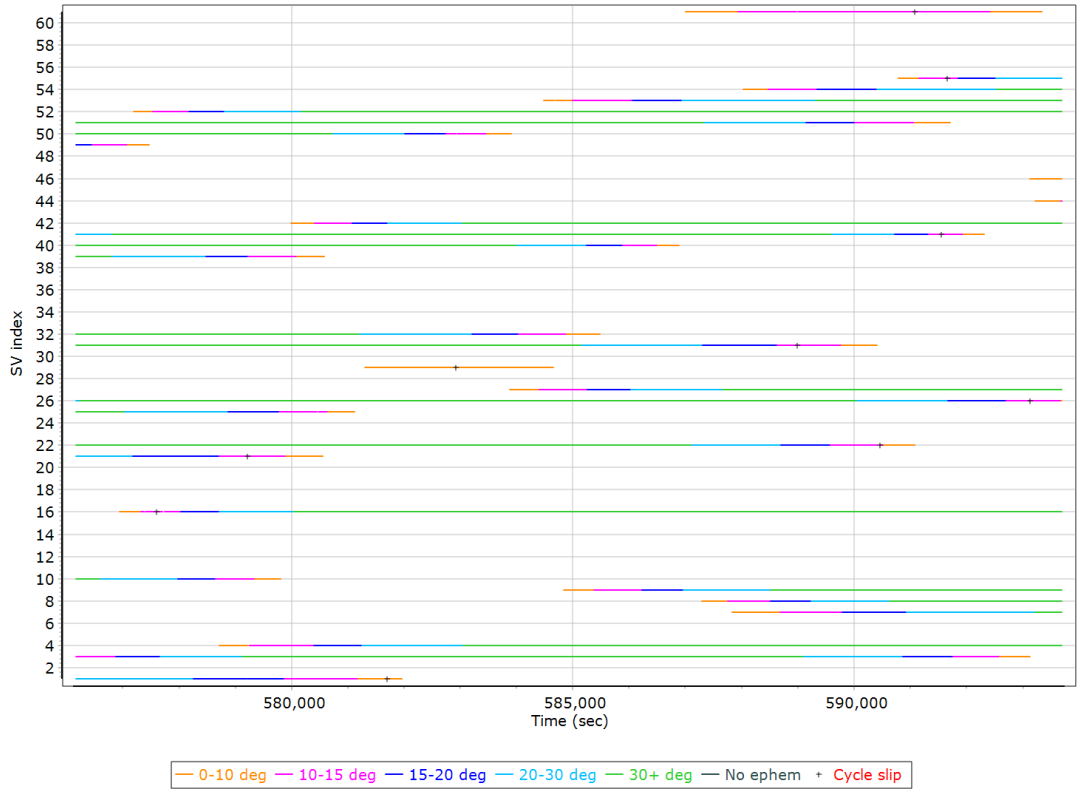
GPS L1 SNR



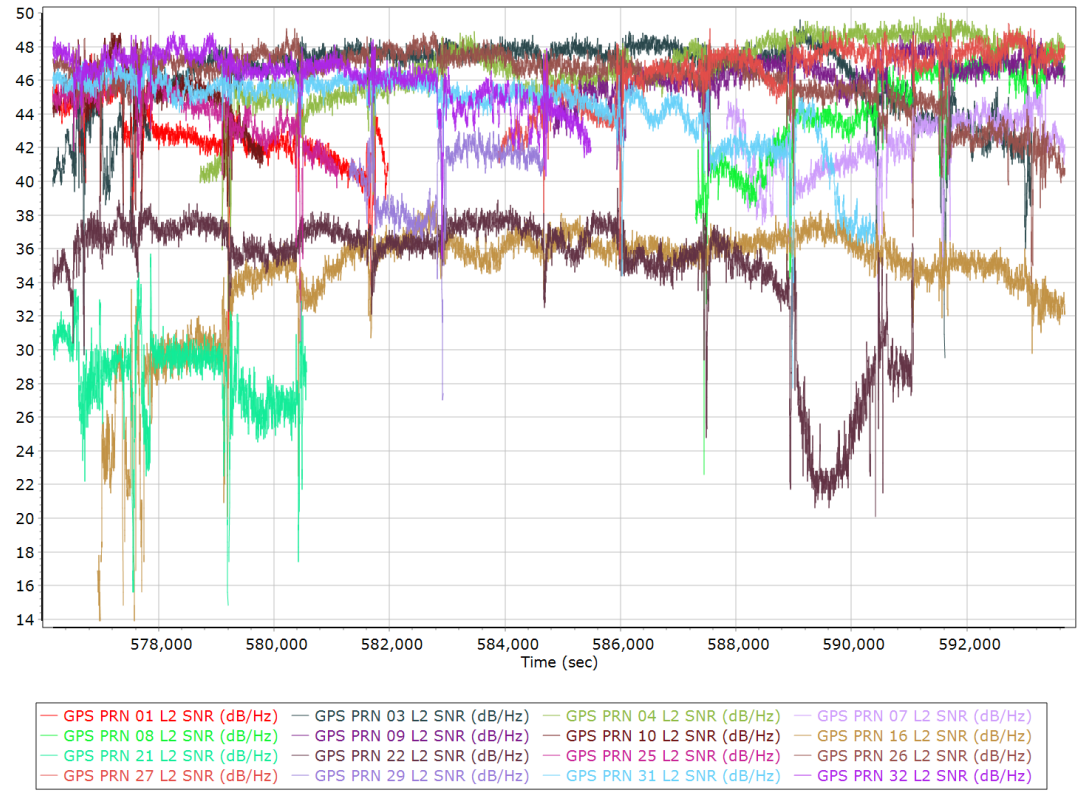
GLONASS L1 SNR



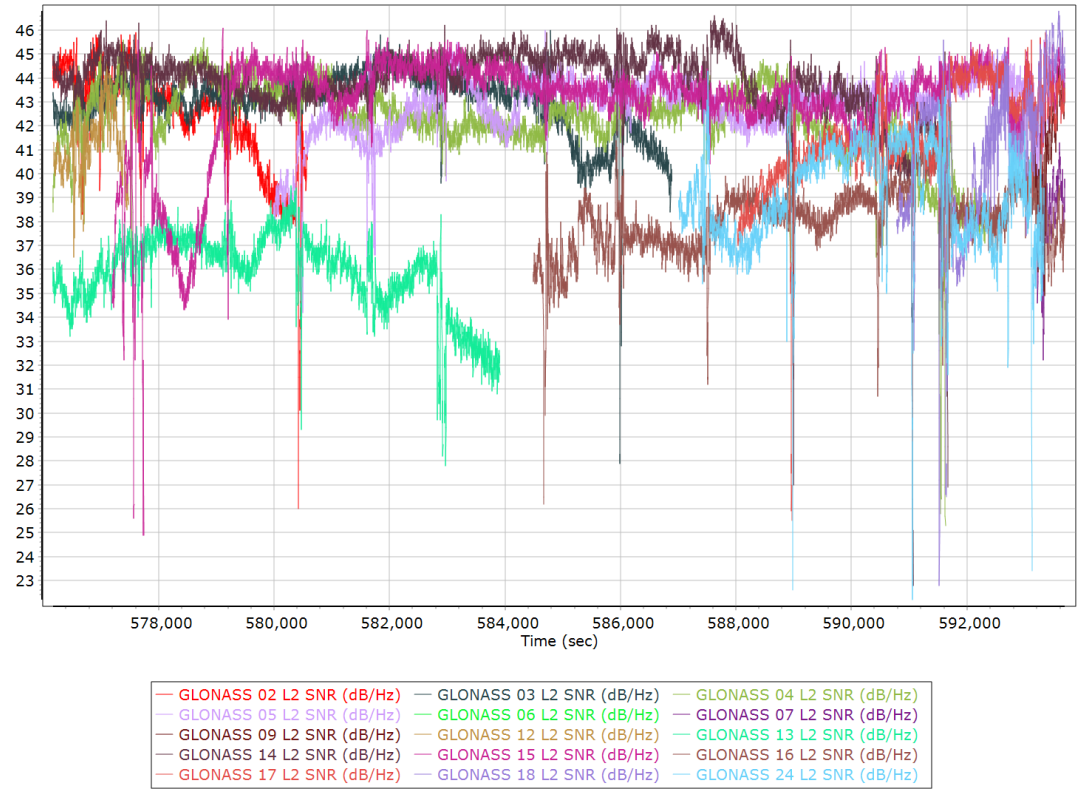
GPS/GLONASS L2 Satellite Lock/Elevation



GPS L2 SNR



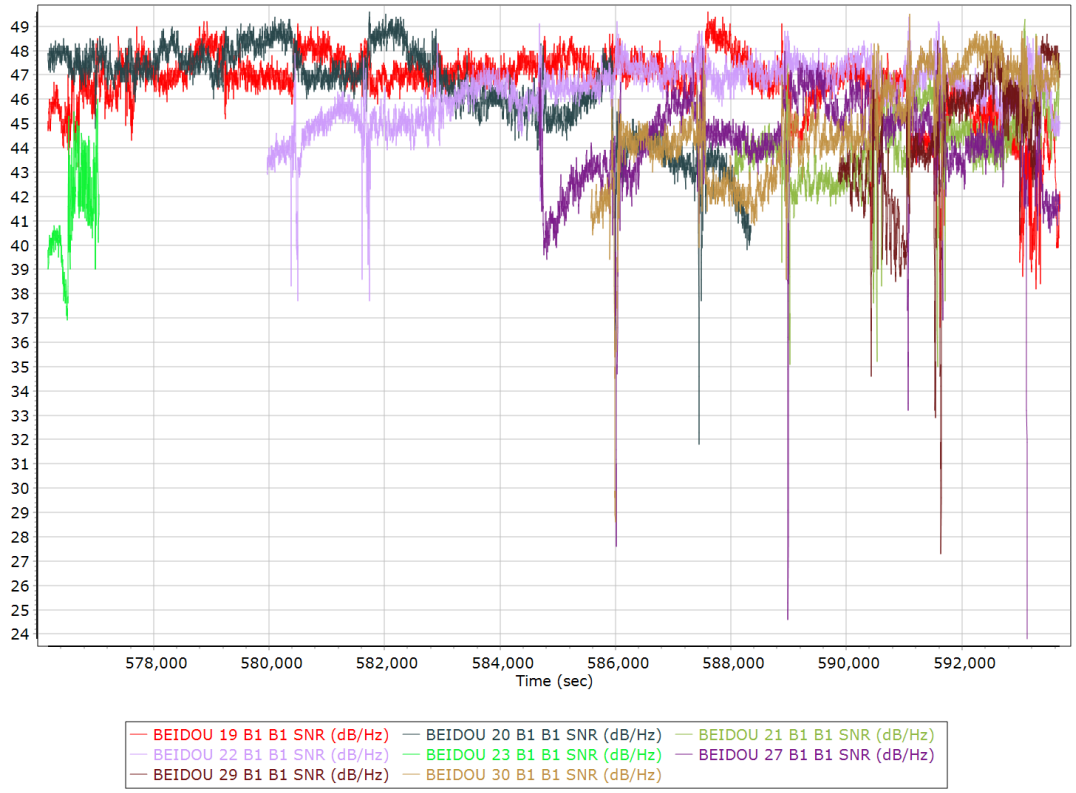
GLONASS L2 SNR



BEIDOU Satellite Lock/Elevation



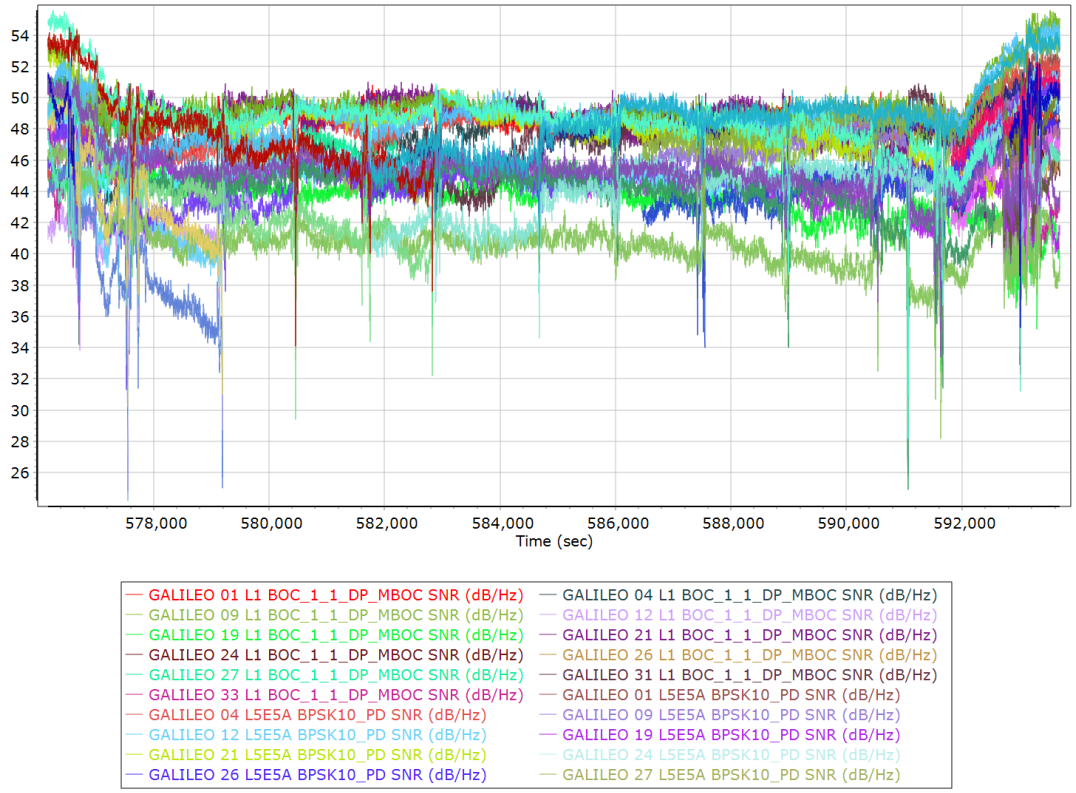
BEIDOU SNR



GALILEO Satellite Lock/Elevation

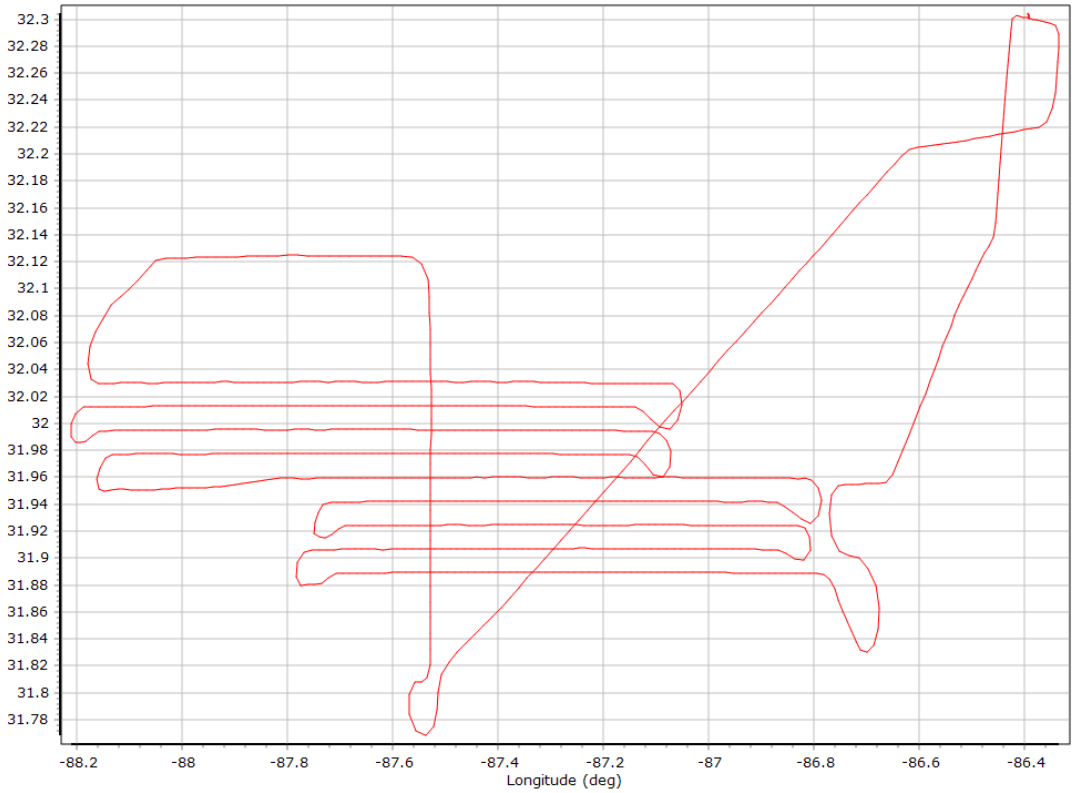


GALILEO SNR

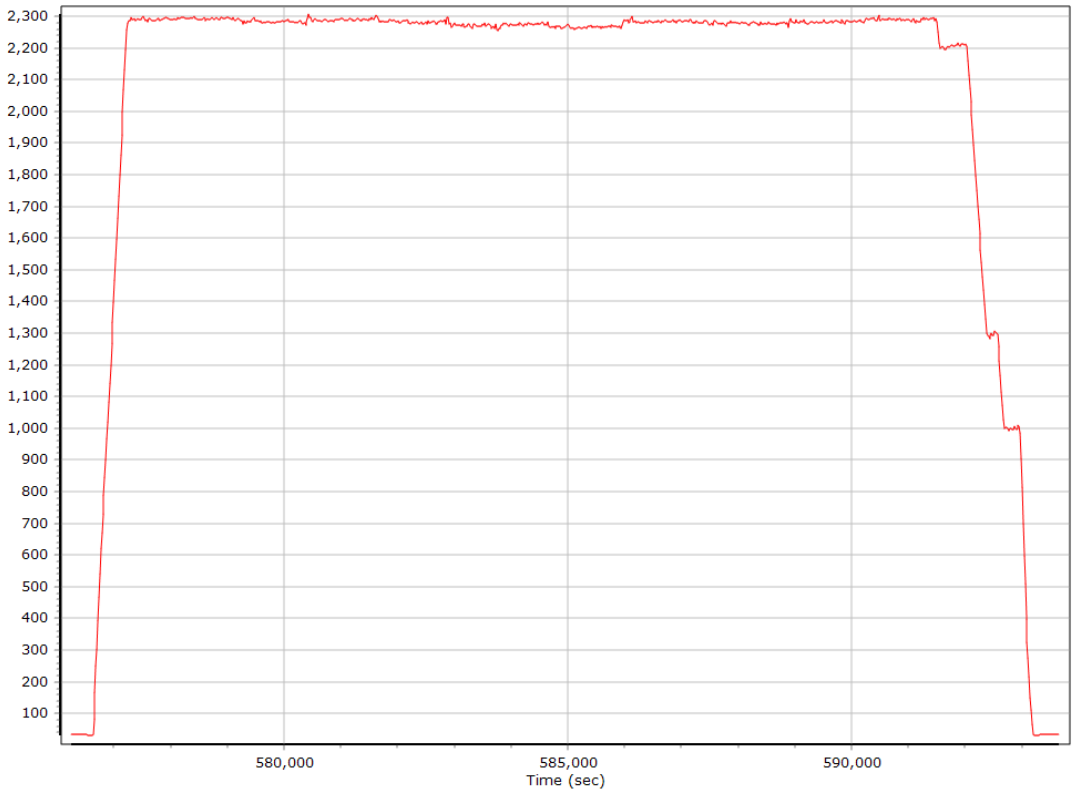

54
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36
34
32
30
28
26
578,000
580,000
582,000
584,000
586,000
588,000
590,000
592,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 27 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

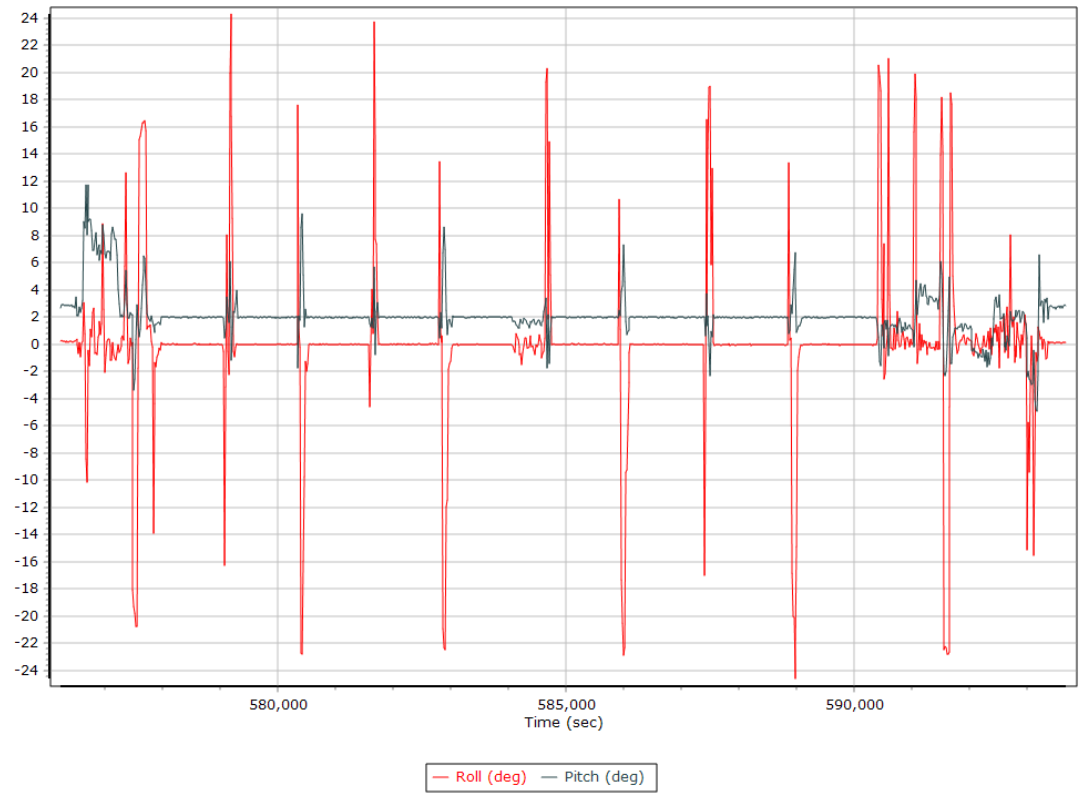
Top View



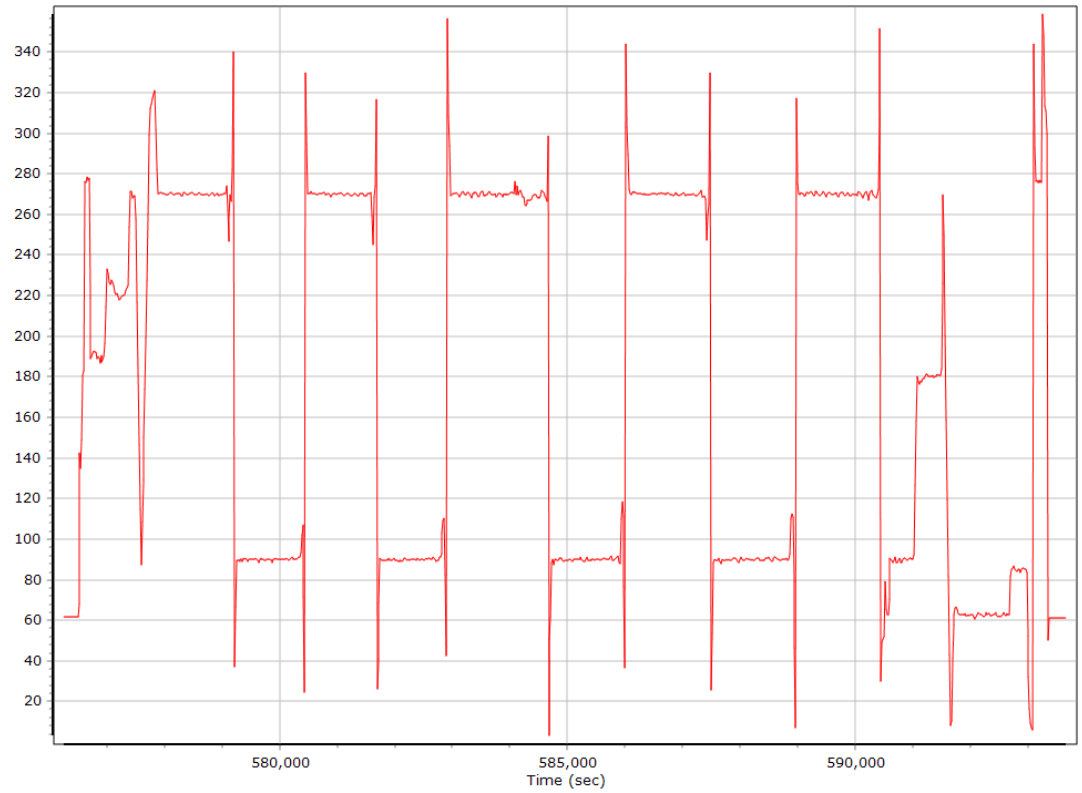
Altitude



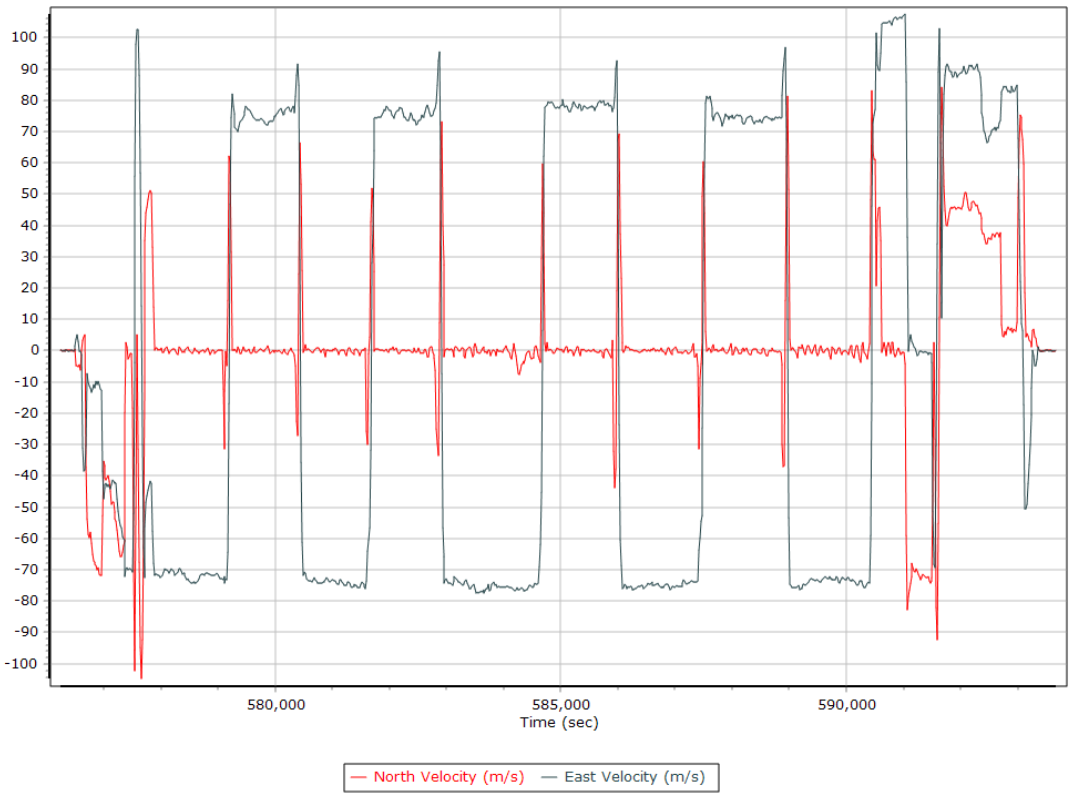
Roll/Pitch



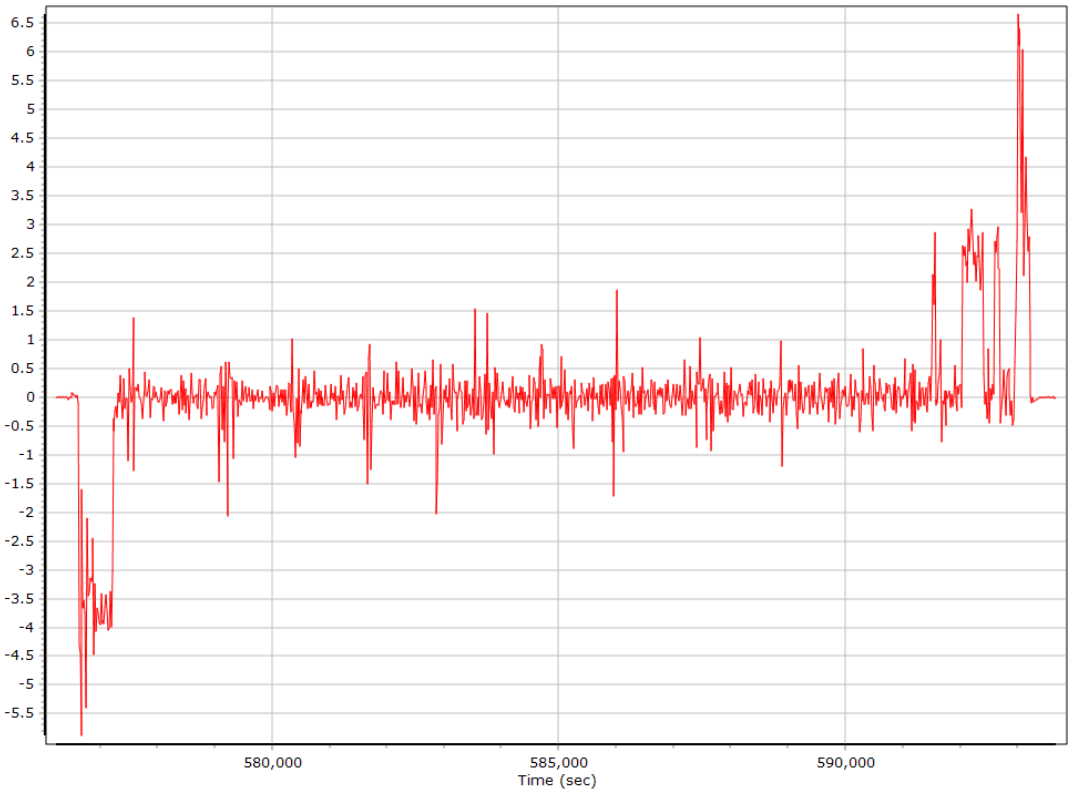
Heading



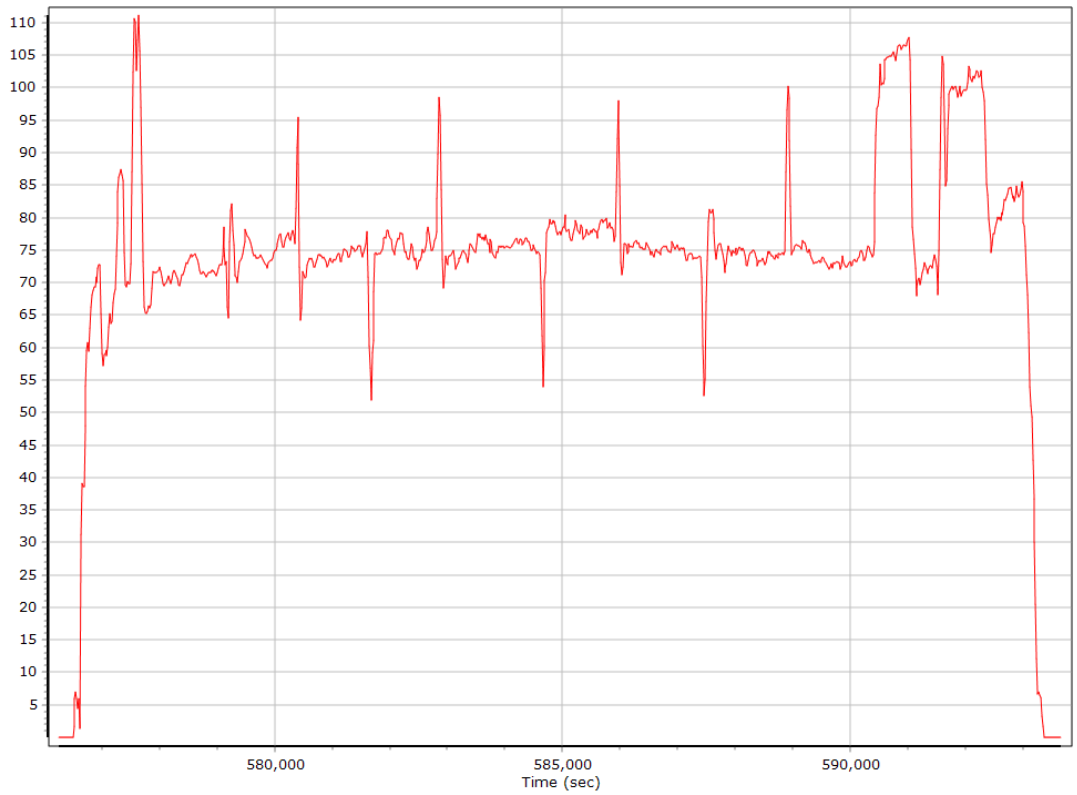
North/East Velocity



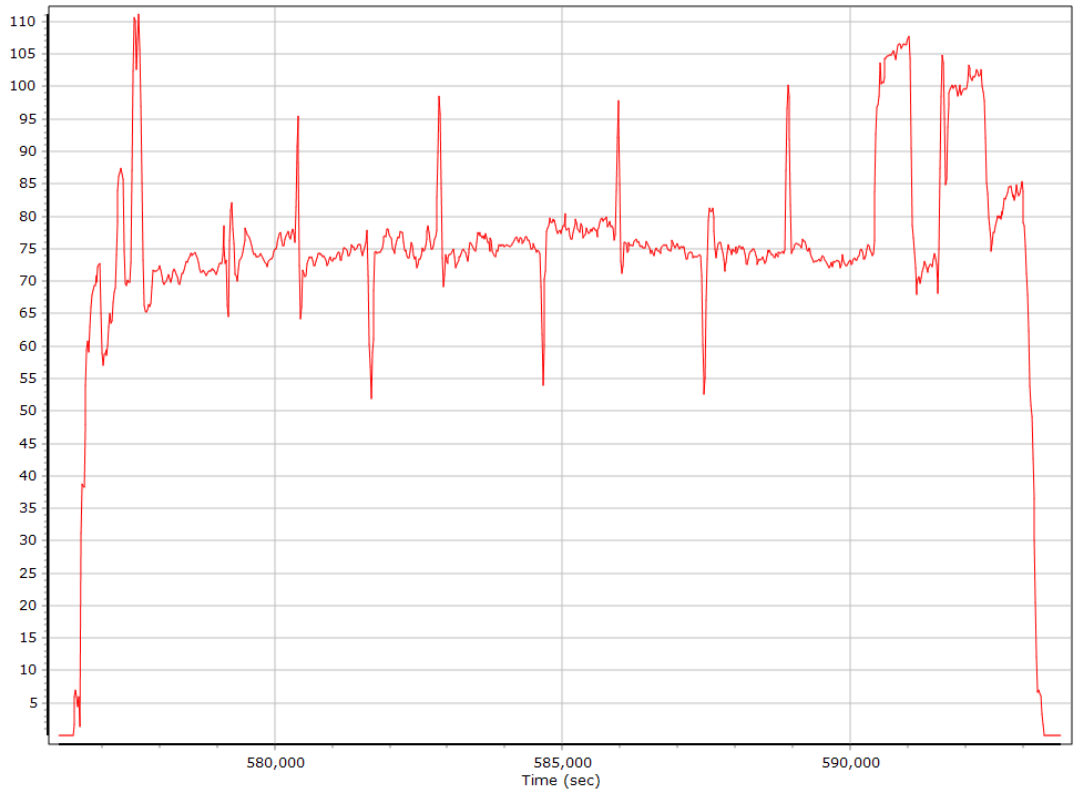
Down Velocity



Total Speed



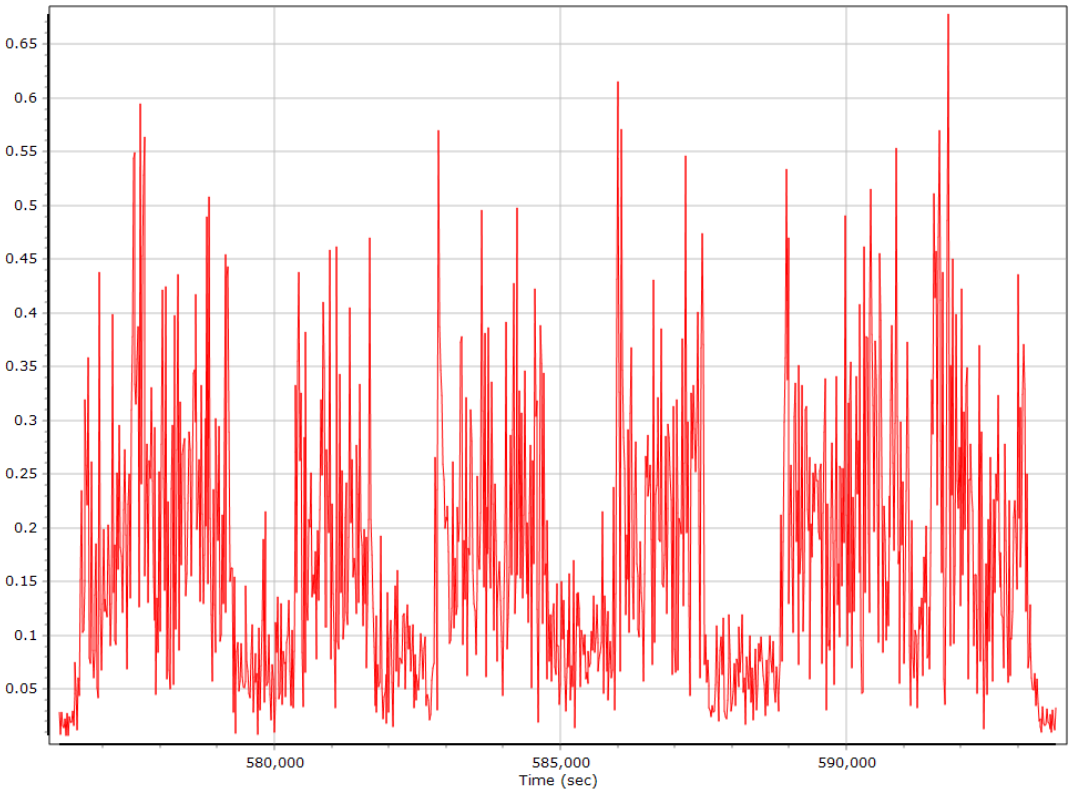
Ground Speed



Body Acceleration



Total Body Acceleration

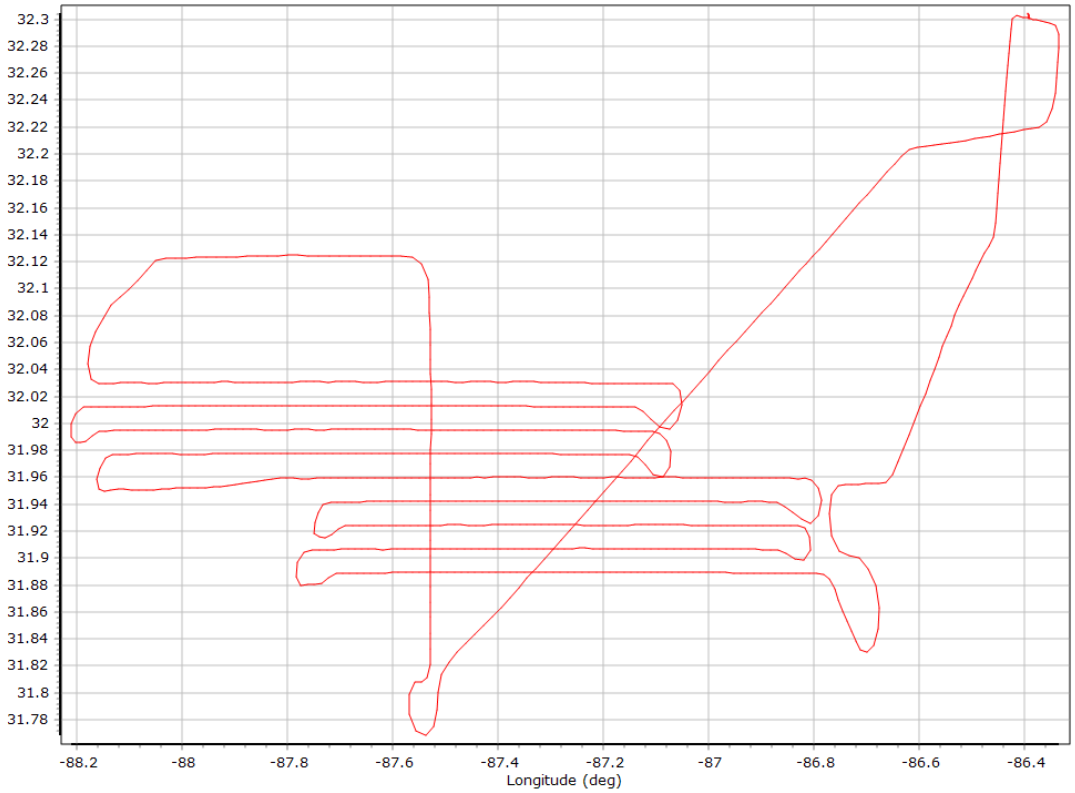


Body Angular Rate

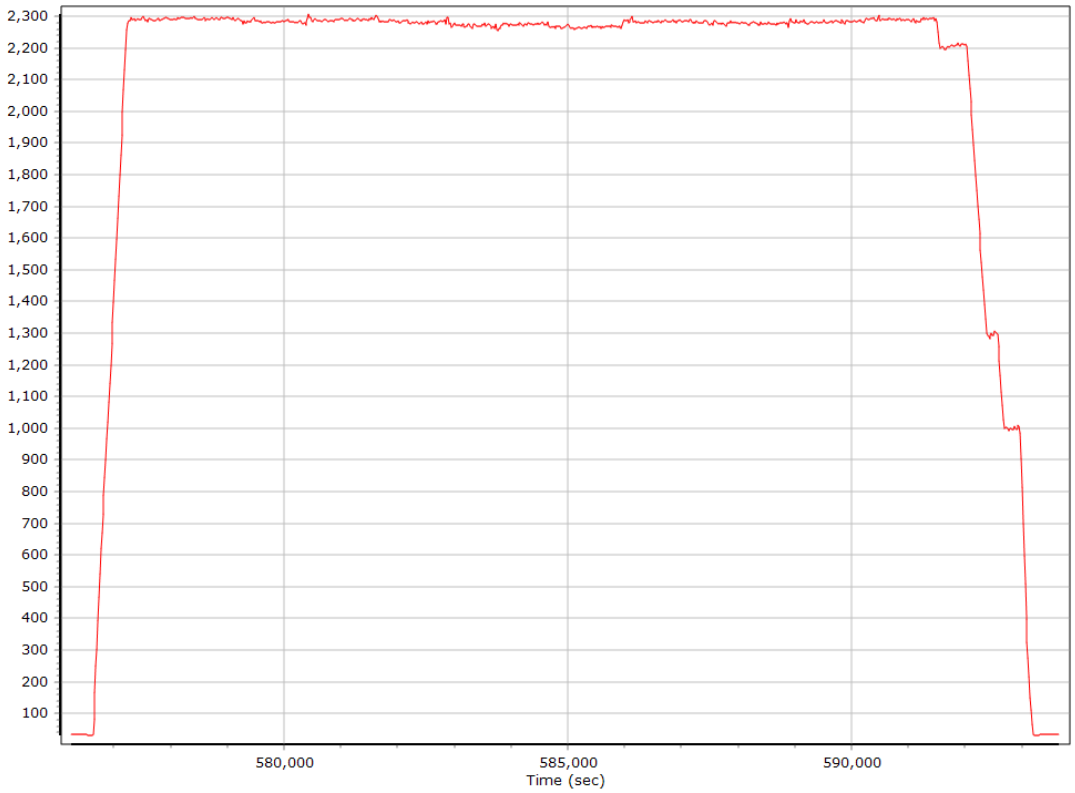


Forward Processed Trajectory Information

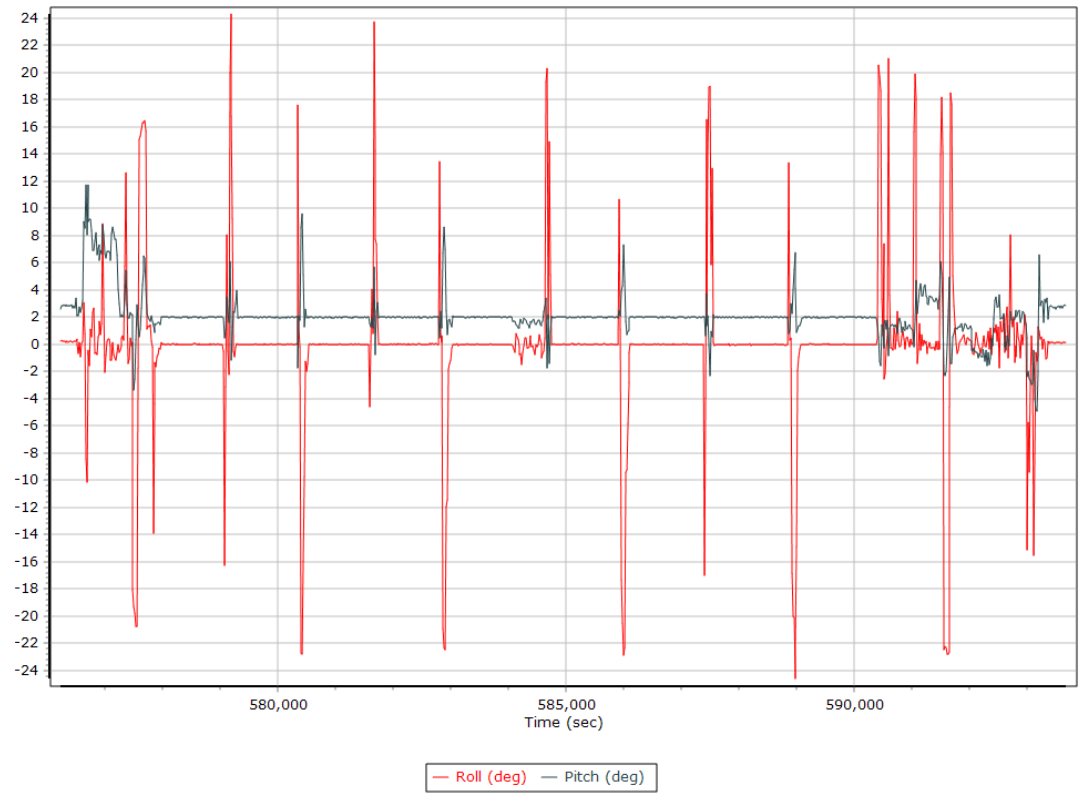
Top View



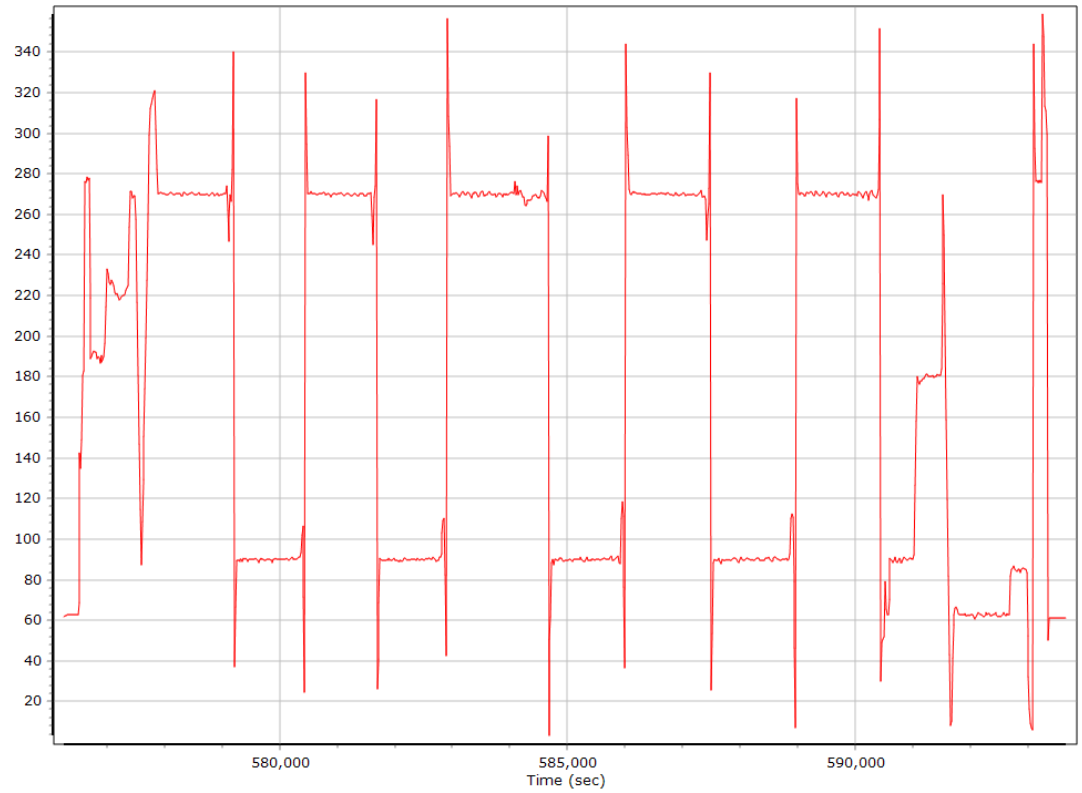
Altitude



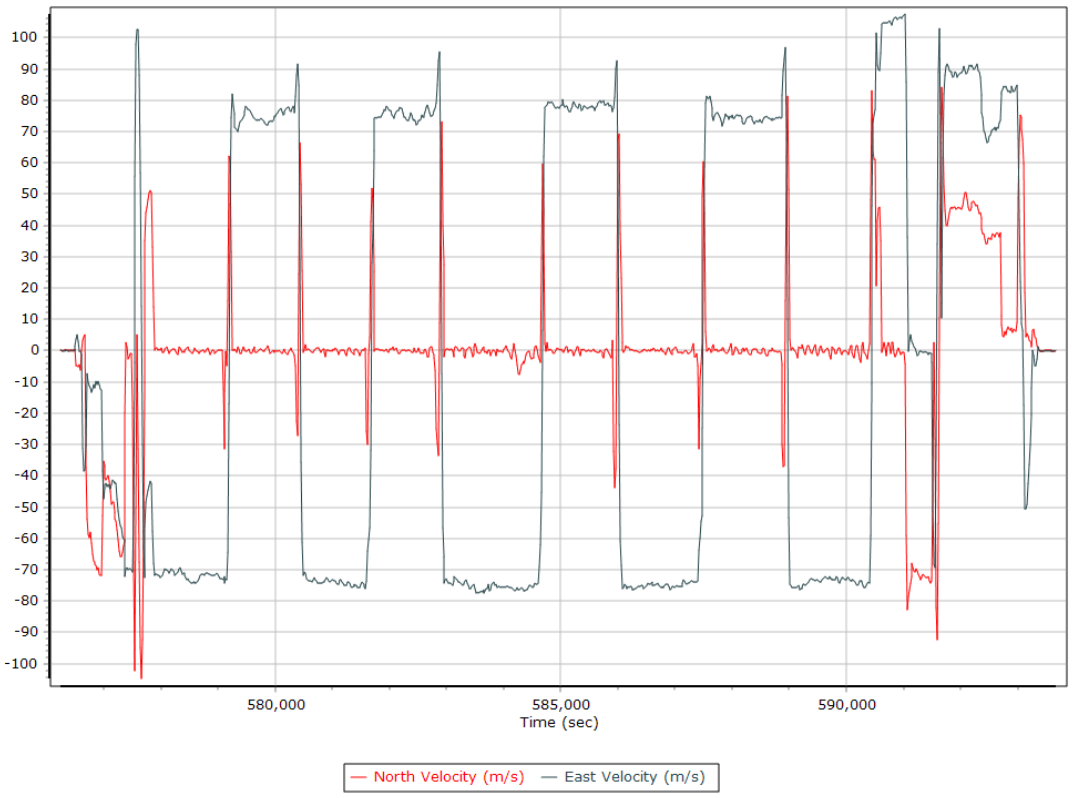
Roll/Pitch



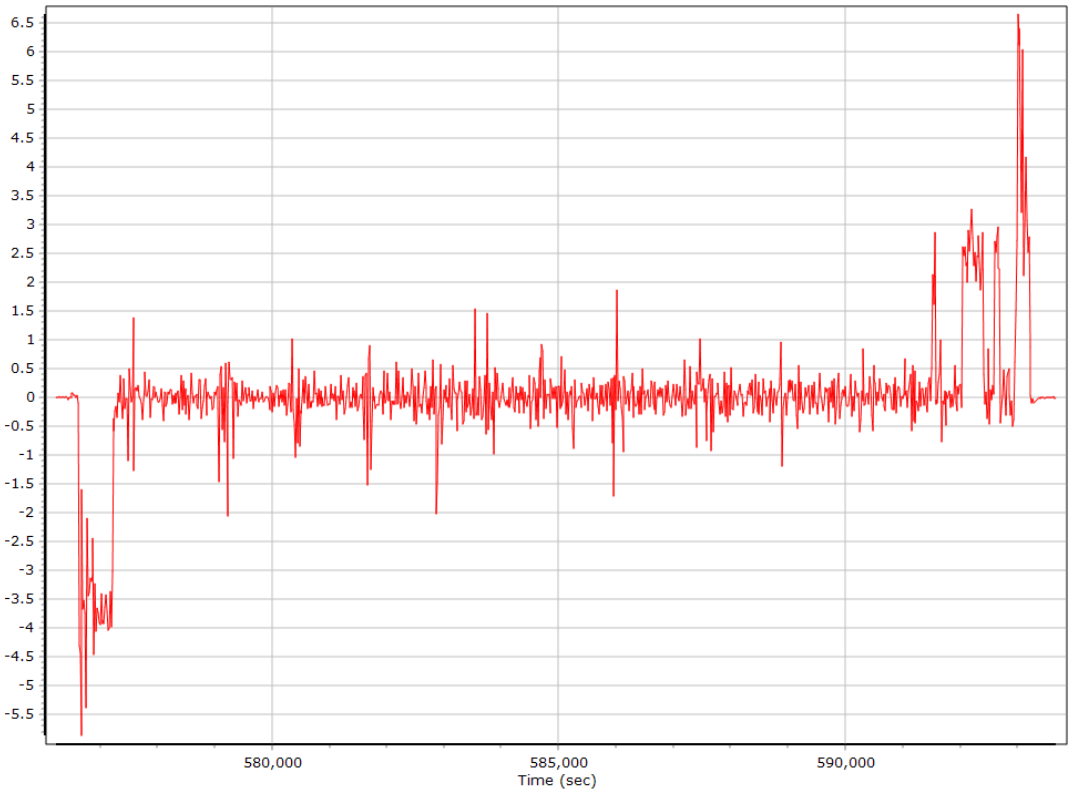
Heading



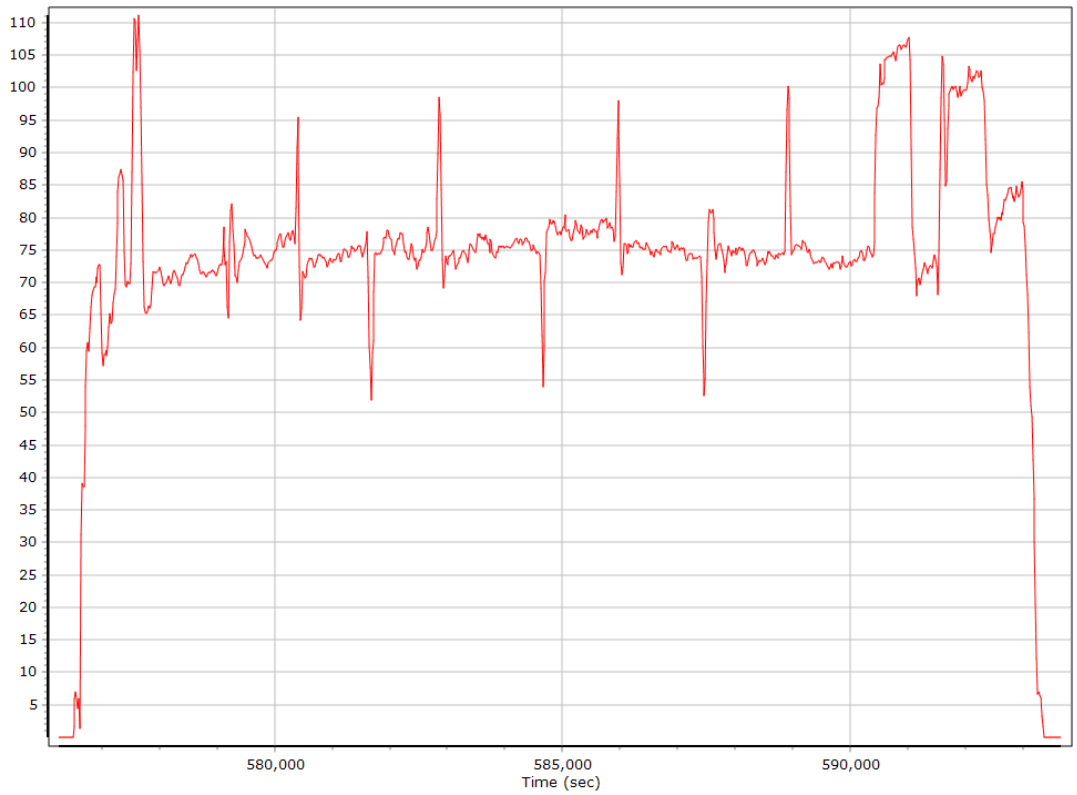
North/East Velocity



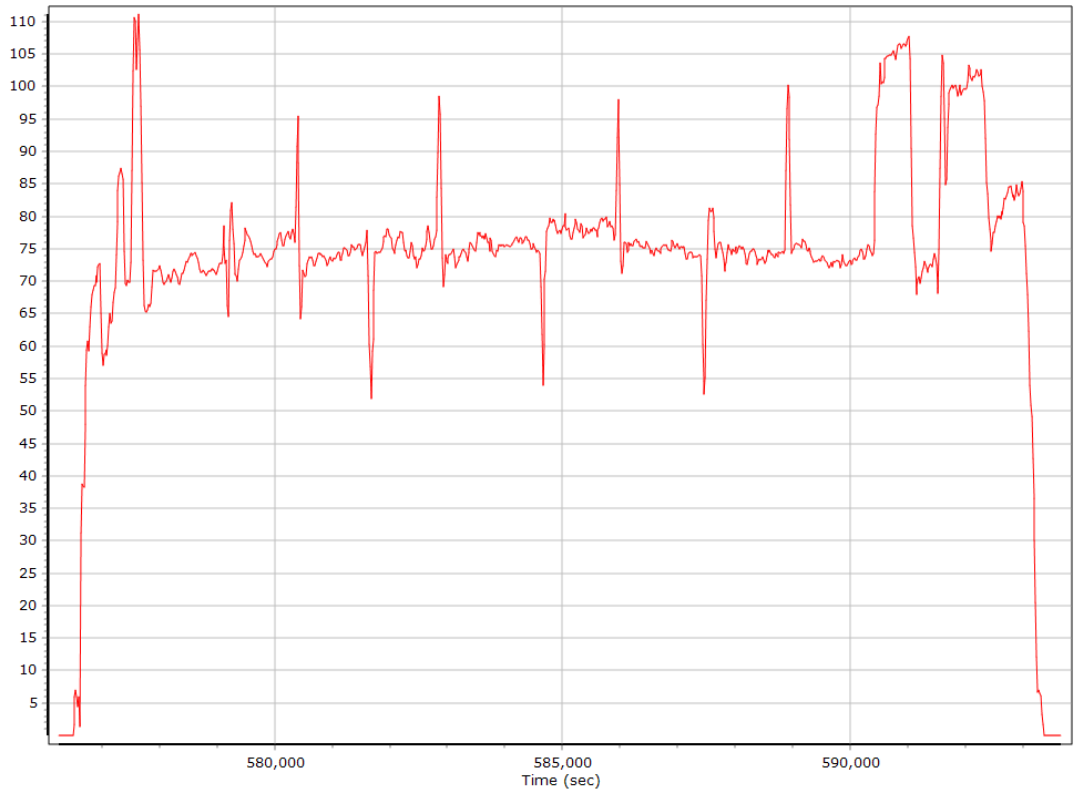
Down Velocity



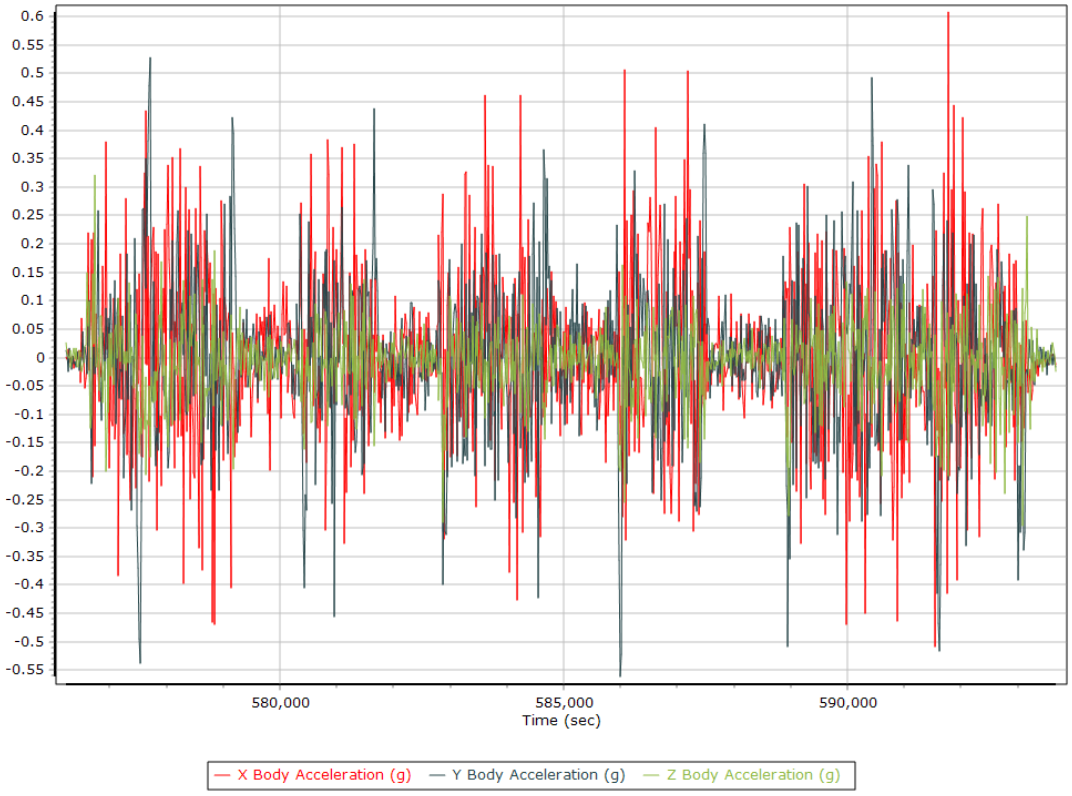
Total Speed



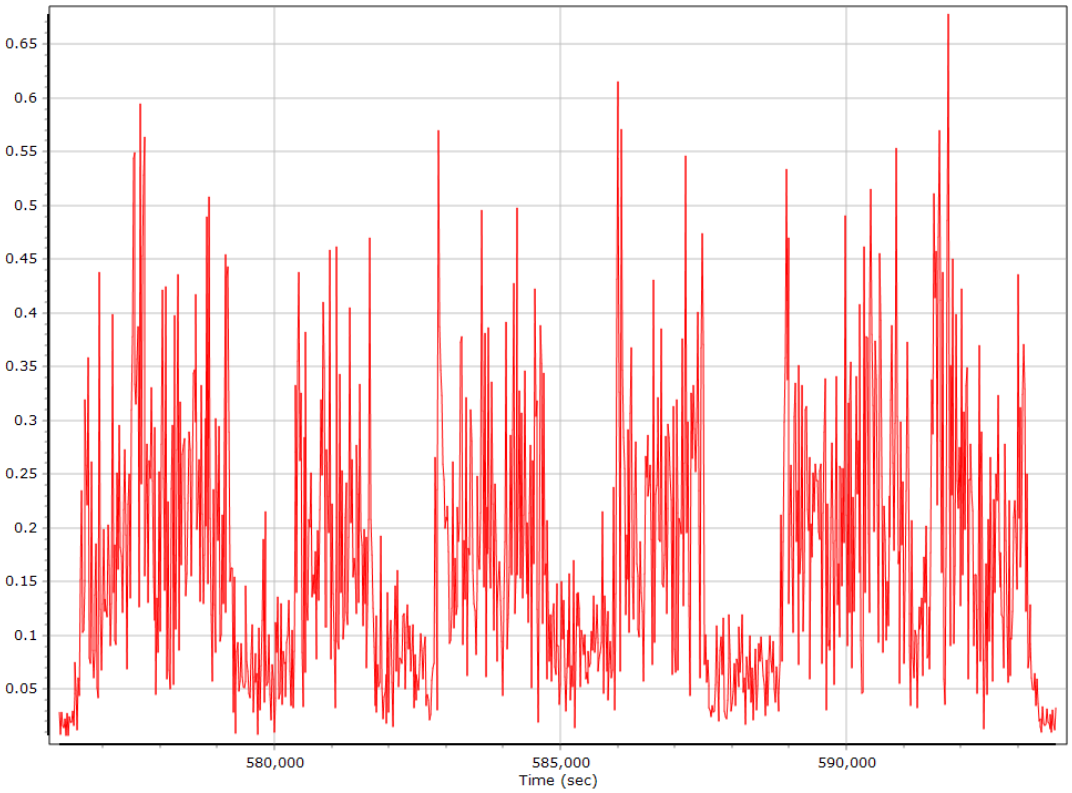
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

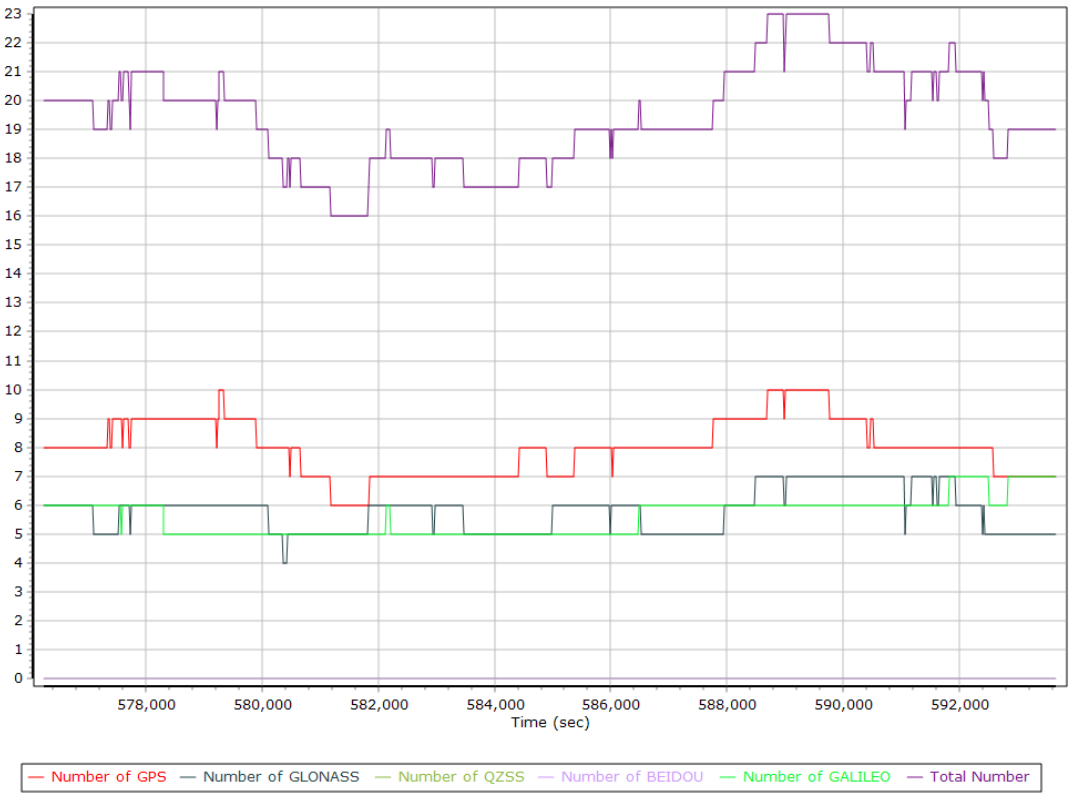


GNSS QC

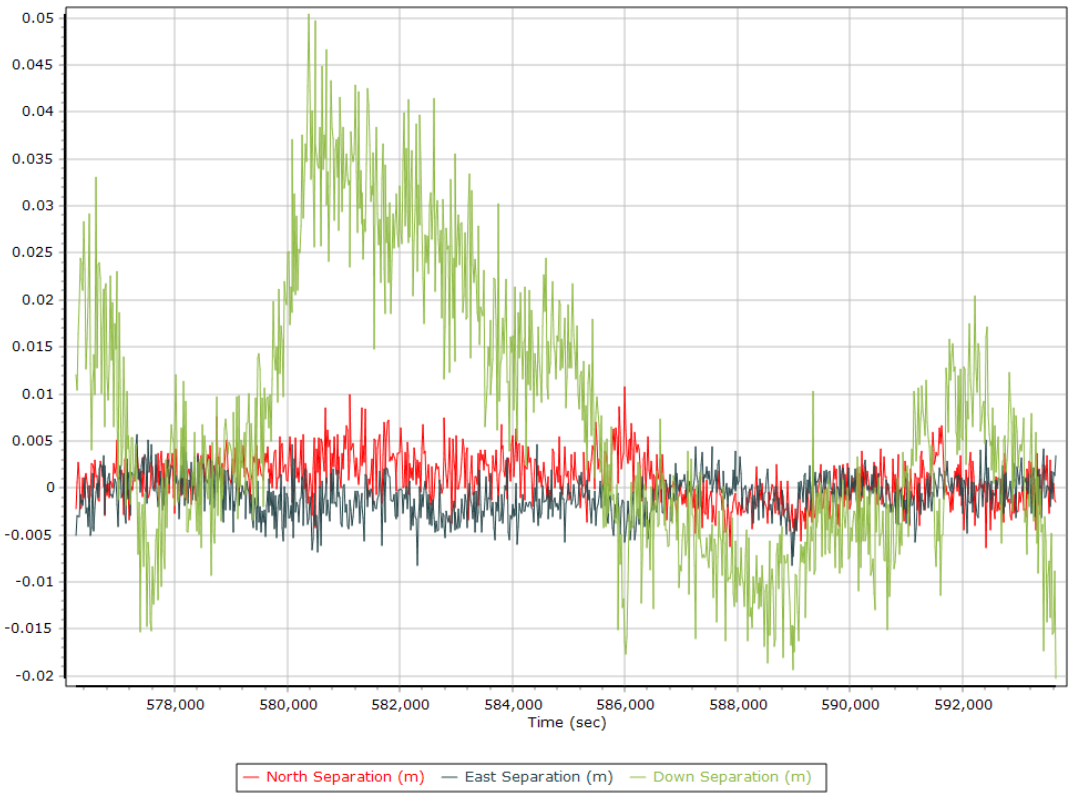
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	10	8
Number of GLONASS SV	4	7	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	7	6
Total number of SV	16	23	19
PDOP	1.01	1.67	1.25
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	17516.00	0.00	0.00
Percentage	100.00	0.00	0.00

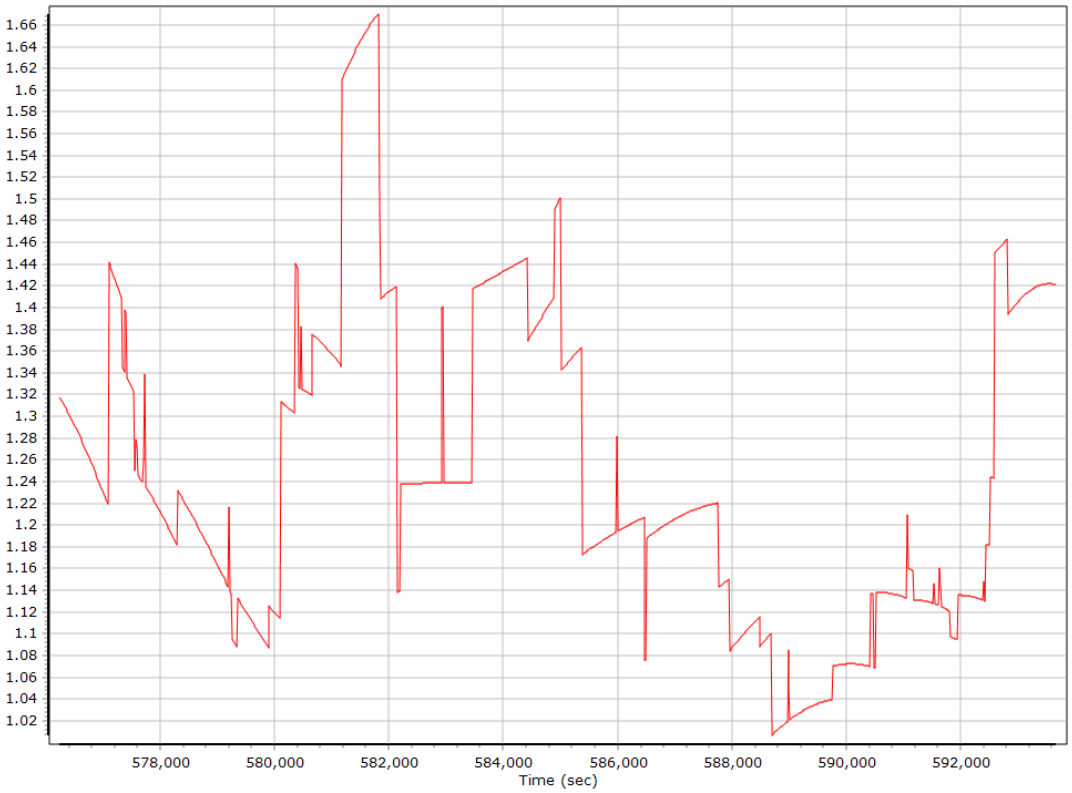
Num SVs in solution



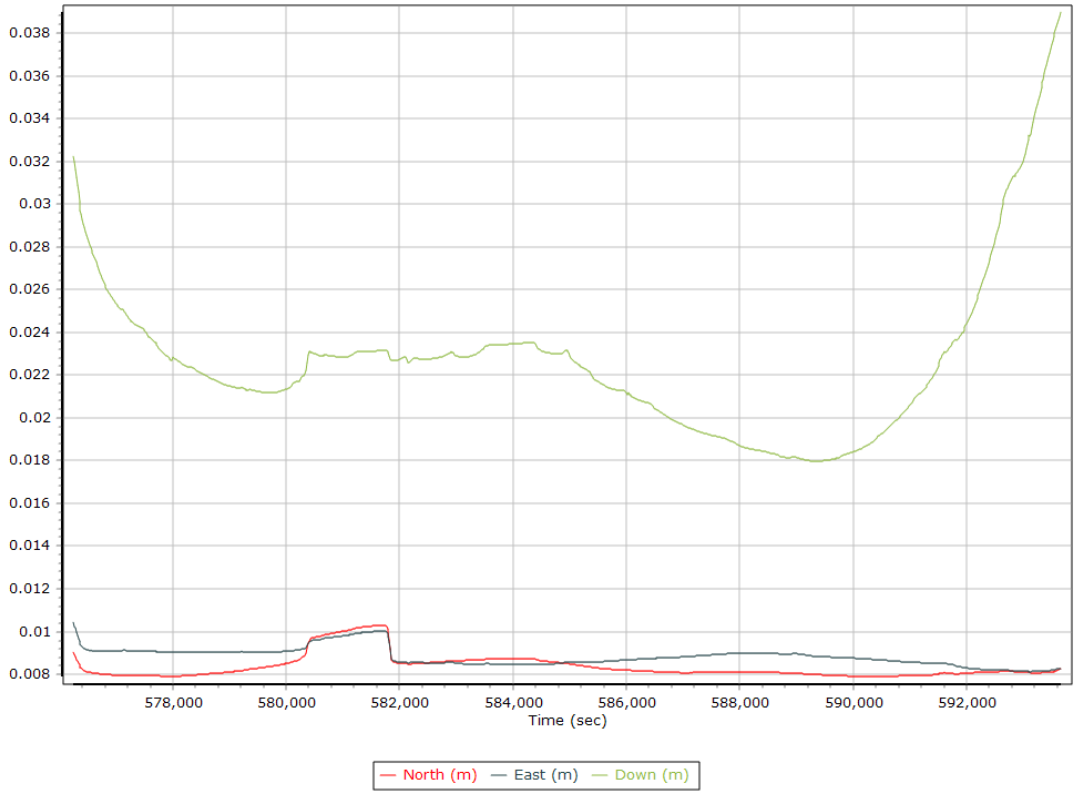
Forward/Reverse Separation



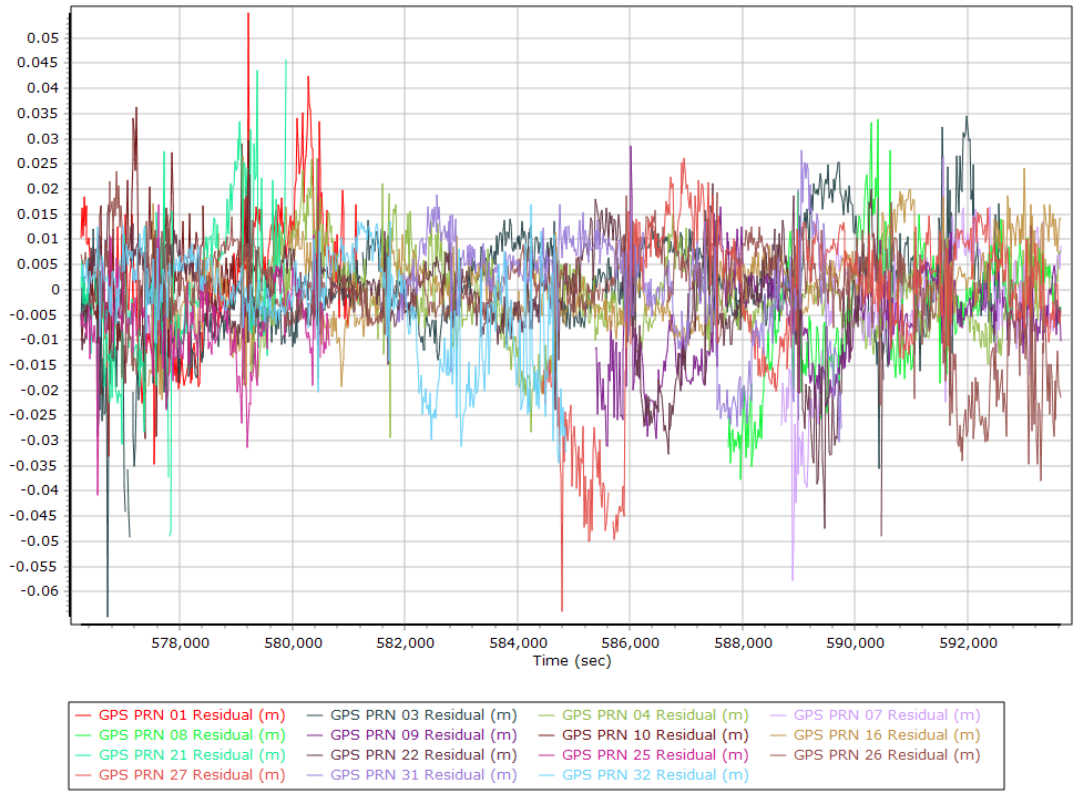
PDOP



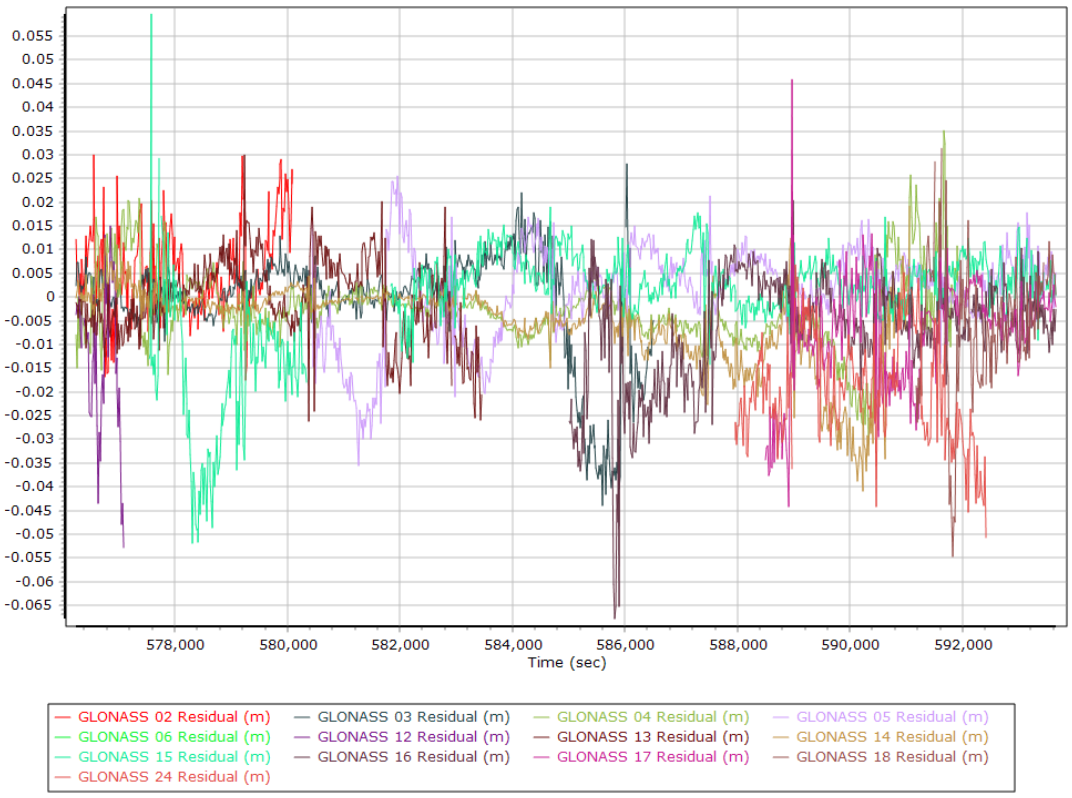
Estimated Position Accuracy



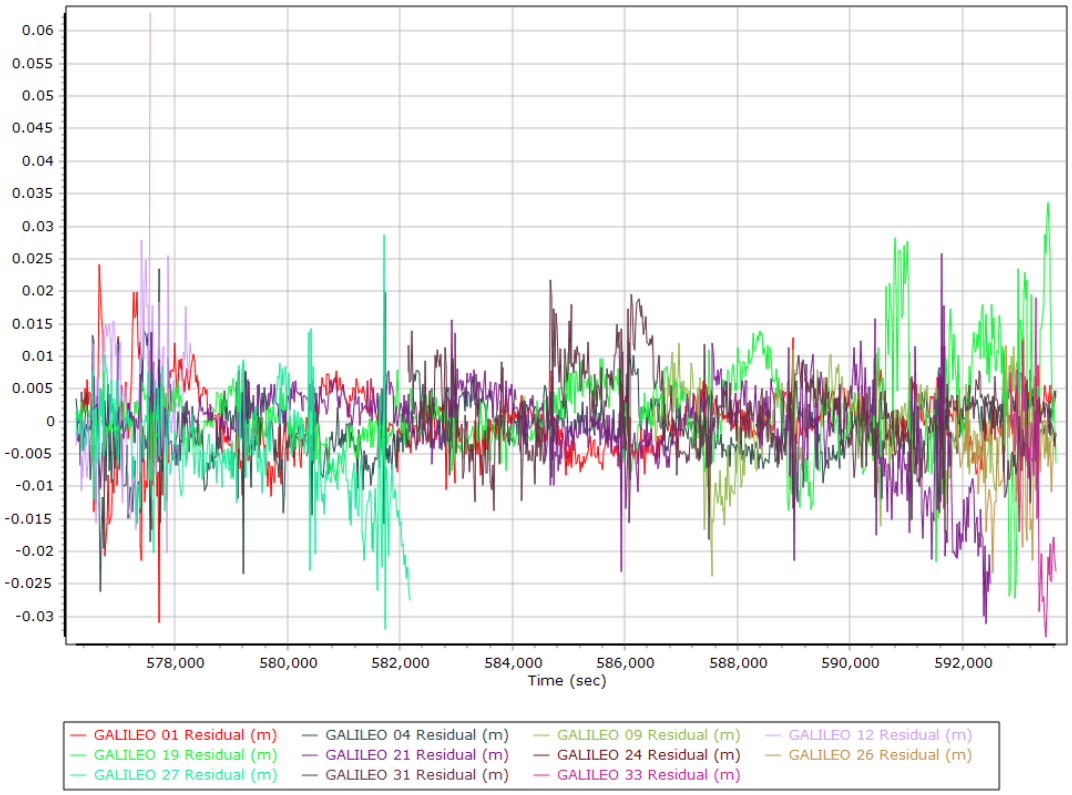
GPS Residuals



GLONASS Residuals



GALILEO Residuals



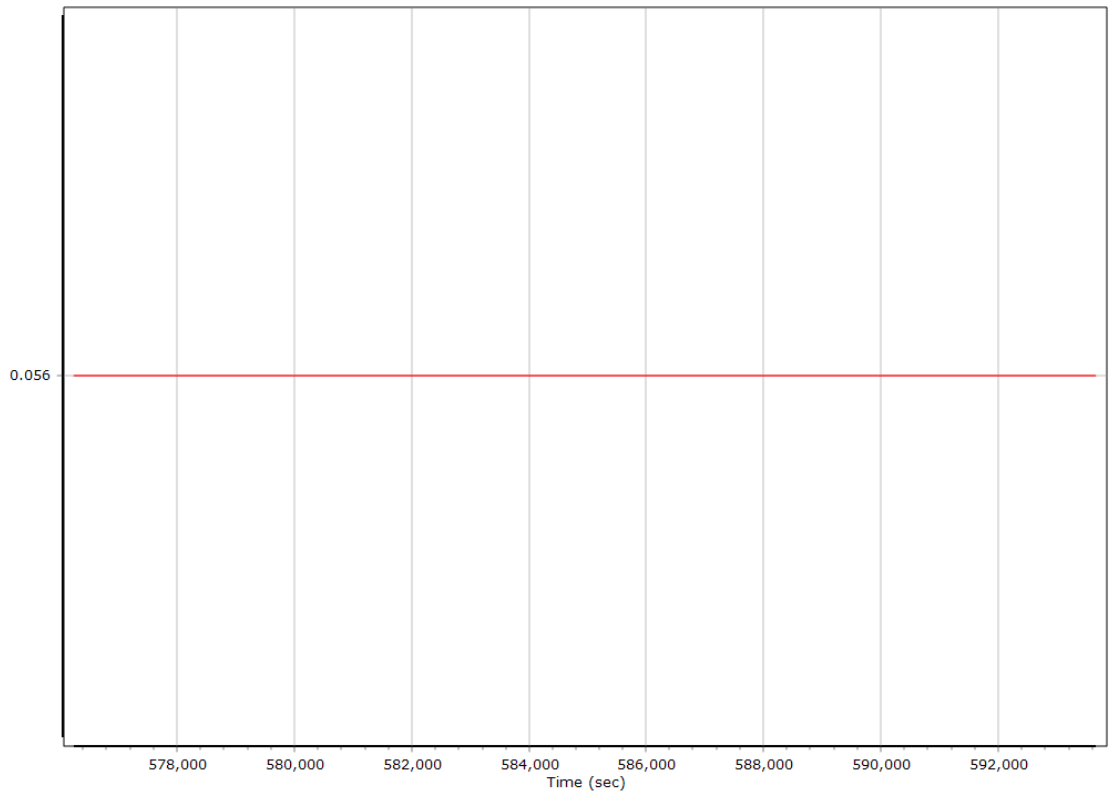
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	576152.000 (1/16/2021 4:02:32 PM)		
Processing end time	593677.000 (1/16/2021 8:54:37 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

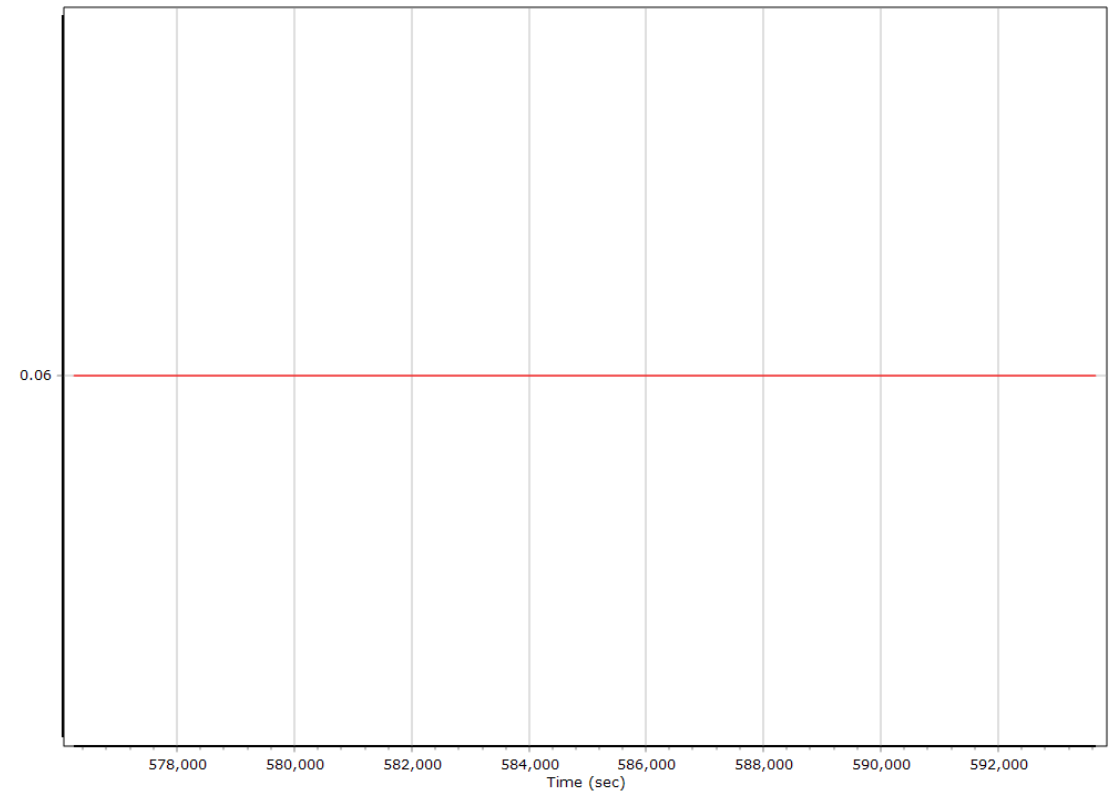
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

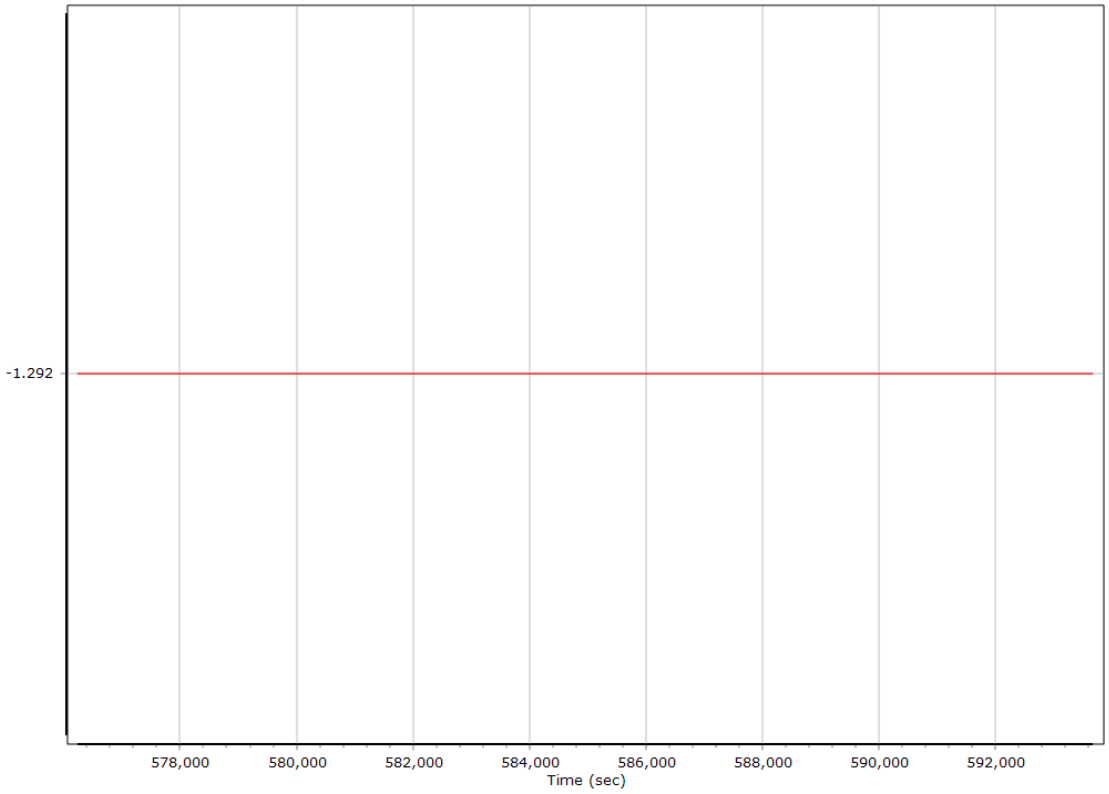
X Reference-Primary GNSS Lever Arm (m)



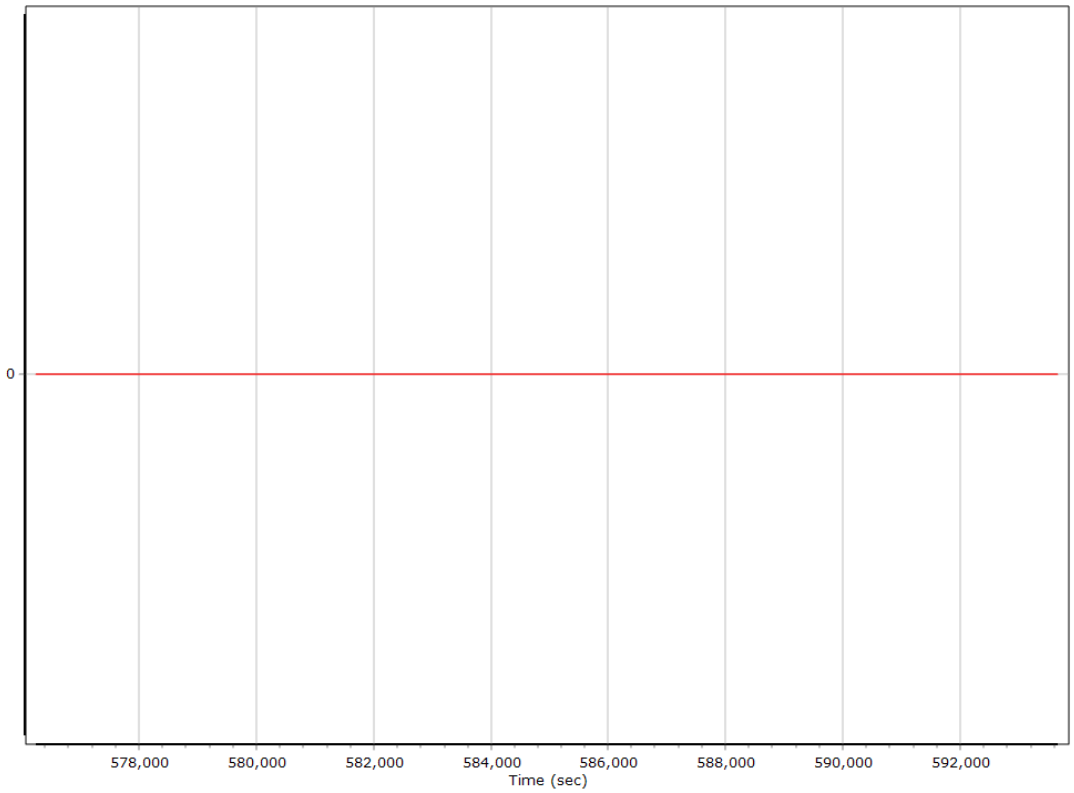
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



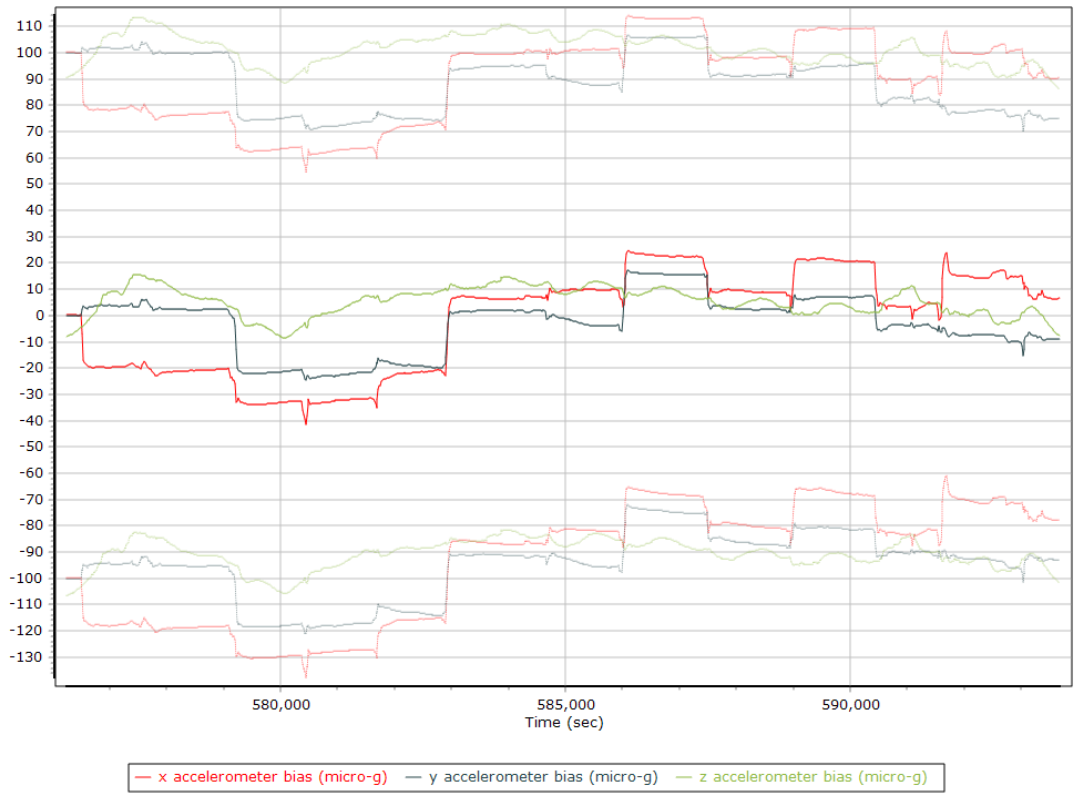
Reference-Primary GNSS Lever Arm Figure of Merit



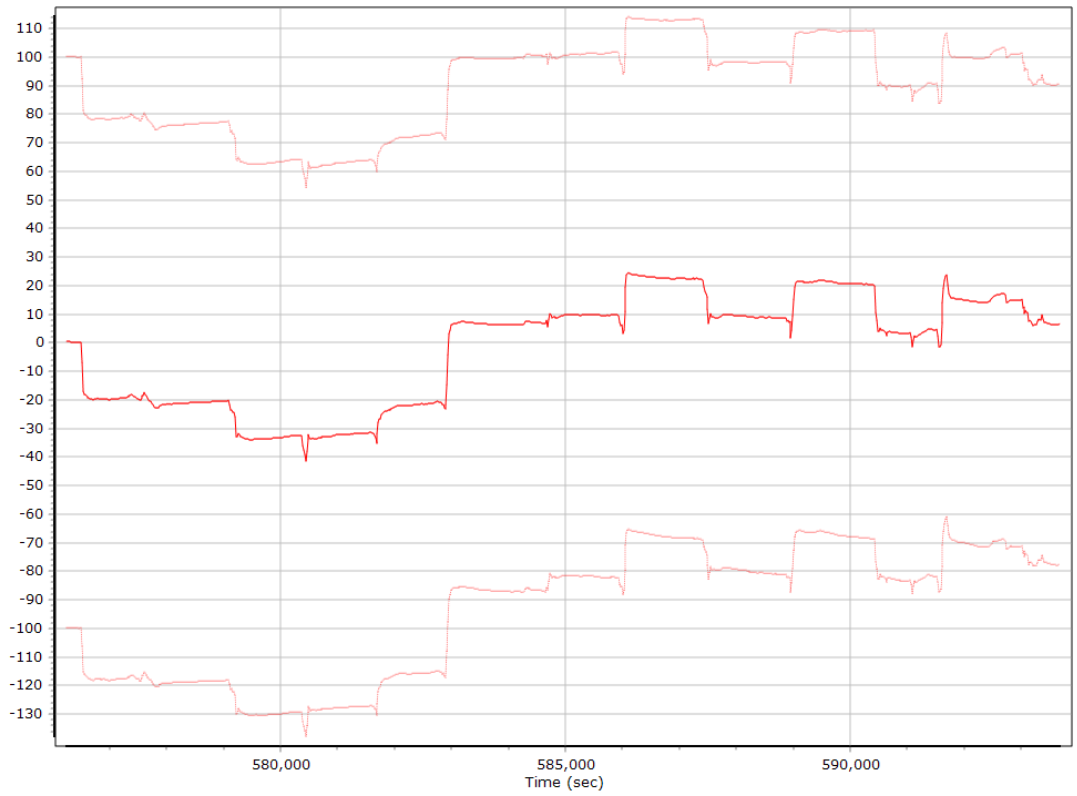
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

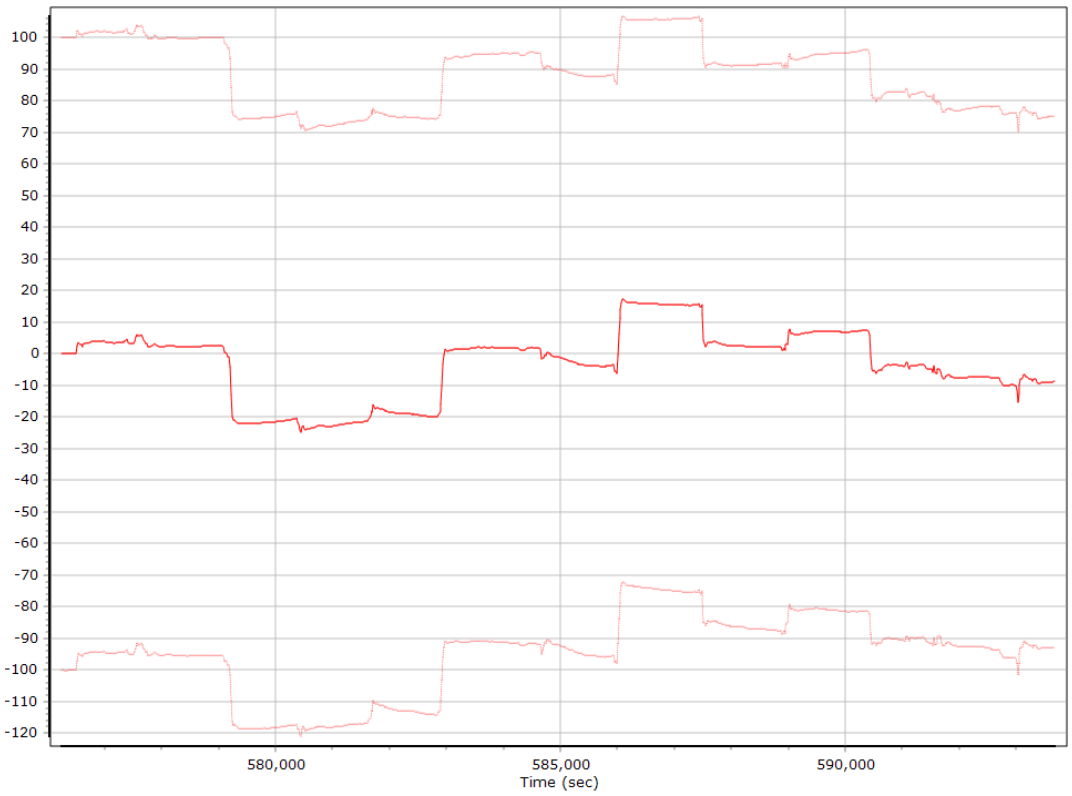
Accelerometer Bias (micro-g)



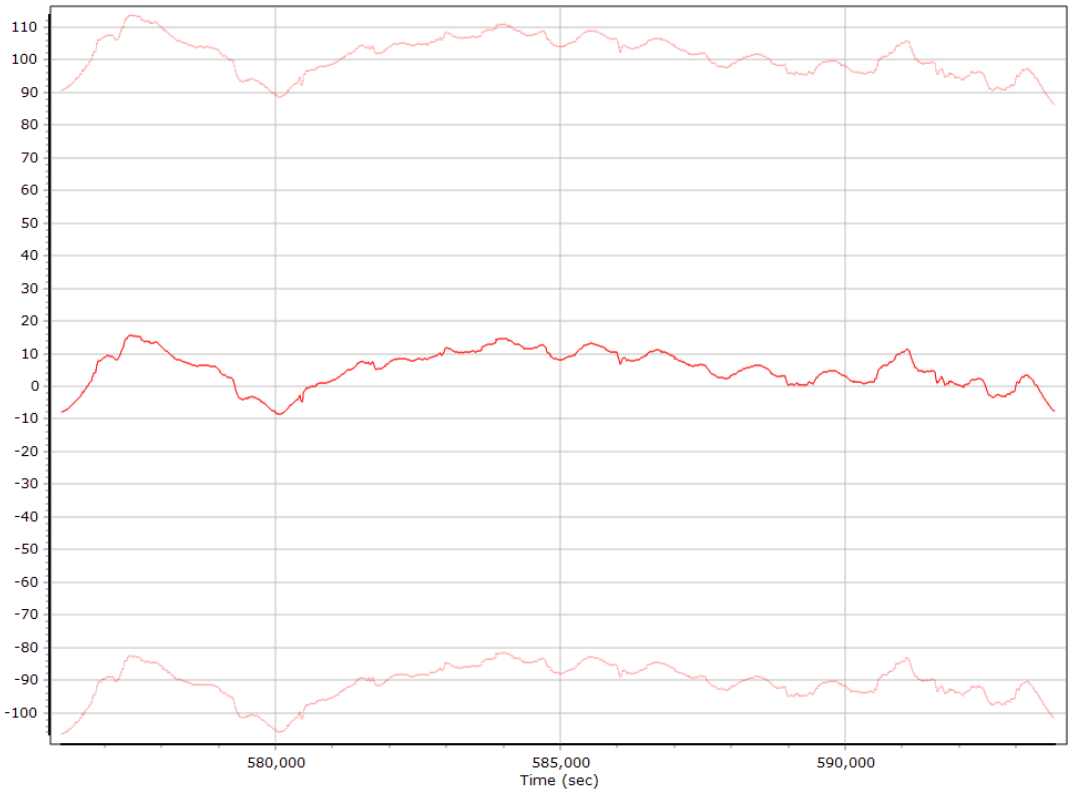
X Accelerometer Bias (micro-g)



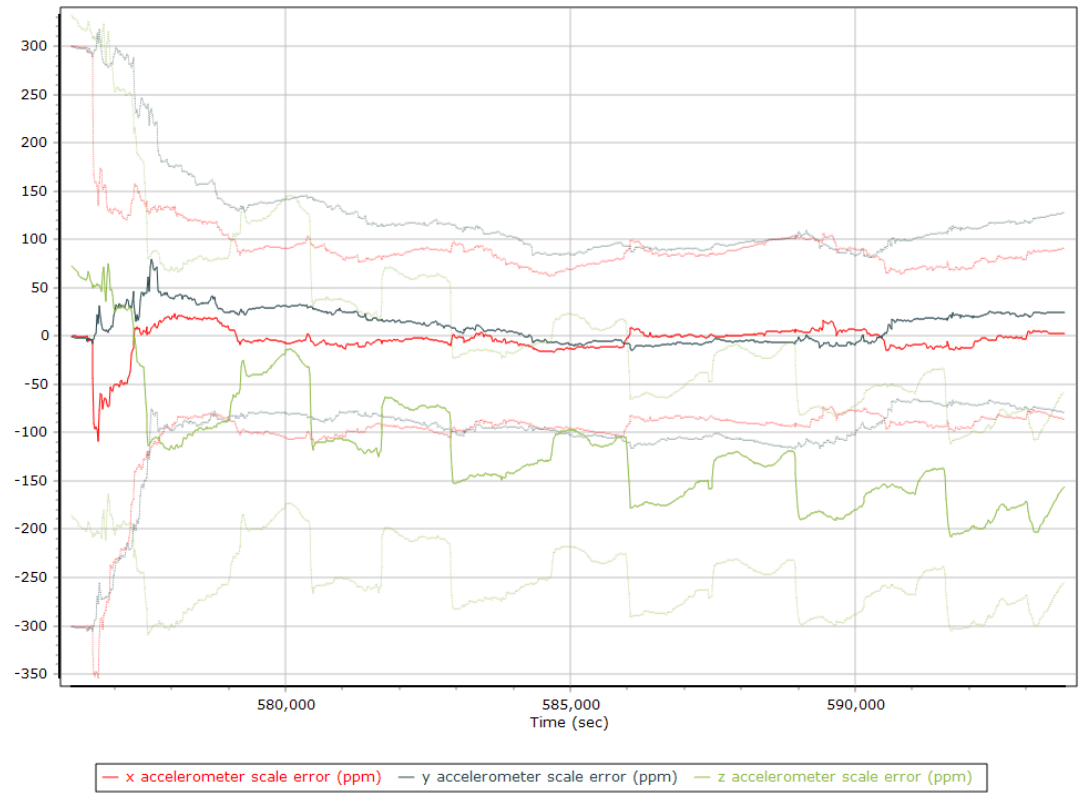
Y Accelerometer Bias (micro-g)



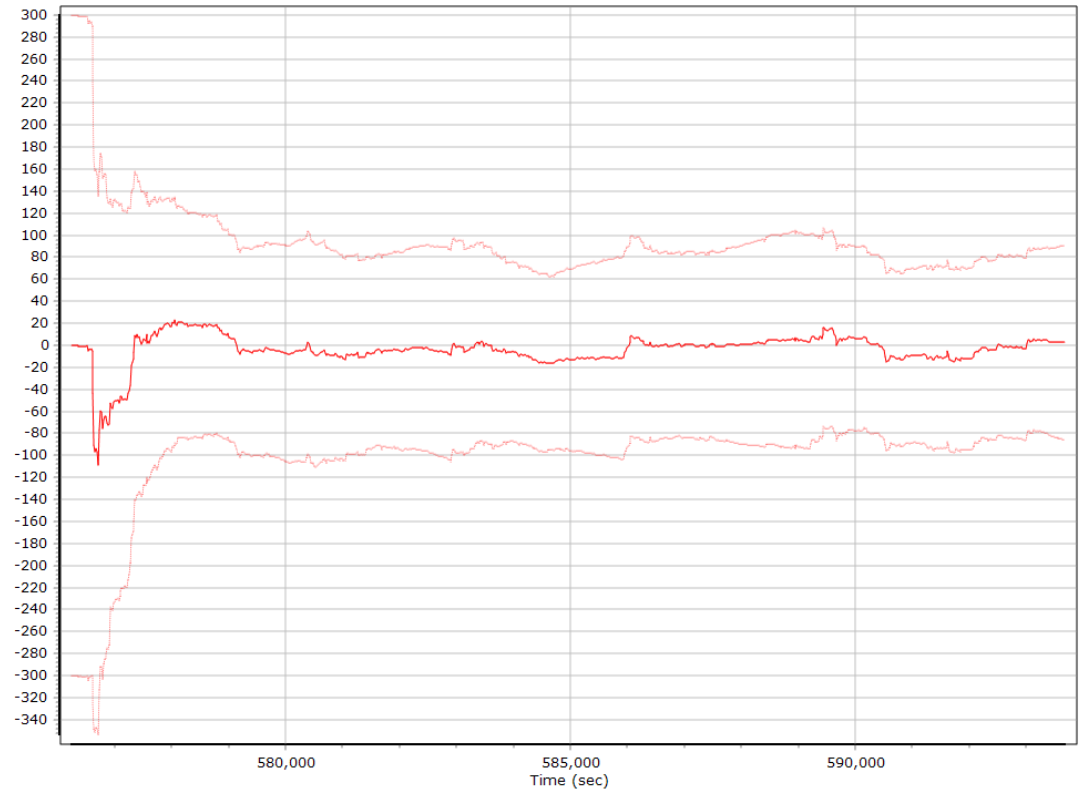
Z Accelerometer Bias (micro-g)



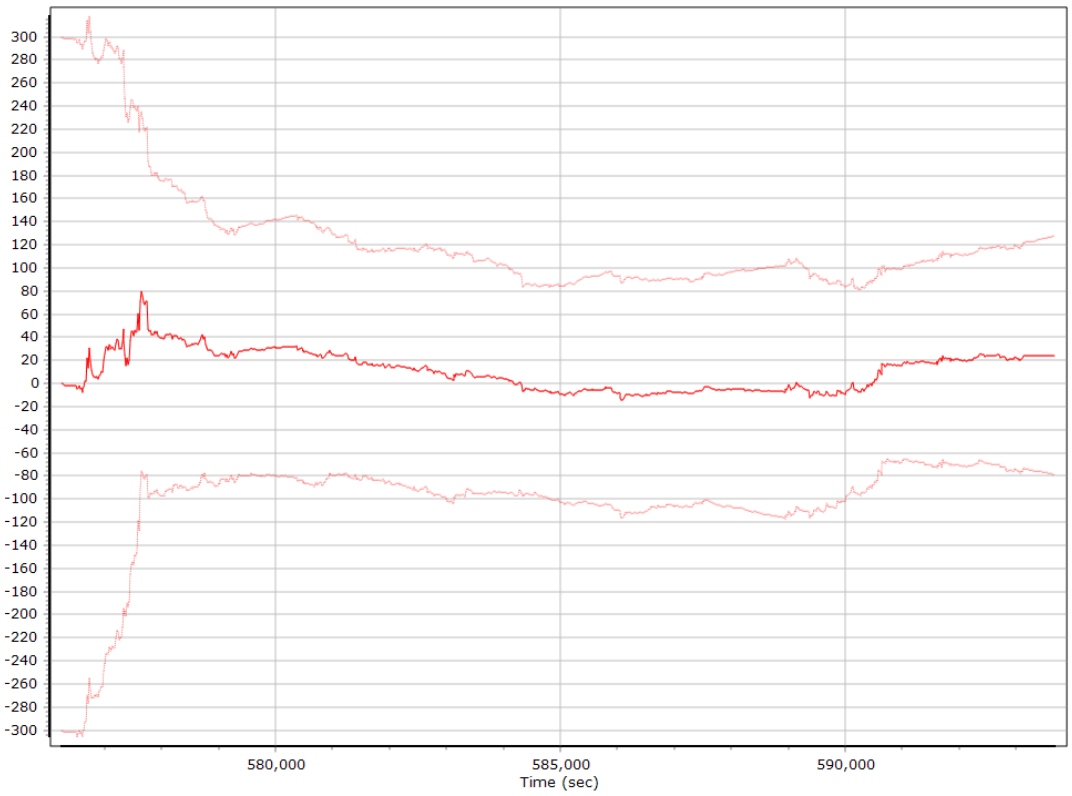
Accelerometer Scale Error (ppm)



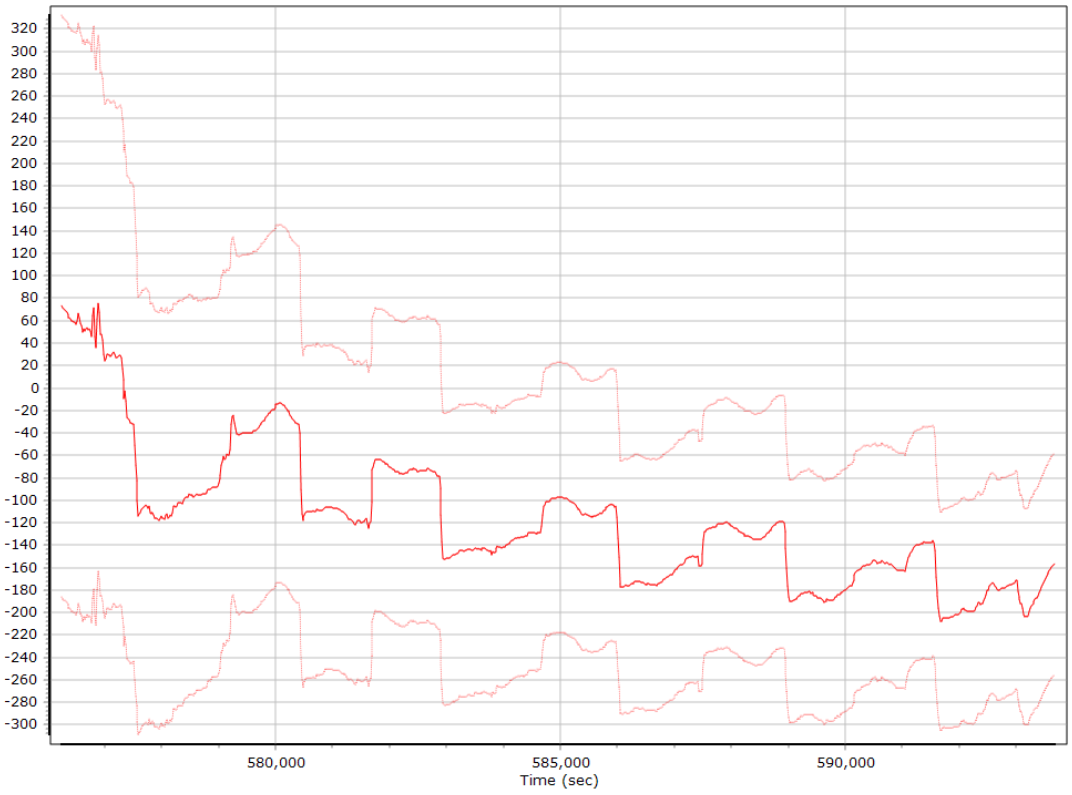
X Accelerometer Scale Error (ppm)



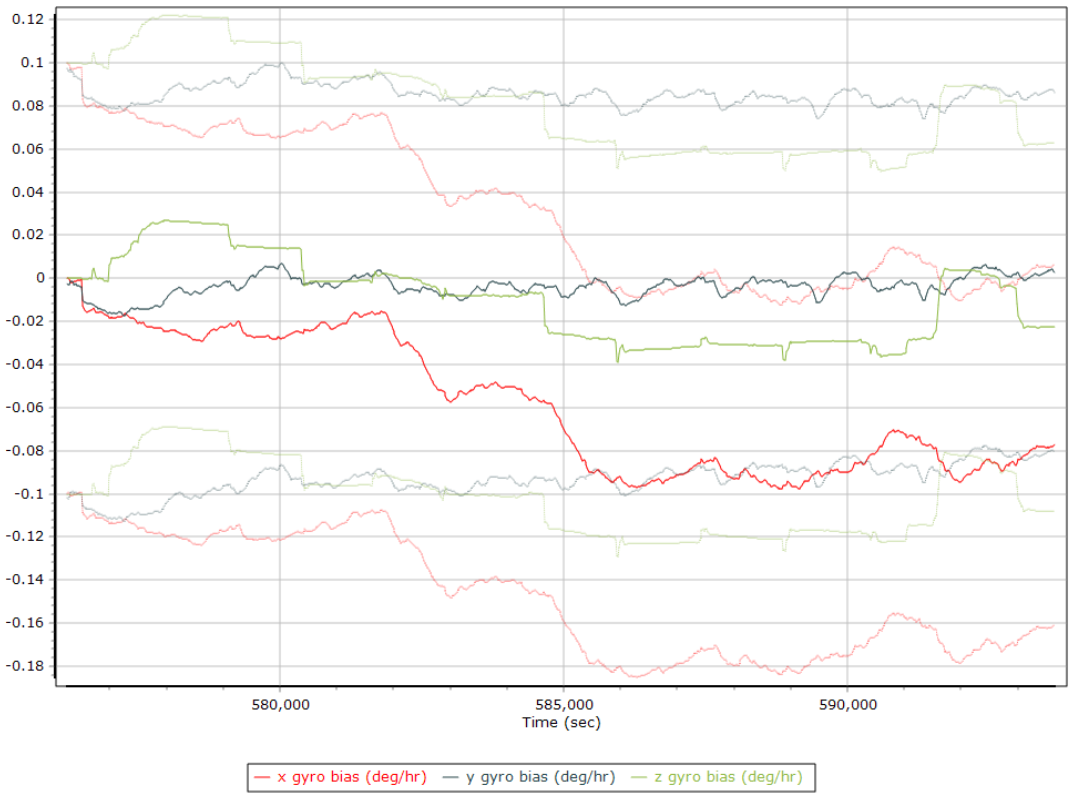
Y Accelerometer Scale Error (ppm)



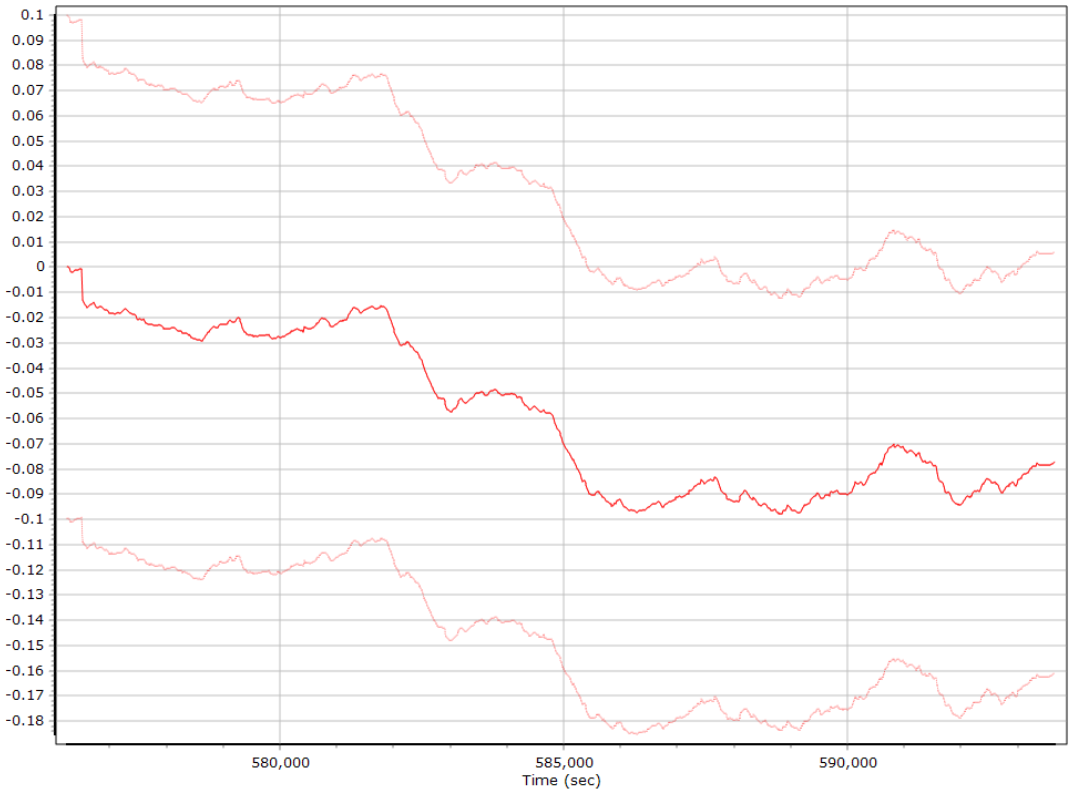
Z Accelerometer Scale Error (ppm)



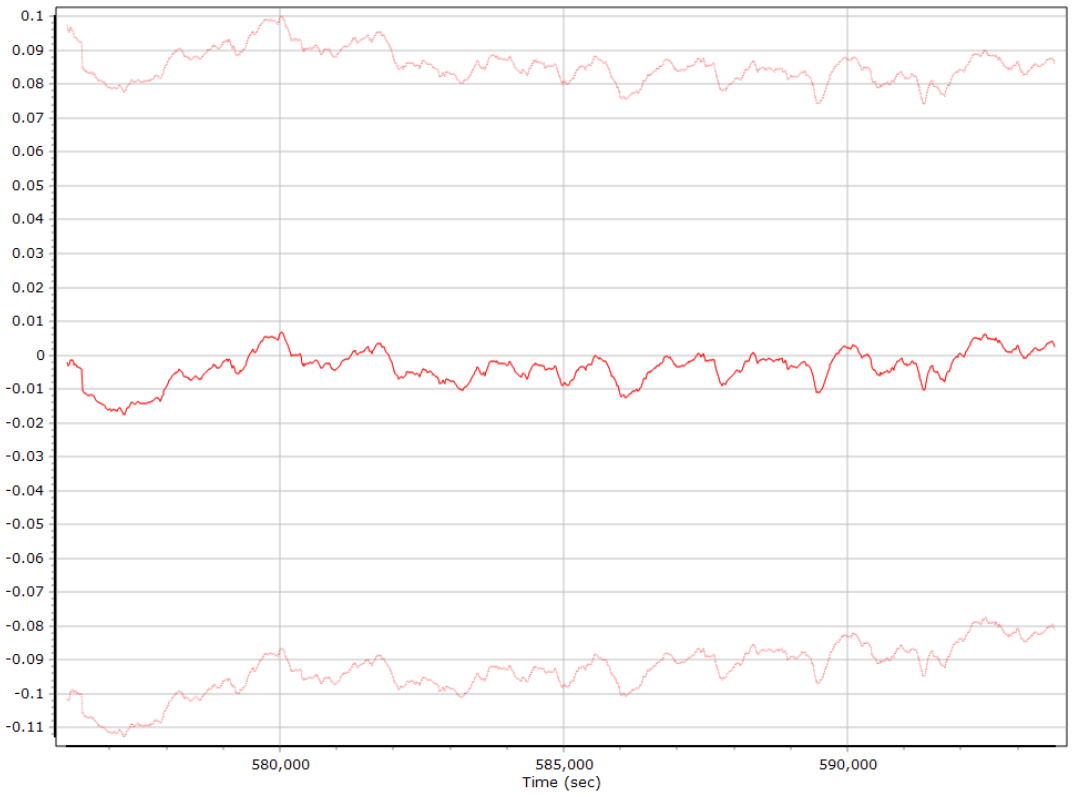
Gyro Bias (deg/h)



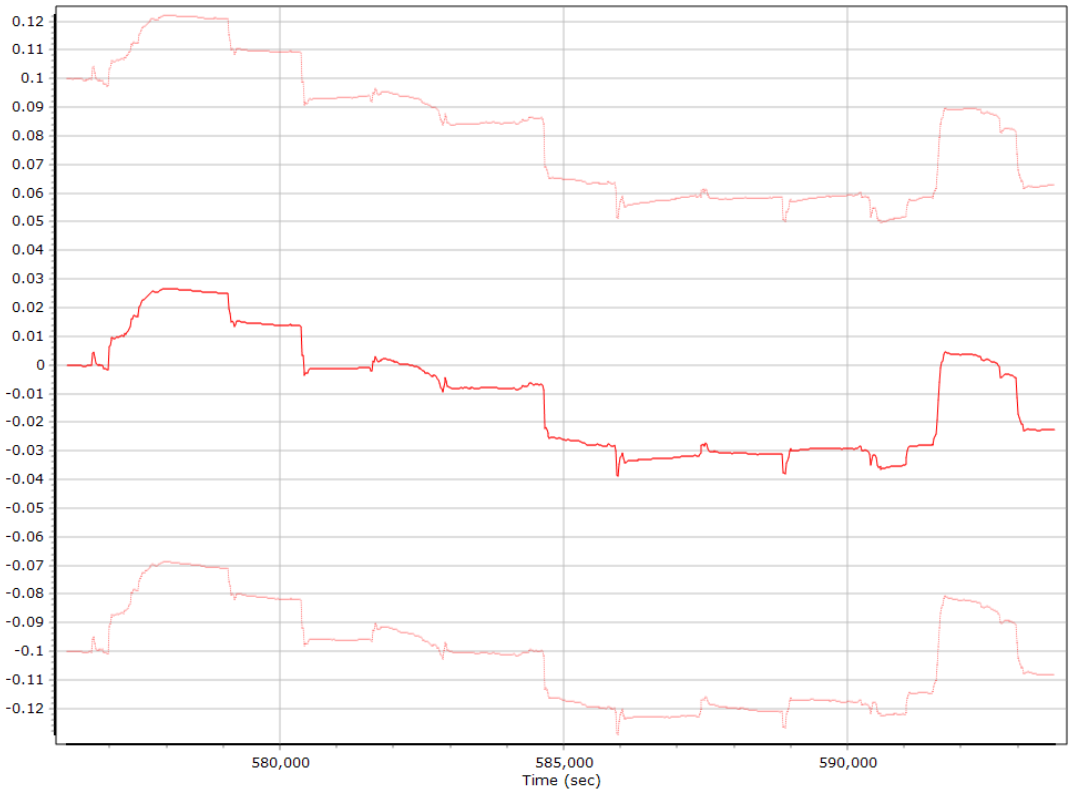
X Gyro Bias (deg/h)



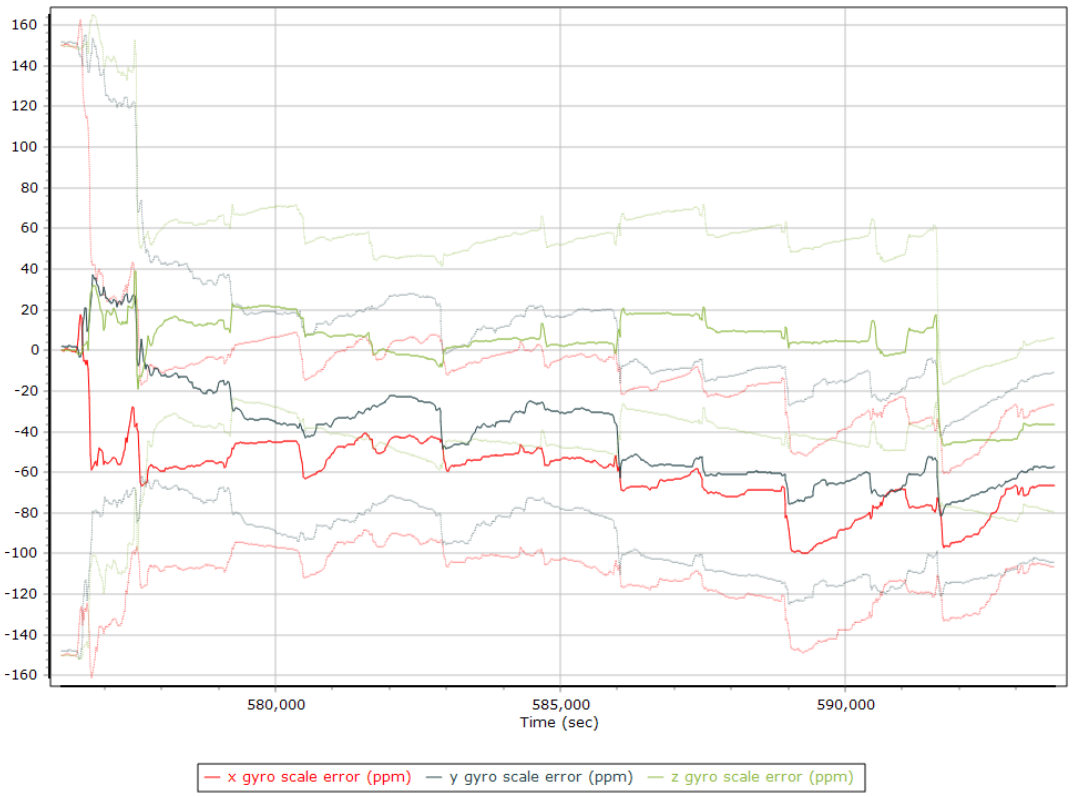
Y Gyro Bias (deg/h)



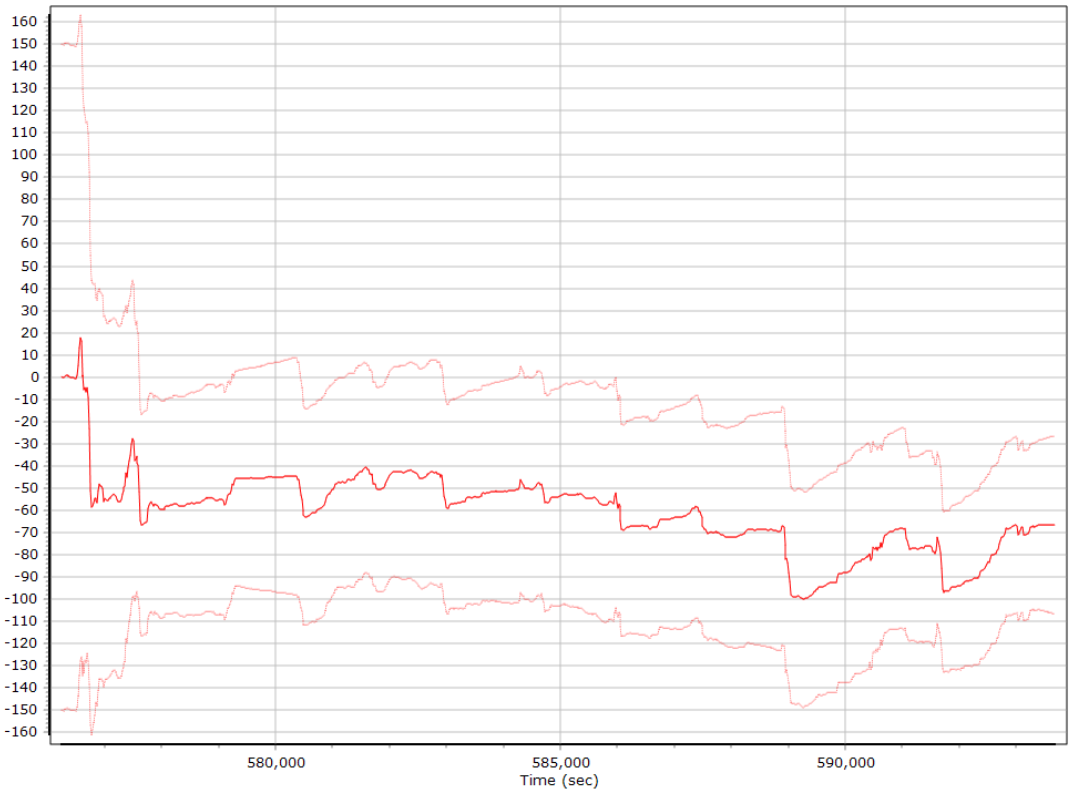
Z Gyro Bias (deg/h)



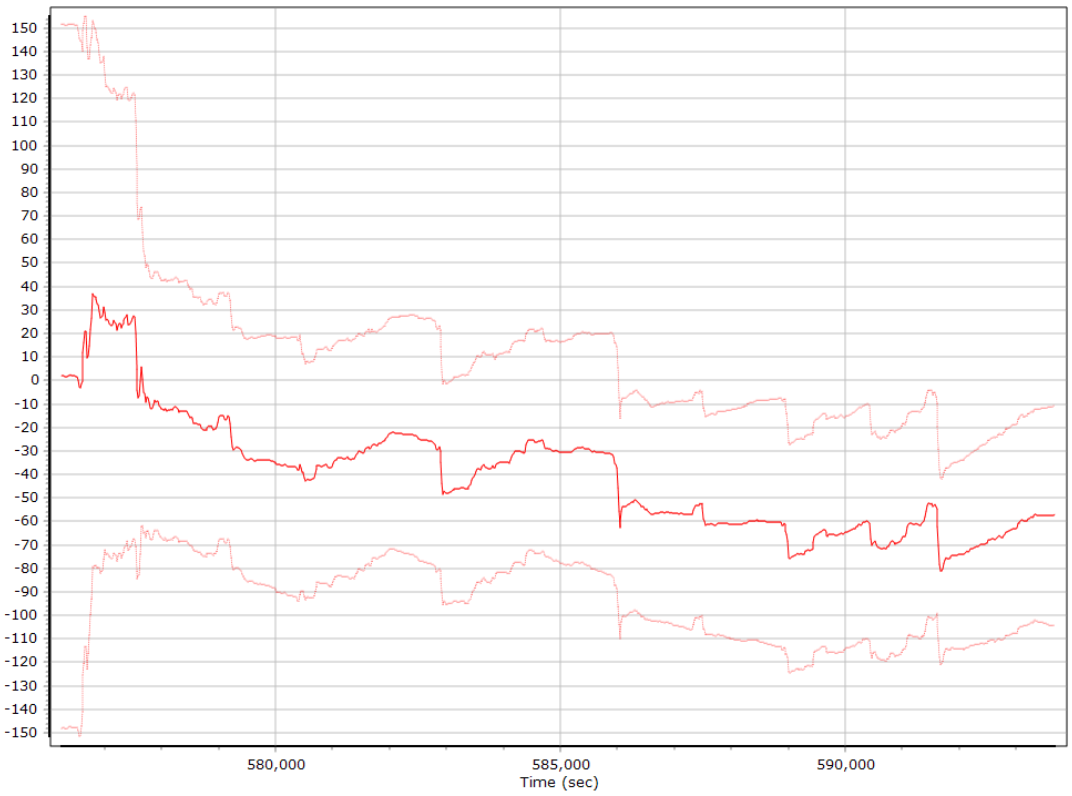
Gyro Scale Error (ppm)



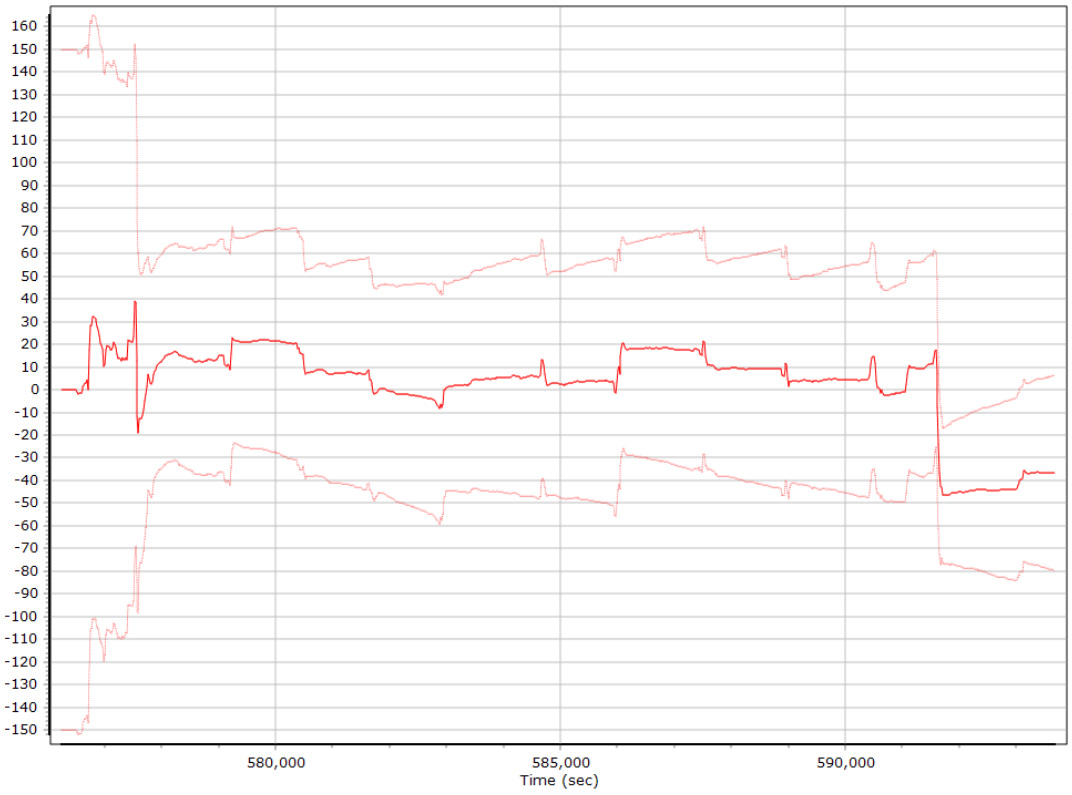
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

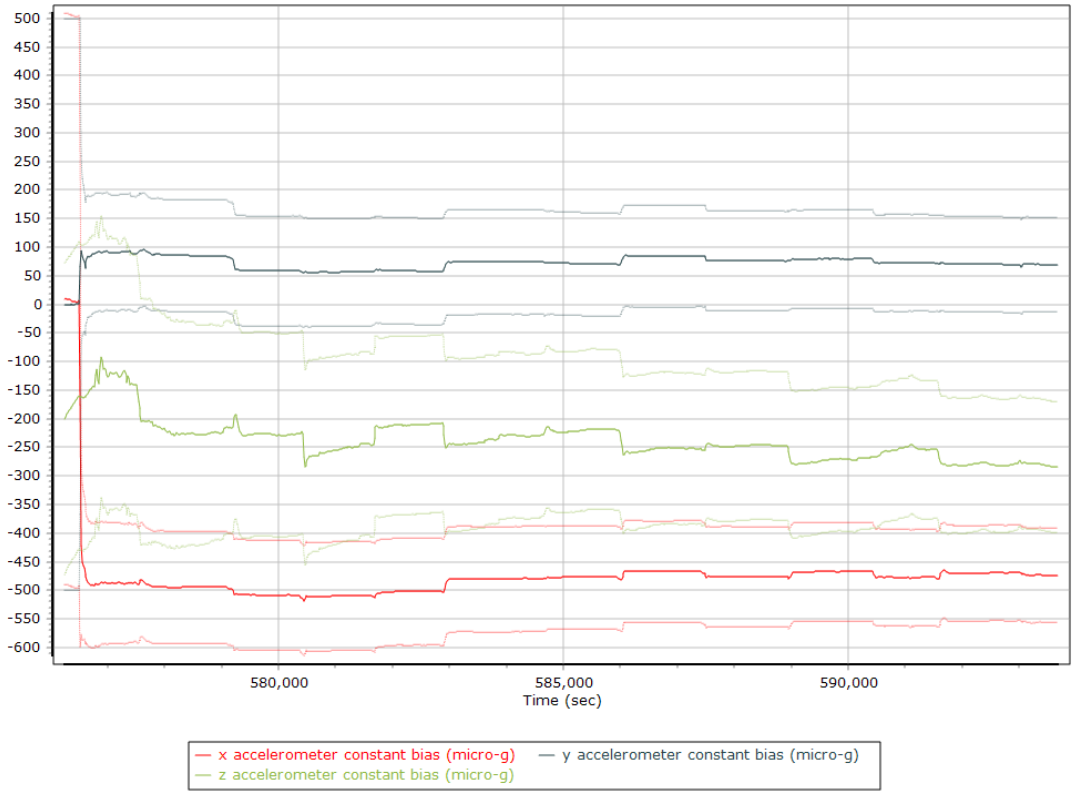


Z Gyro Scale Error (ppm)

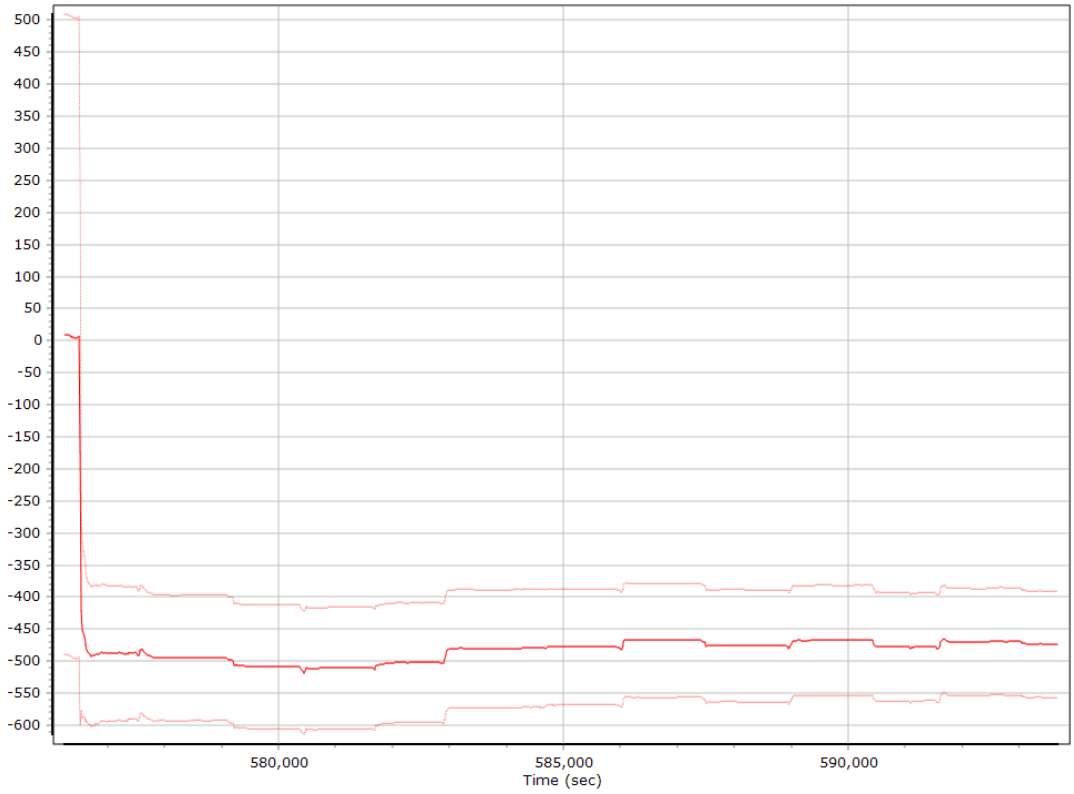


Forward Processed Estimated Constant Errors, Reference Frame

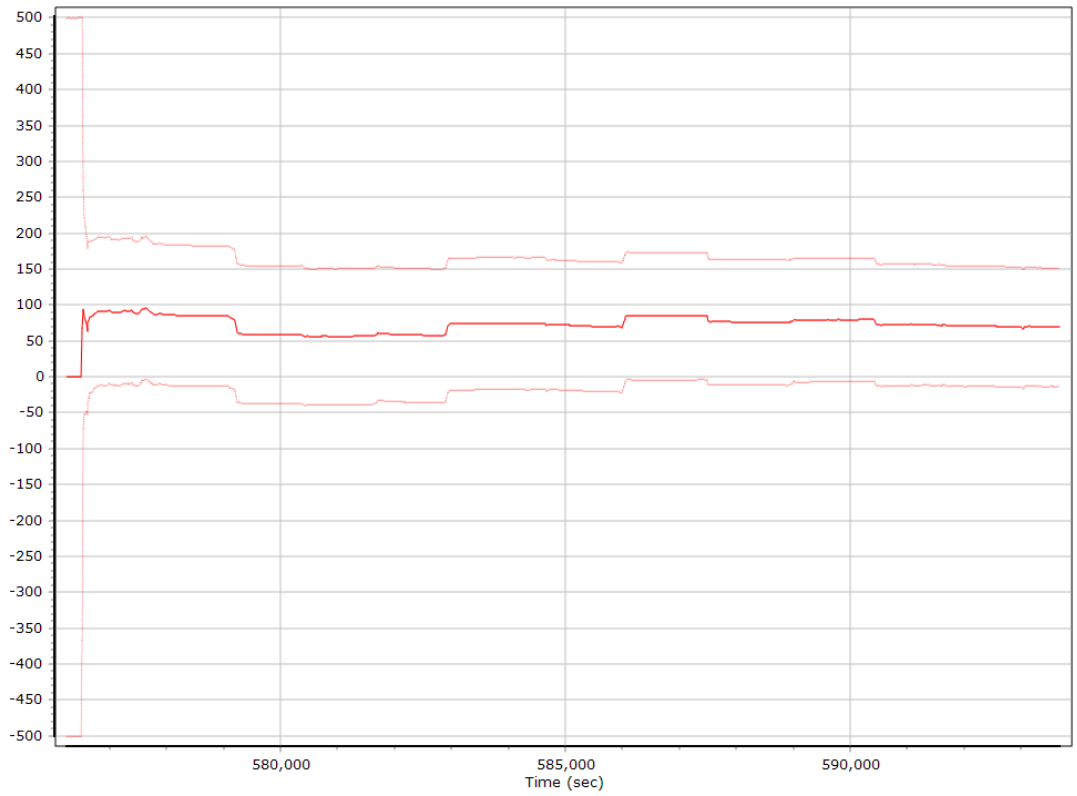
Accelerometer Bias (micro-g)



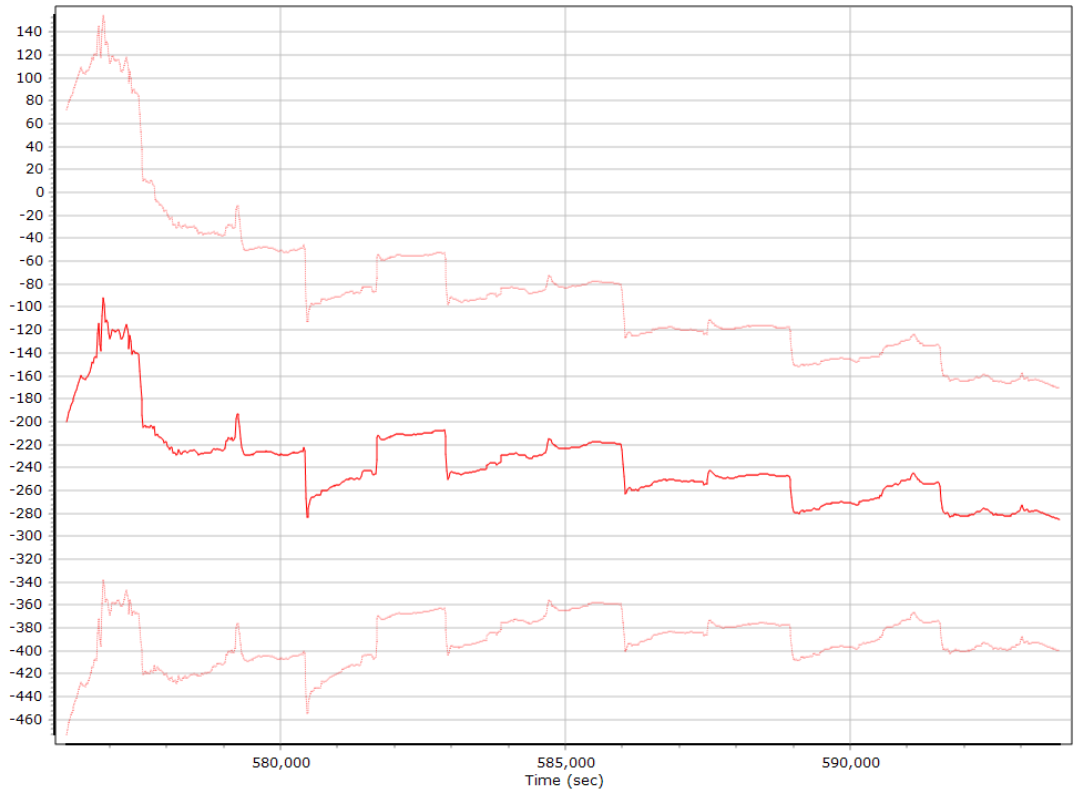
X Accelerometer Bias (micro-g)



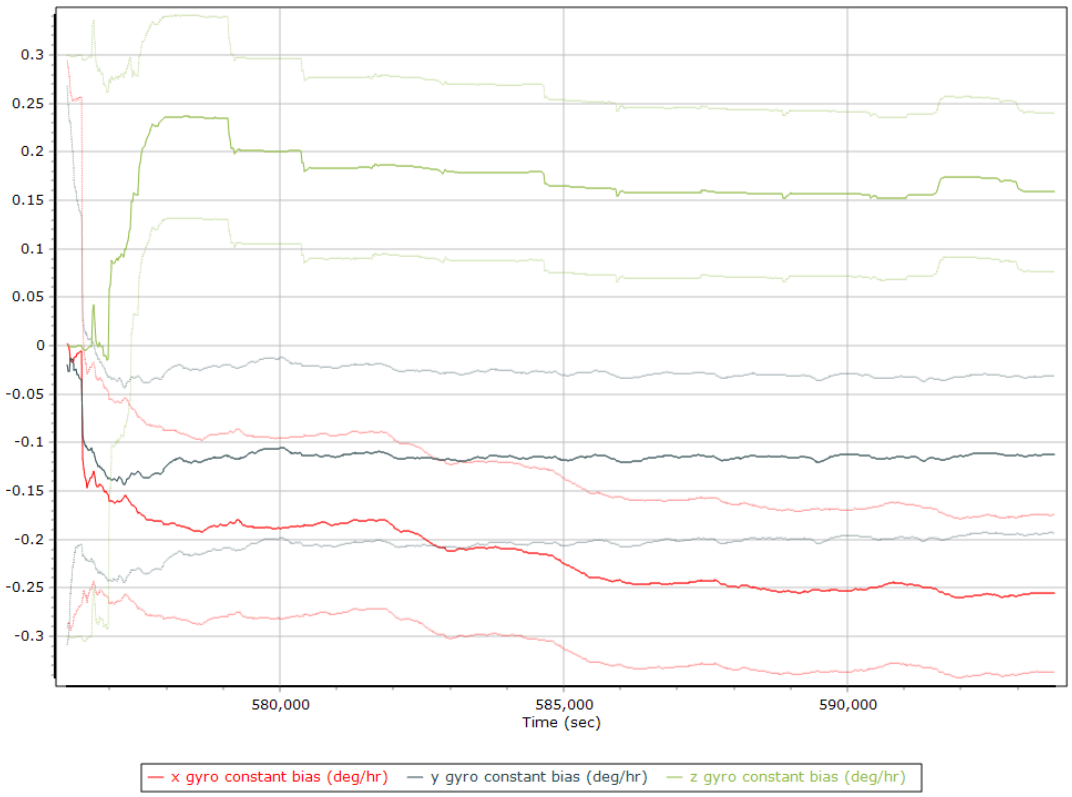
Y Accelerometer Bias (micro-g)



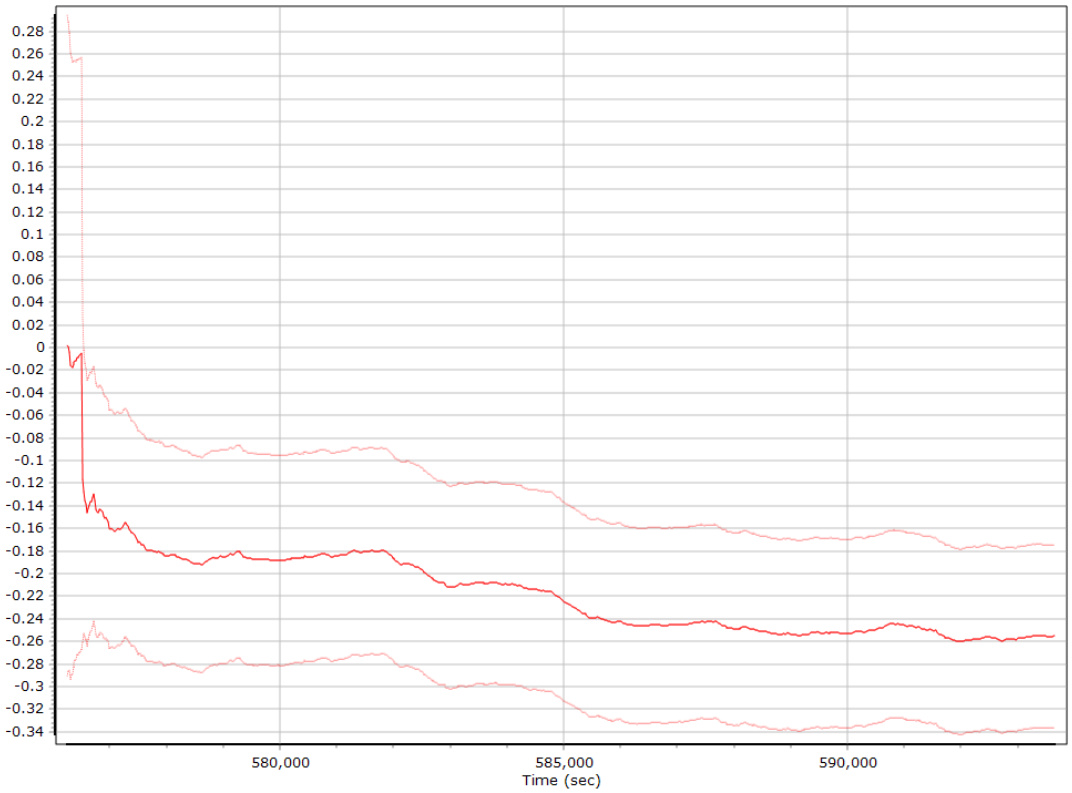
Z Accelerometer Bias (micro-g)



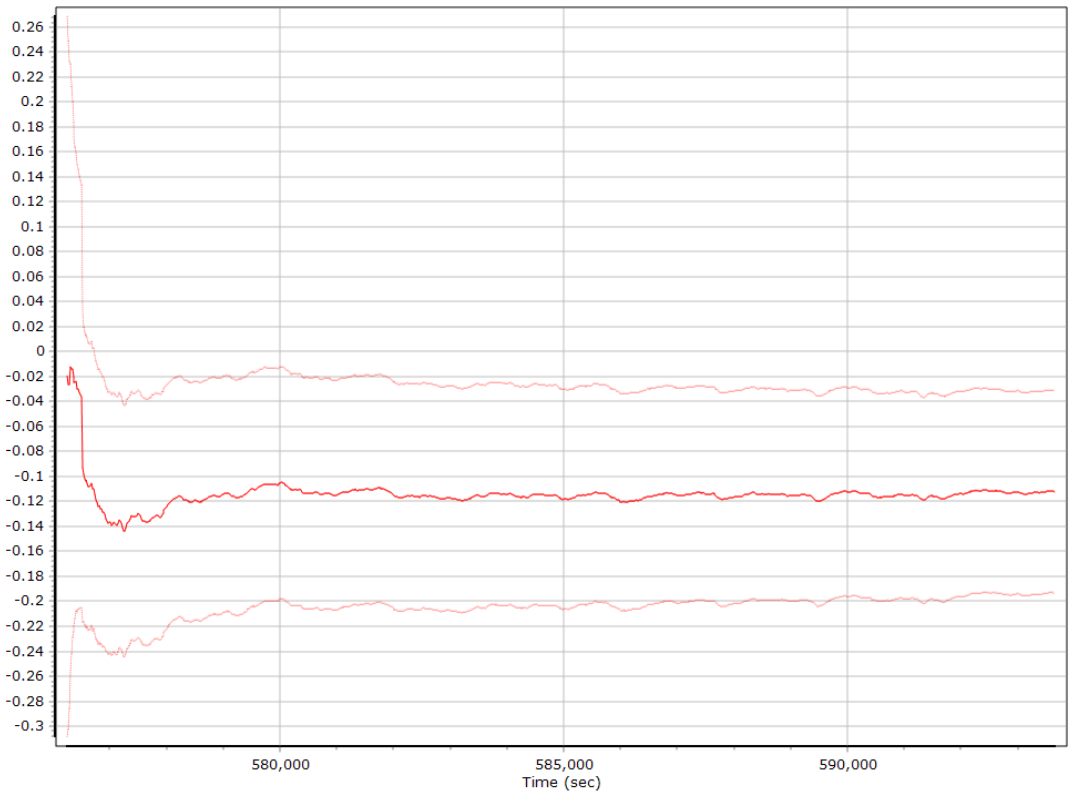
Gyro Bias (deg/h)



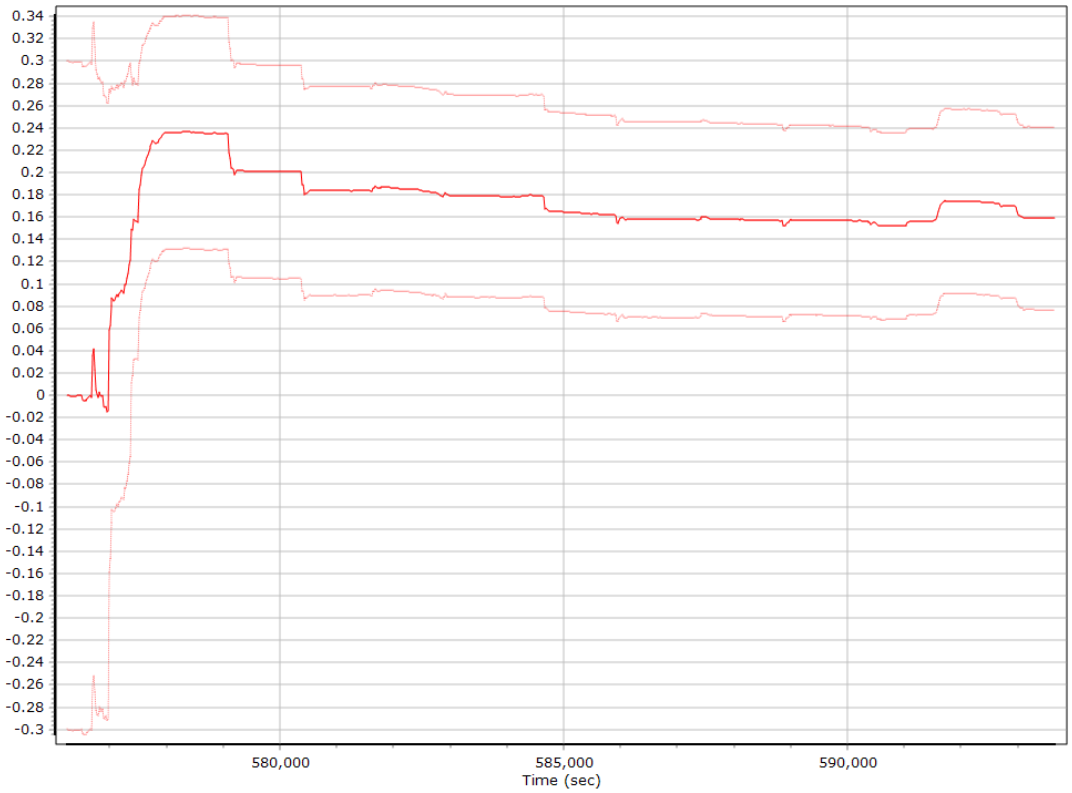
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

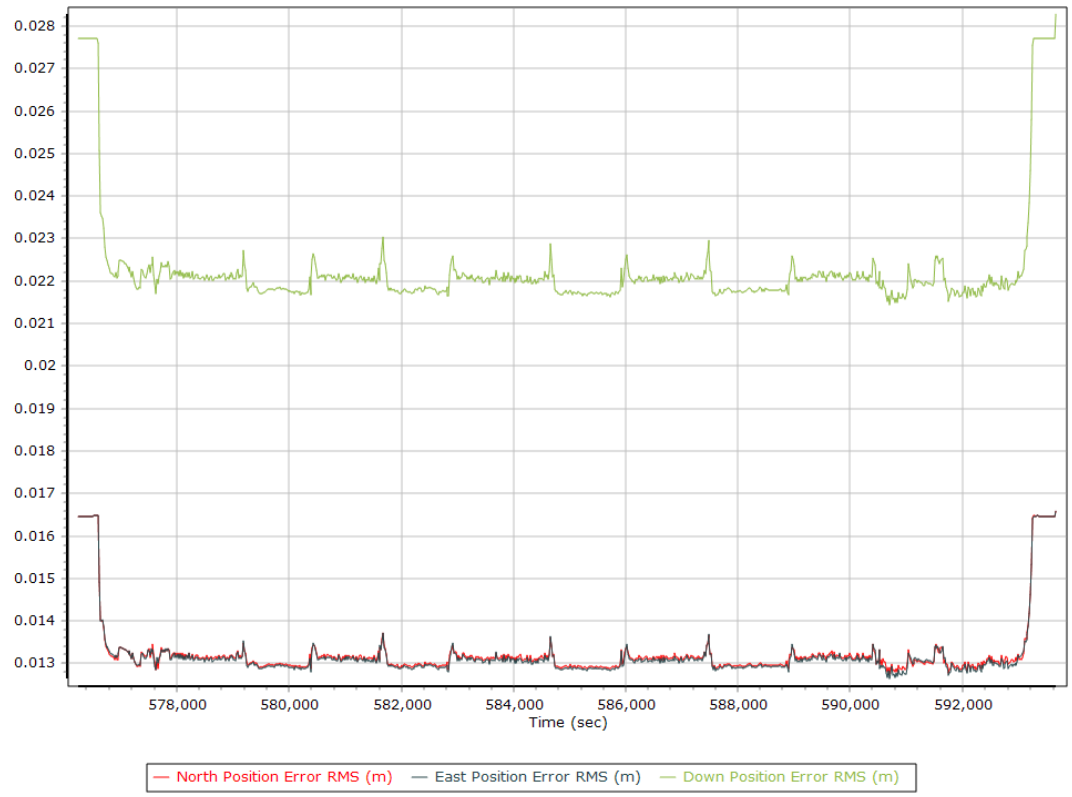


Z Gyro Bias (deg/h)

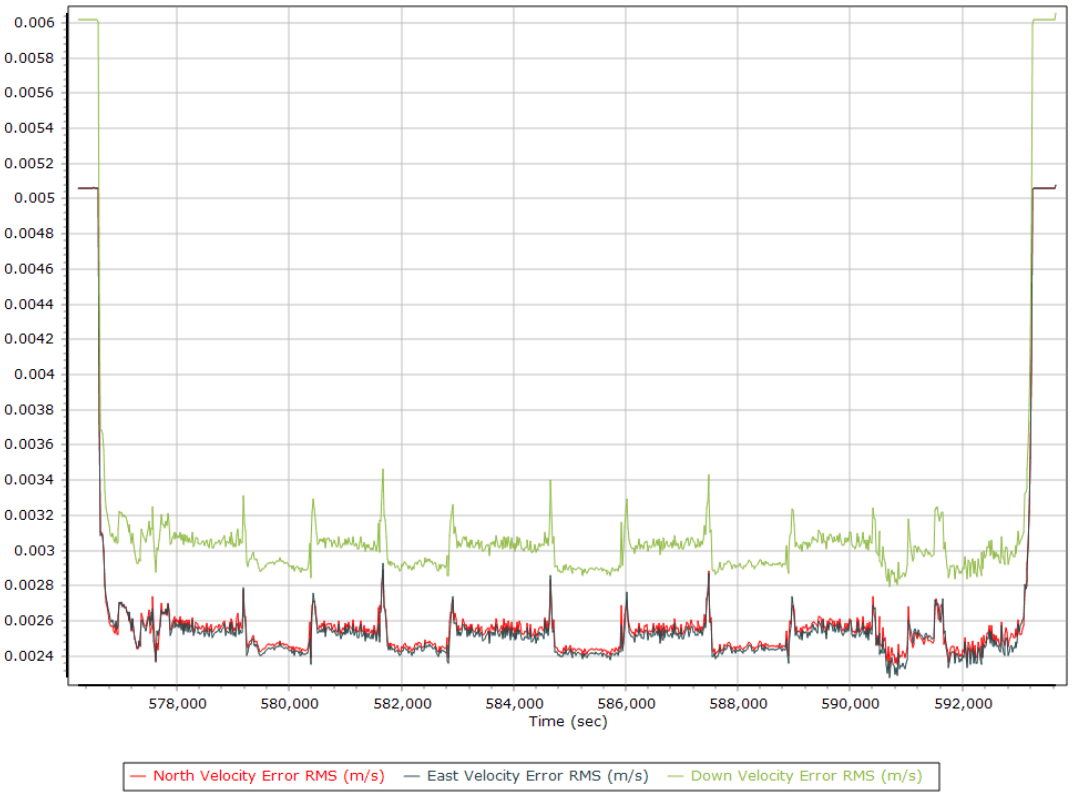


Smoothed Performance Metrics

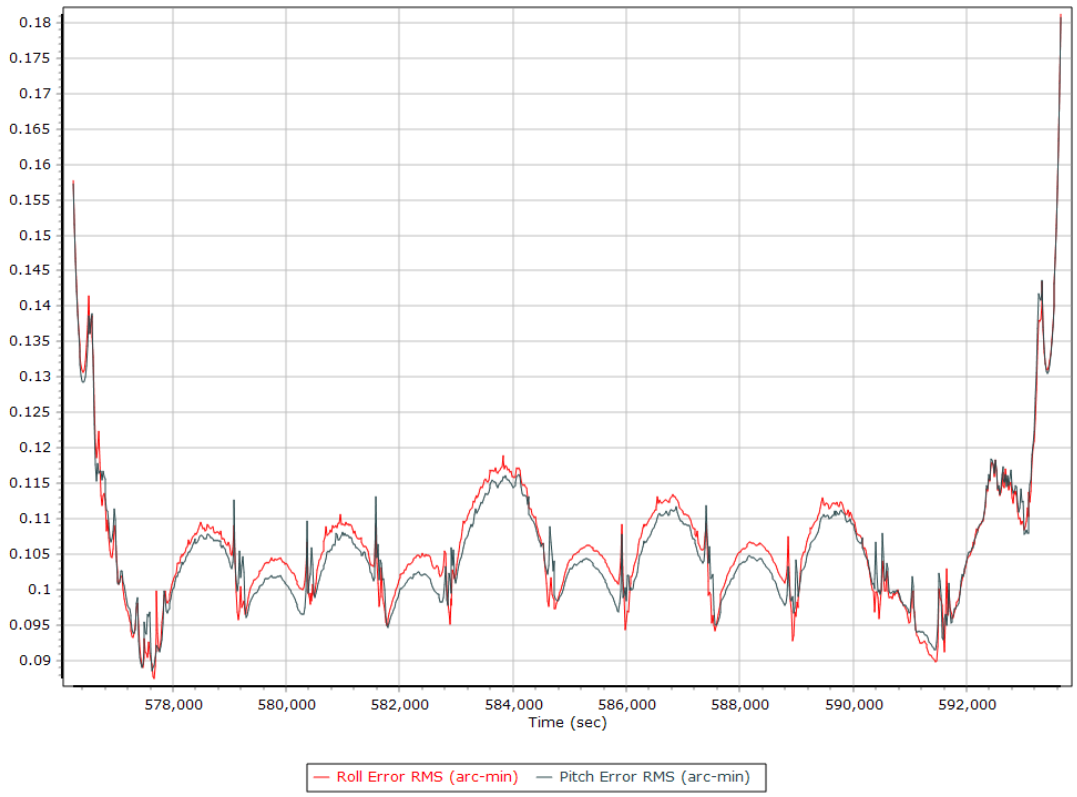
Position Error RMS (m)



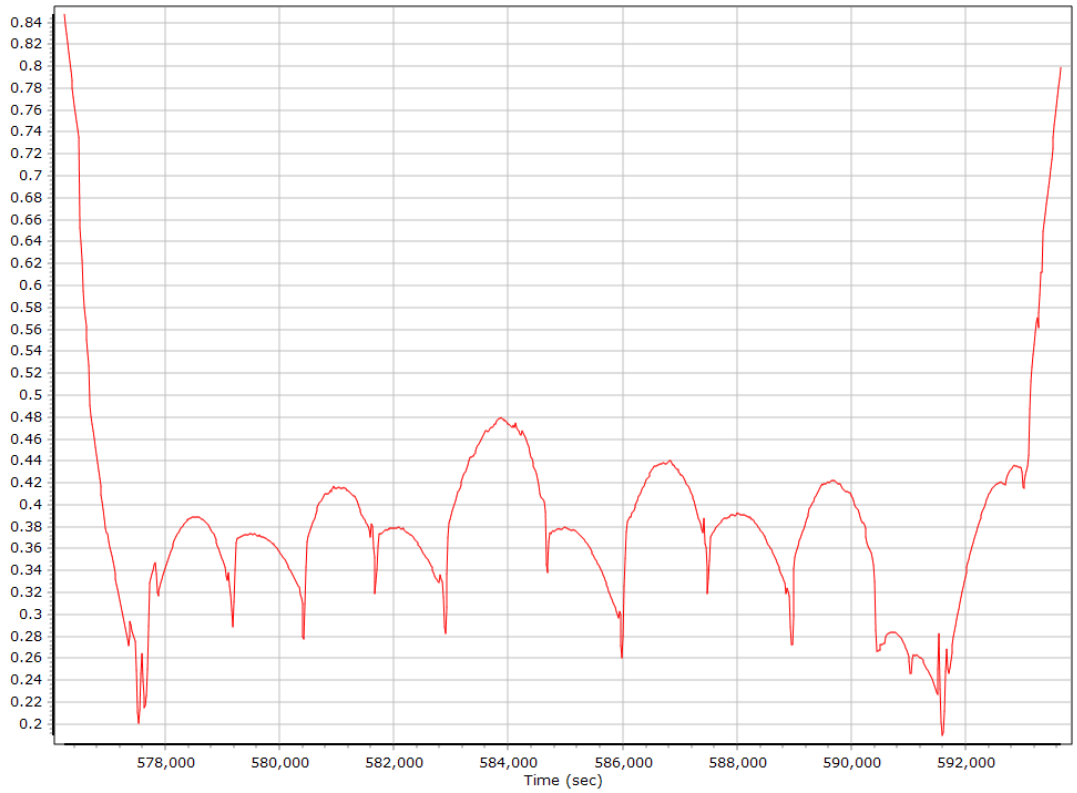
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)



Heading Error RMS (arc-min)

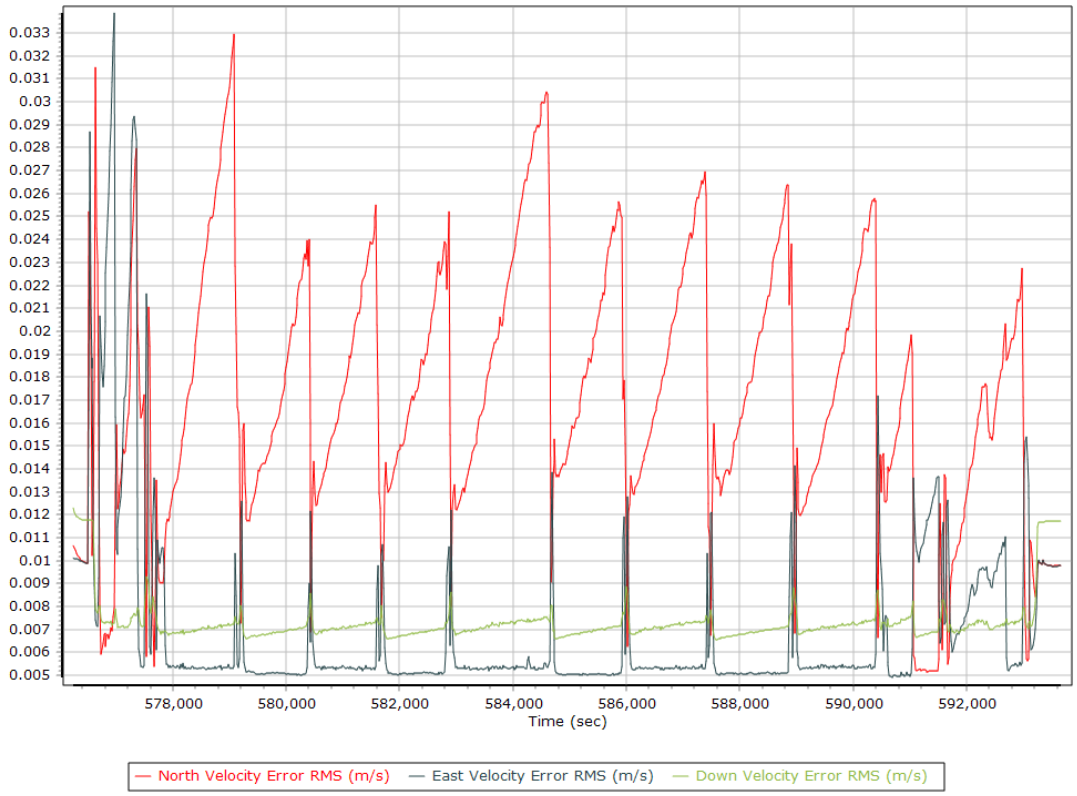


Forward Processed Performance Metrics

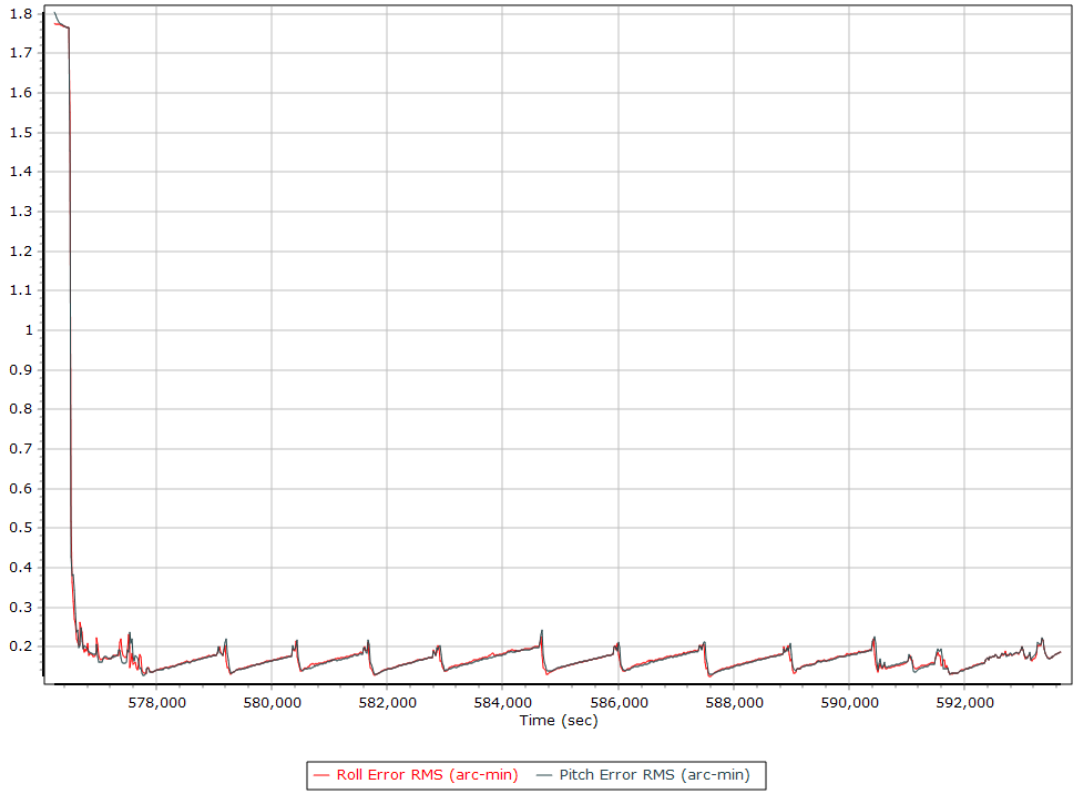
Position Error RMS (m)



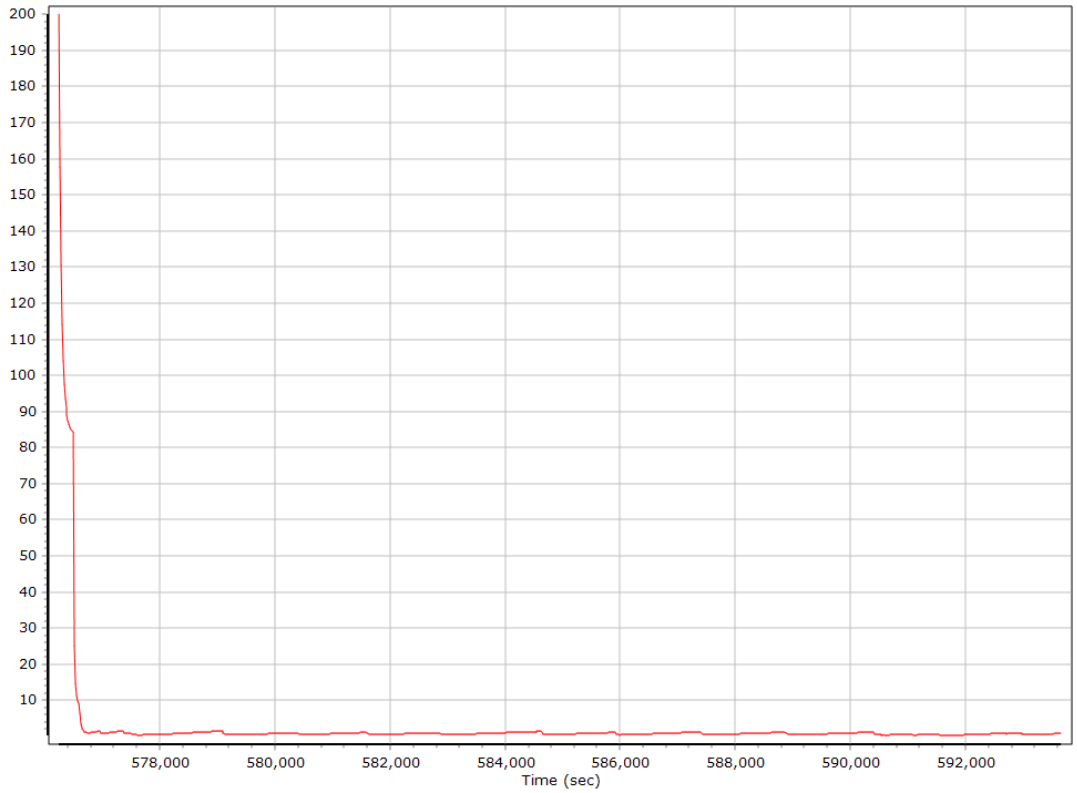
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

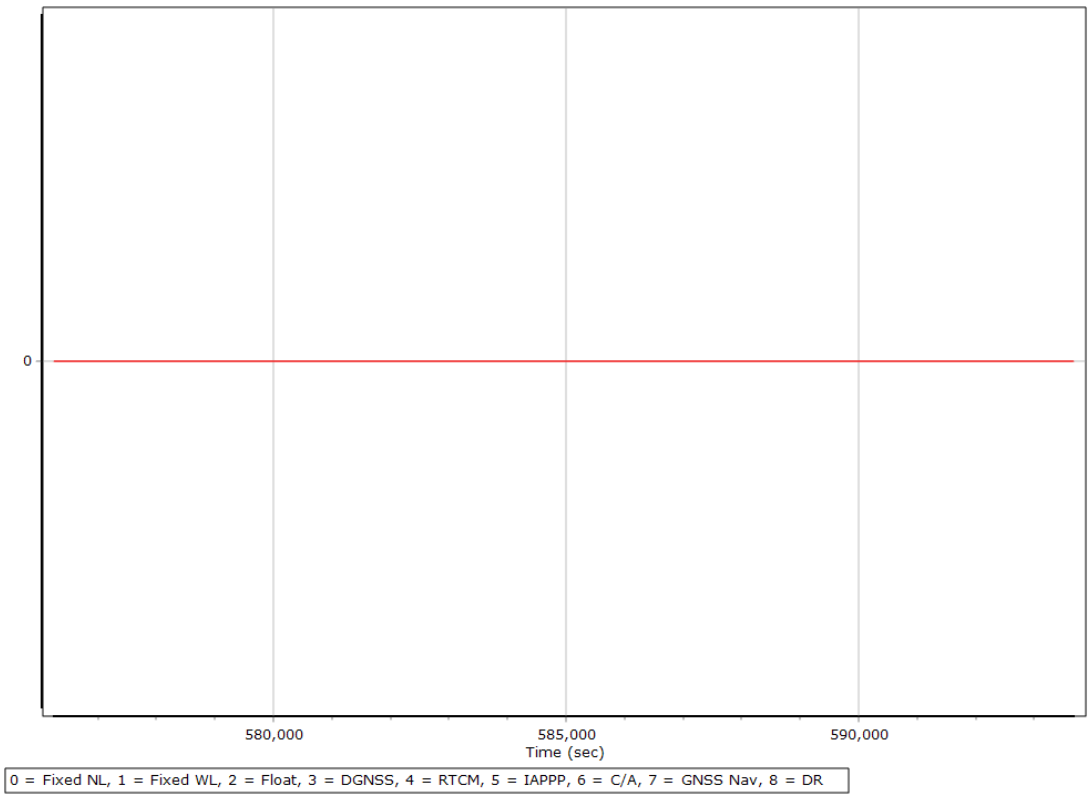


Heading Error RMS (arc-min)

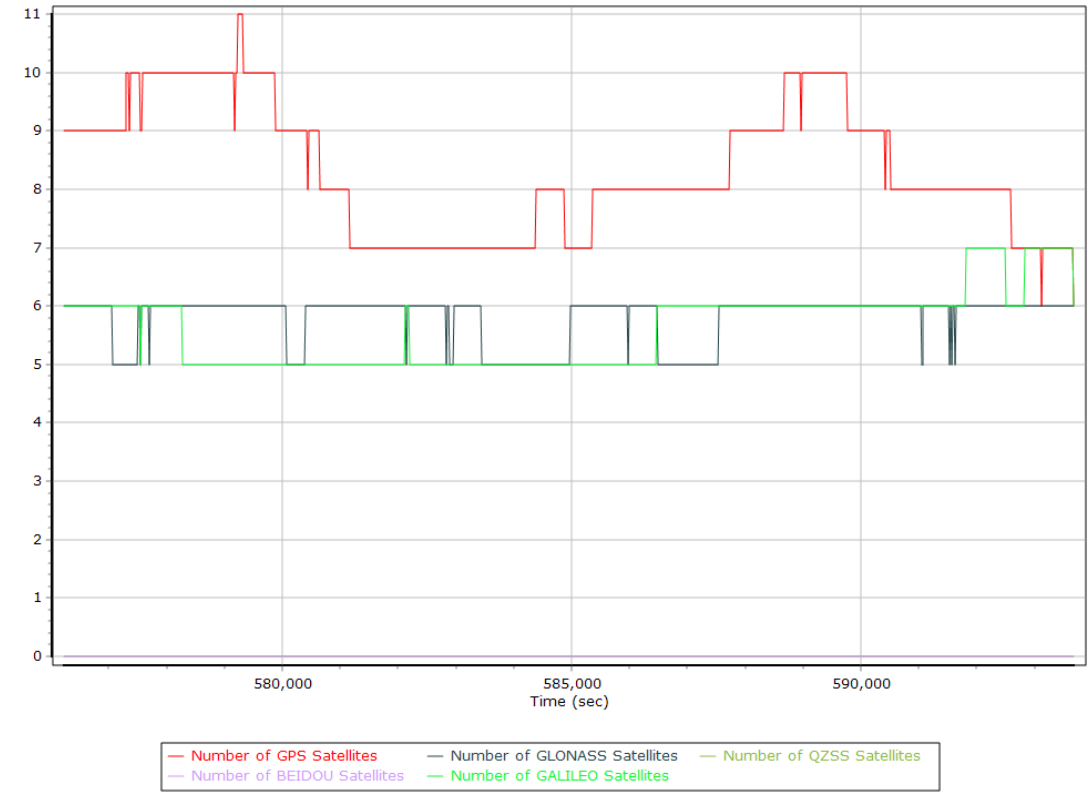


Forward Processed Solution Status

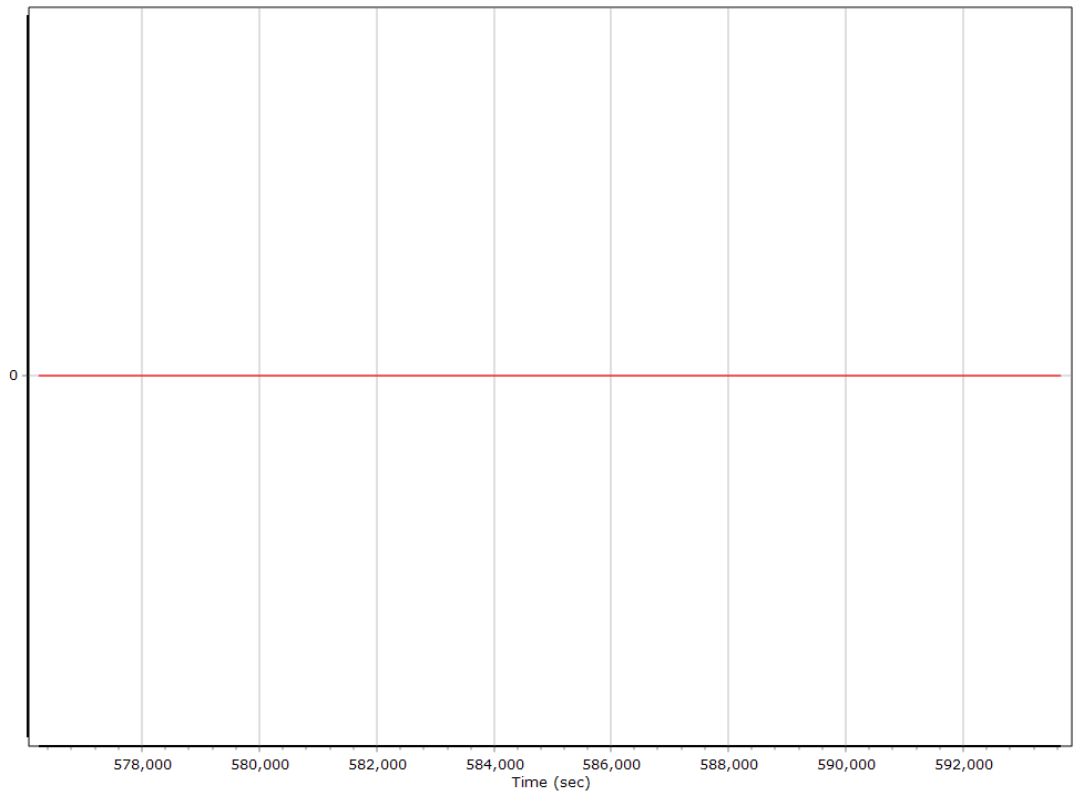
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	01172021A_4040
Processing date	2022-01-05 15:34:17
Mission date	2021-01-17 16:25:13
Mission duration	02:13:48.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
210117_162454_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0170.21g	GLONASS Broadcast Ephemeris
Ephm0170.21n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_01172021A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	210117_162454_INS-GPS_1.raw		
Last raw data file	210117_162454_INS-GPS_1.raw		
Start GPS week	2141		
Start time	59094.710 (1/17/2021 4:24:54 PM)		
End time	67123.075 (1/17/2021 6:38:43 PM)		
Start of fine alignment	59118.924 (1/17/2021 4:25:18 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

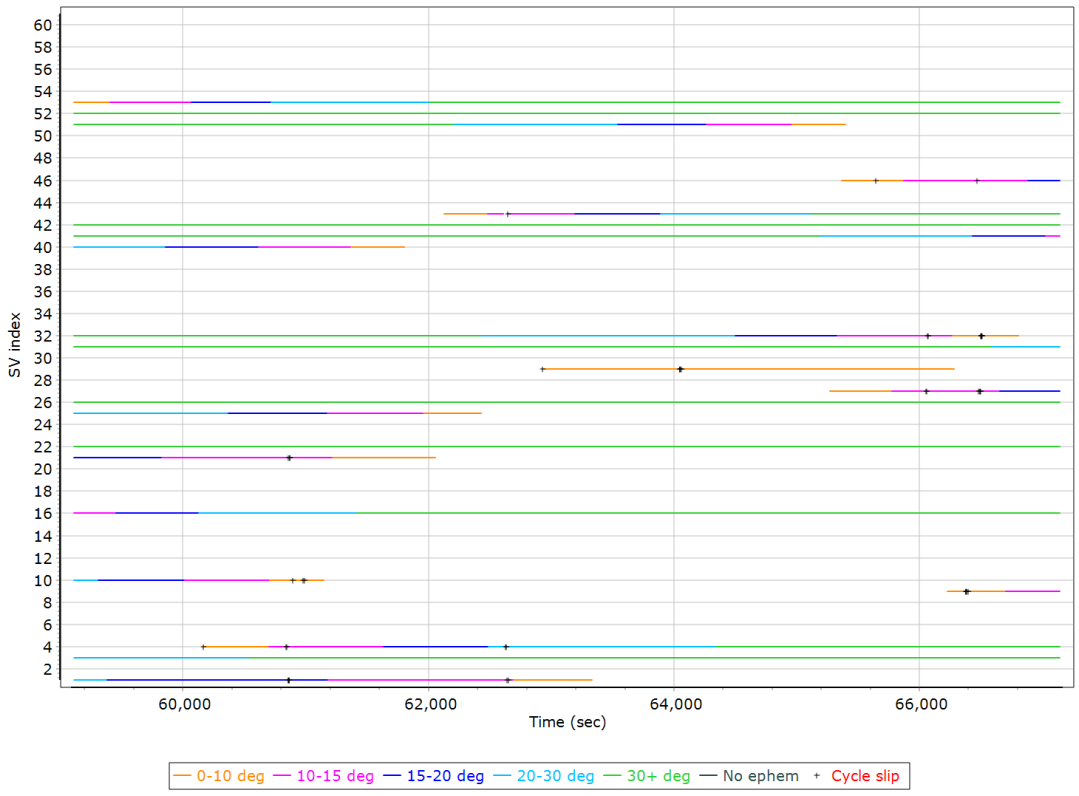
Rover Data QC

Raw IMU Import QC Summary

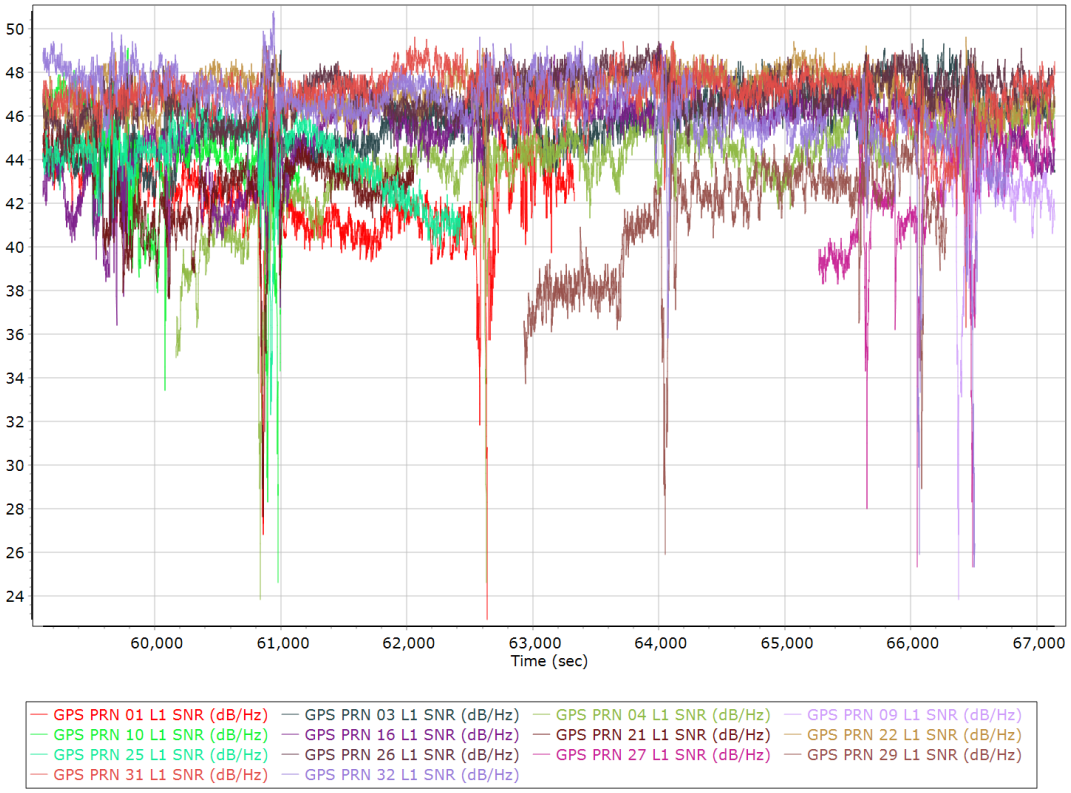
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_01172021A_4040.log
IMU Records Processed	1605469
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

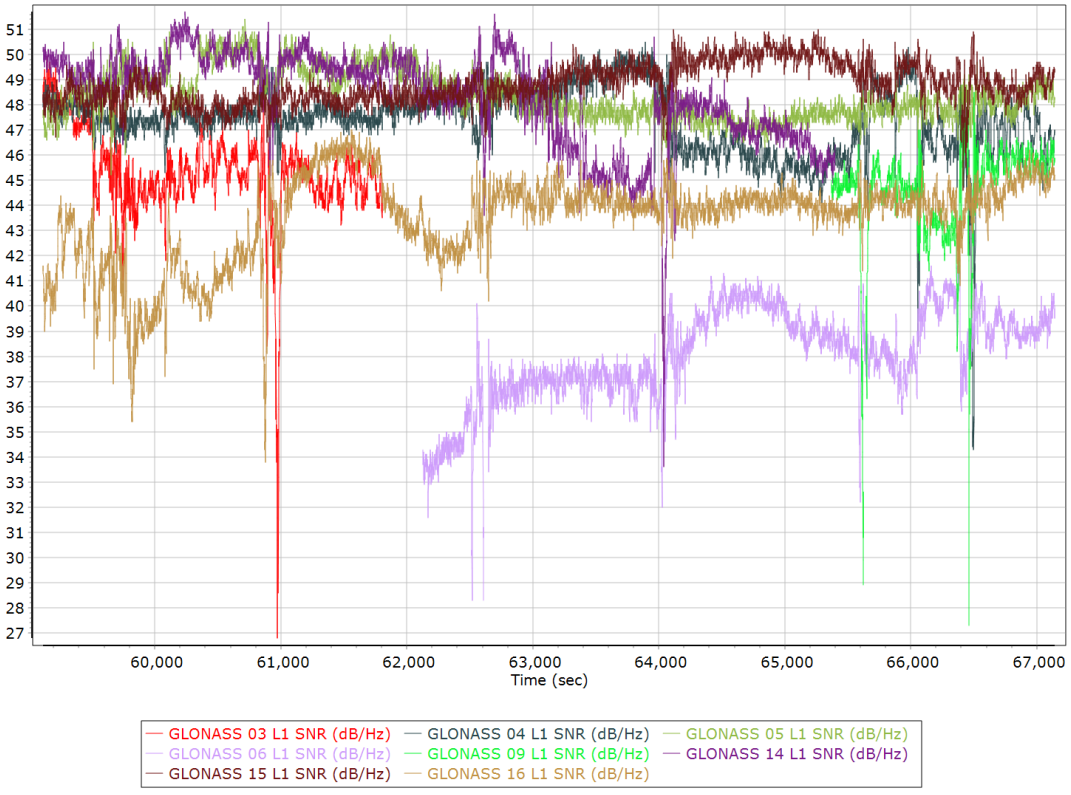
GPS/GLONASS L1 Satellite Lock/Elevation



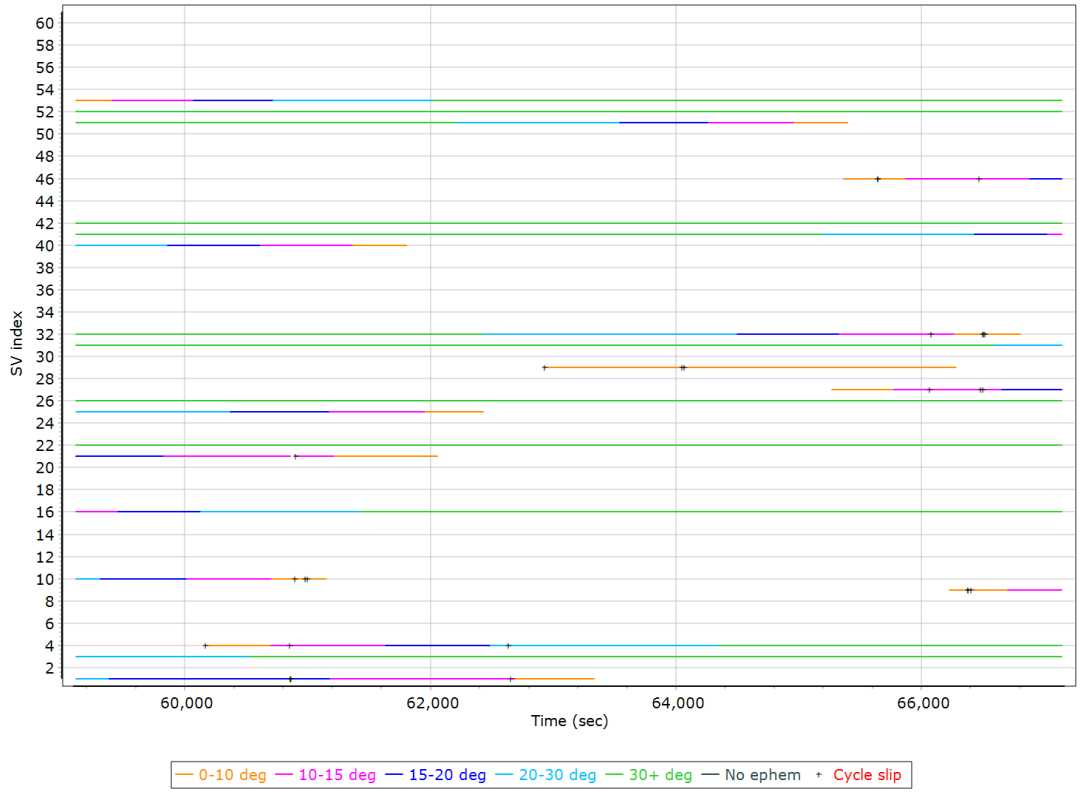
GPS L1 SNR



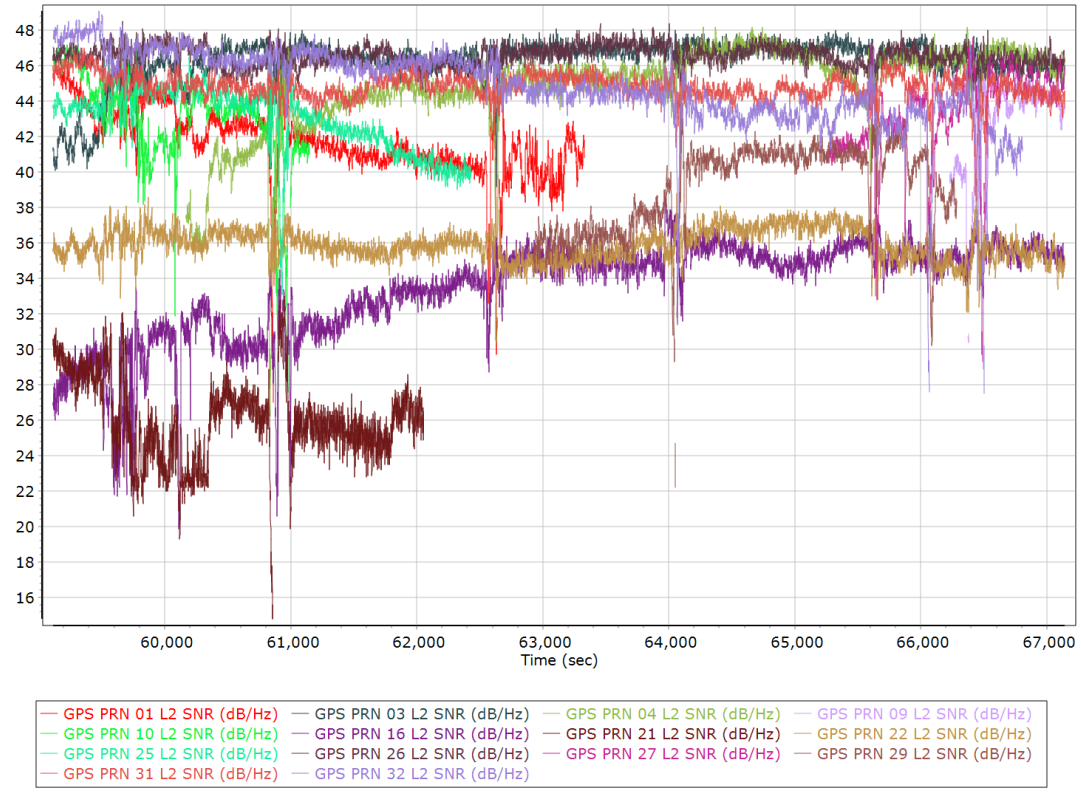
GLONASS L1 SNR



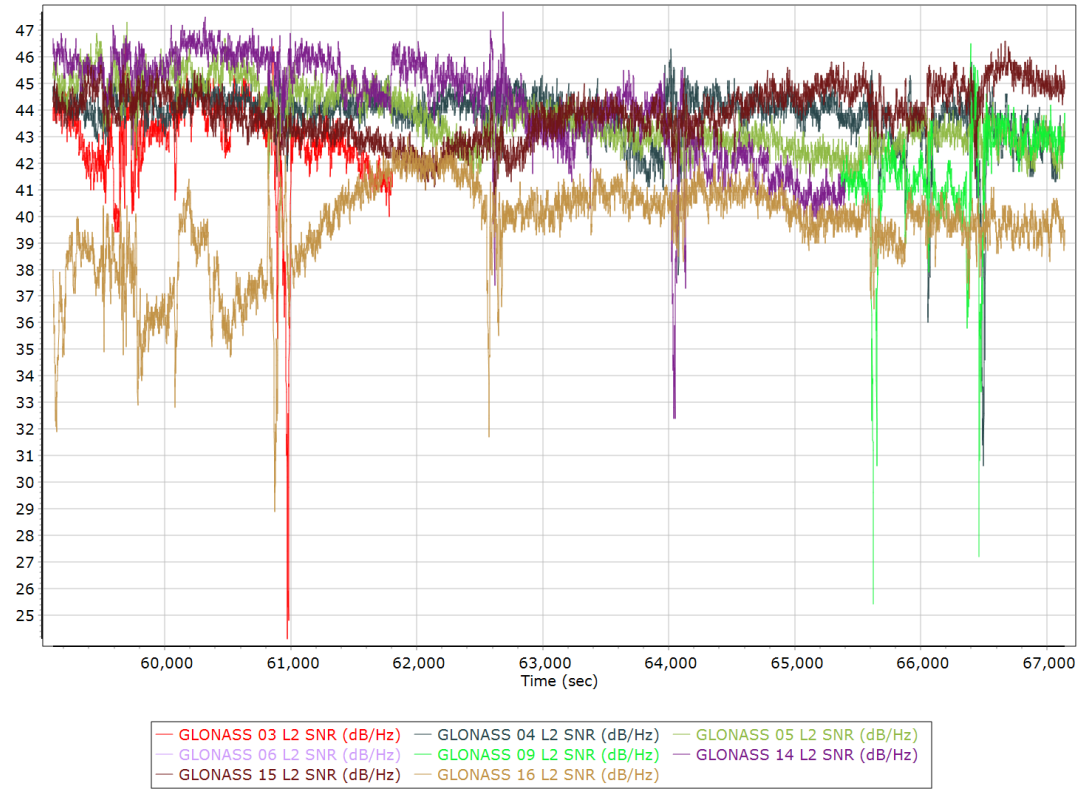
GPS/GLONASS L2 Satellite Lock/Elevation



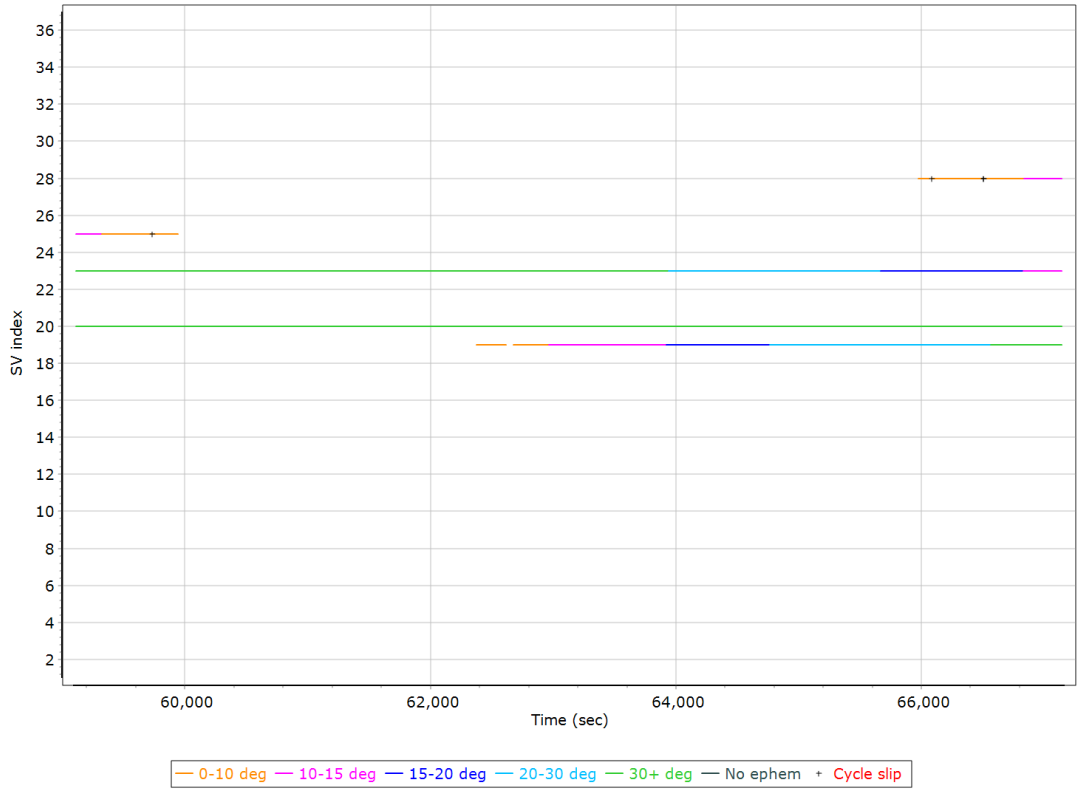
GPS L2 SNR



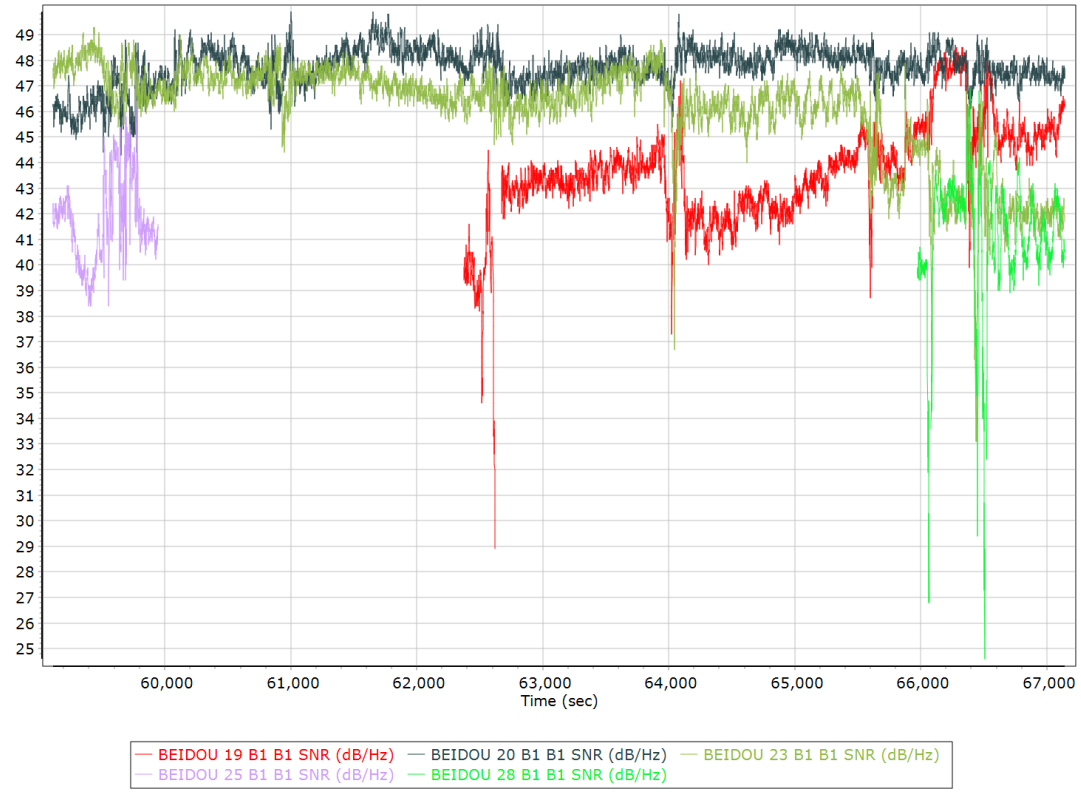
GLONASS L2 SNR



BEIDOU Satellite Lock/Elevation



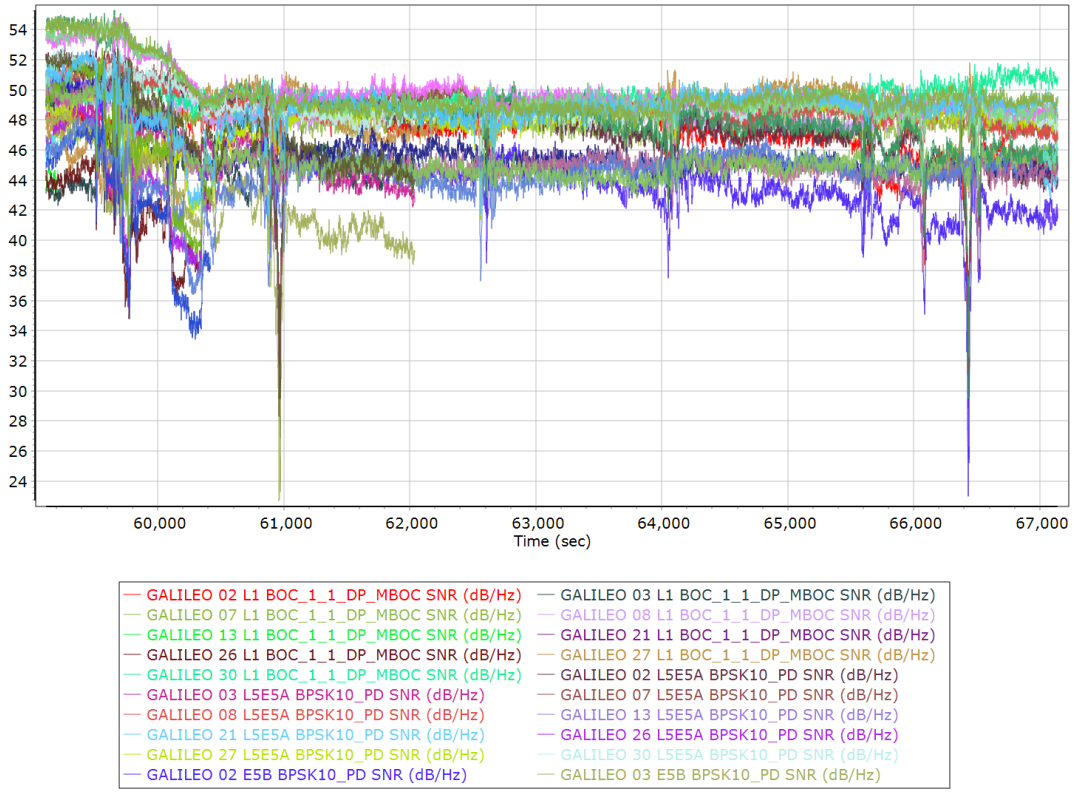
BEIDOU SNR



GALILEO Satellite Lock/Elevation

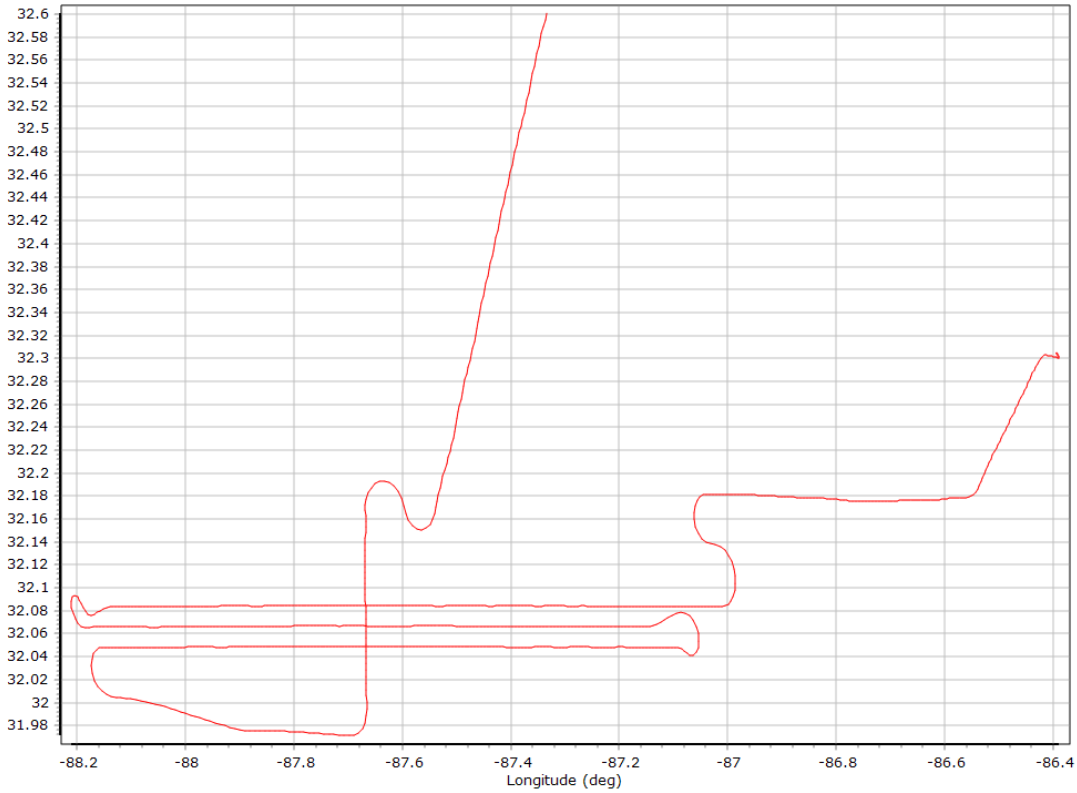


GALILEO SNR

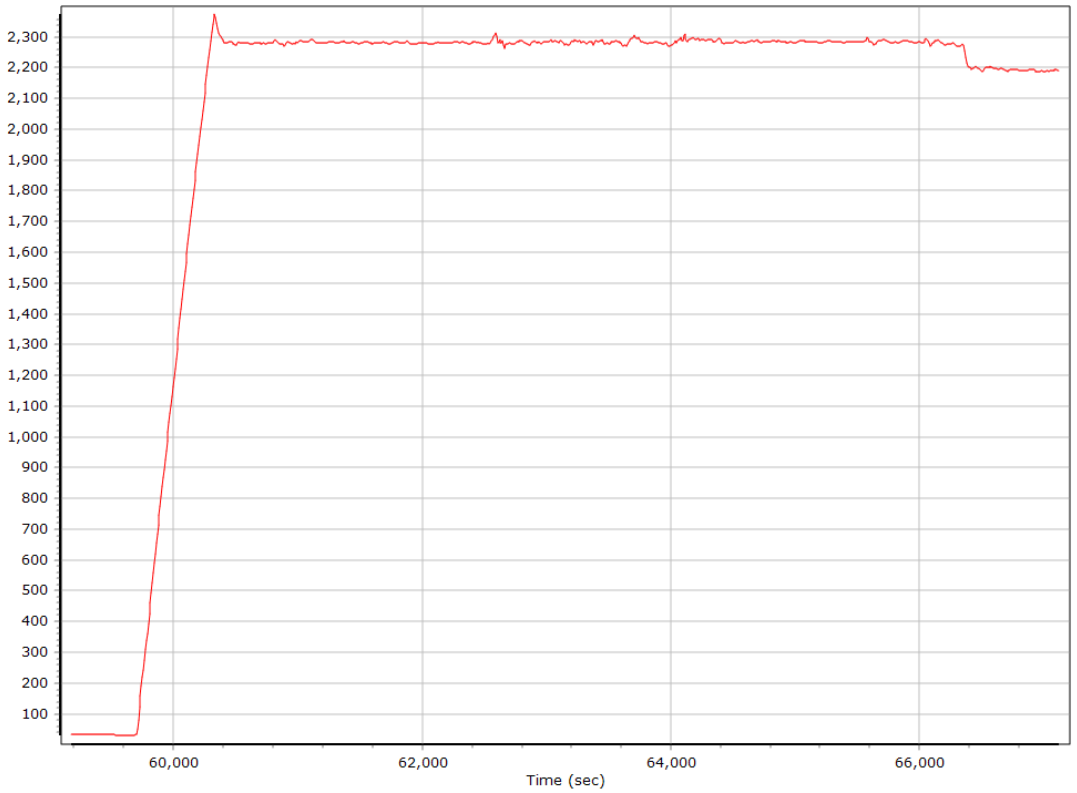

54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
60,000
61,000
62,000
63,000
64,000
65,000
66,000
67,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 27 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 02 E5B BPSK10_PD SNR (dB/Hz)
GALILEO 03 E5B BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

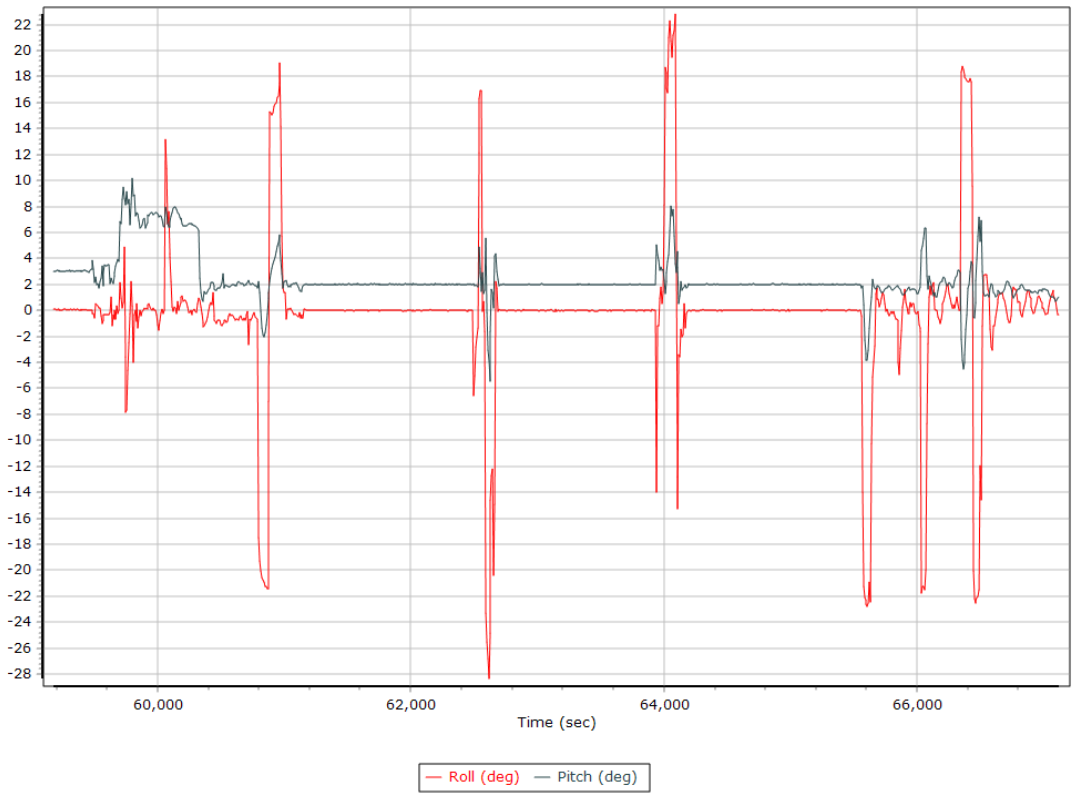
Top View



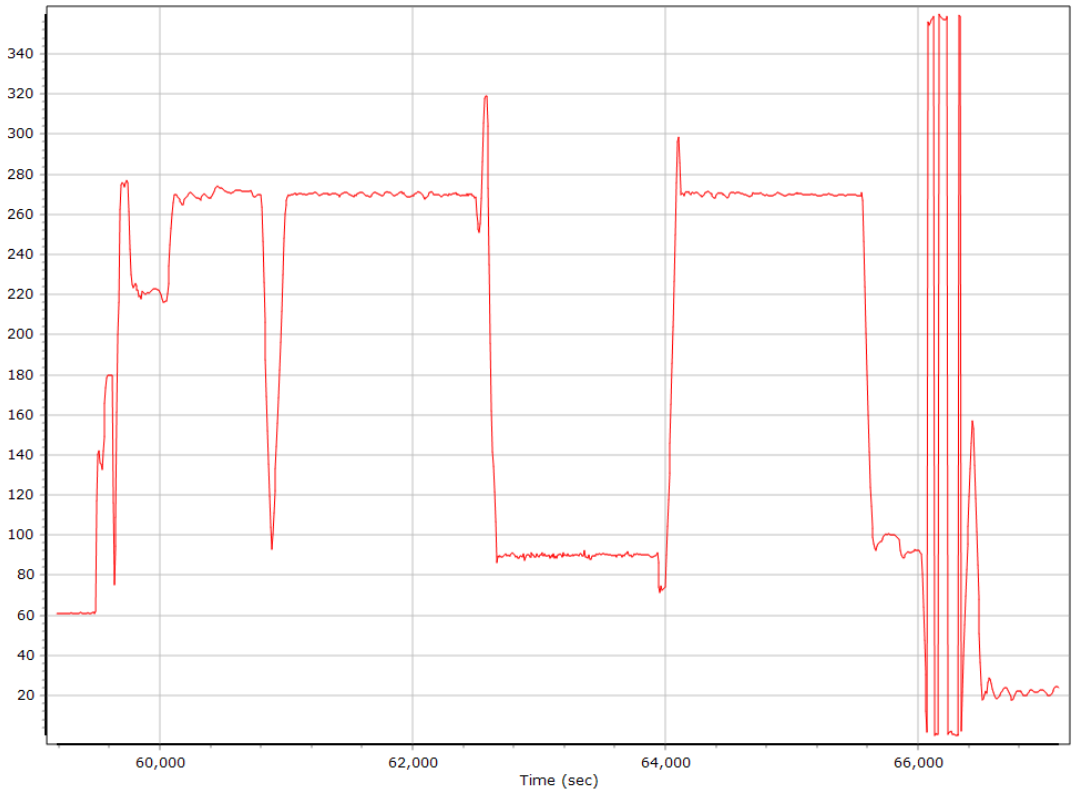
Altitude



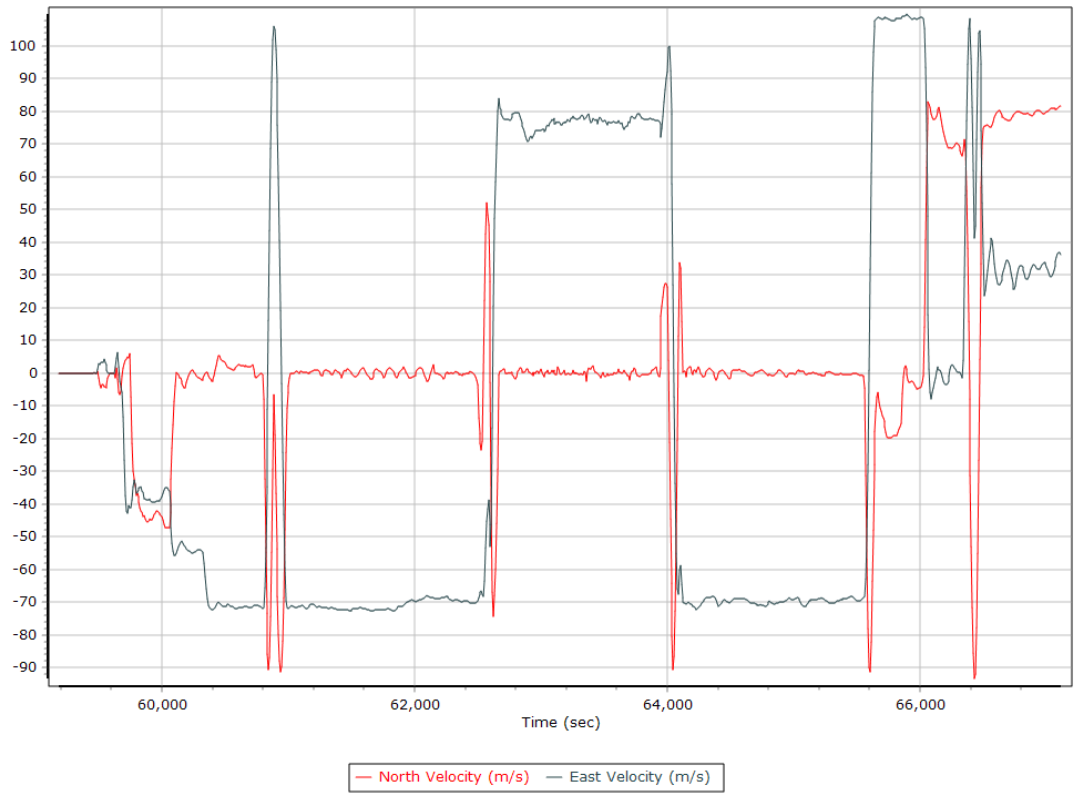
Roll/Pitch



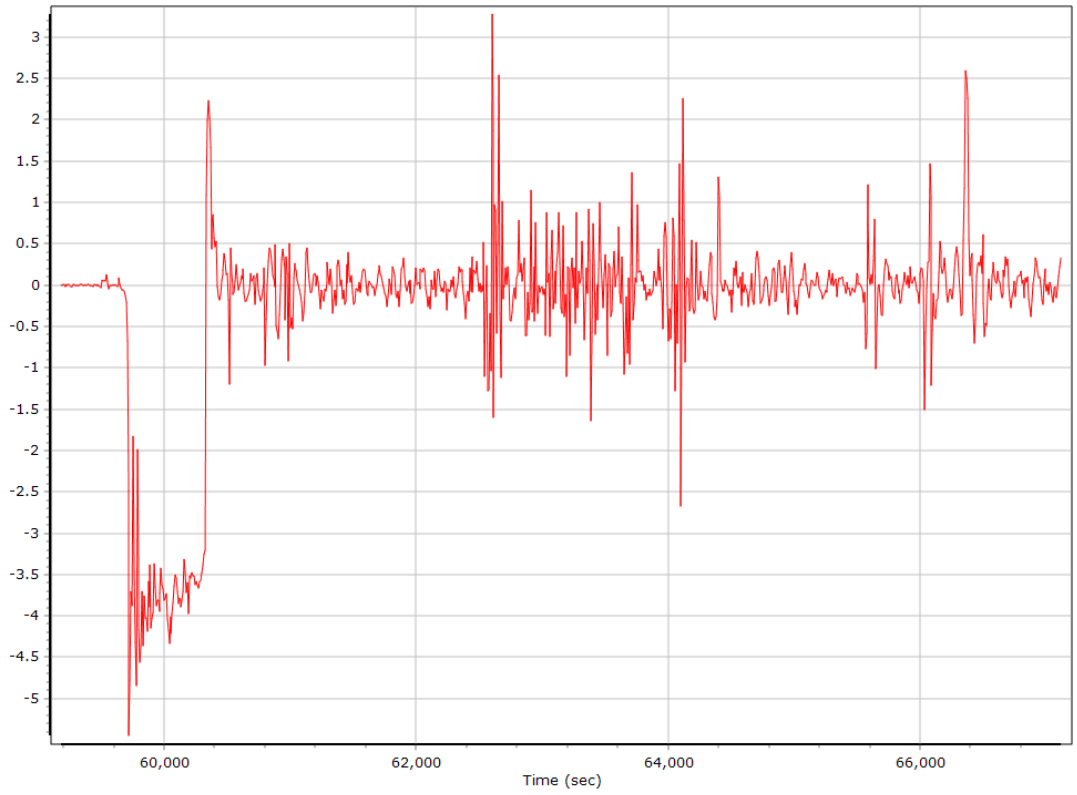
Heading



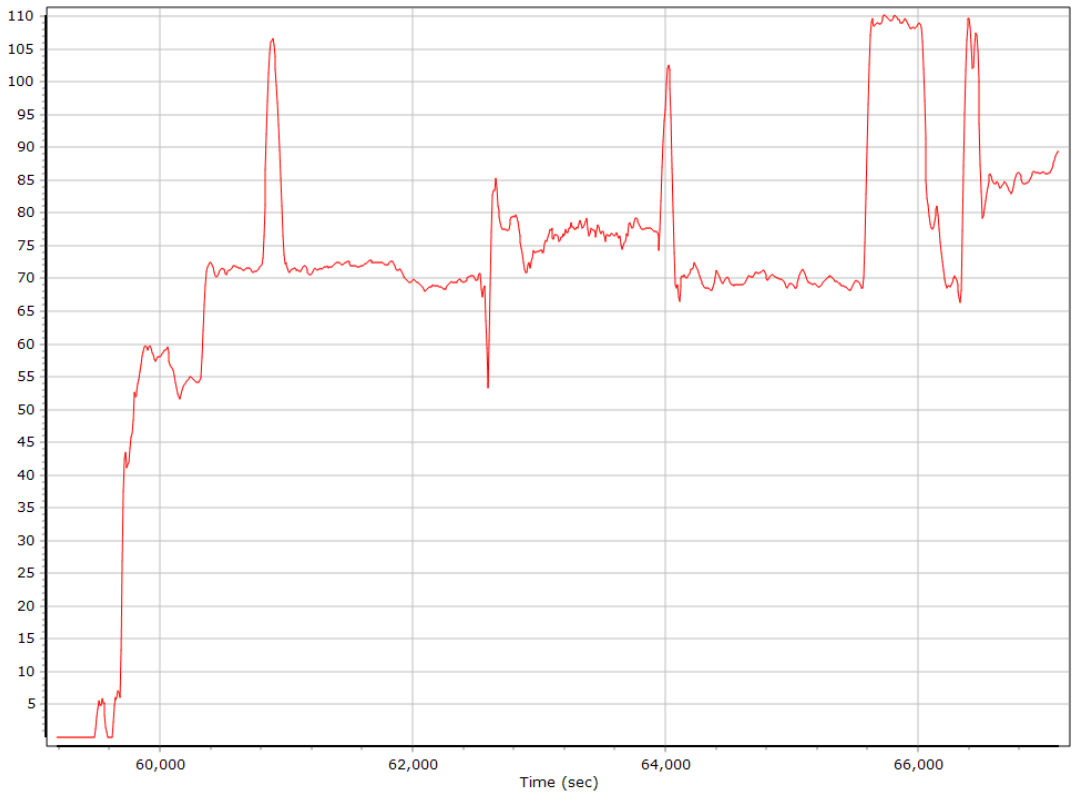
North/East Velocity



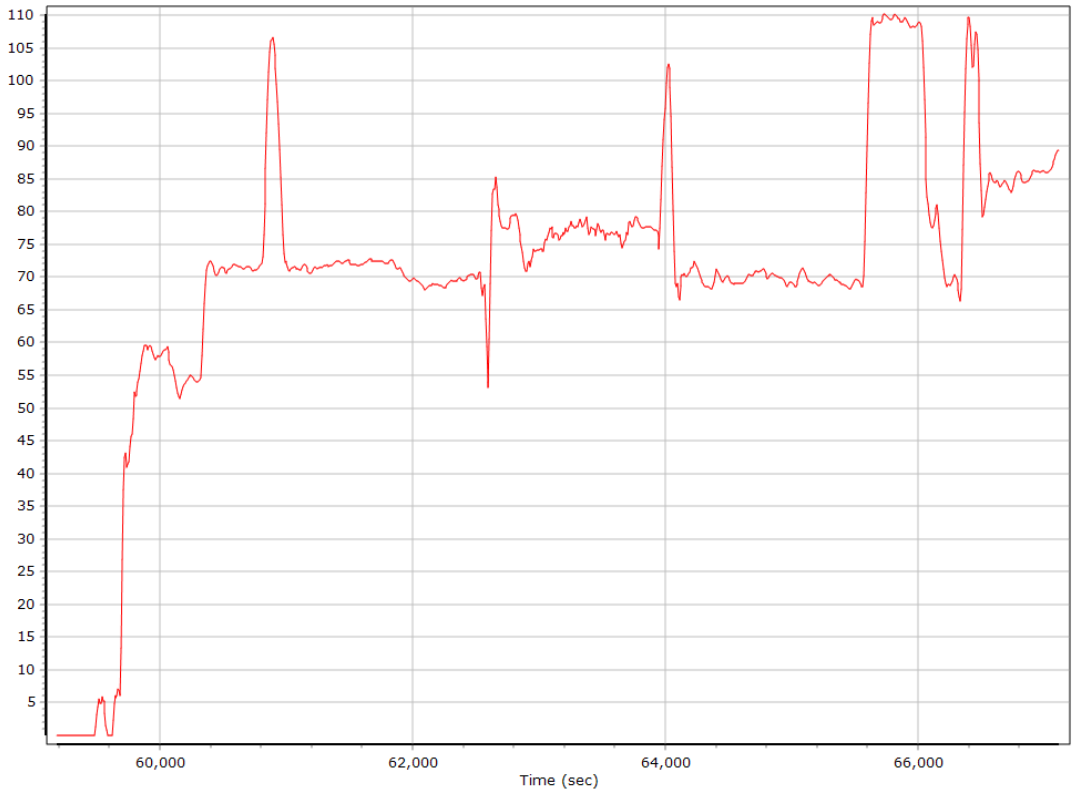
Down Velocity



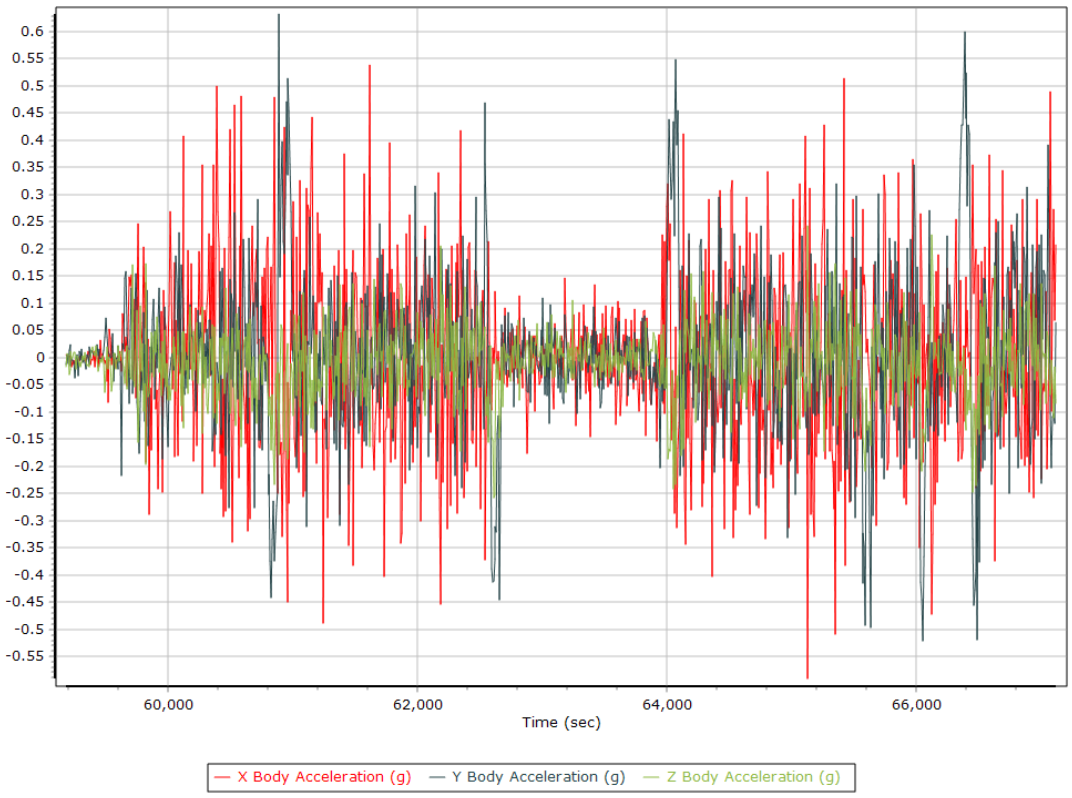
Total Speed



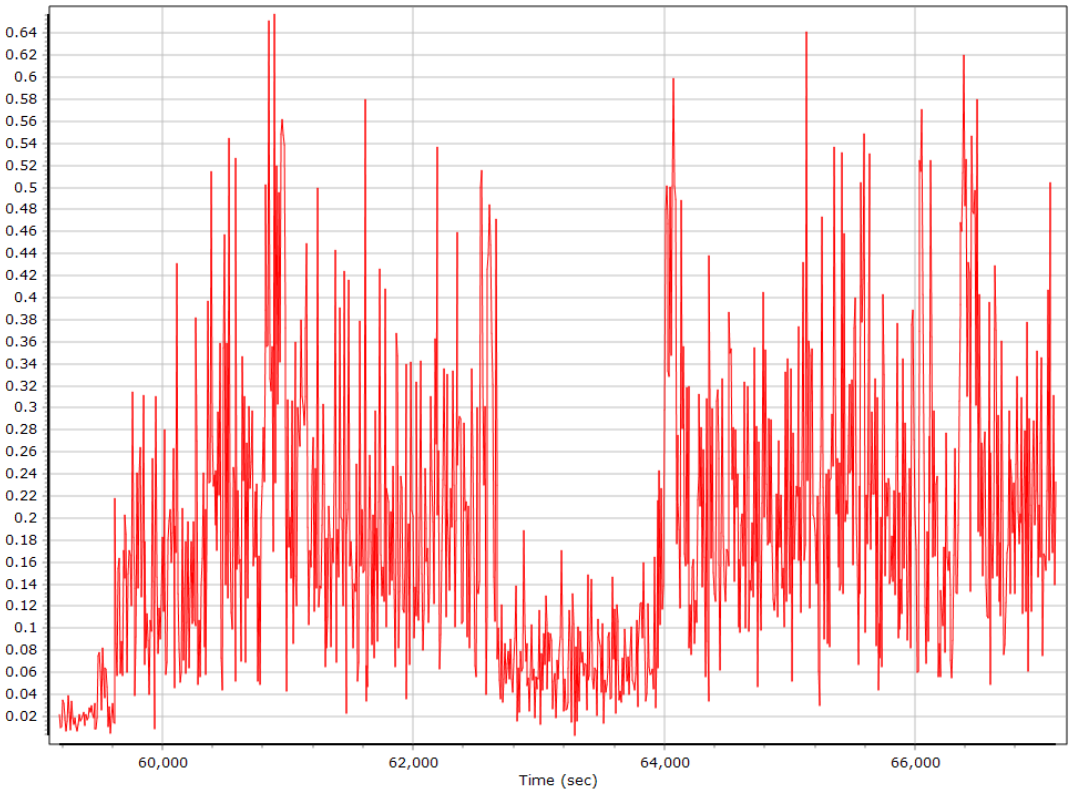
Ground Speed



Body Acceleration



Total Body Acceleration

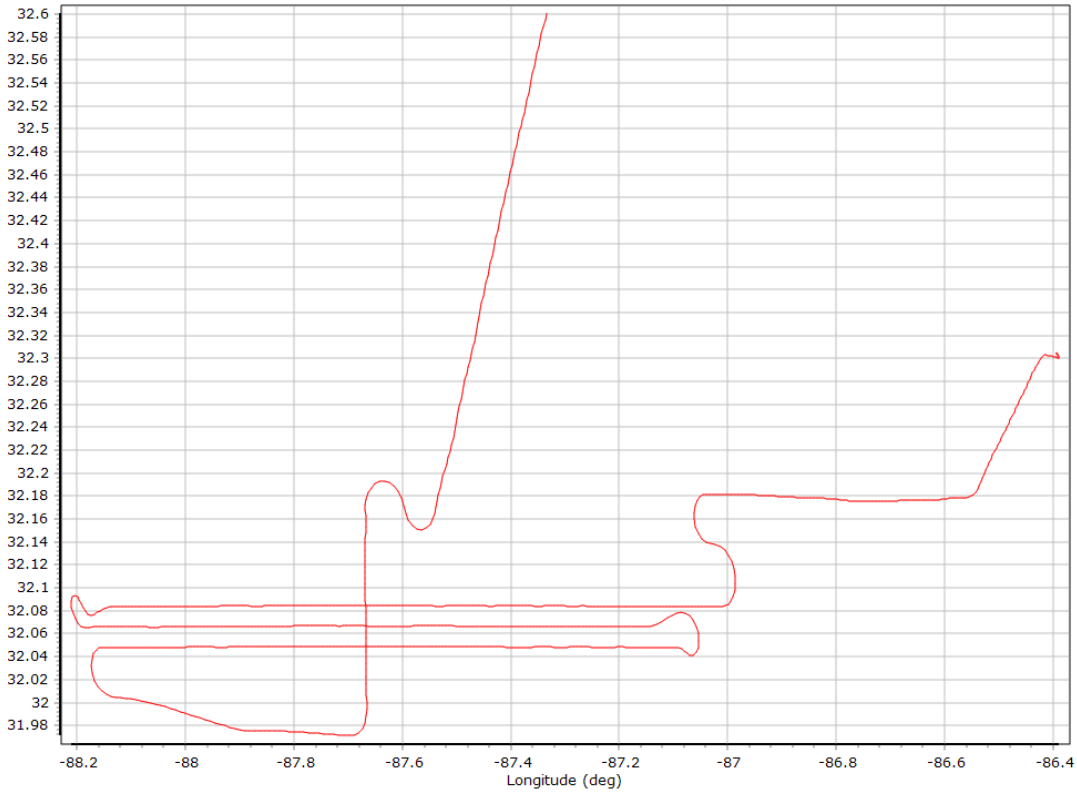


Body Angular Rate

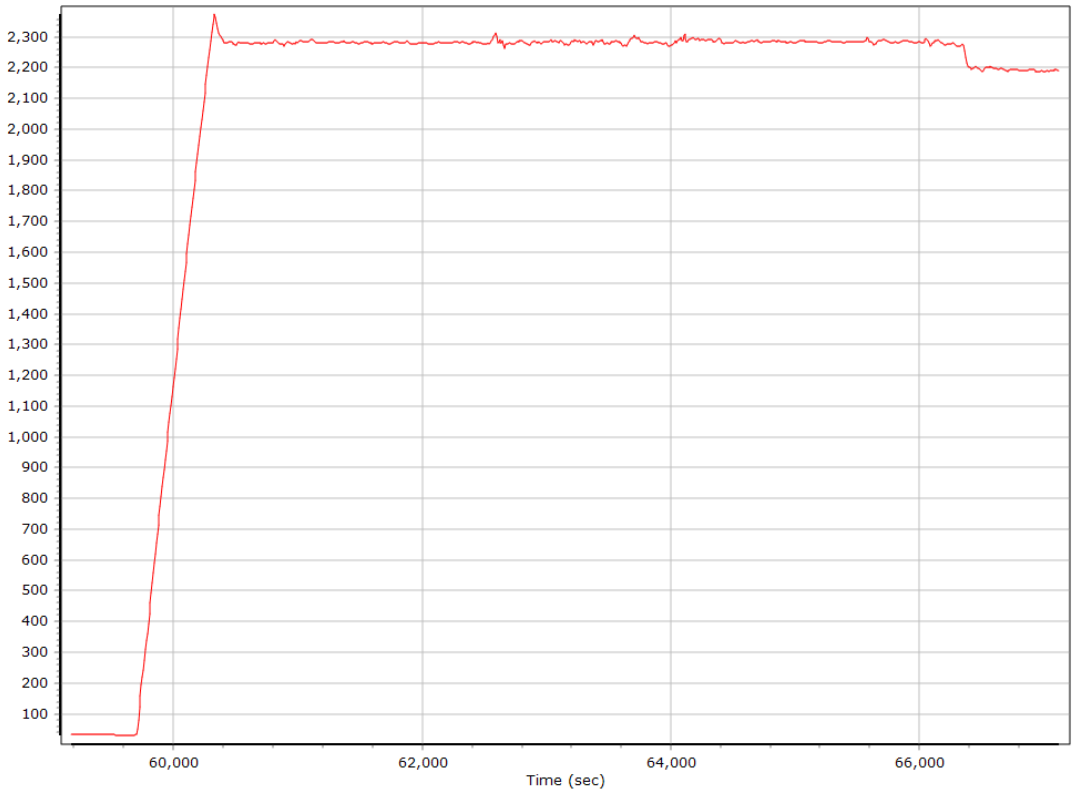


Forward Processed Trajectory Information

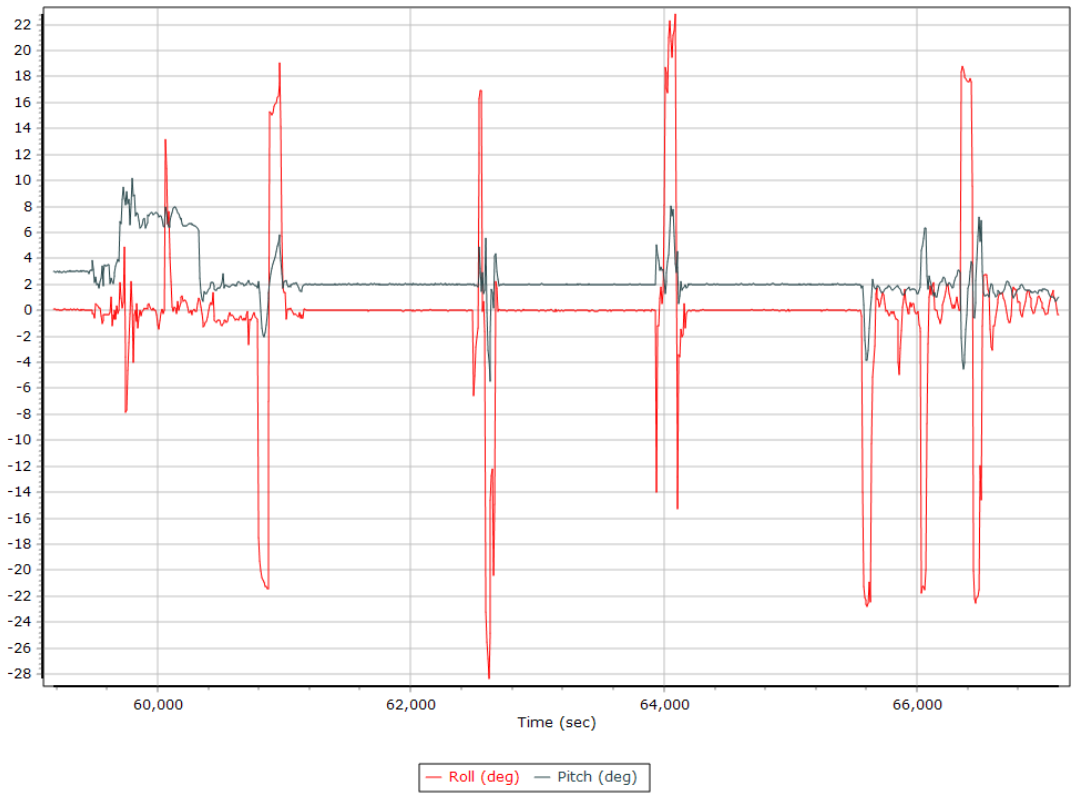
Top View



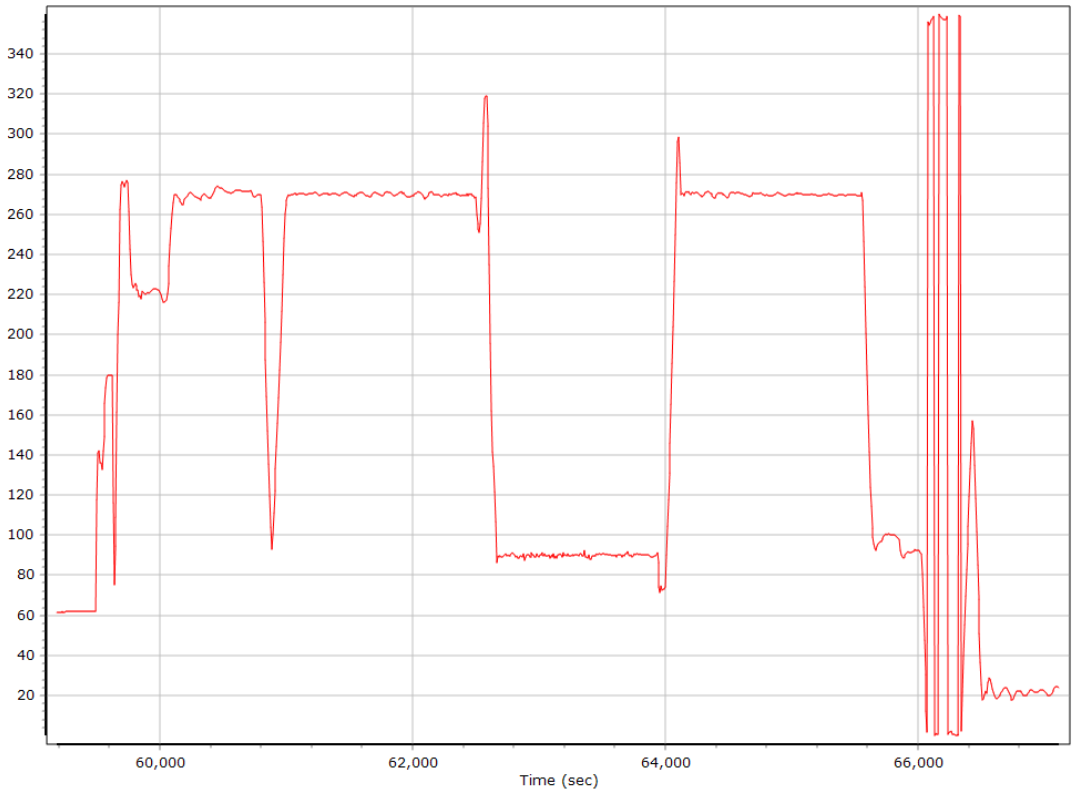
Altitude



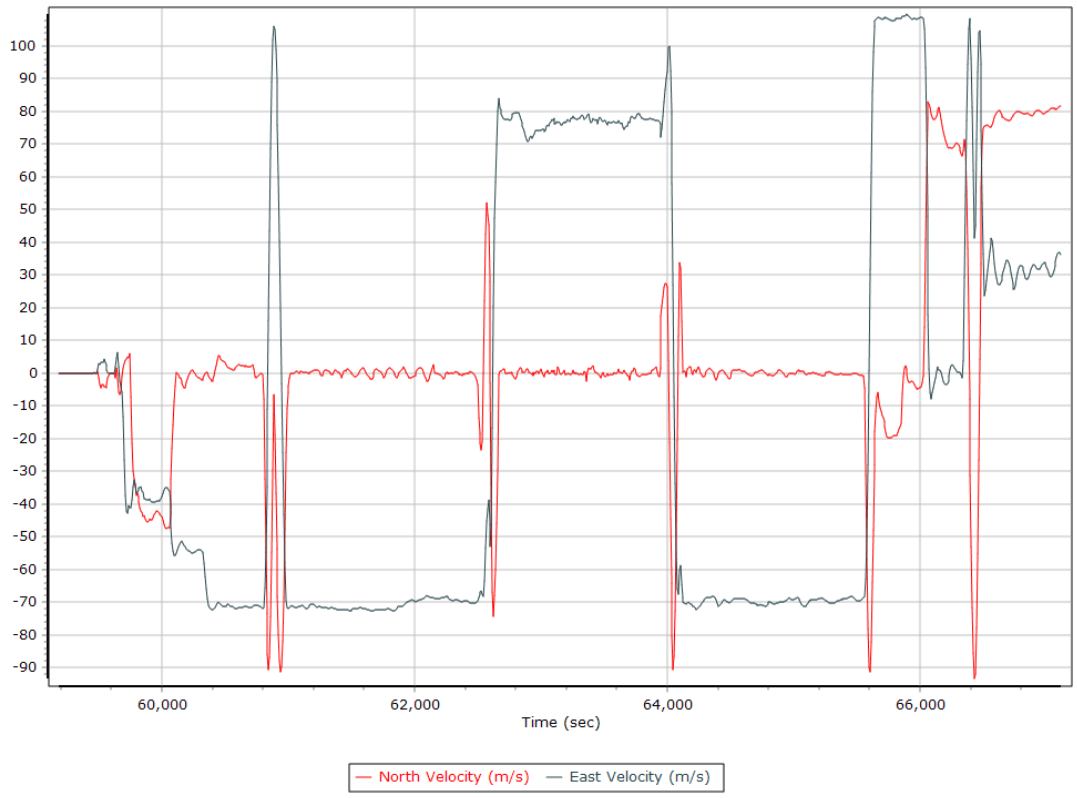
Roll/Pitch



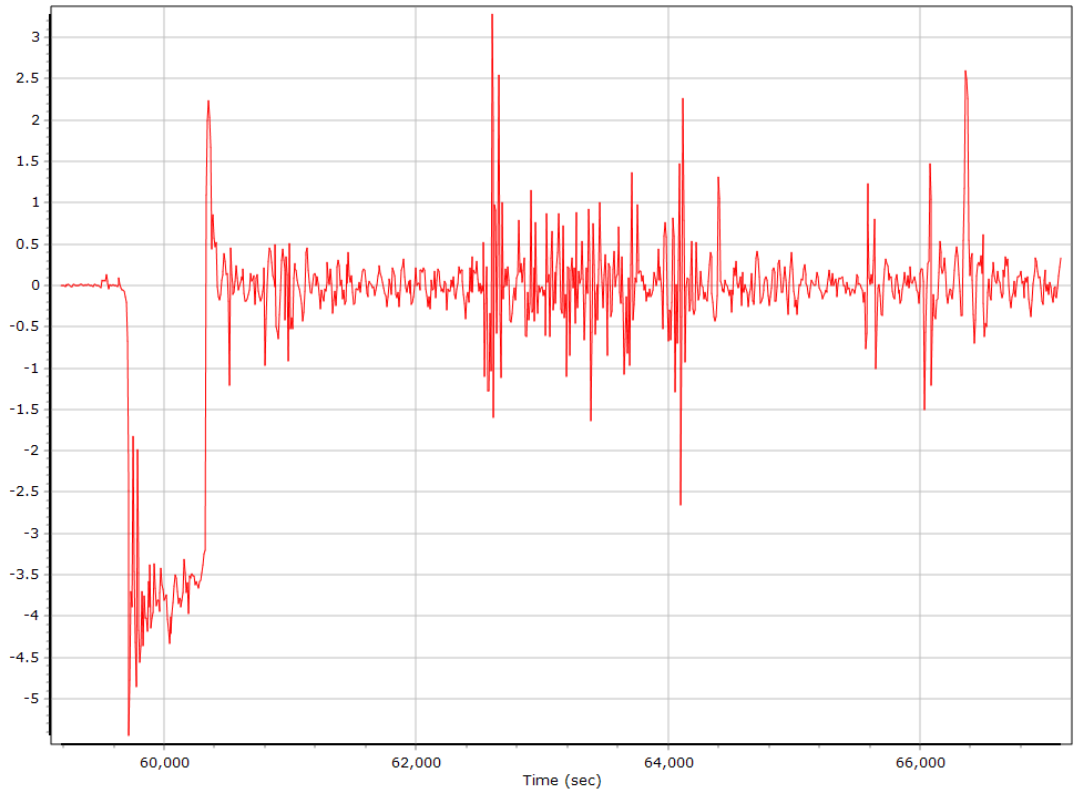
Heading



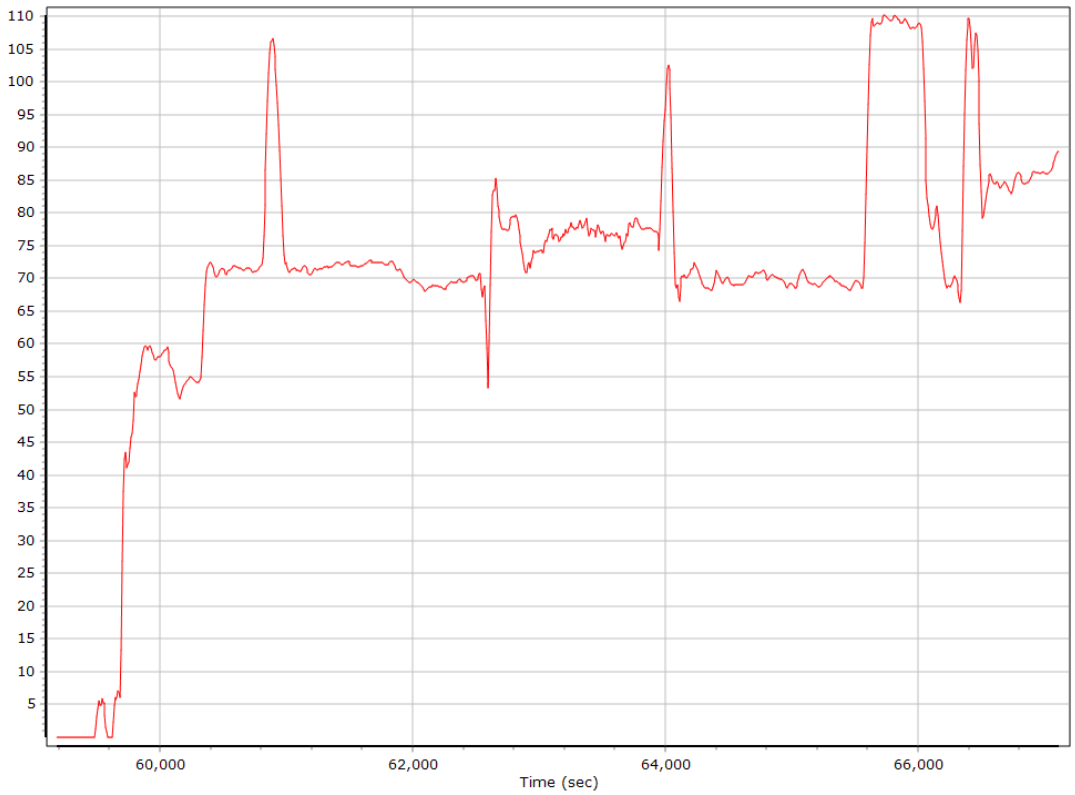
North/East Velocity



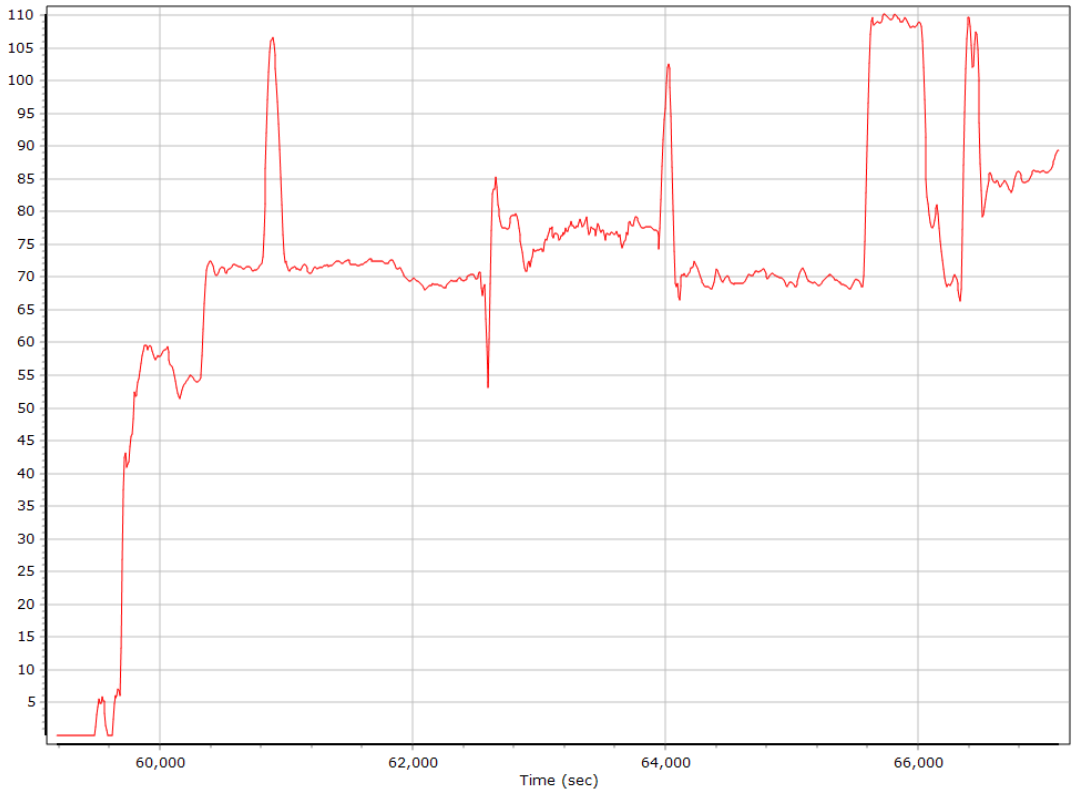
Down Velocity



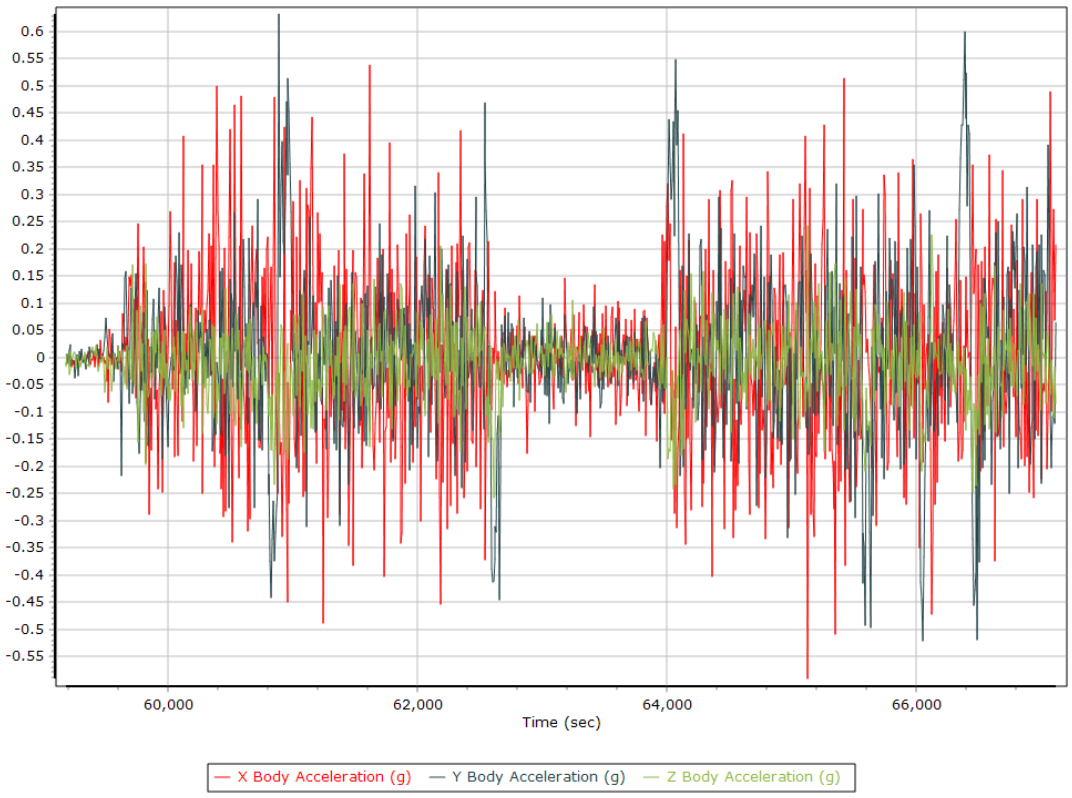
Total Speed



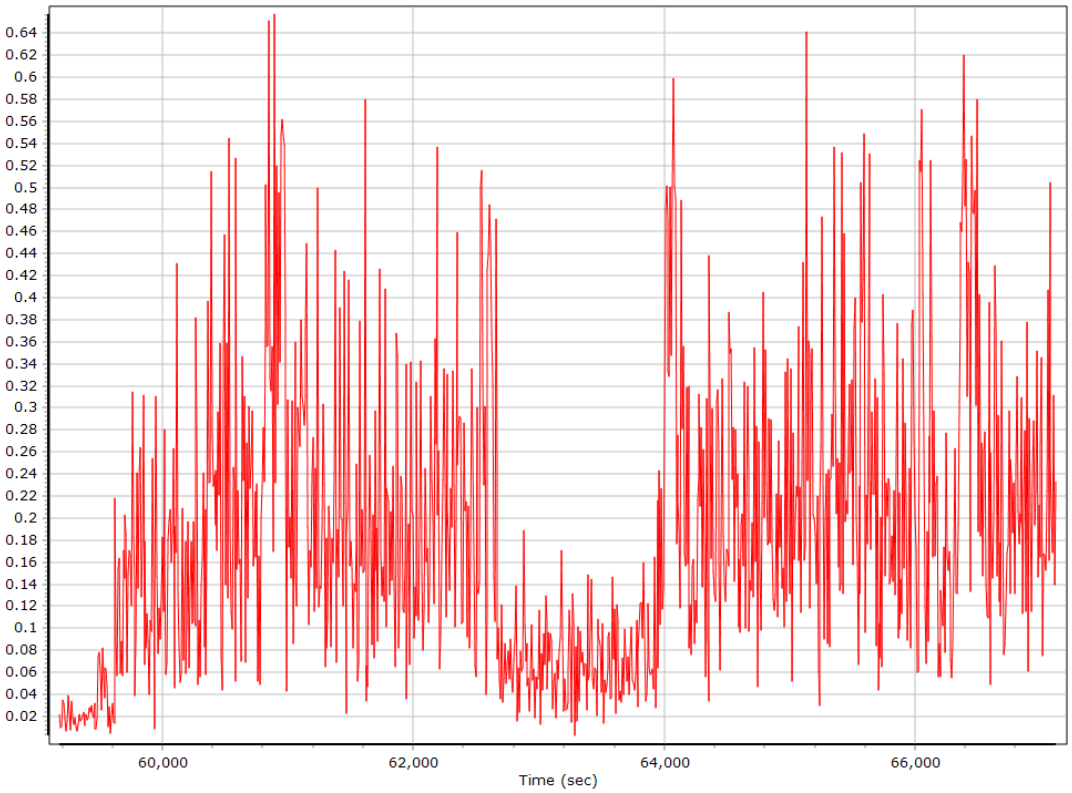
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

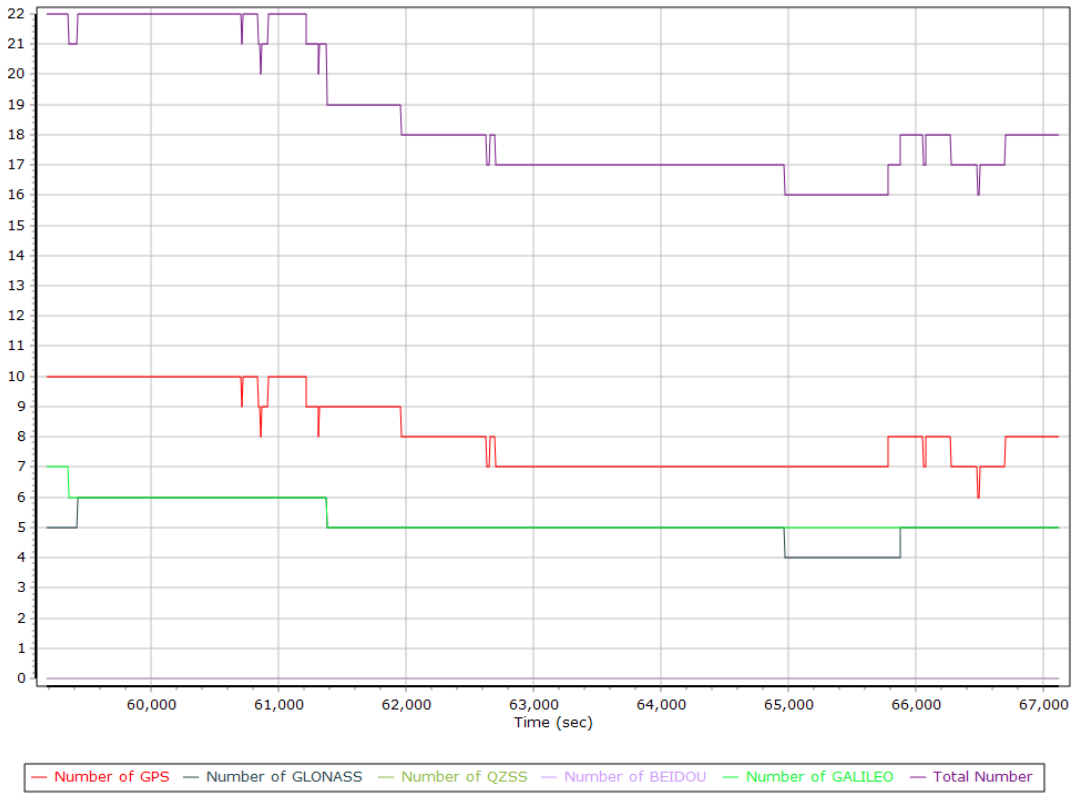


GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	10	8
Number of GLONASS SV	4	6	5
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	7	5
Total number of SV	16	22	19
PDOP	1.03	1.68	1.31
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	8016.00	0.00	0.00
Percentage	100.00	0.00	0.00

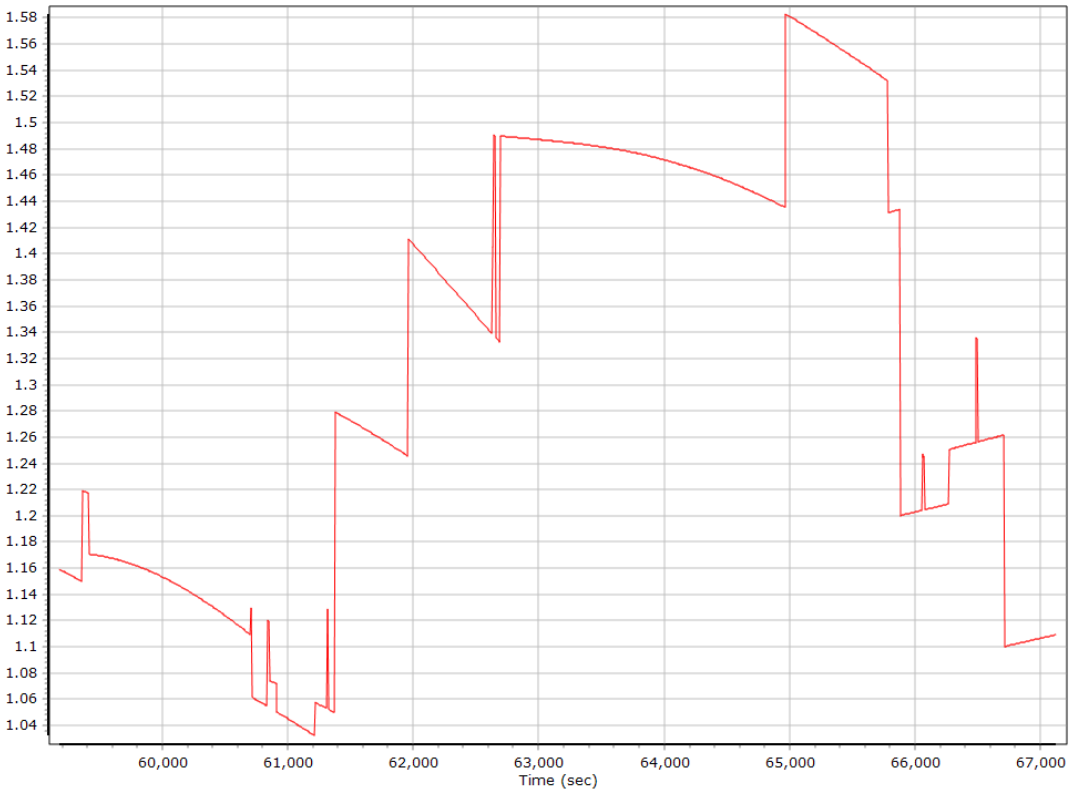
Num SVs in solution



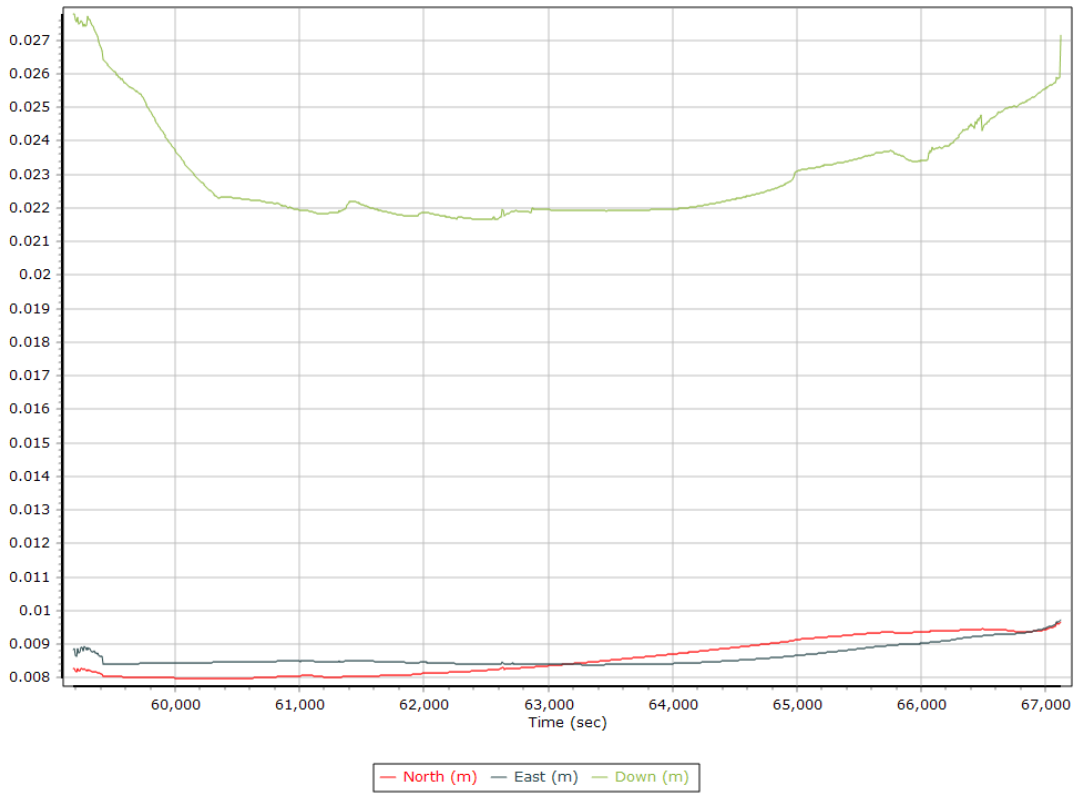
Forward/Reverse Separation



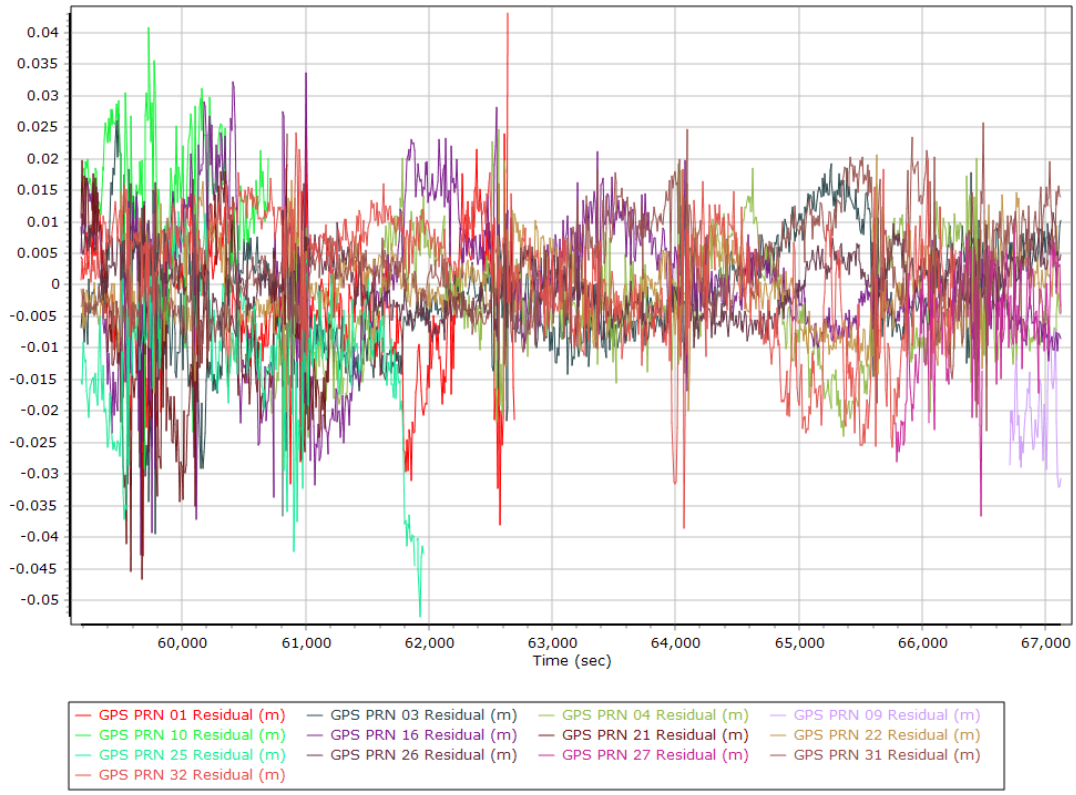
PDOP



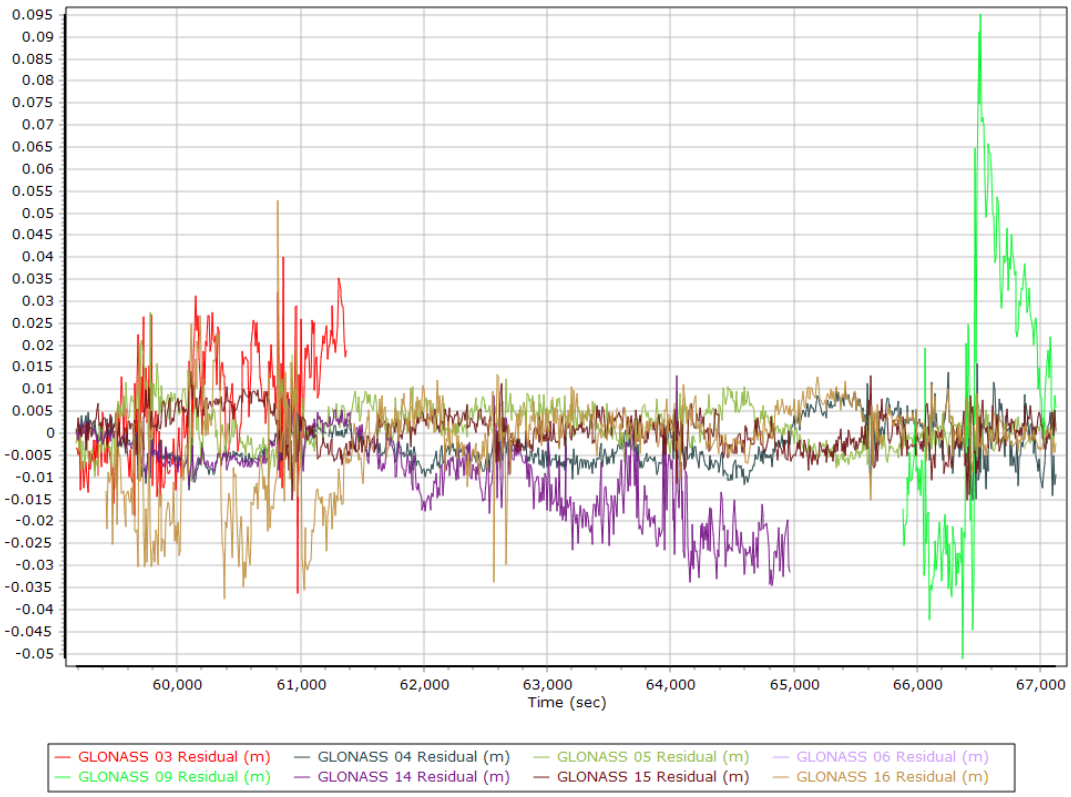
Estimated Position Accuracy



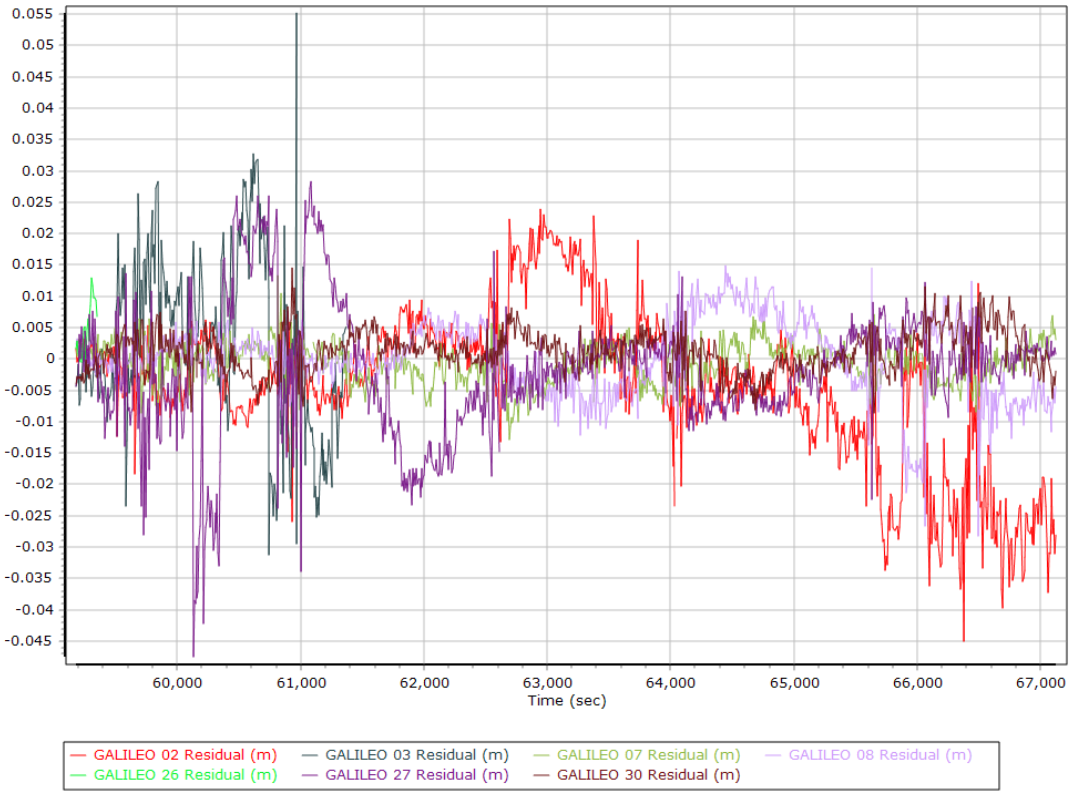
GPS Residuals



GLONASS Residuals



GALILEO Residuals



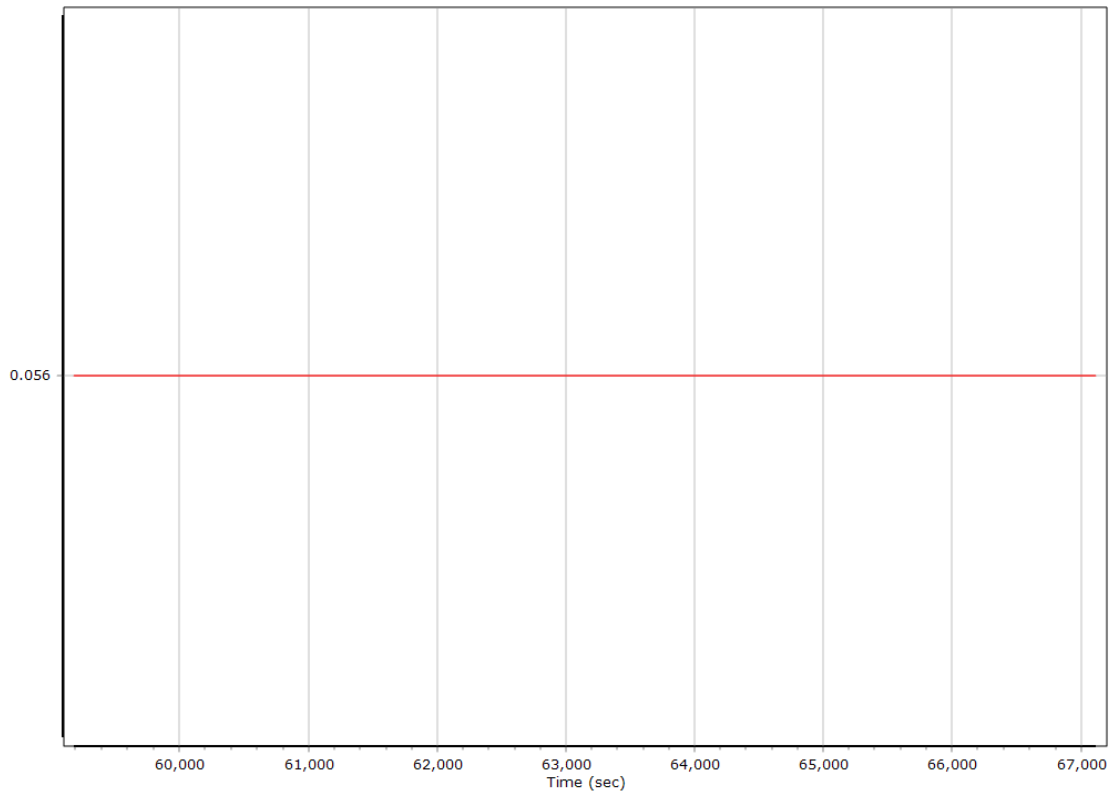
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	59095.000 (1/17/2021 4:24:55 PM)		
Processing end time	67123.000 (1/17/2021 6:38:43 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

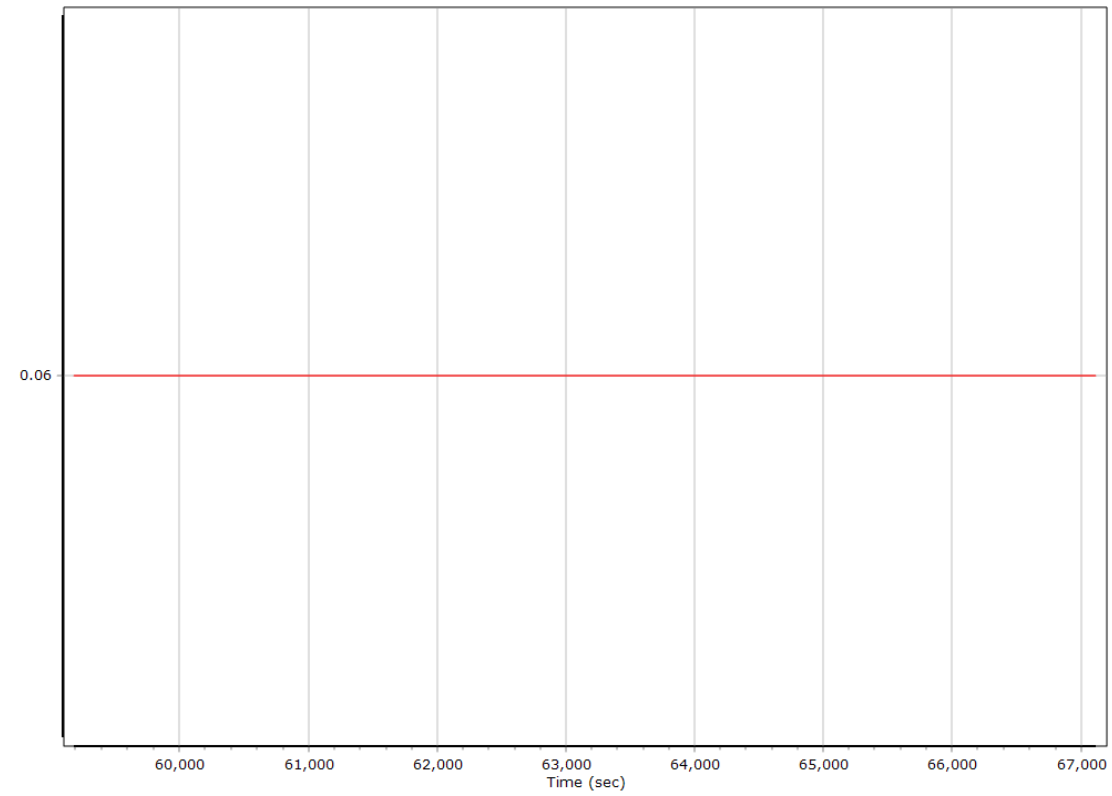
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

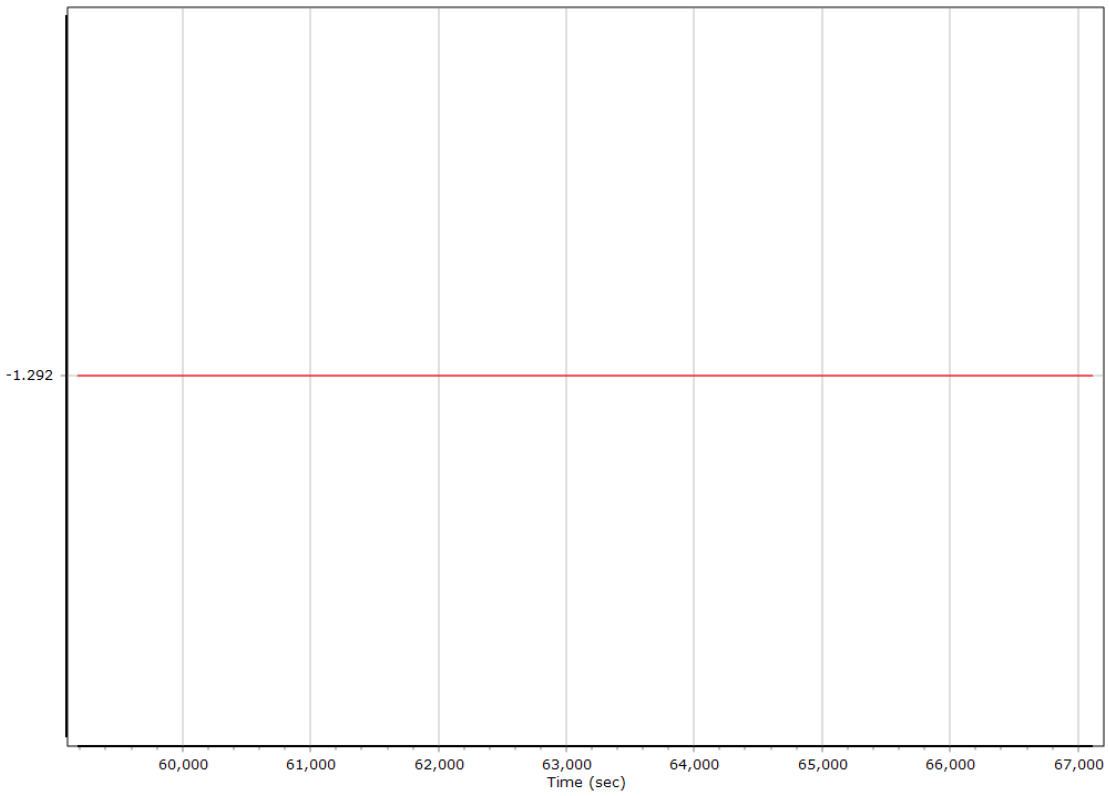
X Reference-Primary GNSS Lever Arm (m)



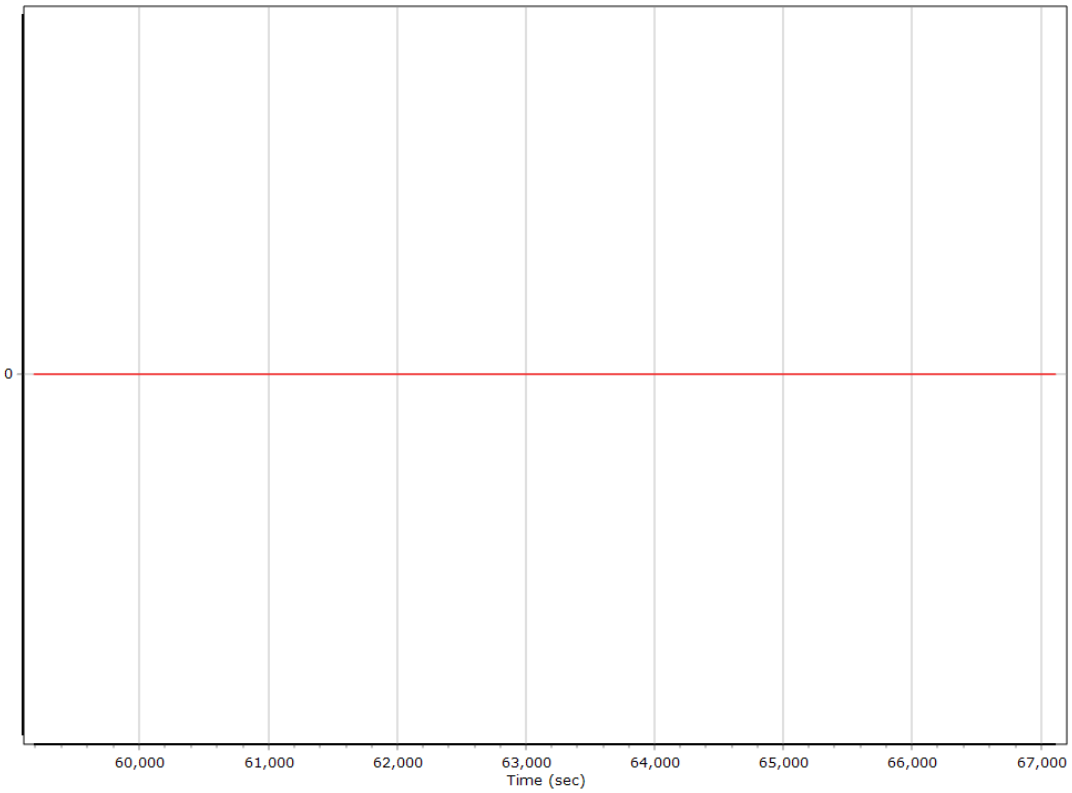
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



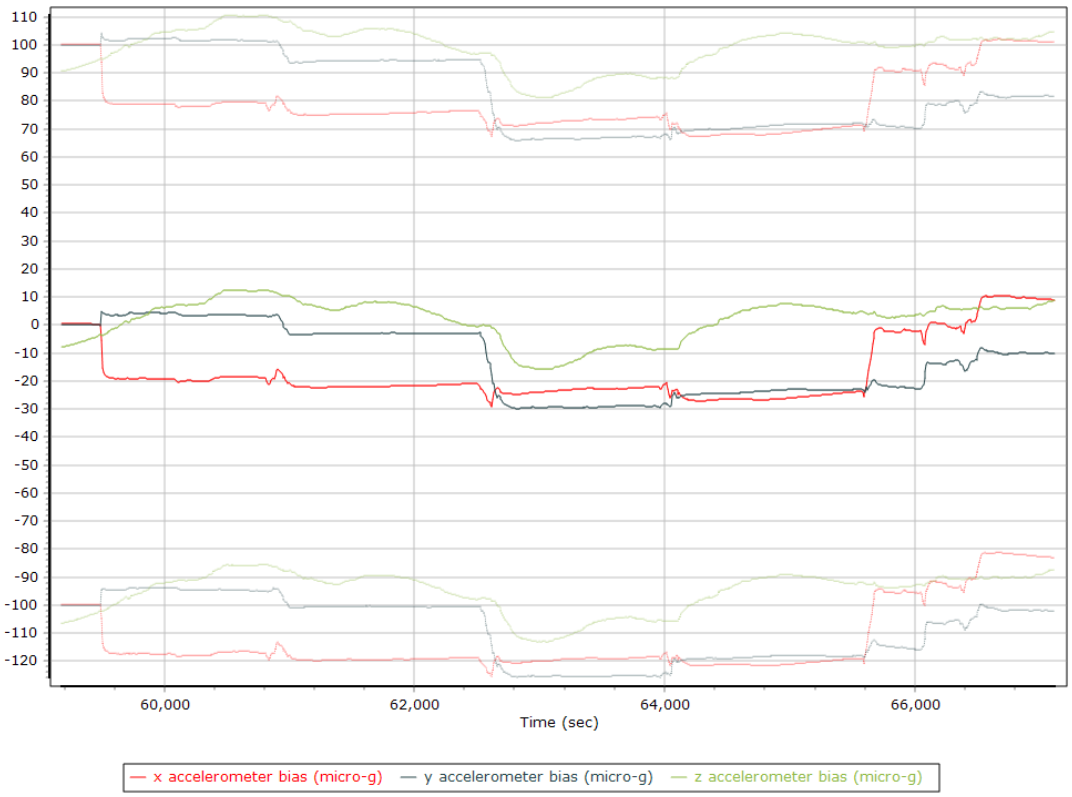
Reference-Primary GNSS Lever Arm Figure of Merit



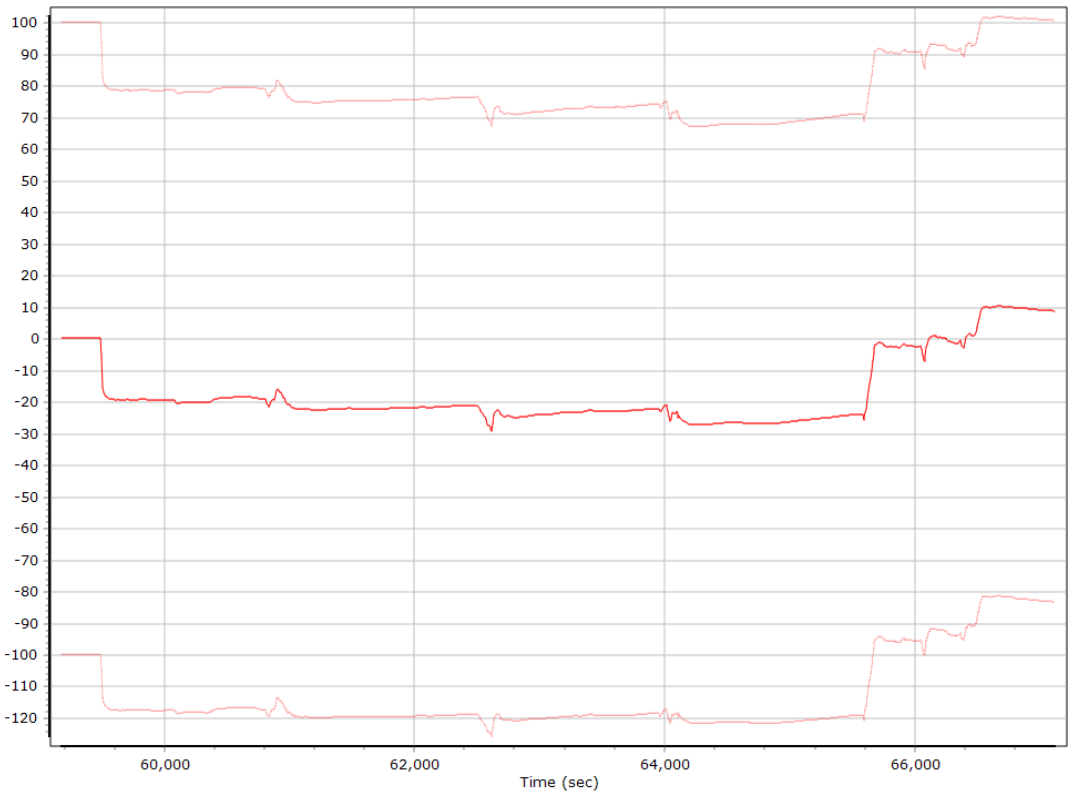
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

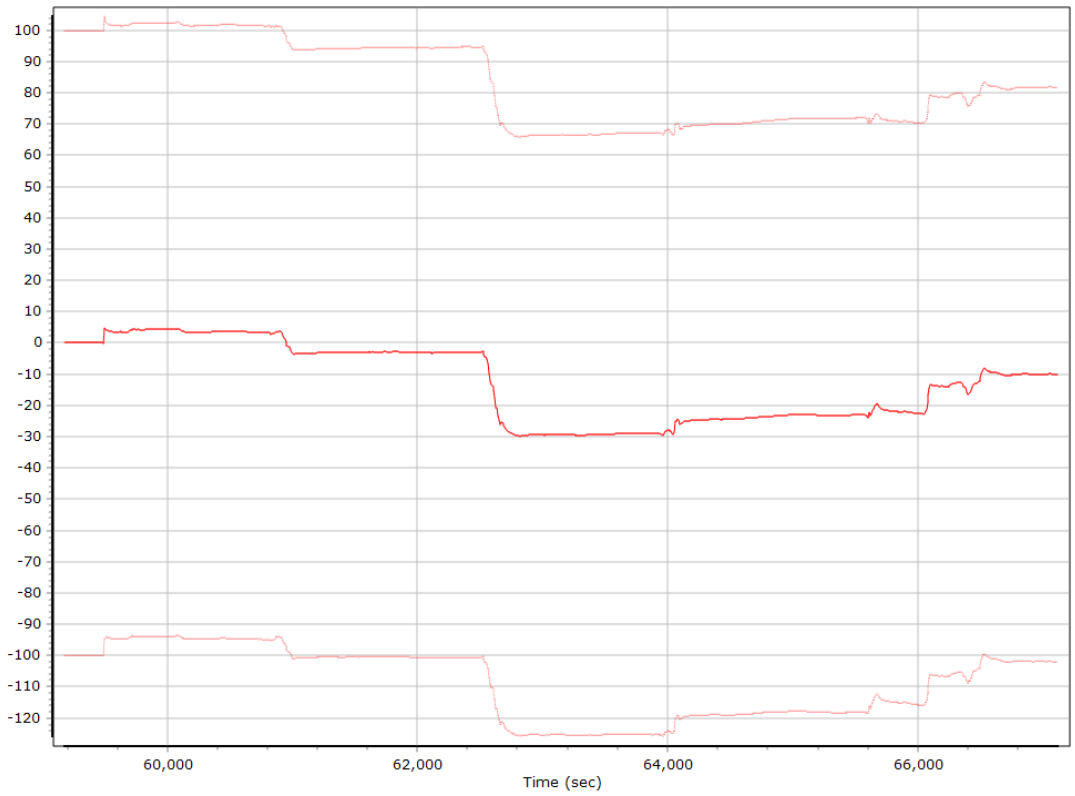
Accelerometer Bias (micro-g)



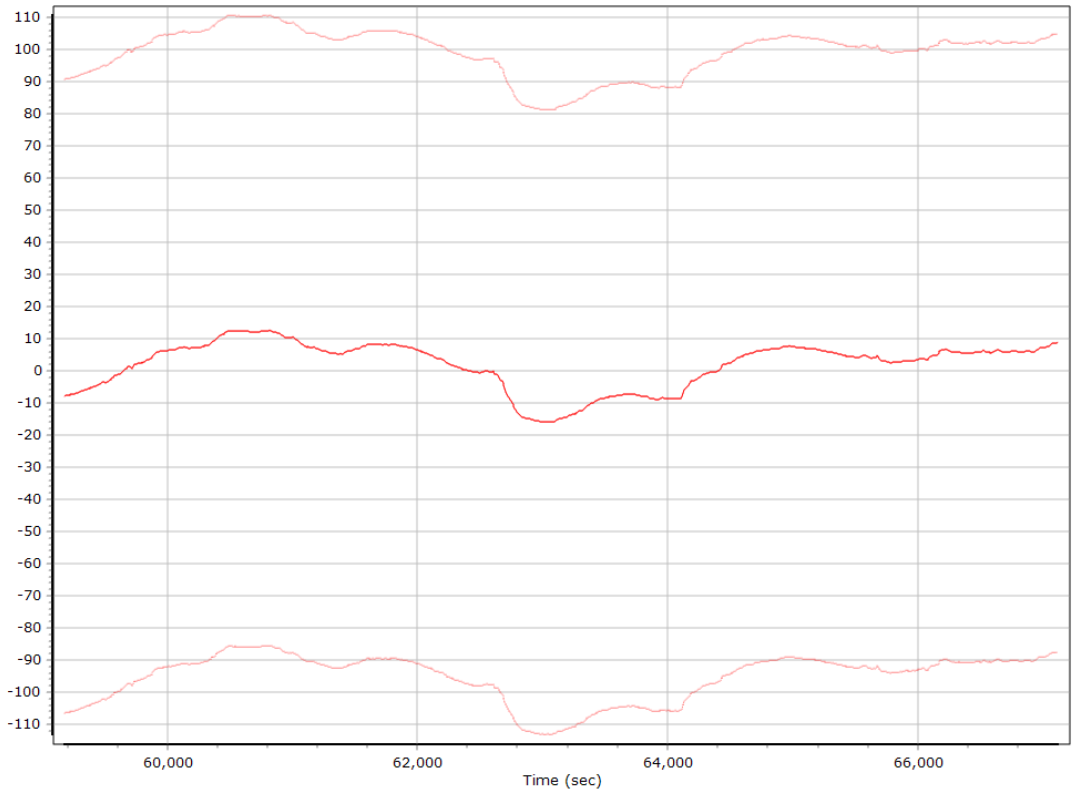
X Accelerometer Bias (micro-g)



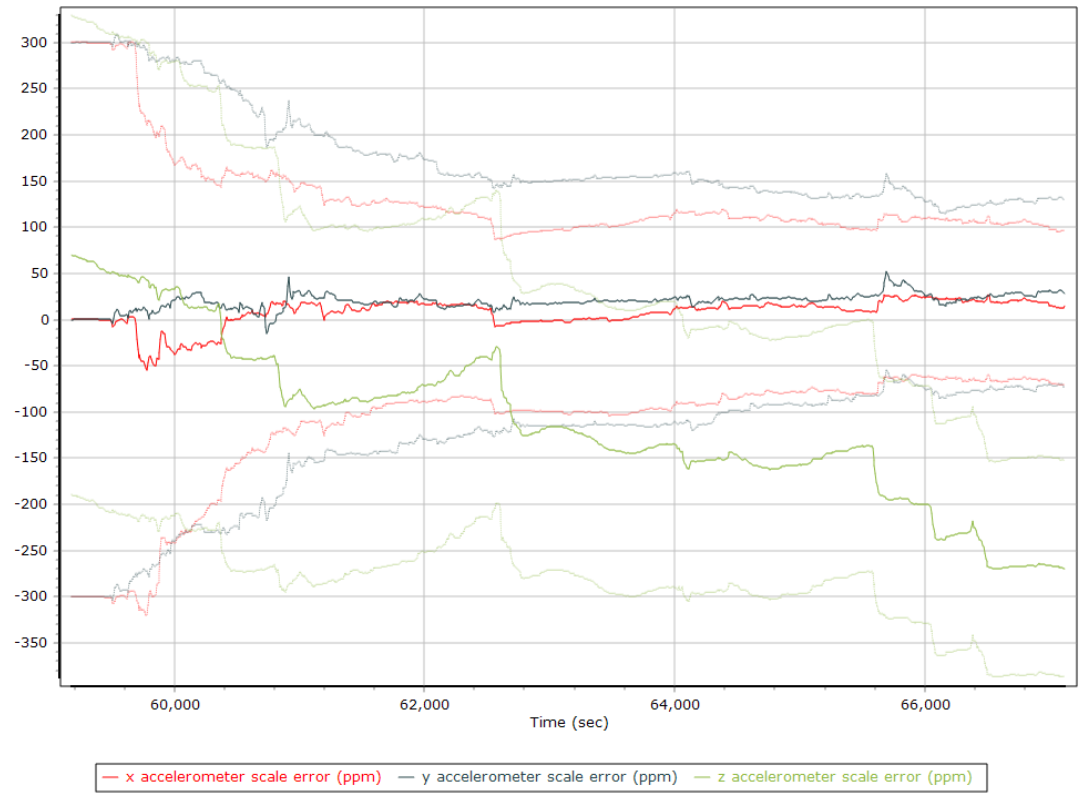
Y Accelerometer Bias (micro-g)



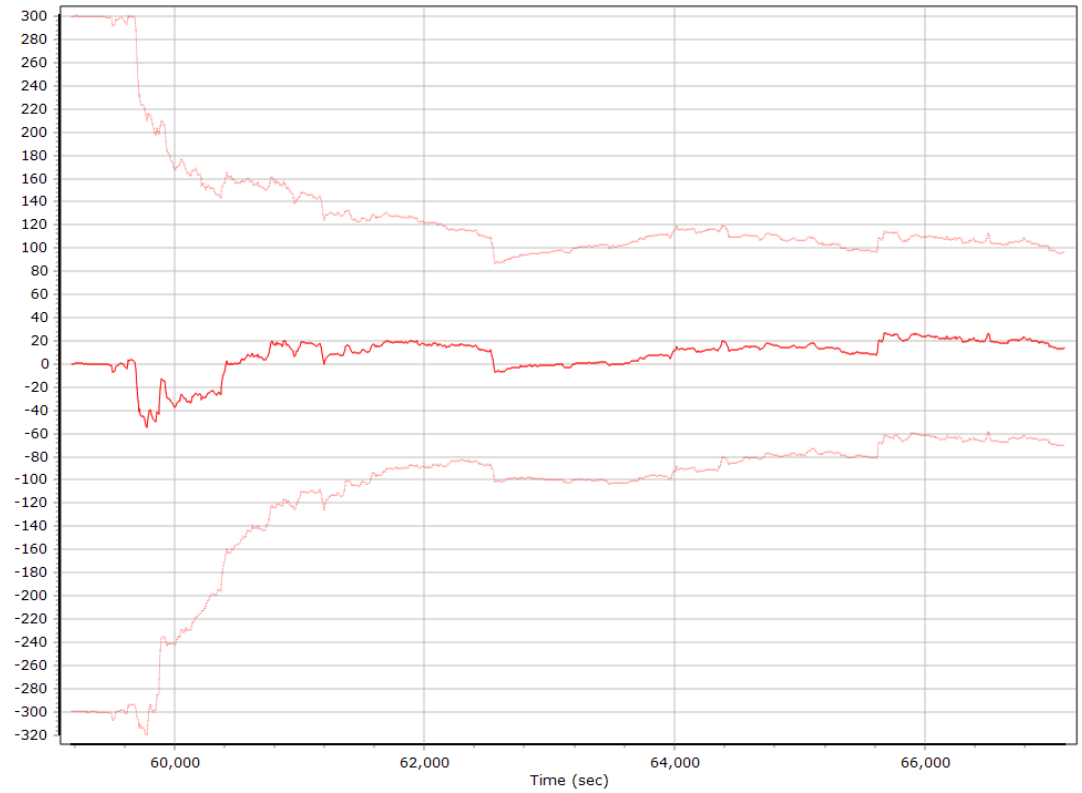
Z Accelerometer Bias (micro-g)



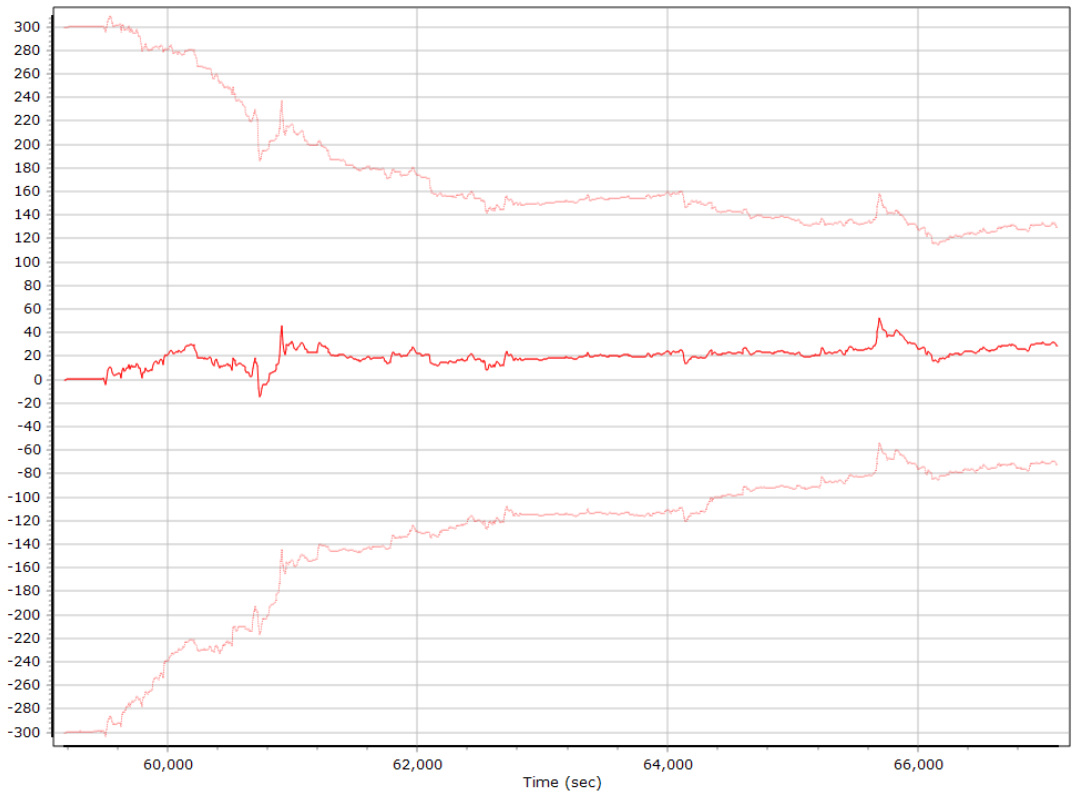
Accelerometer Scale Error (ppm)



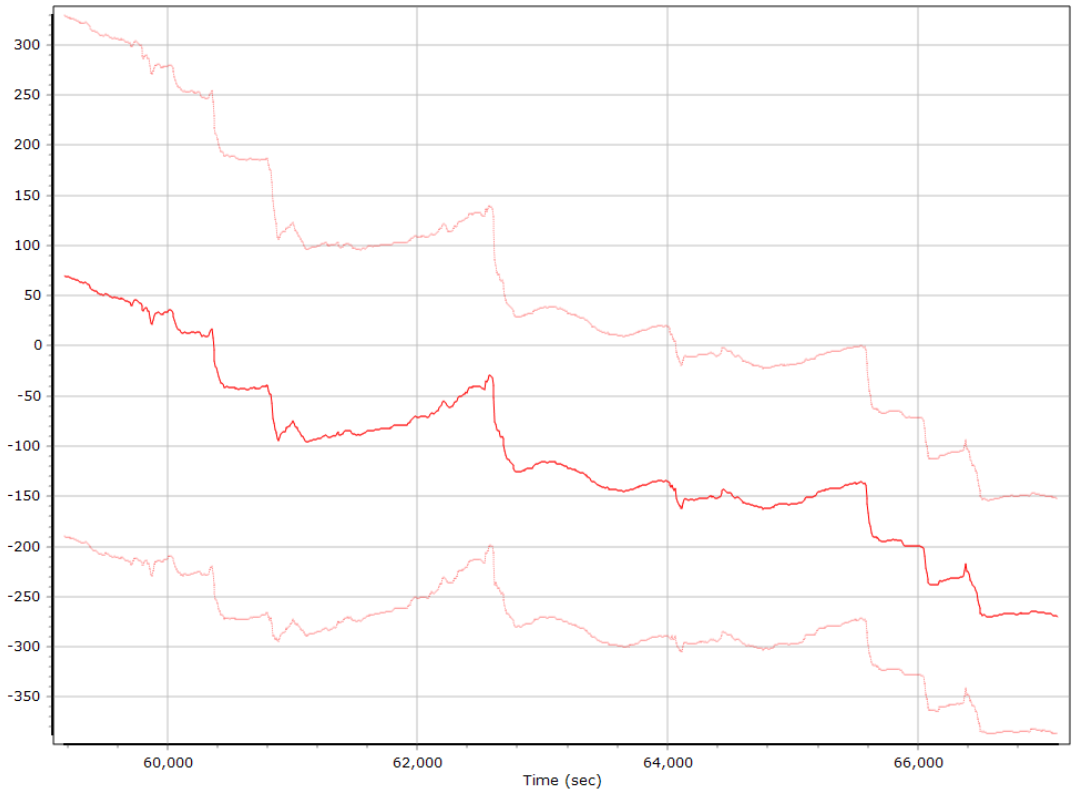
X Accelerometer Scale Error (ppm)



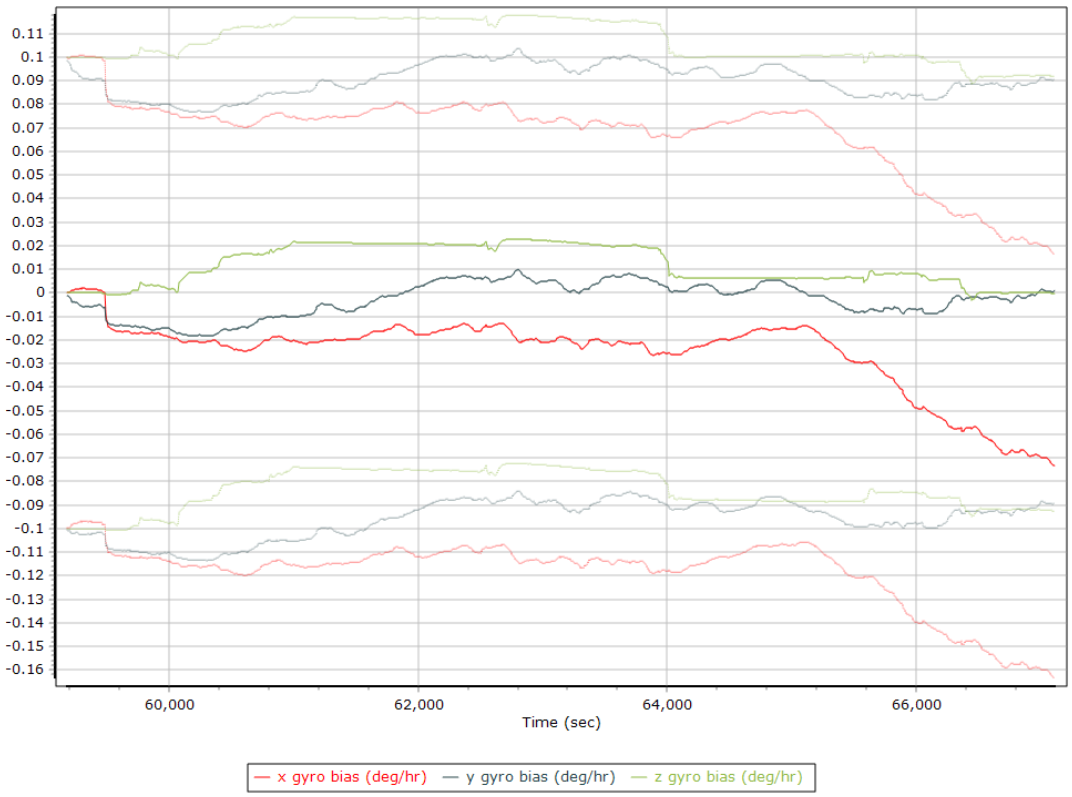
Y Accelerometer Scale Error (ppm)



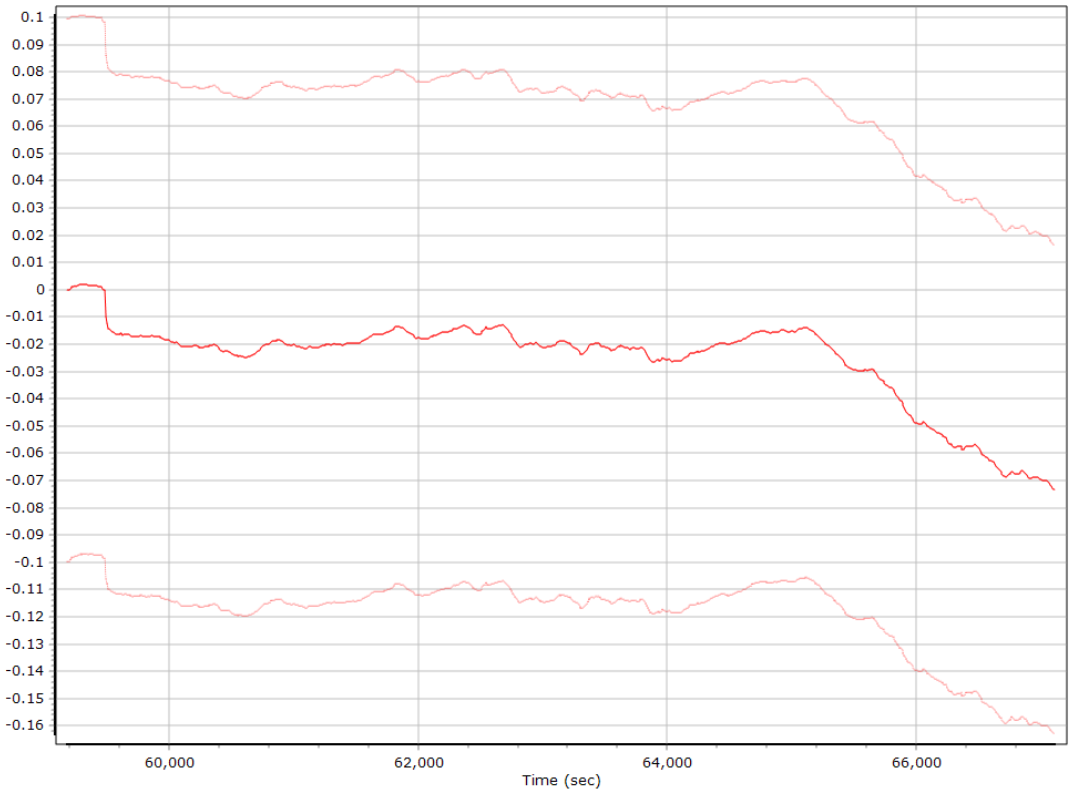
Z Accelerometer Scale Error (ppm)



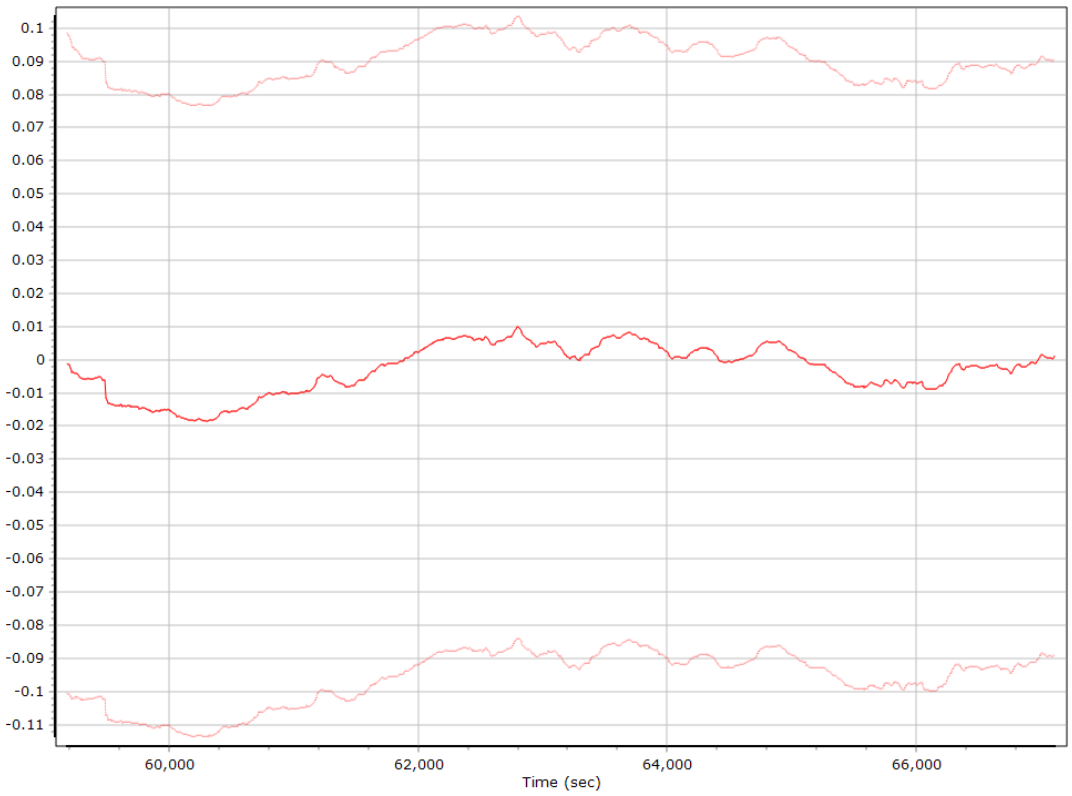
Gyro Bias (deg/h)



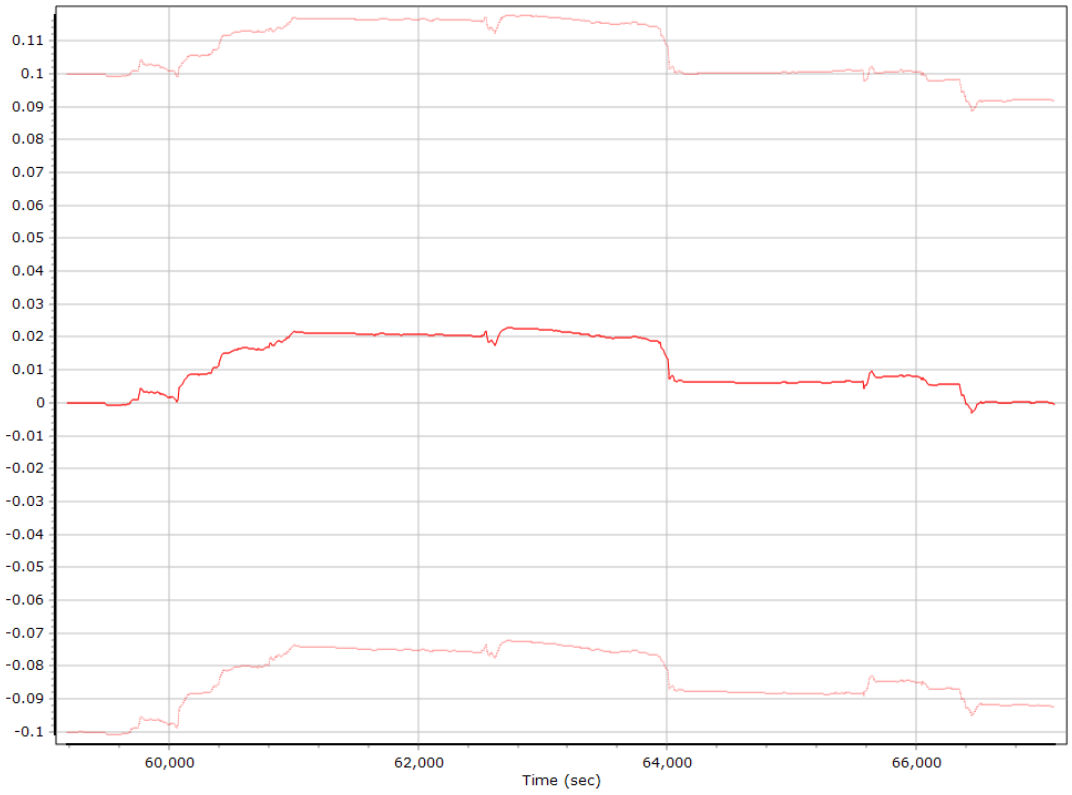
X Gyro Bias (deg/h)



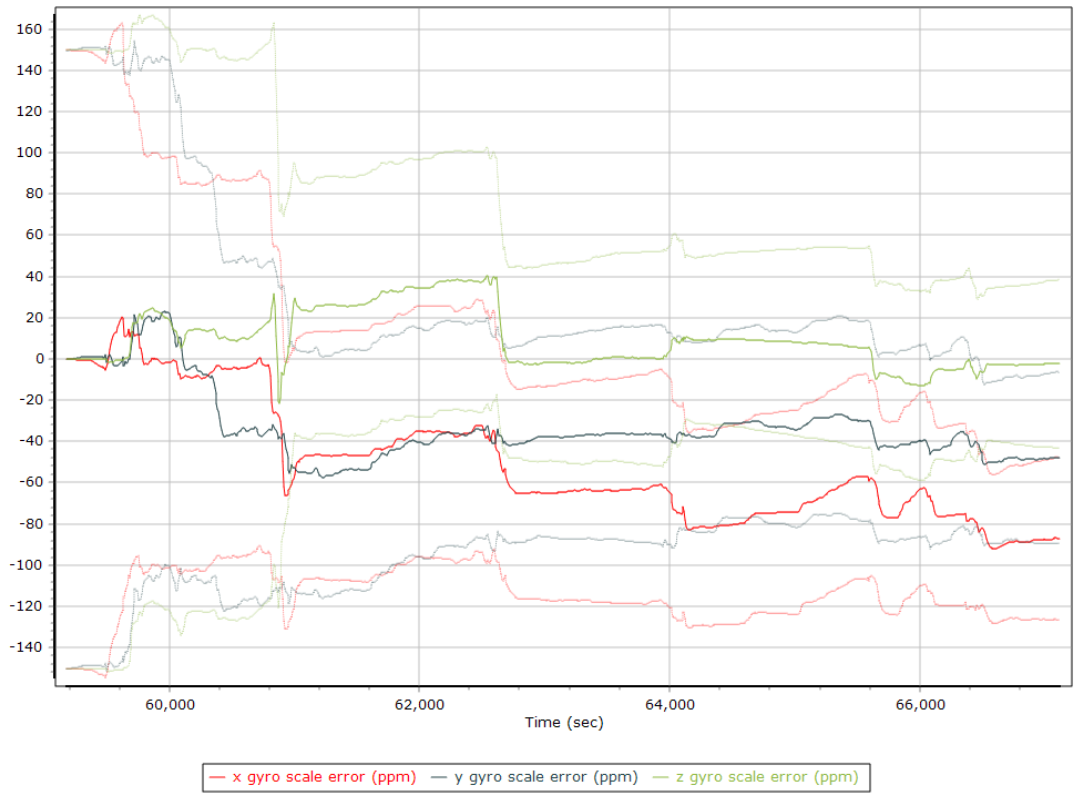
Y Gyro Bias (deg/h)



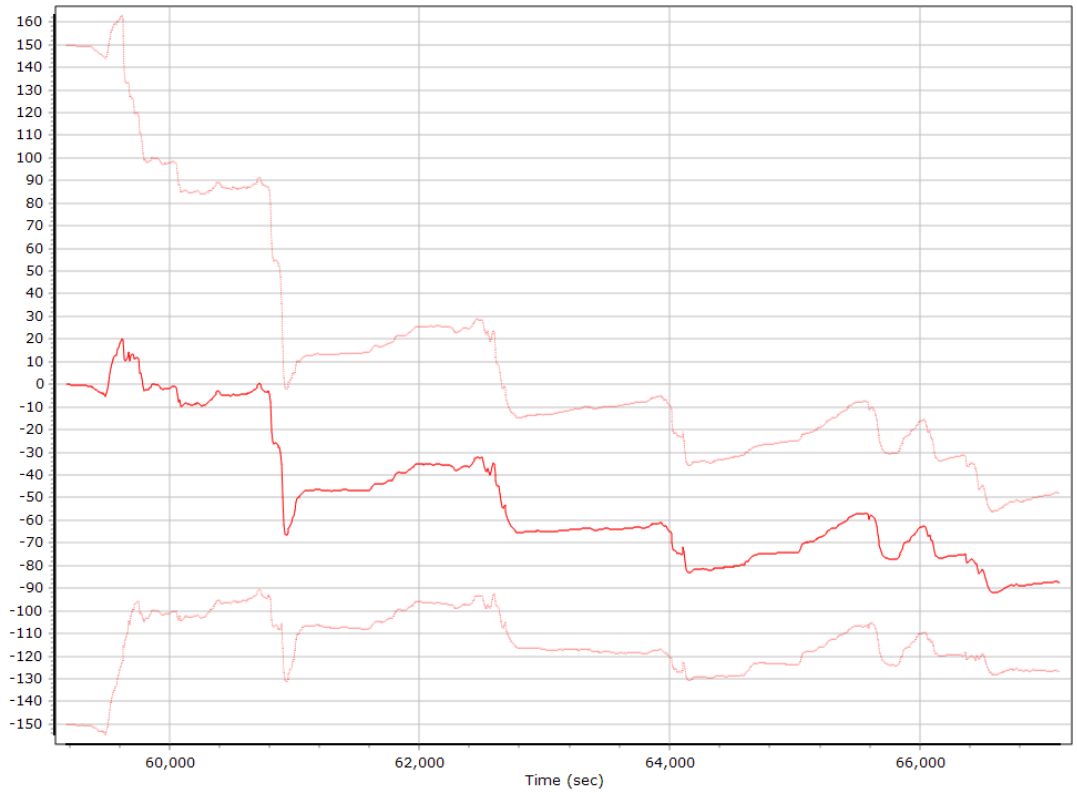
Z Gyro Bias (deg/h)



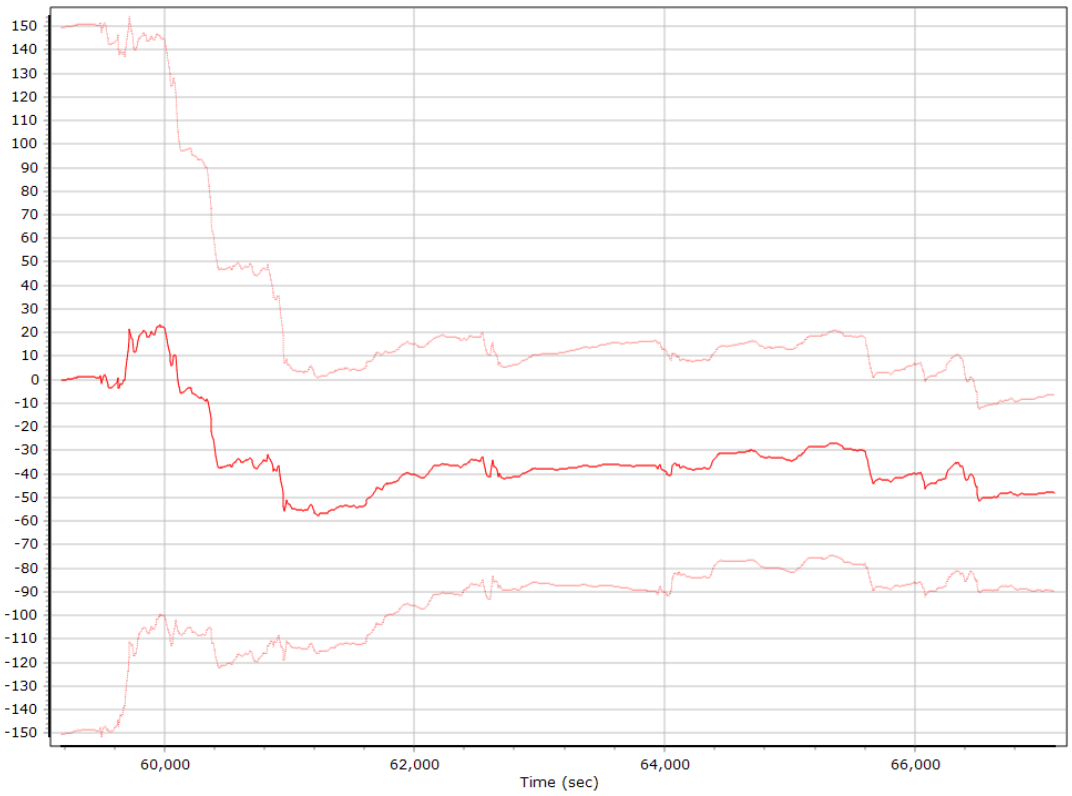
Gyro Scale Error (ppm)



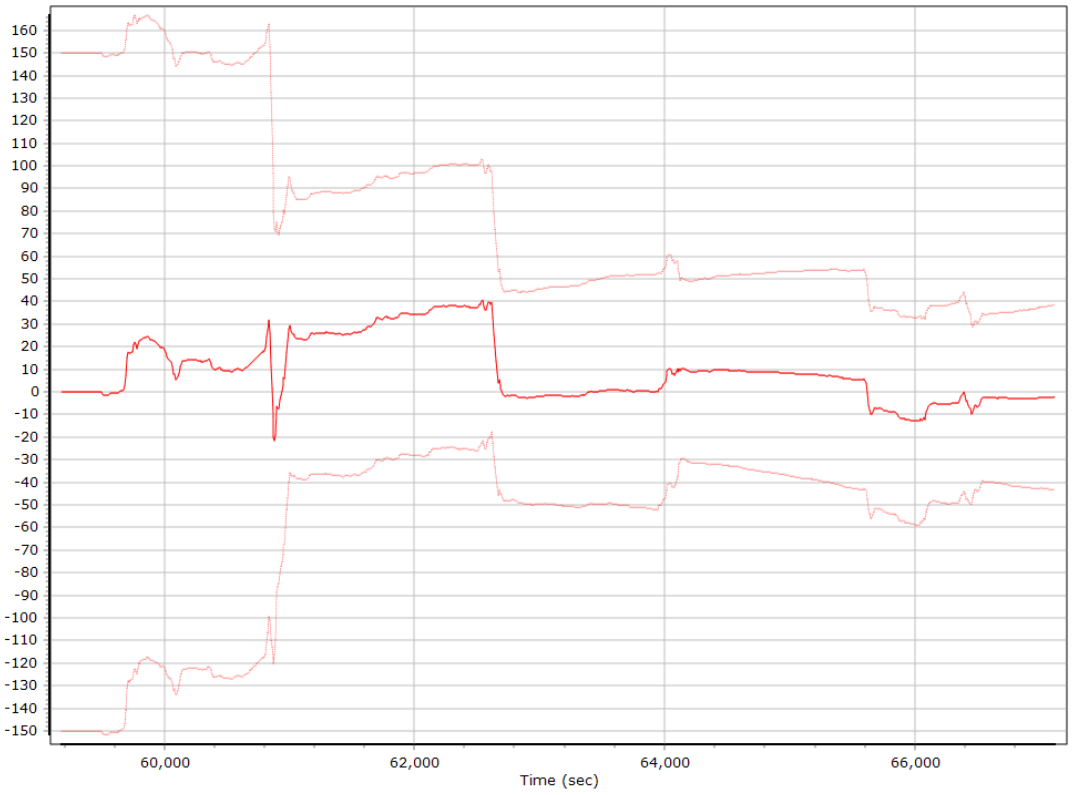
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

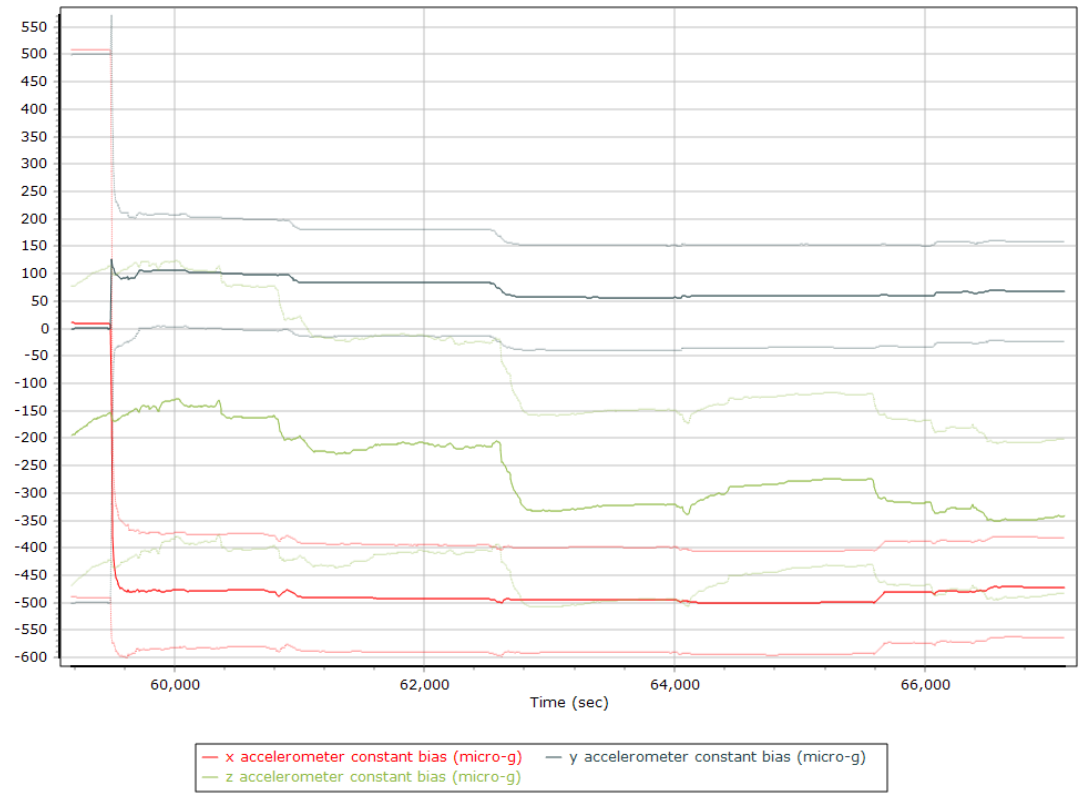


Z Gyro Scale Error (ppm)

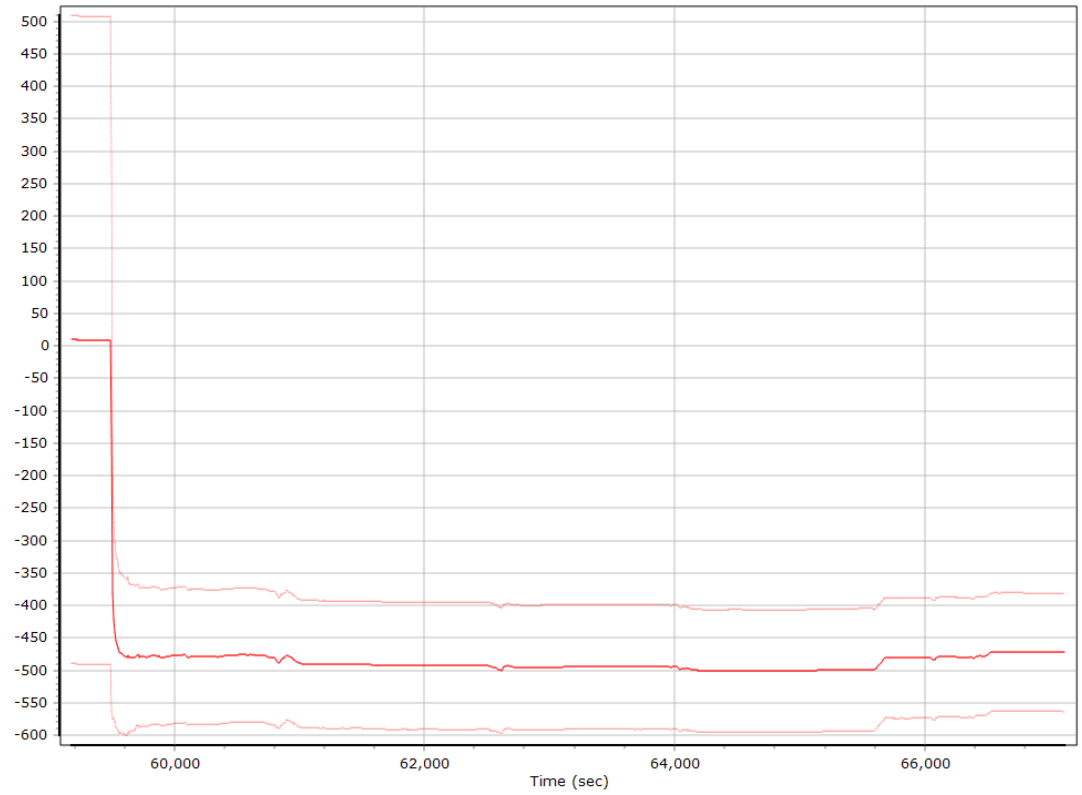


Forward Processed Estimated Constant Errors, Reference Frame

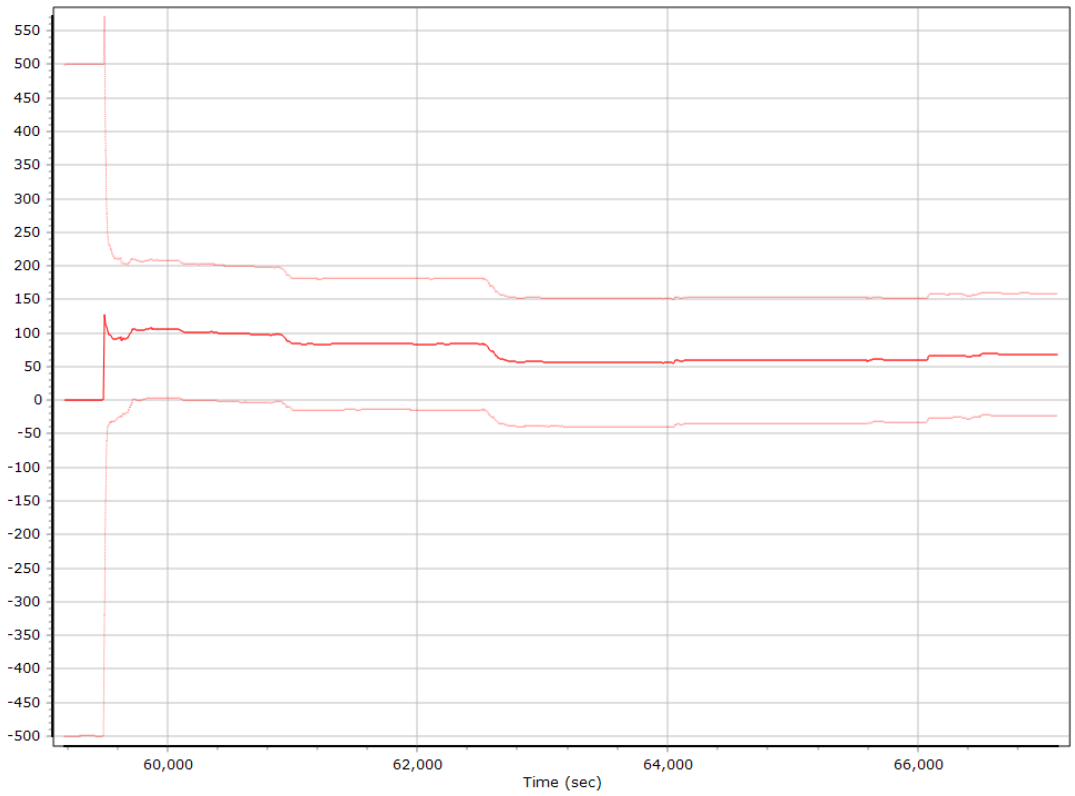
Accelerometer Bias (micro-g)



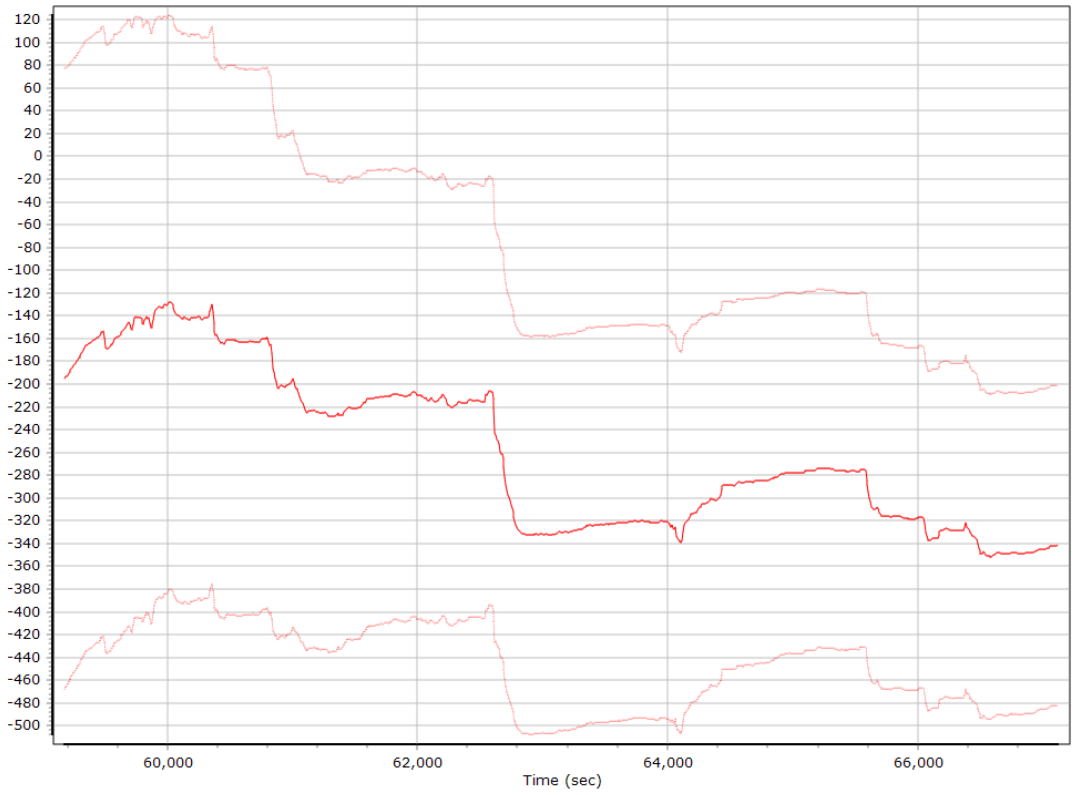
X Accelerometer Bias (micro-g)



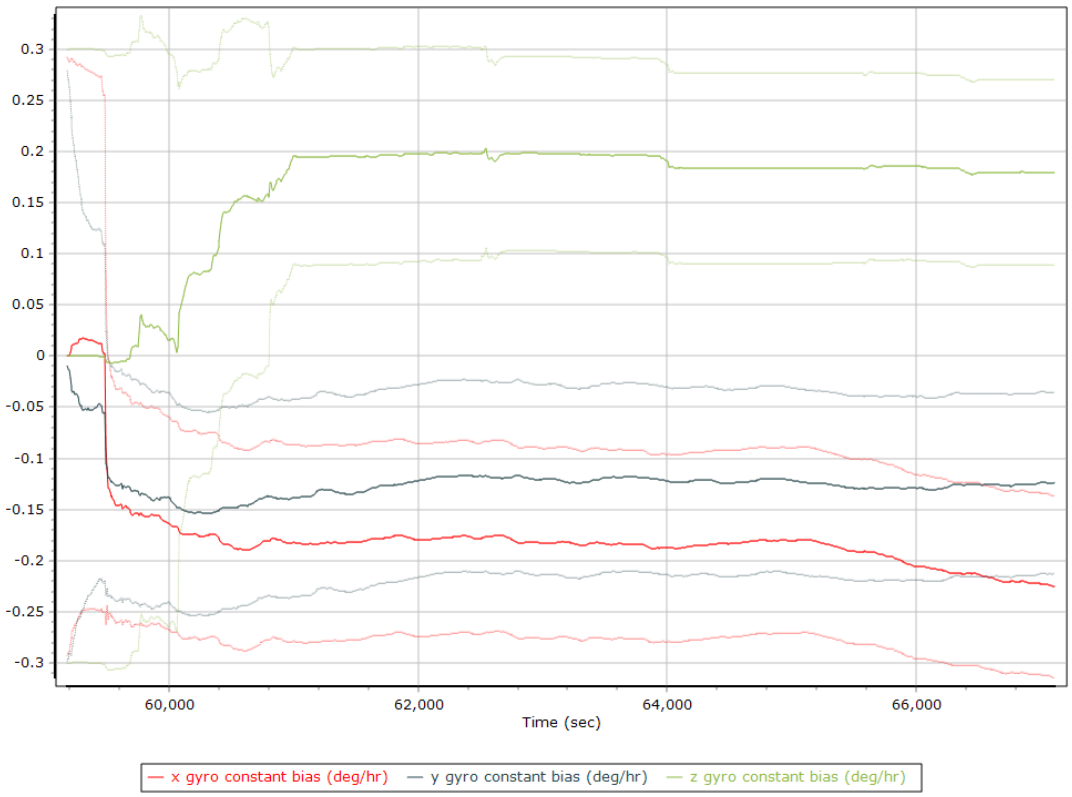
Y Accelerometer Bias (micro-g)



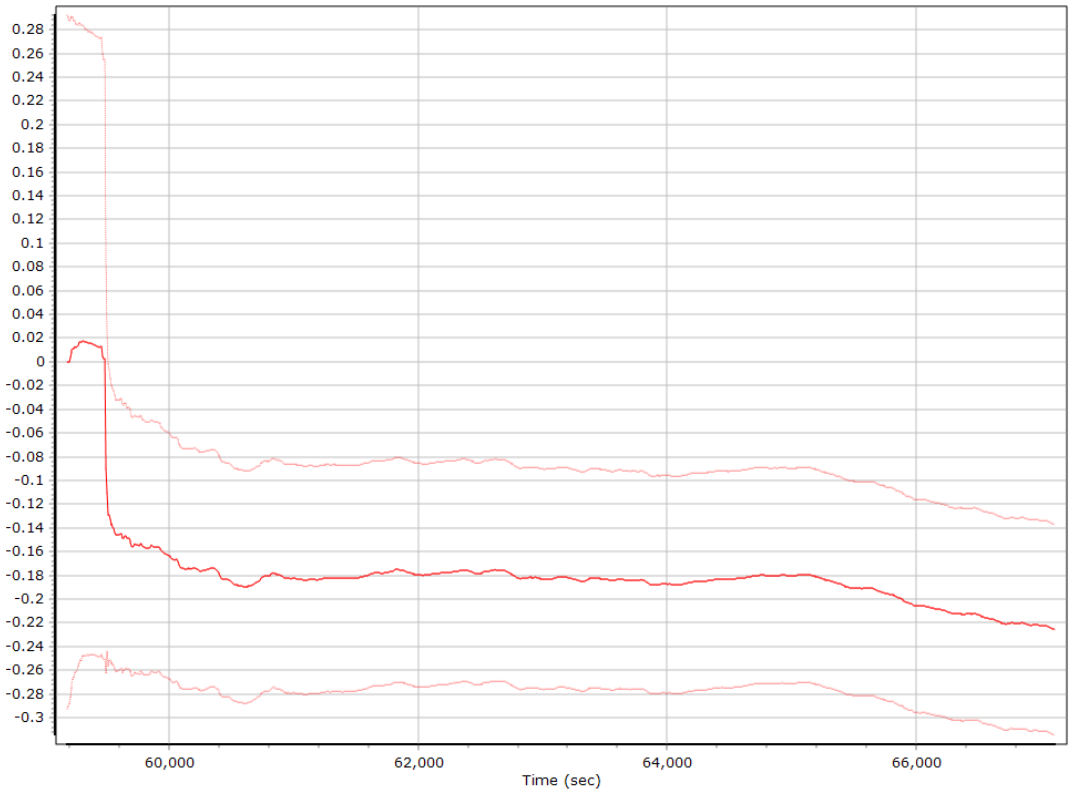
Z Accelerometer Bias (micro-g)



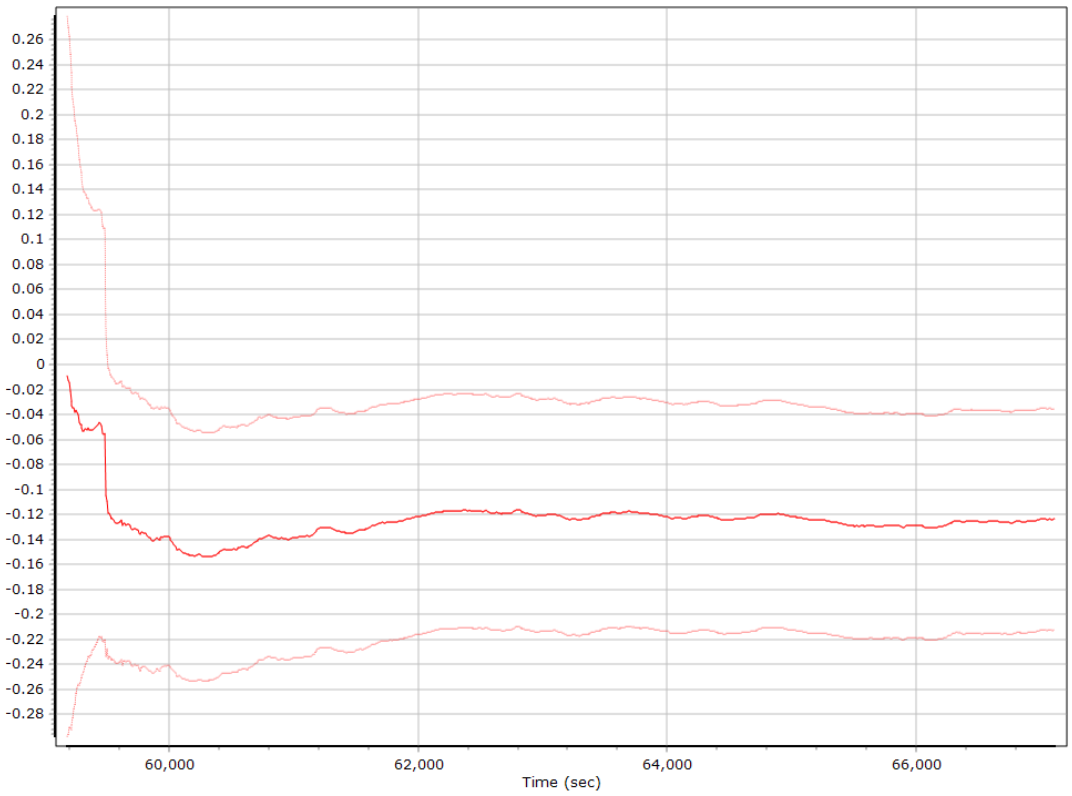
Gyro Bias (deg/h)



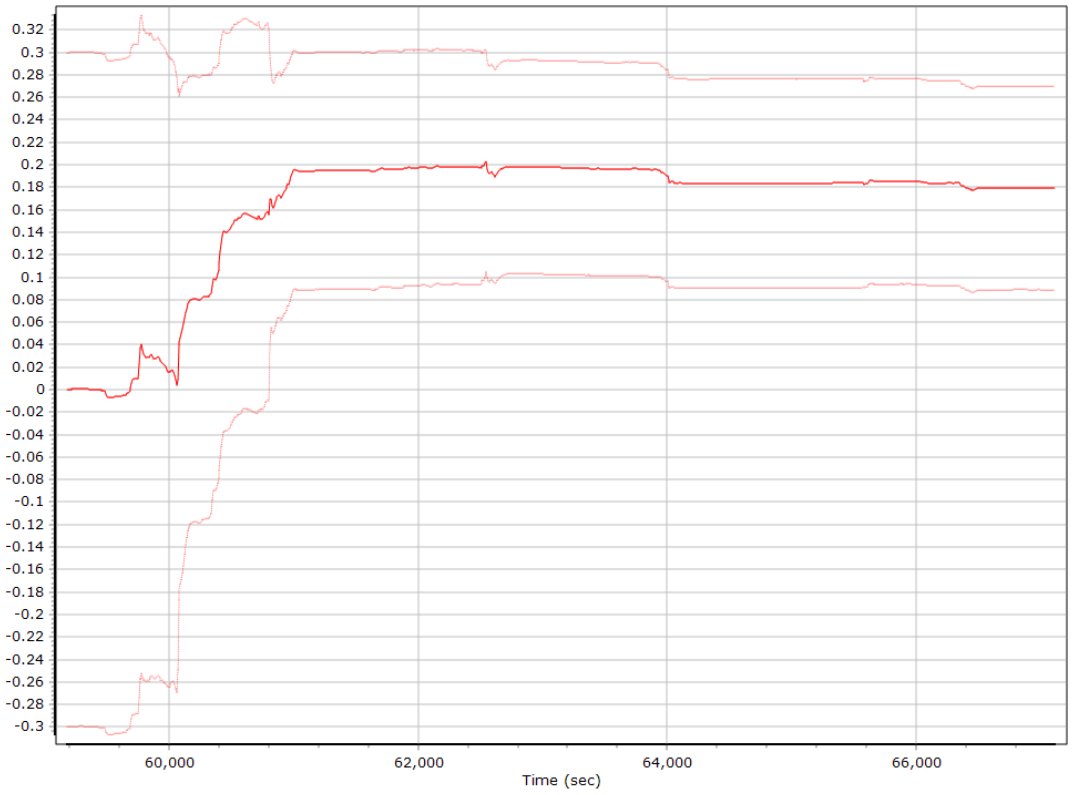
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

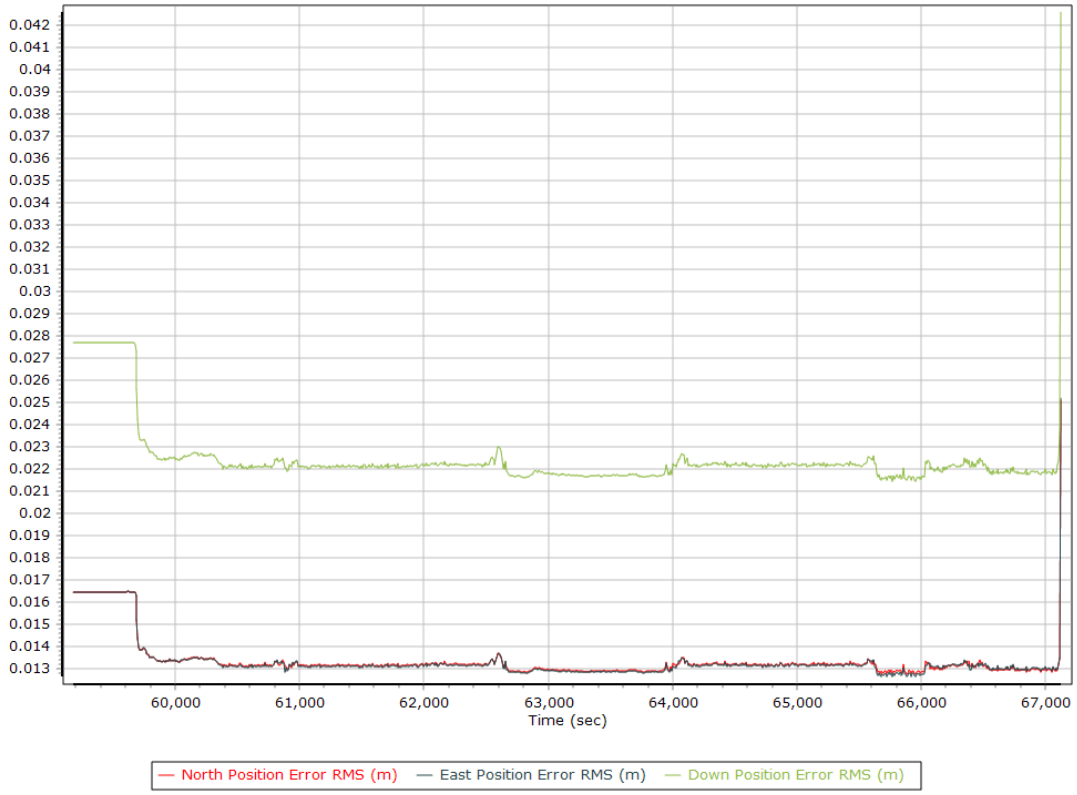


Z Gyro Bias (deg/h)

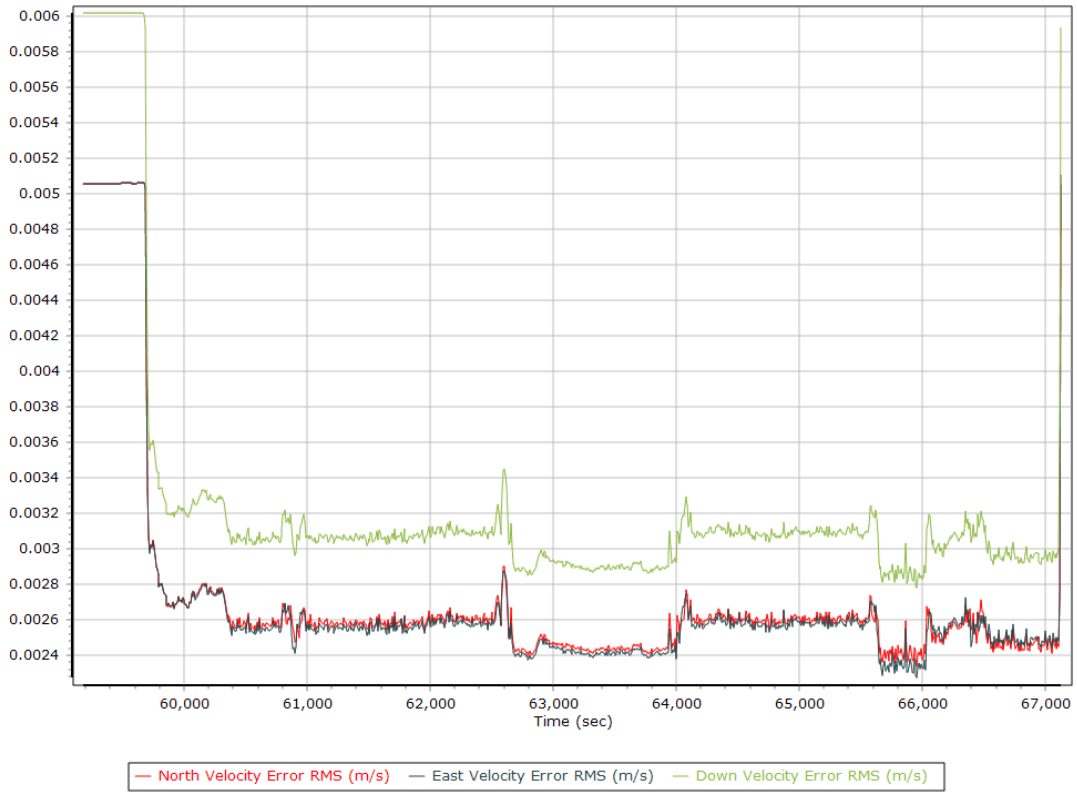


Smoothed Performance Metrics

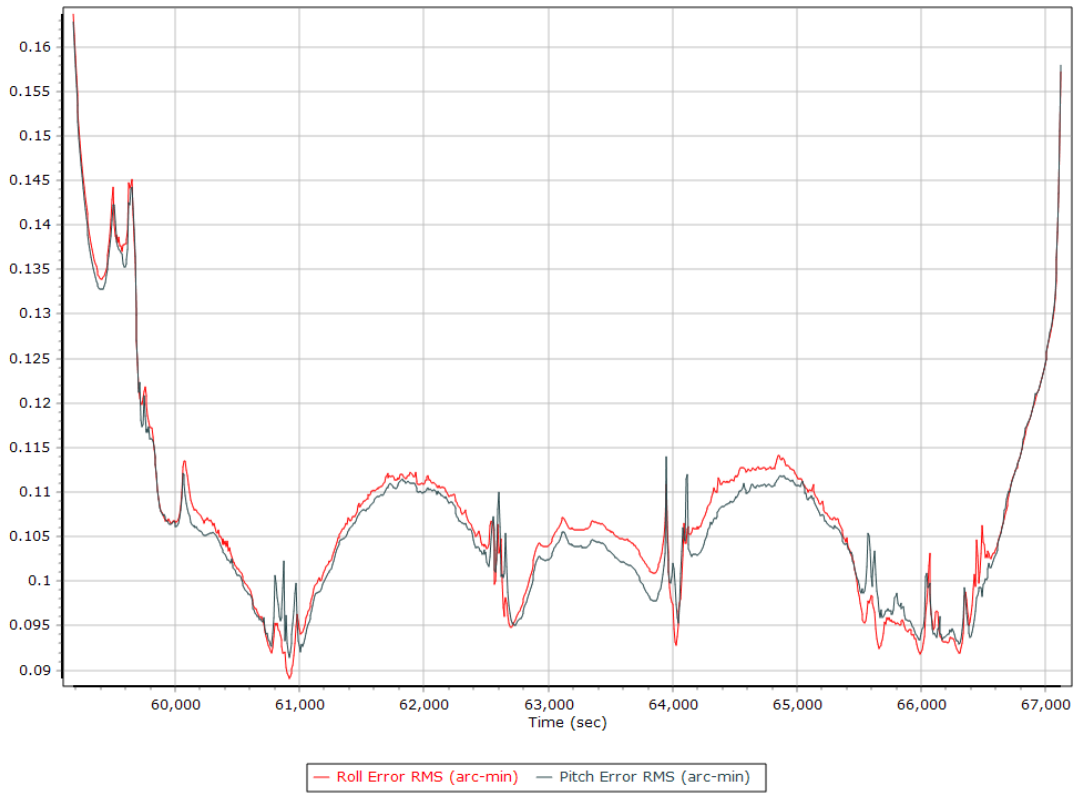
Position Error RMS (m)



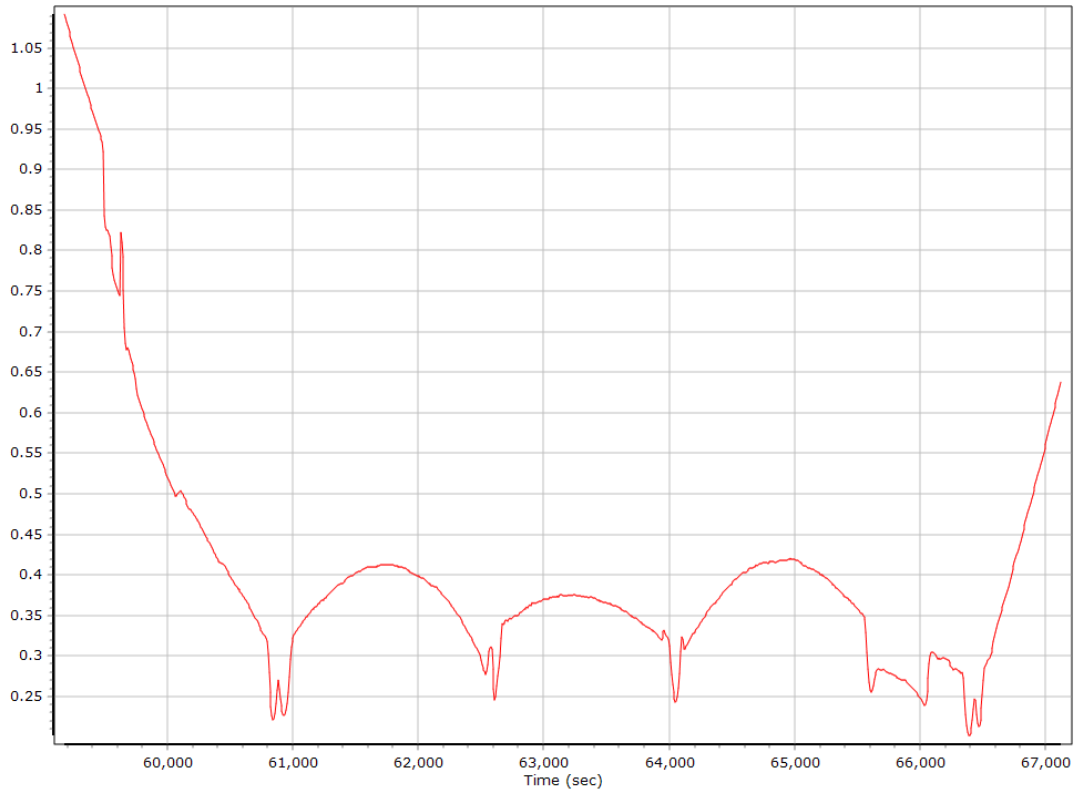
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

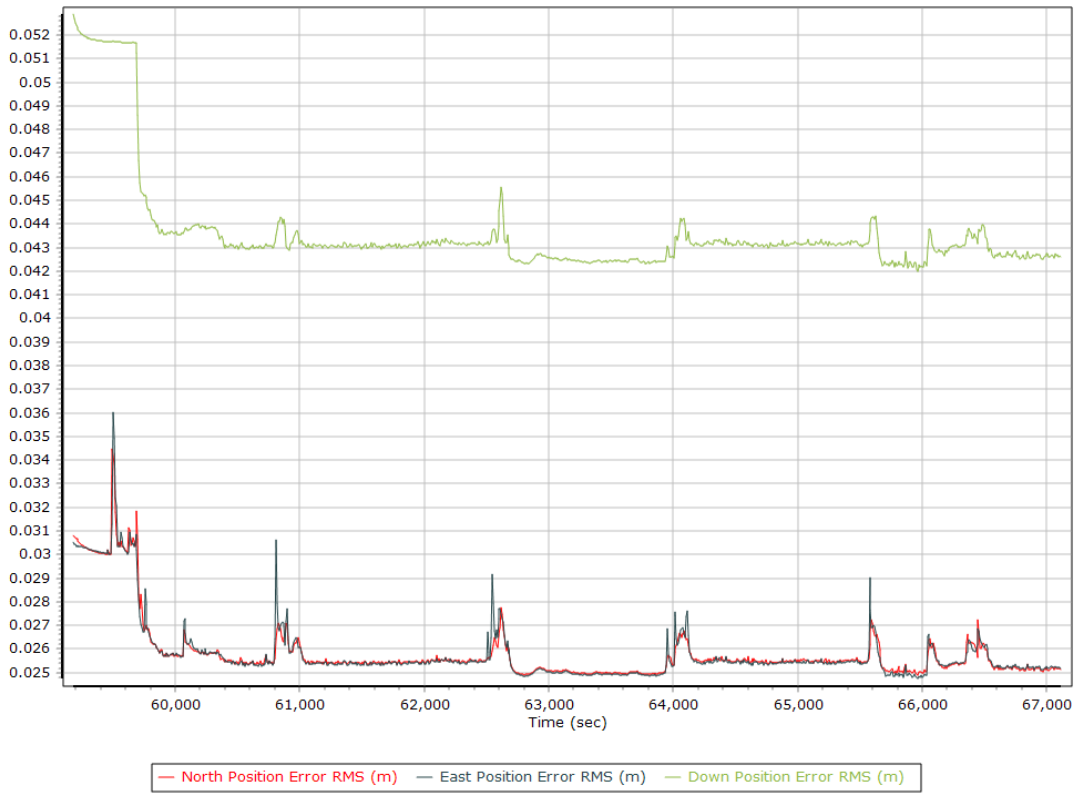


Heading Error RMS (arc-min)

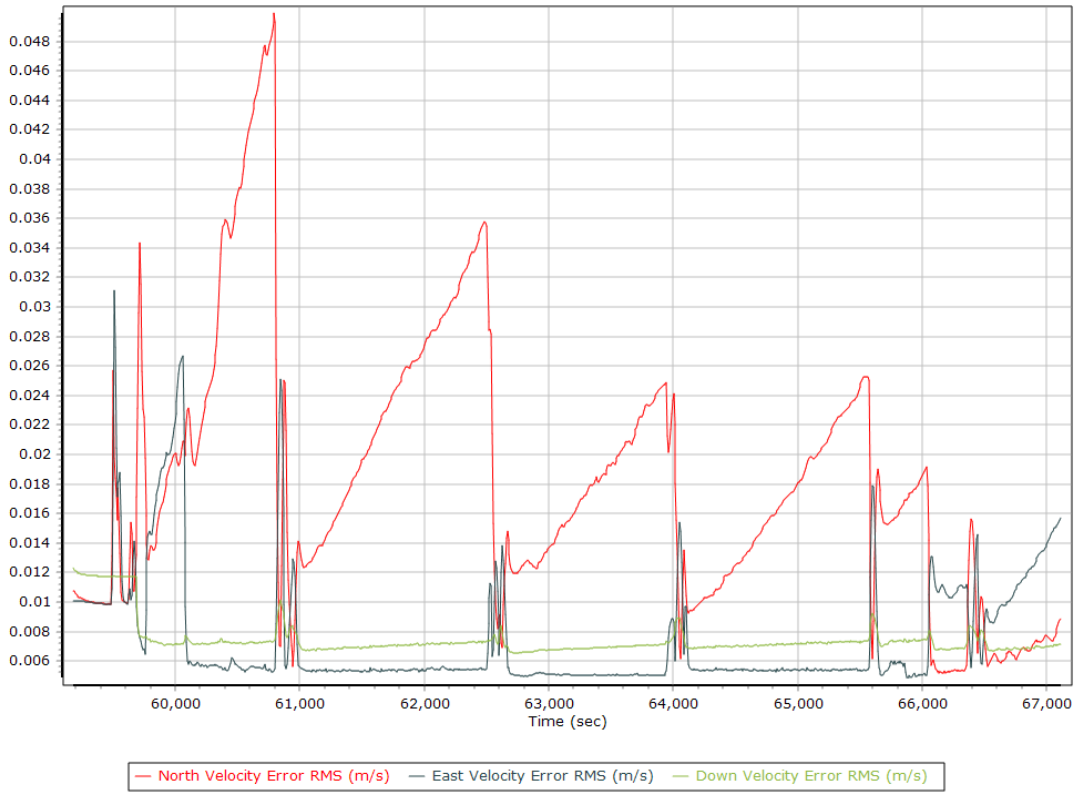


Forward Processed Performance Metrics

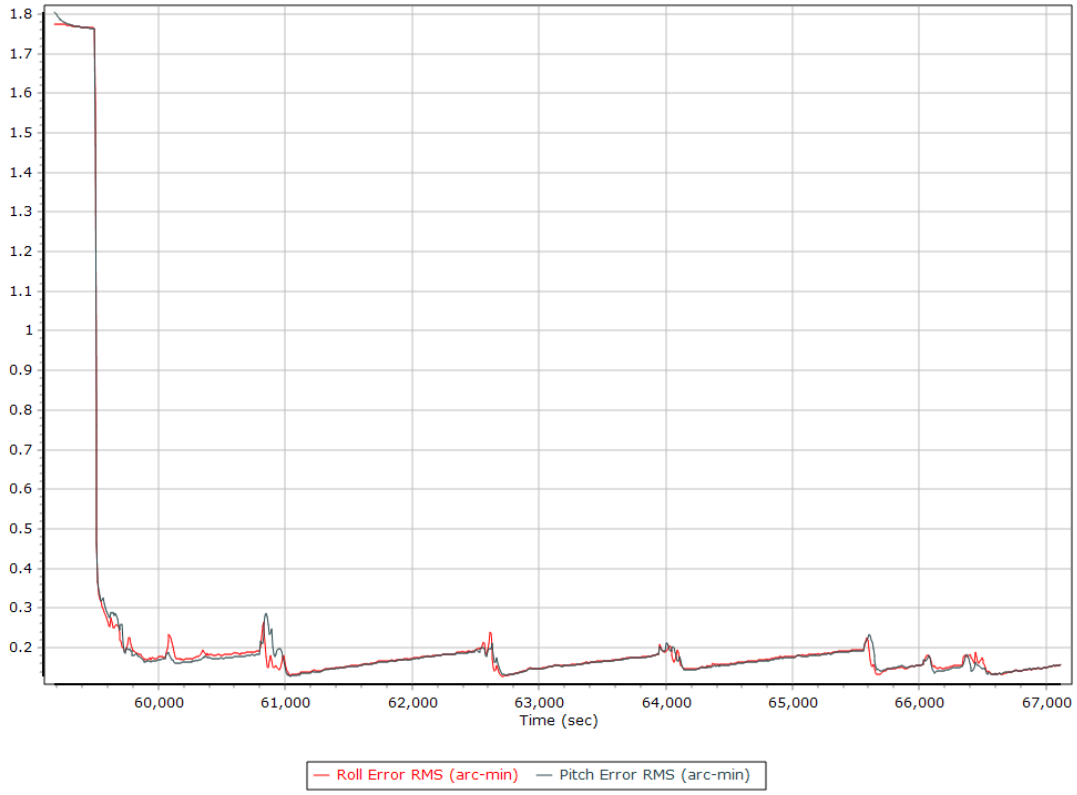
Position Error RMS (m)



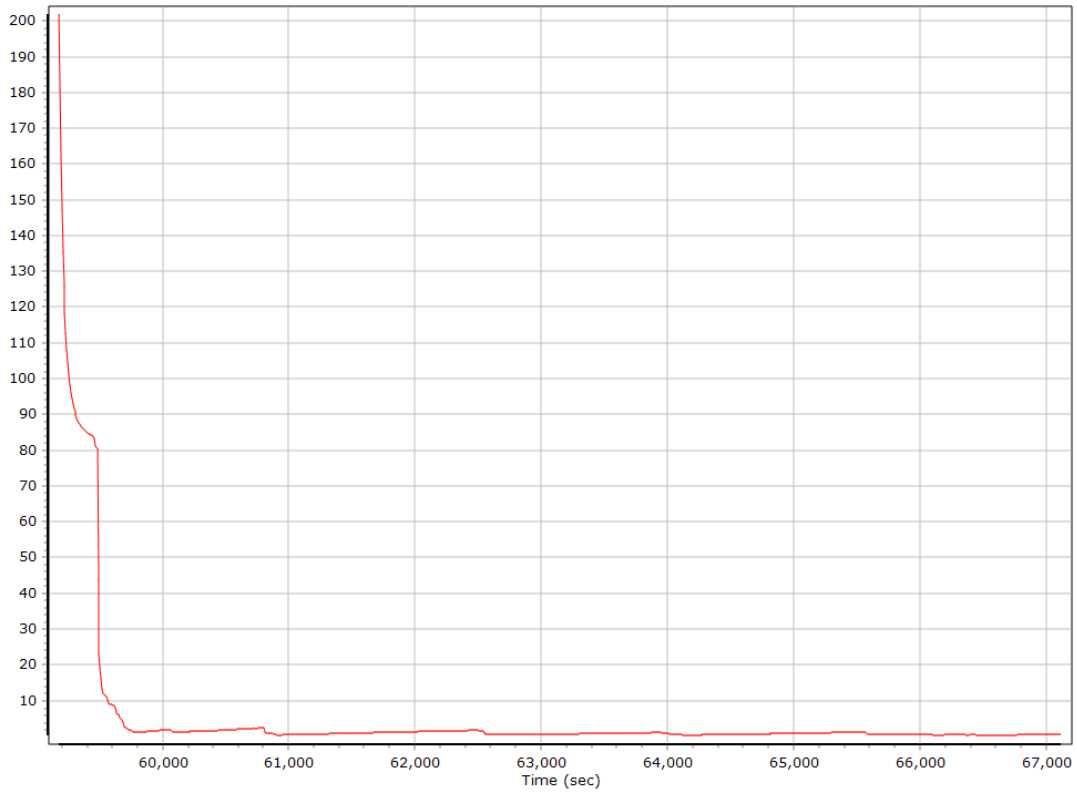
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

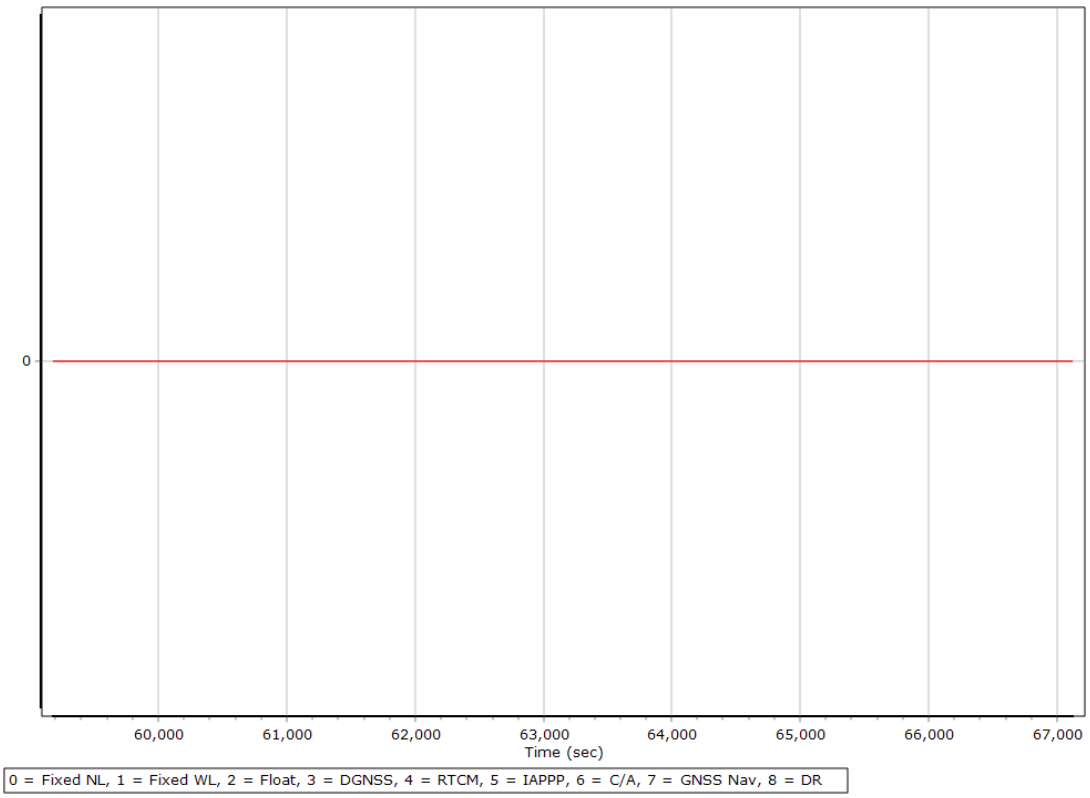


Heading Error RMS (arc-min)

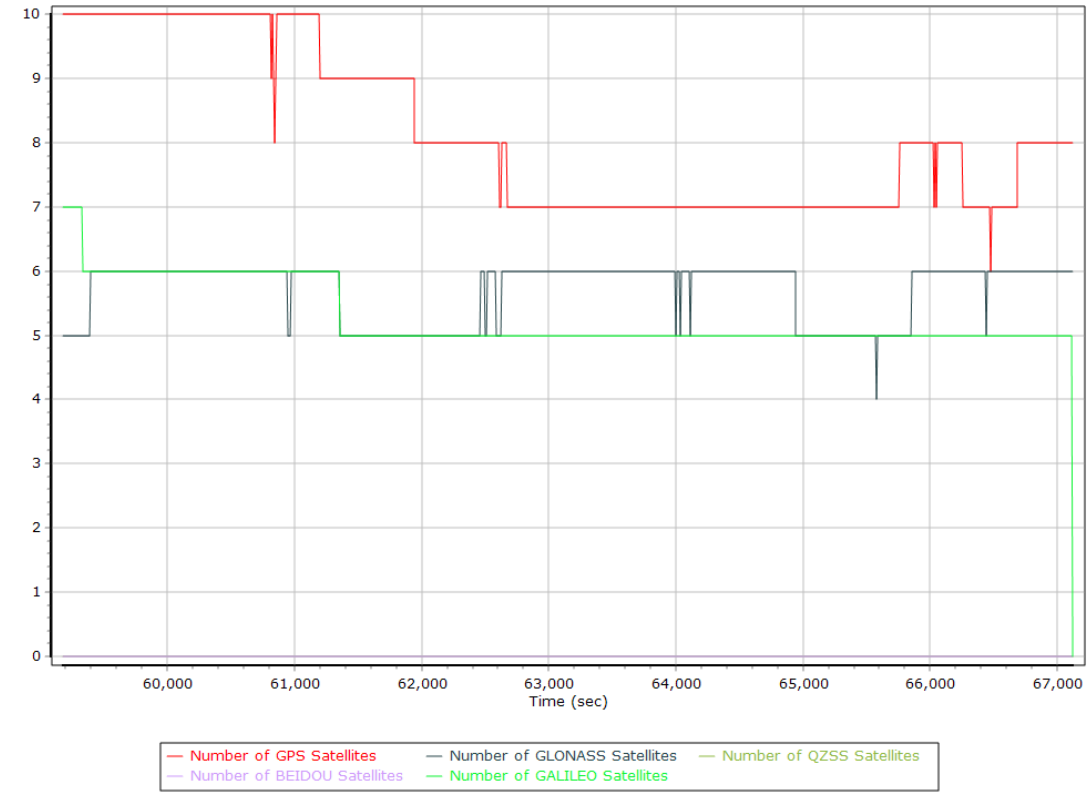


Forward Processed Solution Status

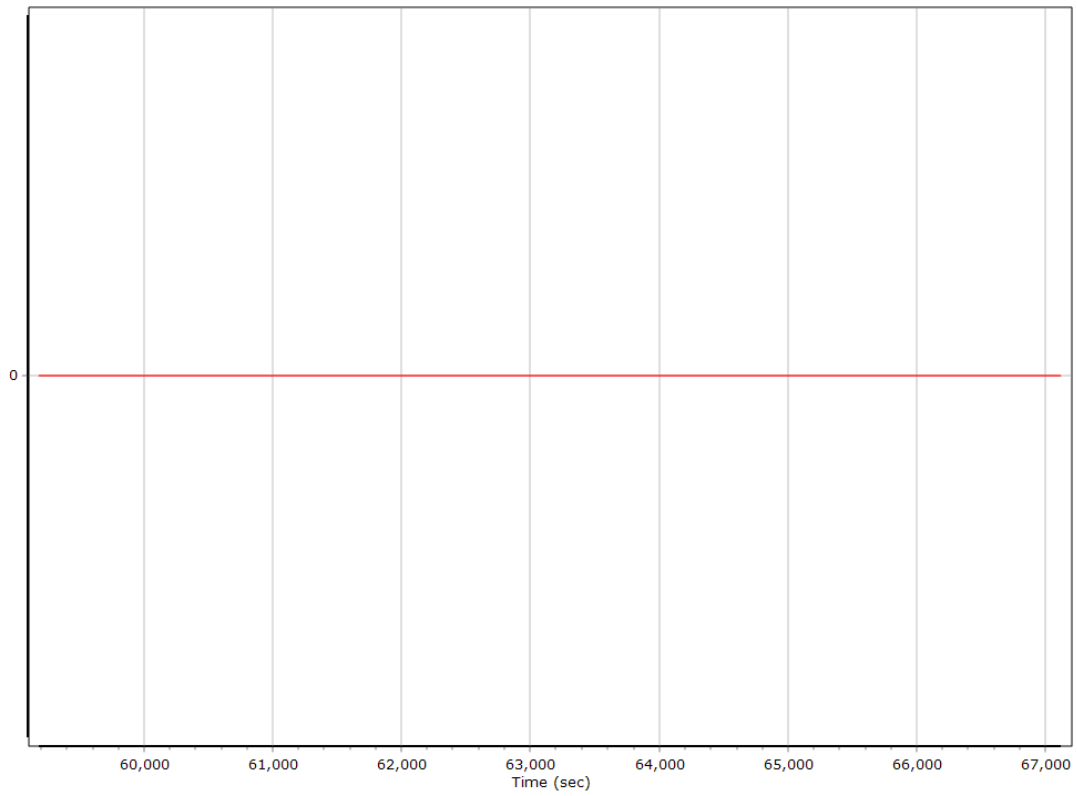
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12102020A_4040
Processing date	2022-01-05 15:02:11
Mission date	2020-12-10 14:16:53
Mission duration	06:07:43.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201210_141635_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3450.20g	GLONASS Broadcast Ephemeris
Ephm3450.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12102020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201210_141635_INS-GPS_1.raw		
Last raw data file	201210_141635_INS-GPS_1.raw		
Start GPS week	2135		
Start time	396994.990 (12/10/2020 2:16:34 PM)		
End time	419048.879 (12/10/2020 8:24:08 PM)		
Start of fine alignment	397018.599 (12/10/2020 2:16:58 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

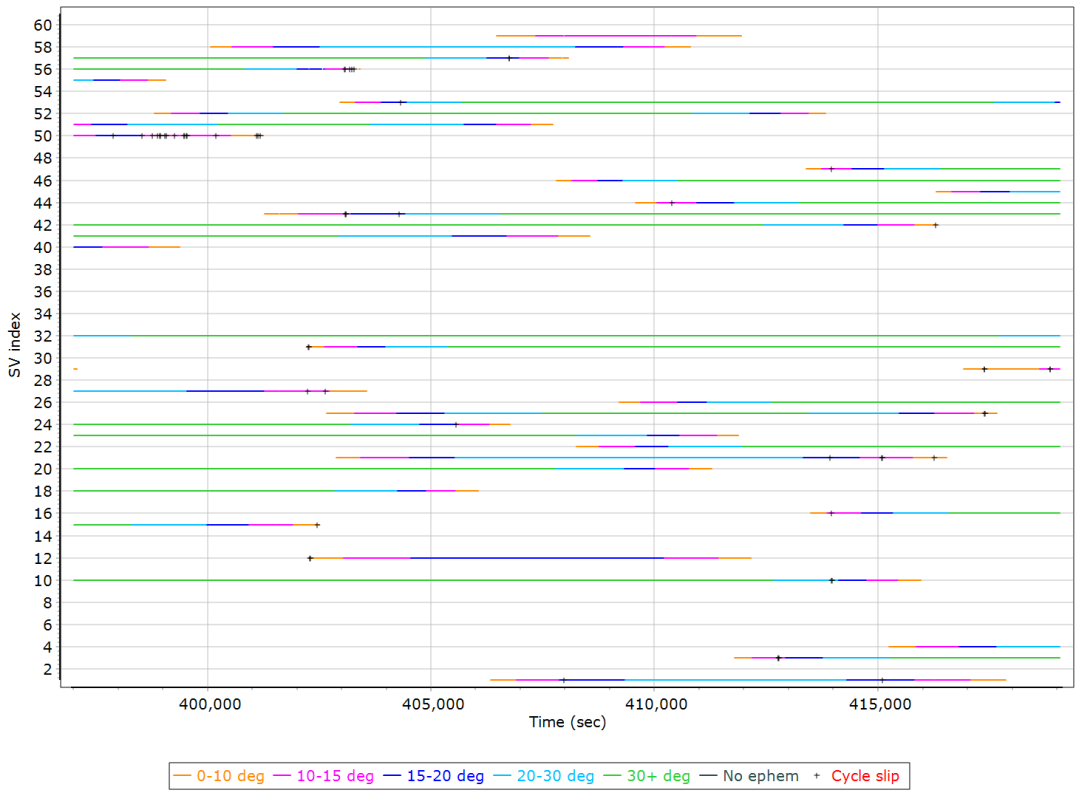
Rover Data QC

Raw IMU Import QC Summary

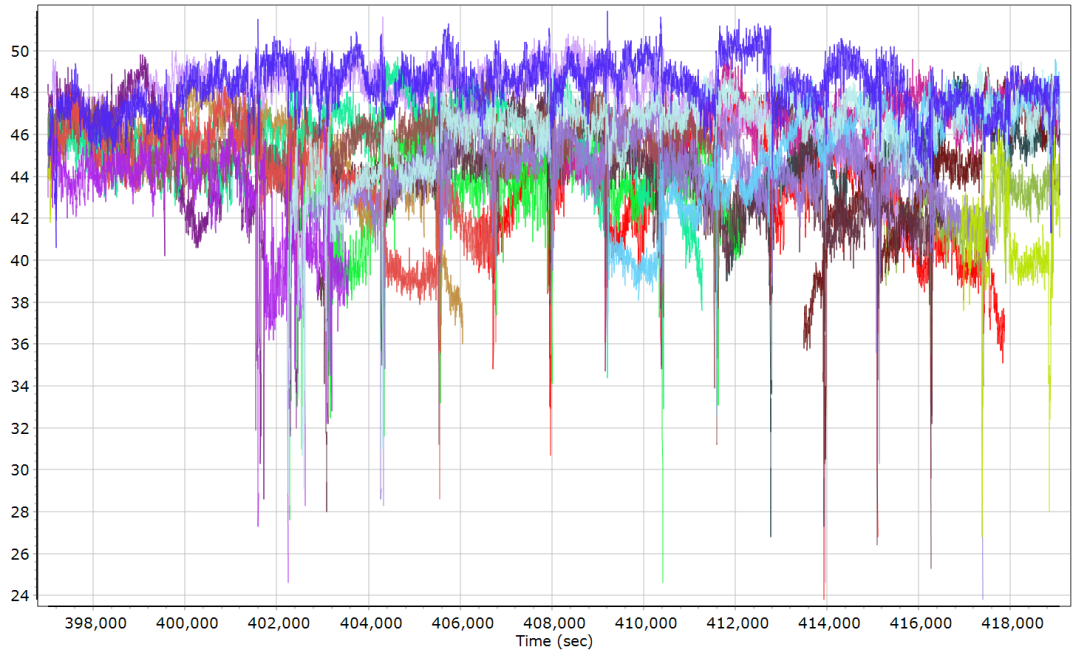
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12102020A_4040.log
IMU Records Processed	4411876
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

GPS/GLONASS L1 Satellite Lock/Elevation

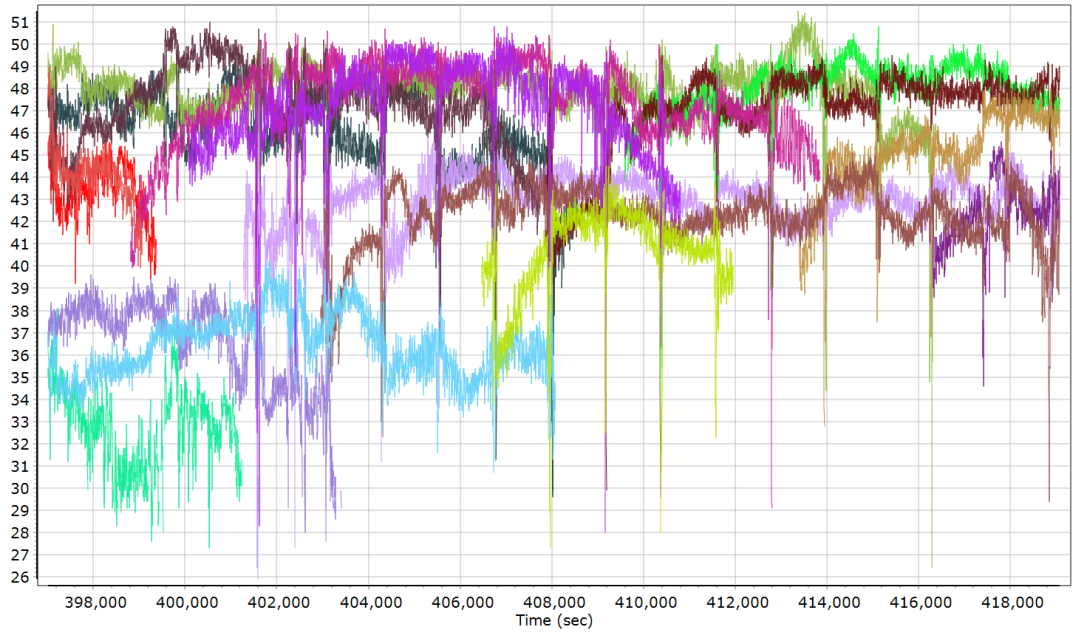


GPS L1 SNR



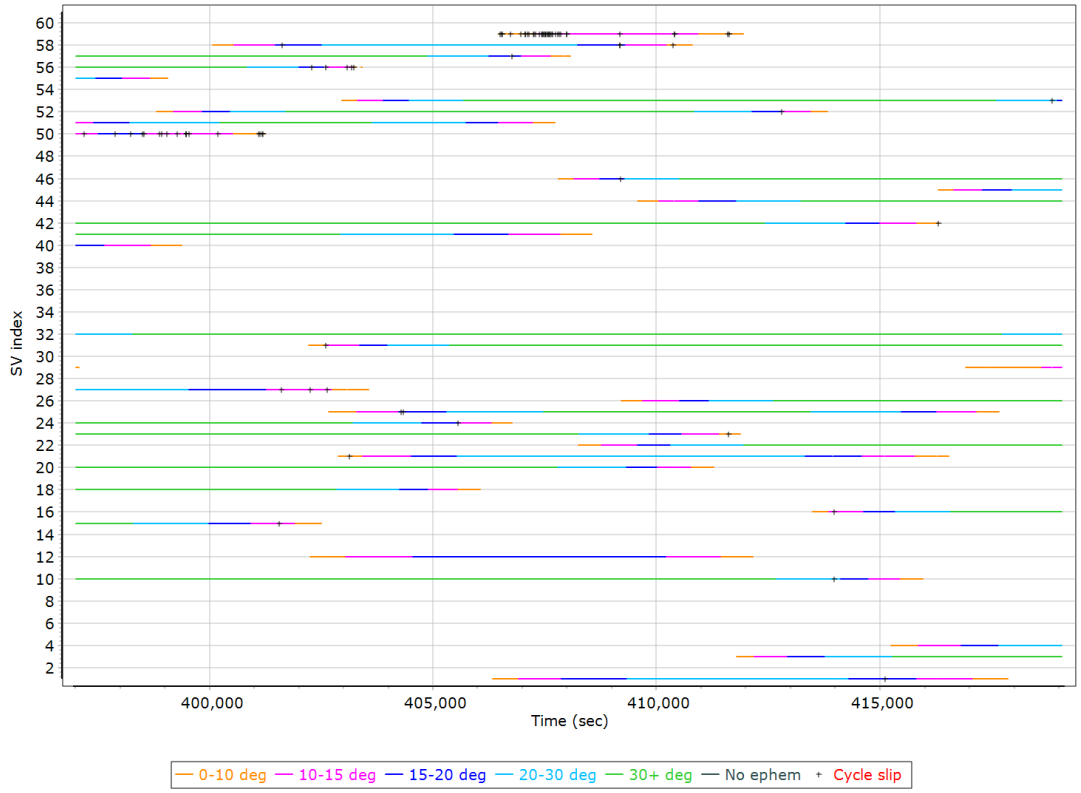
GPS PRN 01 L1 SNR (dB/Hz) GPS PRN 03 L1 SNR (dB/Hz) GPS PRN 04 L1 SNR (dB/Hz) GPS PRN 10 L1 SNR (dB/Hz)
GPS PRN 12 L1 SNR (dB/Hz) GPS PRN 15 L1 SNR (dB/Hz) GPS PRN 16 L1 SNR (dB/Hz) GPS PRN 18 L1 SNR (dB/Hz)
GPS PRN 20 L1 SNR (dB/Hz) GPS PRN 21 L1 SNR (dB/Hz) GPS PRN 22 L1 SNR (dB/Hz) GPS PRN 23 L1 SNR (dB/Hz)
GPS PRN 24 L1 SNR (dB/Hz) GPS PRN 25 L1 SNR (dB/Hz) GPS PRN 26 L1 SNR (dB/Hz) GPS PRN 27 L1 SNR (dB/Hz)
GPS PRN 29 L1 SNR (dB/Hz) GPS PRN 31 L1 SNR (dB/Hz) GPS PRN 32 L1 SNR (dB/Hz)

GLONASS L1 SNR

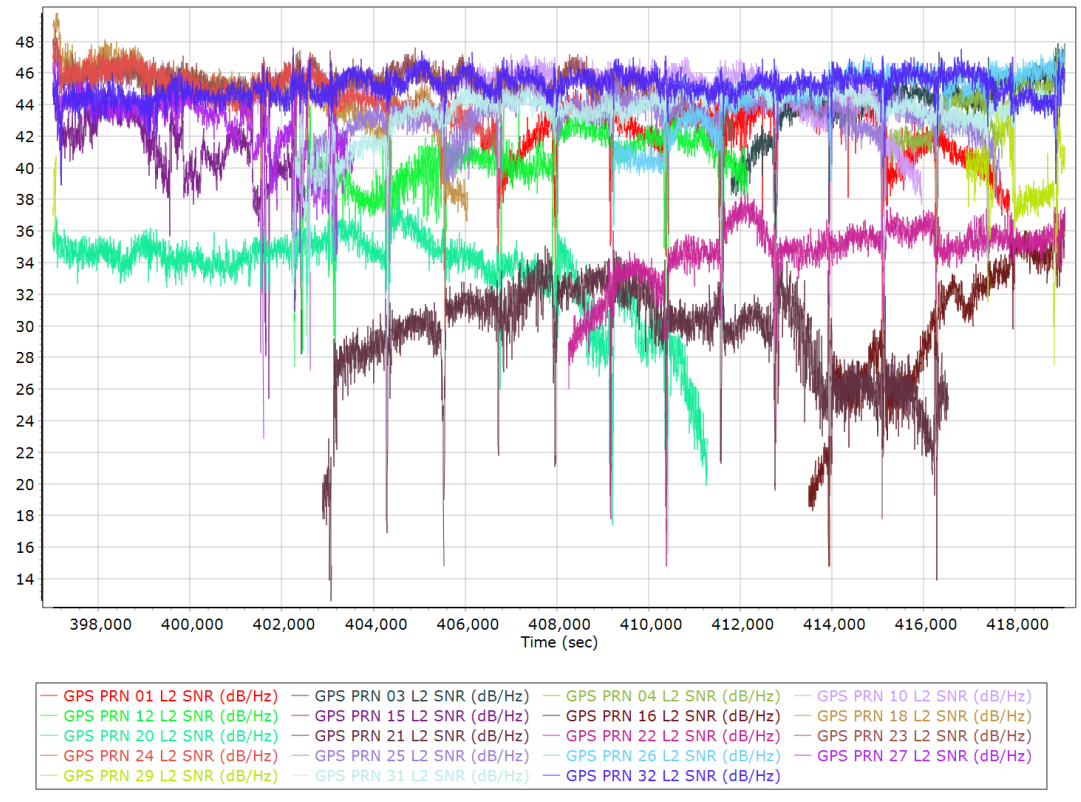


GLONASS 03 L1 SNR (dB/Hz) GLONASS 04 L1 SNR (dB/Hz) GLONASS 05 L1 SNR (dB/Hz)
GLONASS 06 L1 SNR (dB/Hz) GLONASS 07 L1 SNR (dB/Hz) GLONASS 08 L1 SNR (dB/Hz)
GLONASS 09 L1 SNR (dB/Hz) GLONASS 10 L1 SNR (dB/Hz) GLONASS 13 L1 SNR (dB/Hz)
GLONASS 14 L1 SNR (dB/Hz) GLONASS 15 L1 SNR (dB/Hz) GLONASS 16 L1 SNR (dB/Hz)
GLONASS 18 L1 SNR (dB/Hz) GLONASS 19 L1 SNR (dB/Hz) GLONASS 20 L1 SNR (dB/Hz)
GLONASS 21 L1 SNR (dB/Hz) GLONASS 22 L1 SNR (dB/Hz)

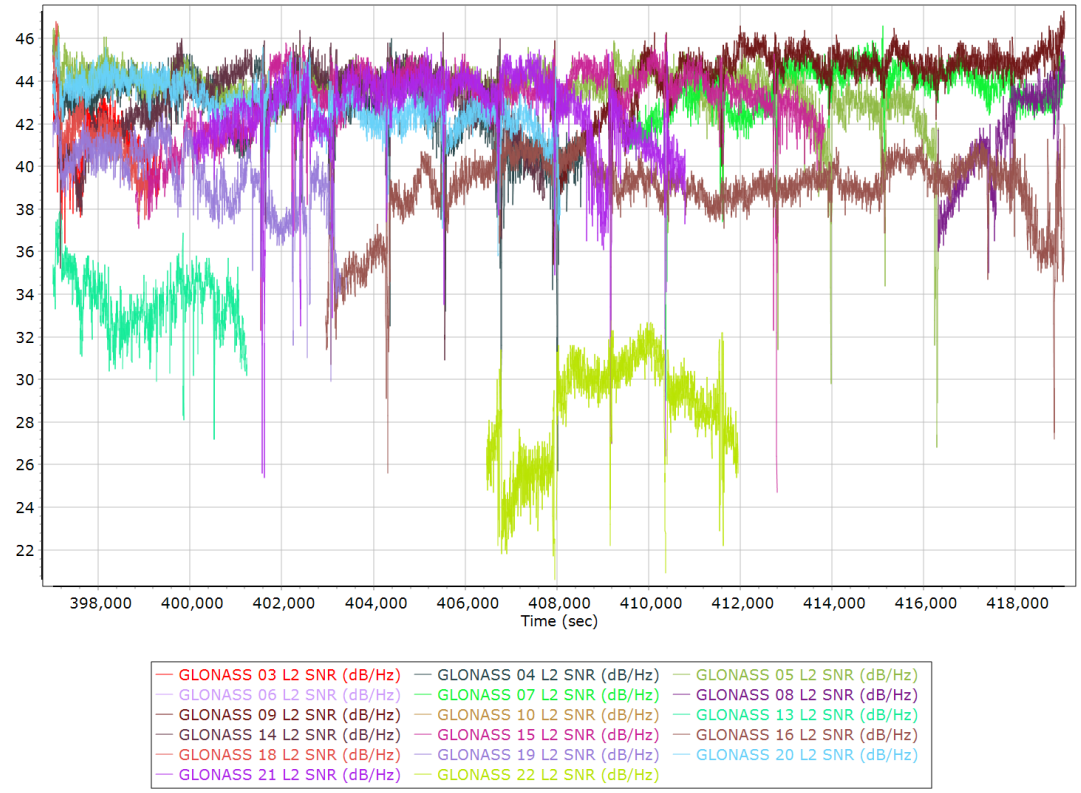
GPS/GLONASS L2 Satellite Lock/Elevation



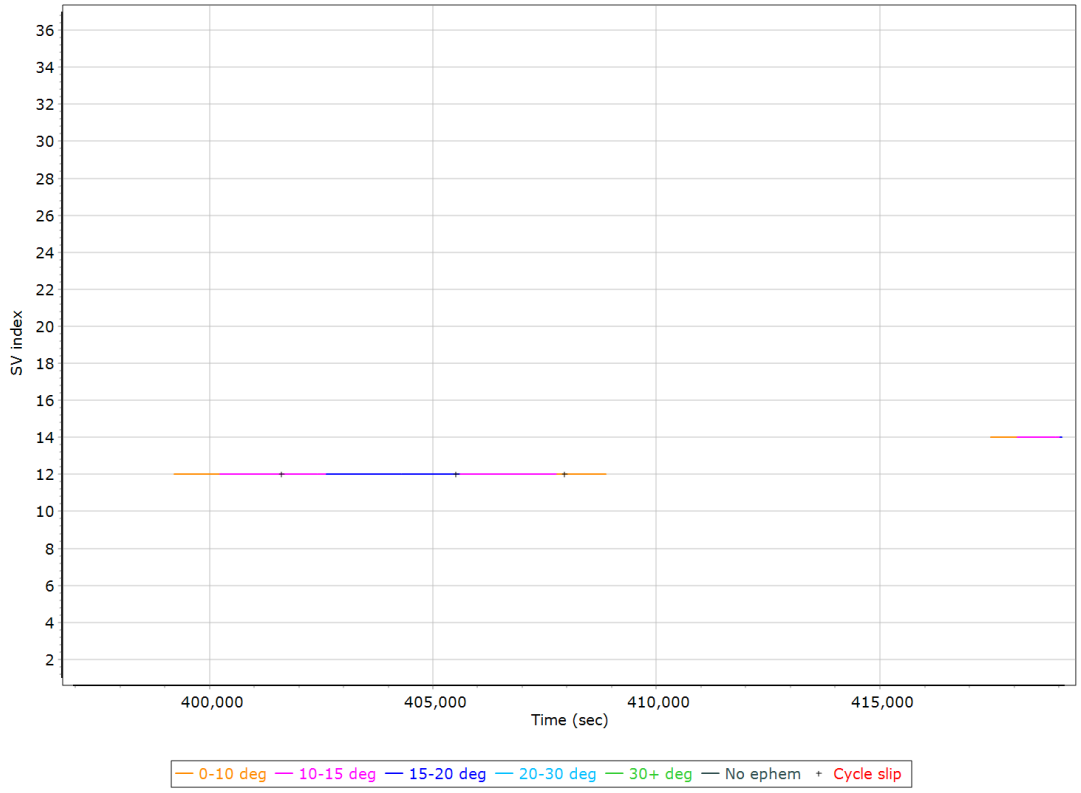
GPS L2 SNR



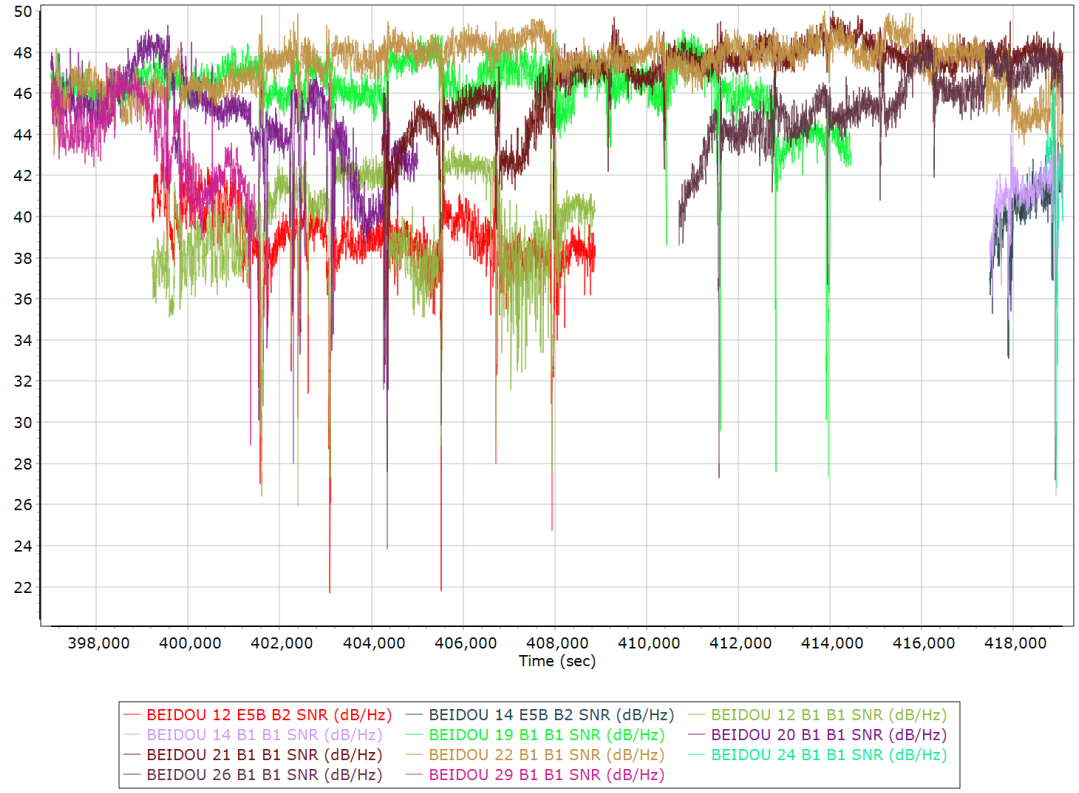
GLONASS L2 SNR



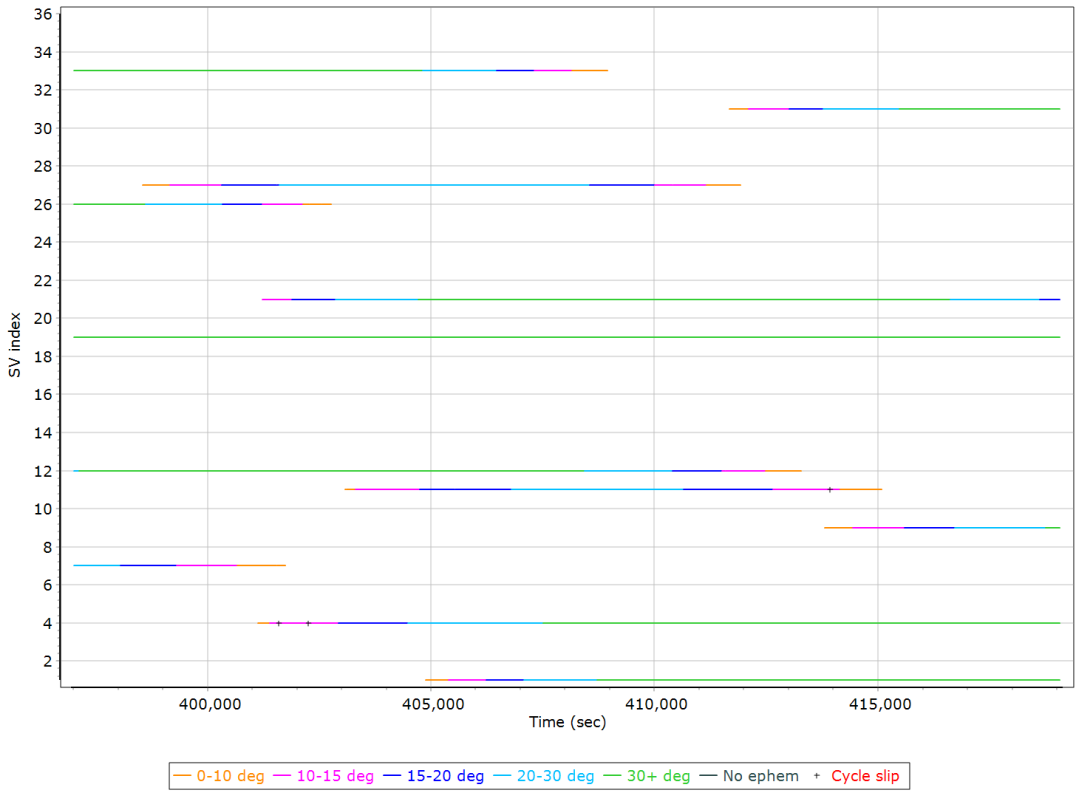
BEIDOU Satellite Lock/Elevation



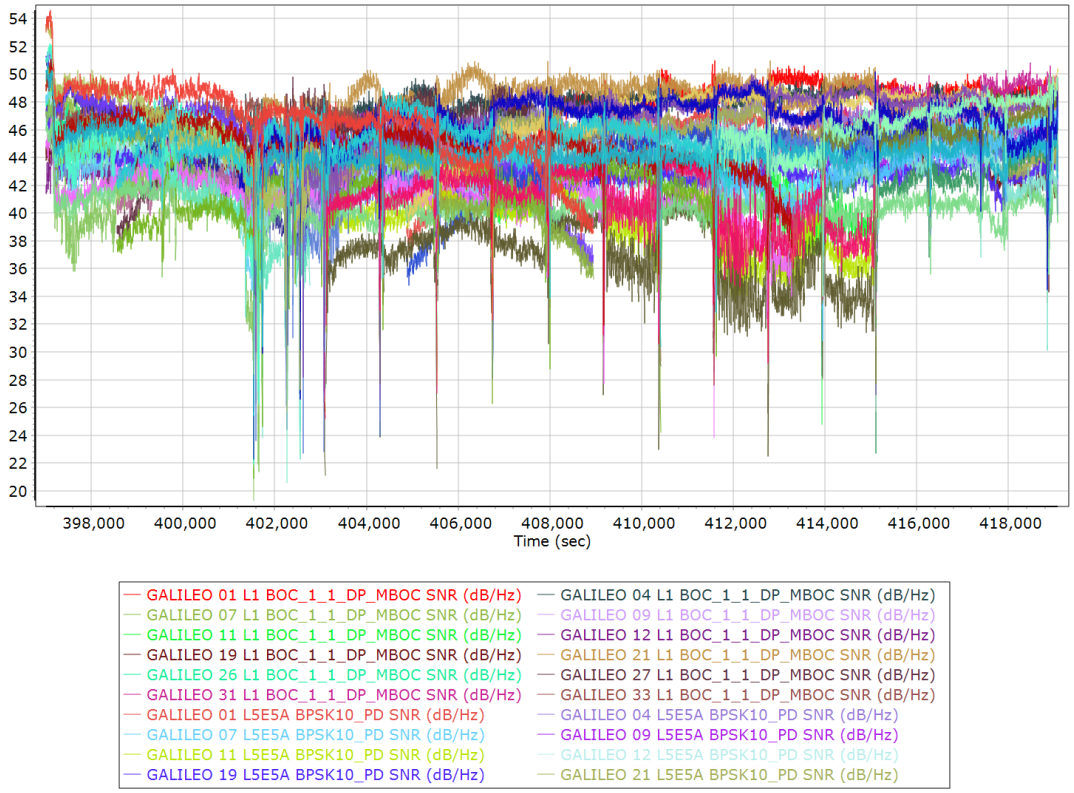
BEIDOU SNR



GALILEO Satellite Lock/Elevation

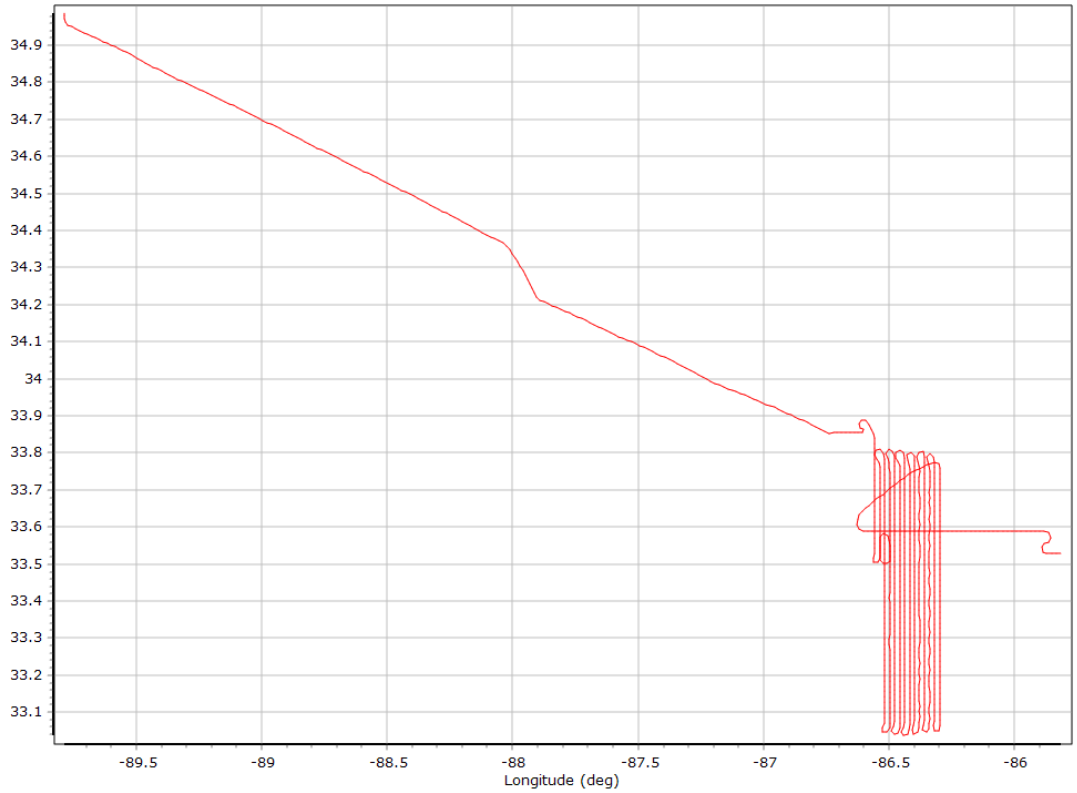


GALILEO SNR

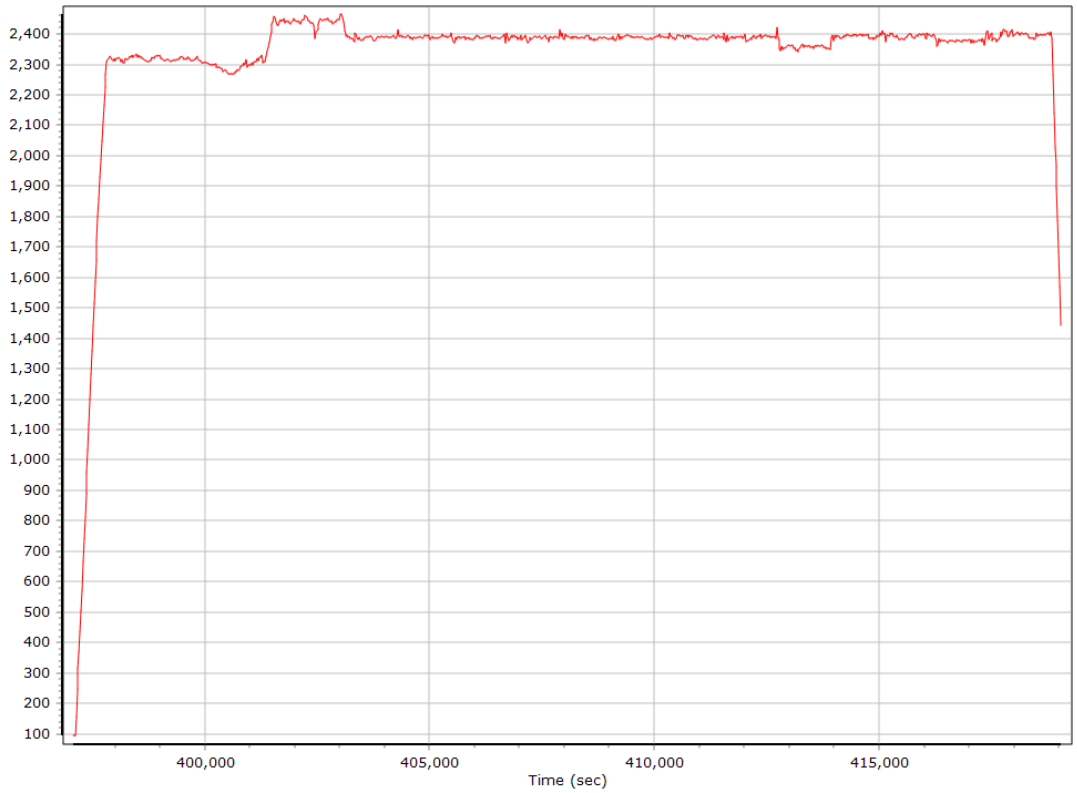

54
52
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38
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26
24
22
20
398,000
400,000
402,000
404,000
406,000
408,000
410,000
412,000
414,000
416,000
418,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 11 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 11 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

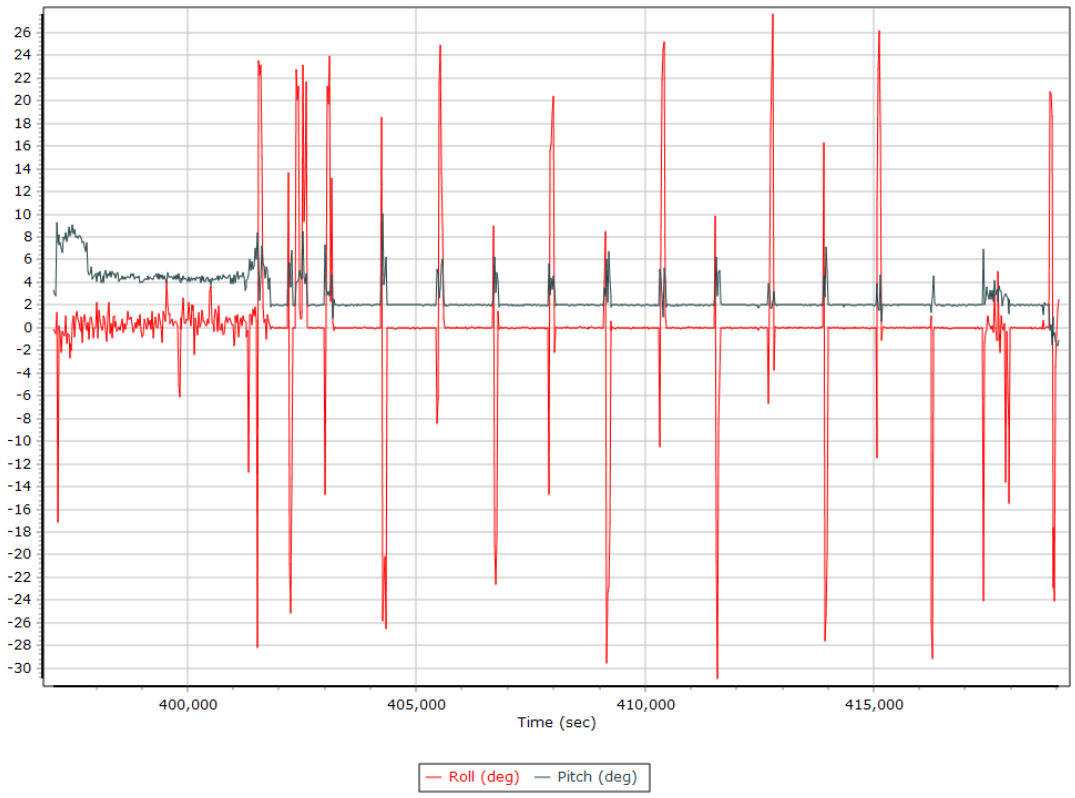
Top View



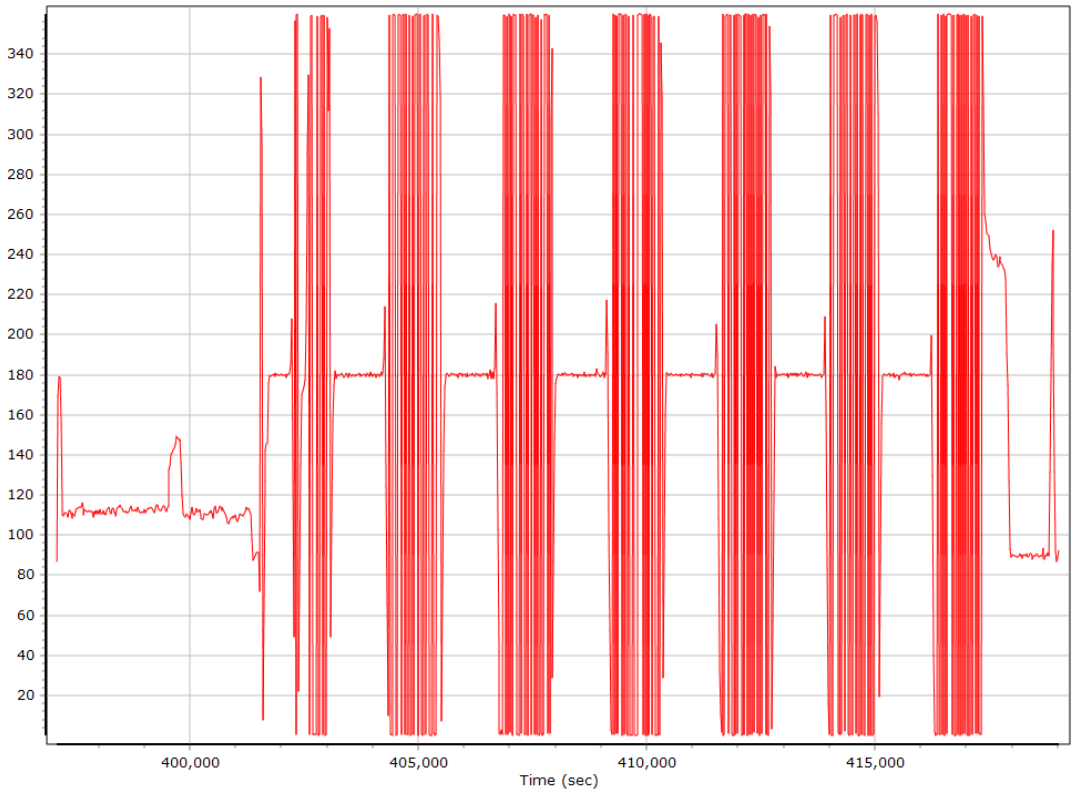
Altitude



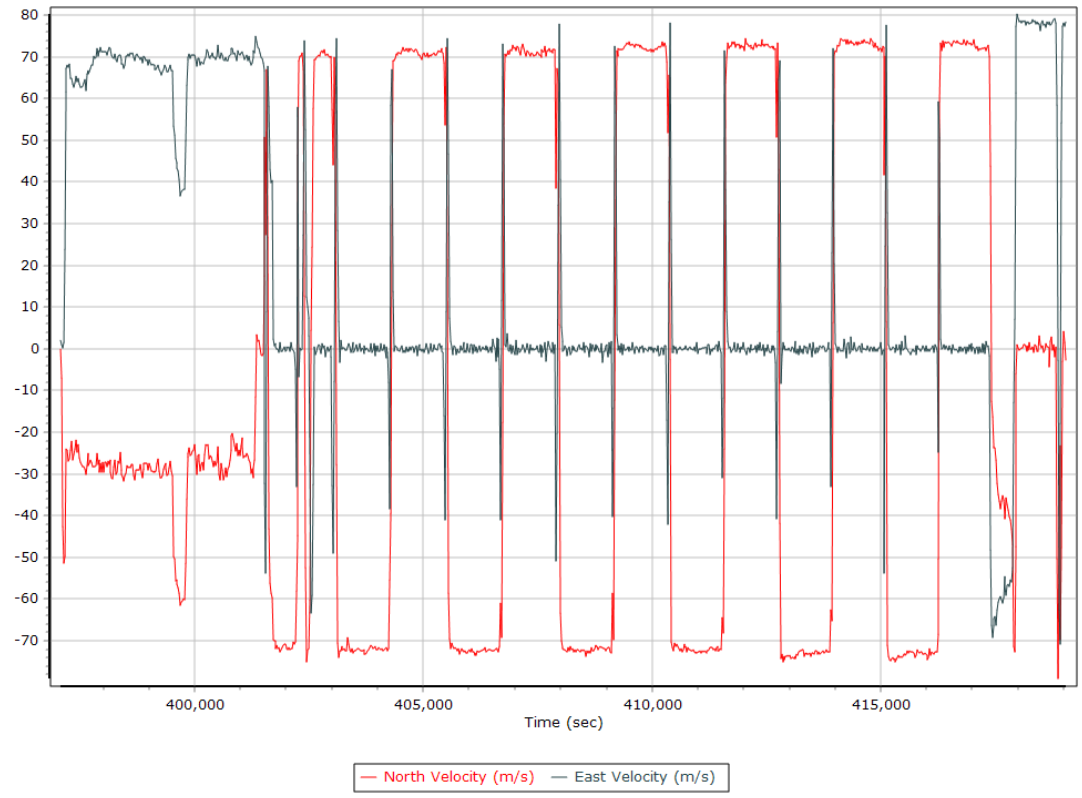
Roll/Pitch



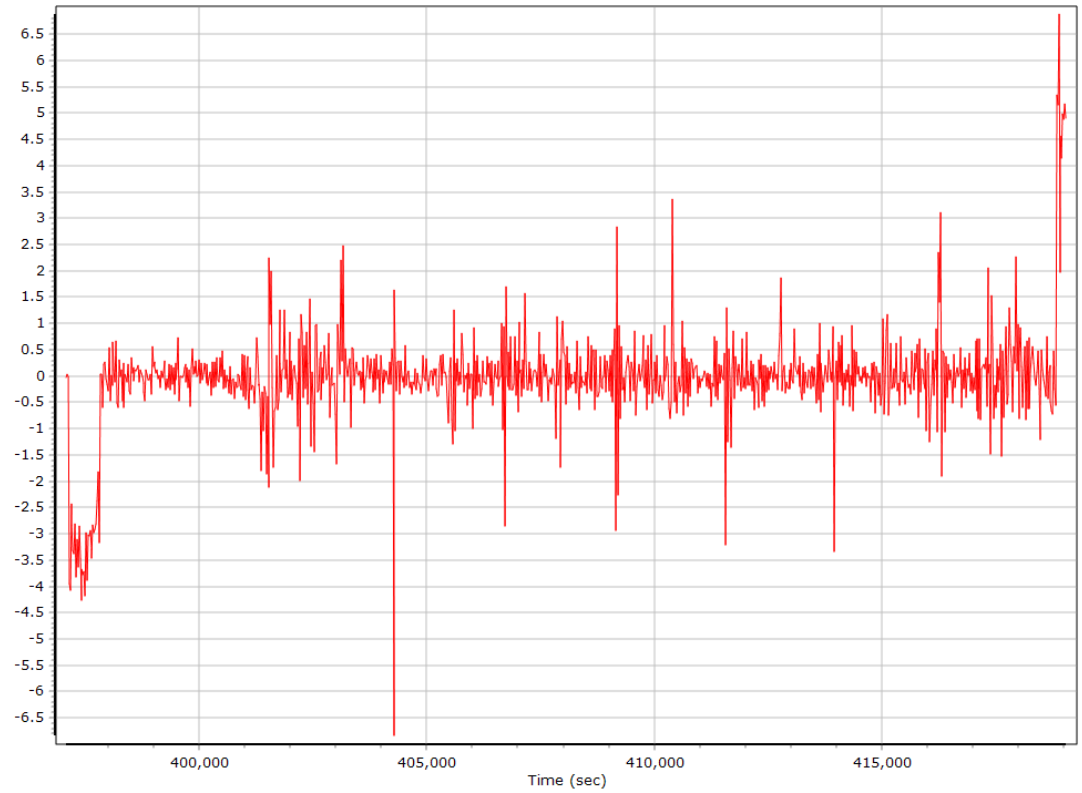
Heading



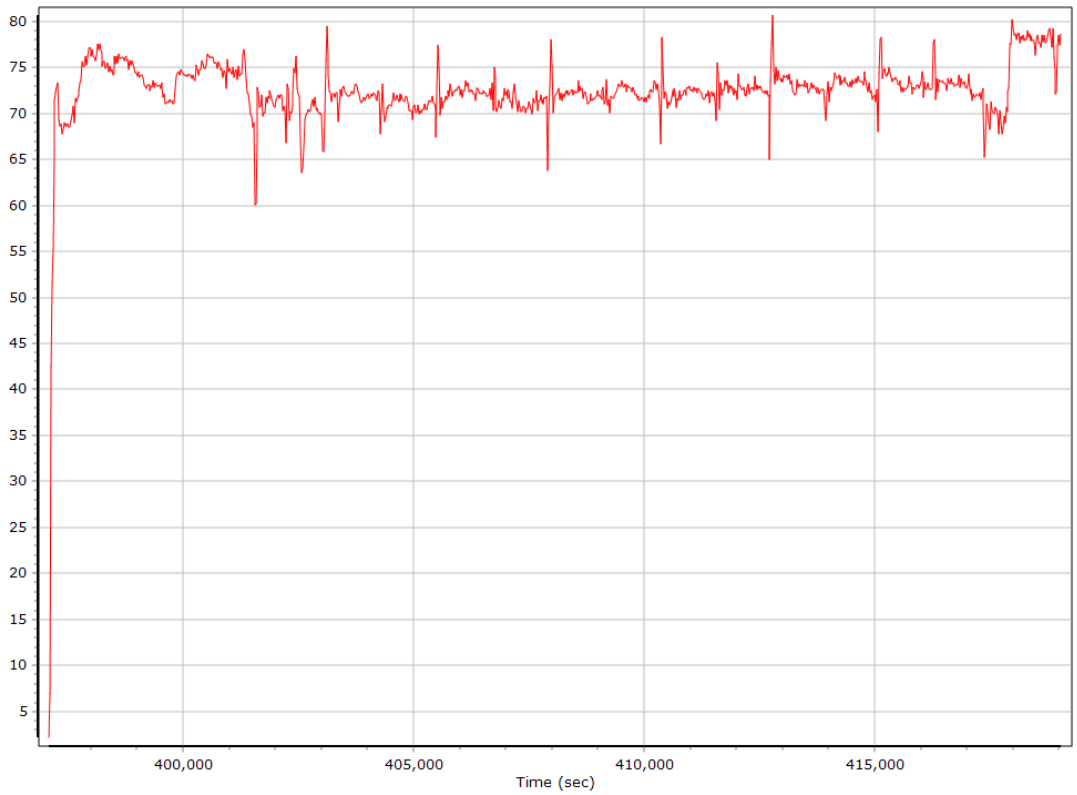
North/East Velocity



Down Velocity



Total Speed



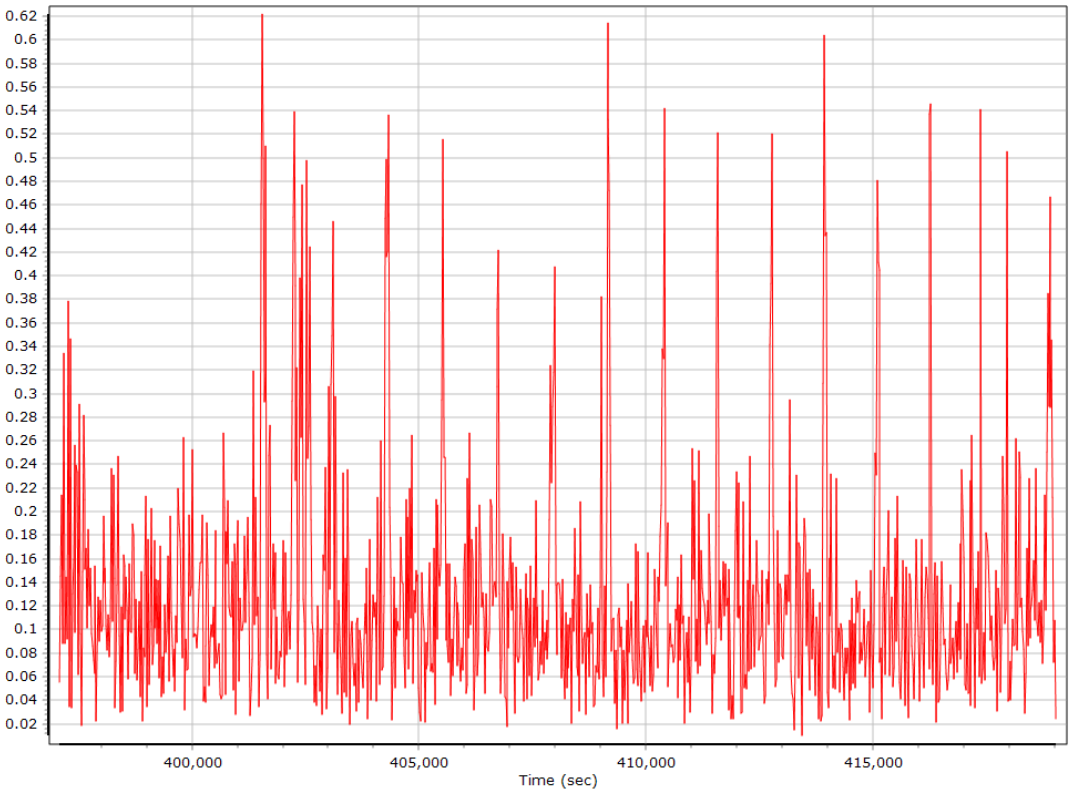
Ground Speed



Body Acceleration



Total Body Acceleration

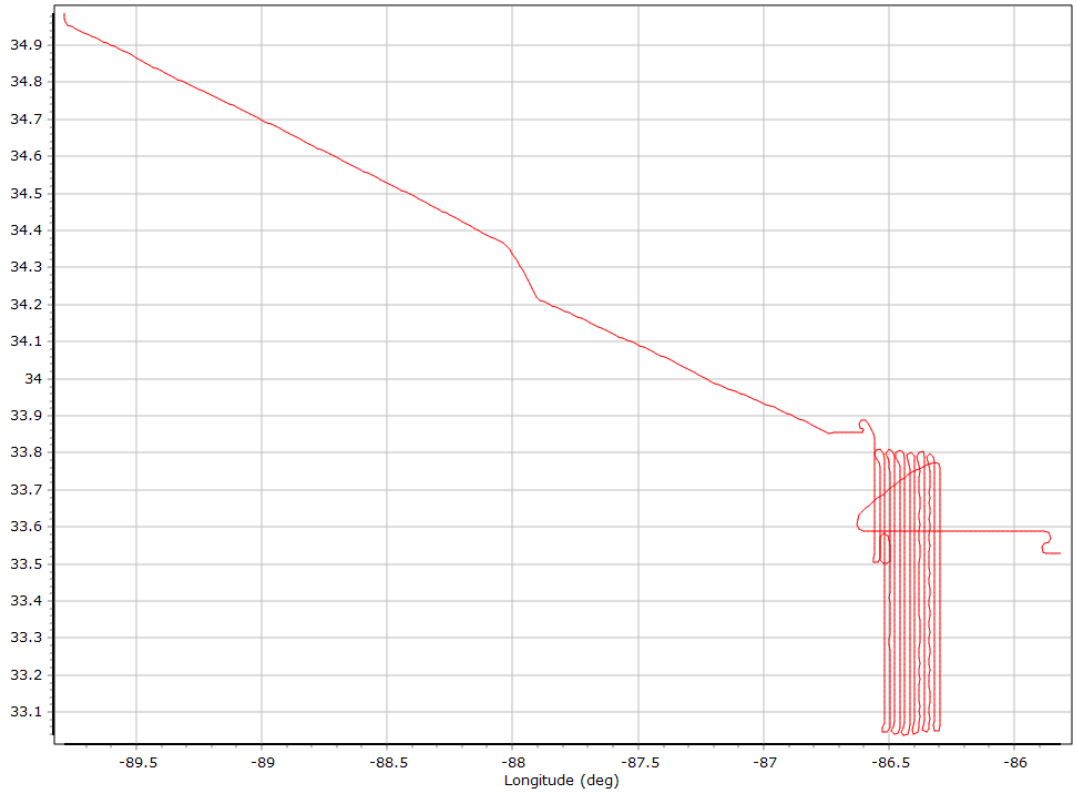


Body Angular Rate

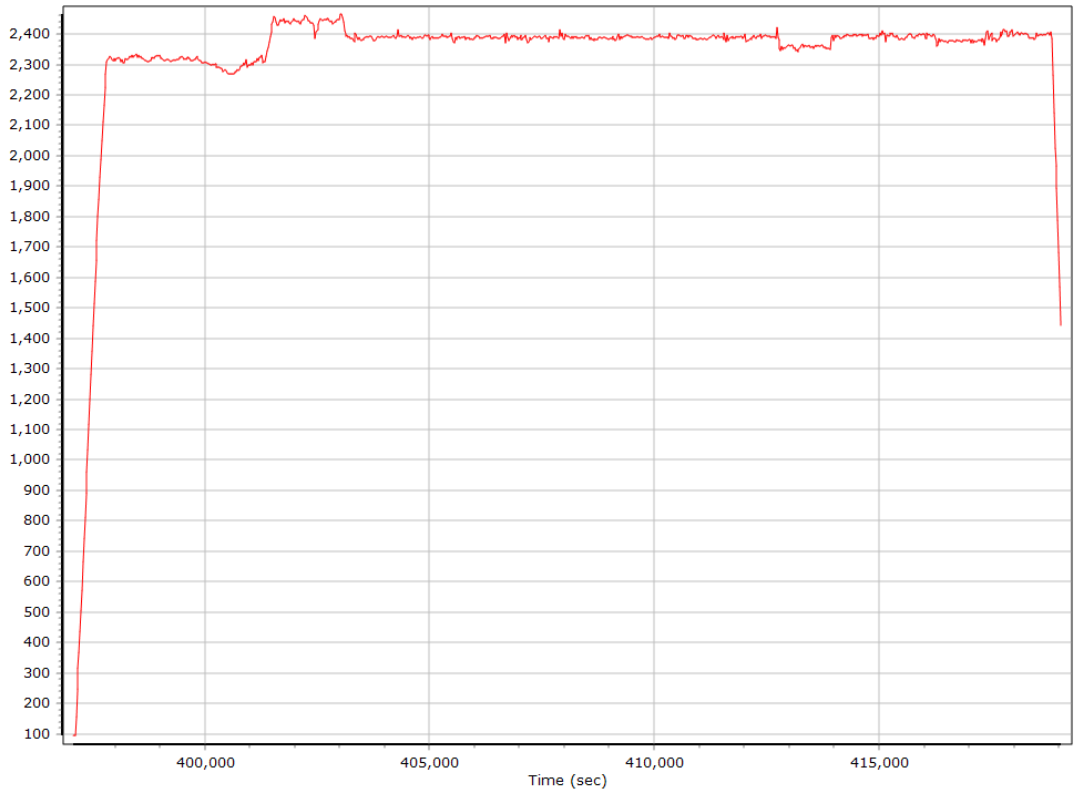


Forward Processed Trajectory Information

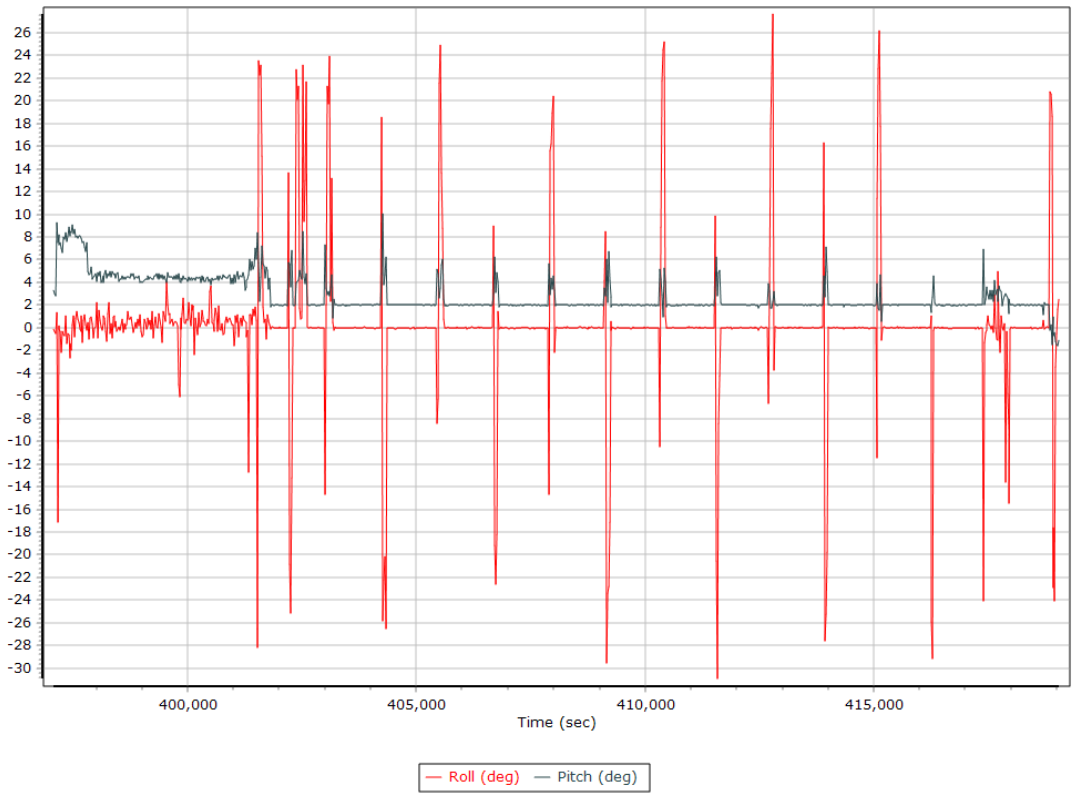
Top View



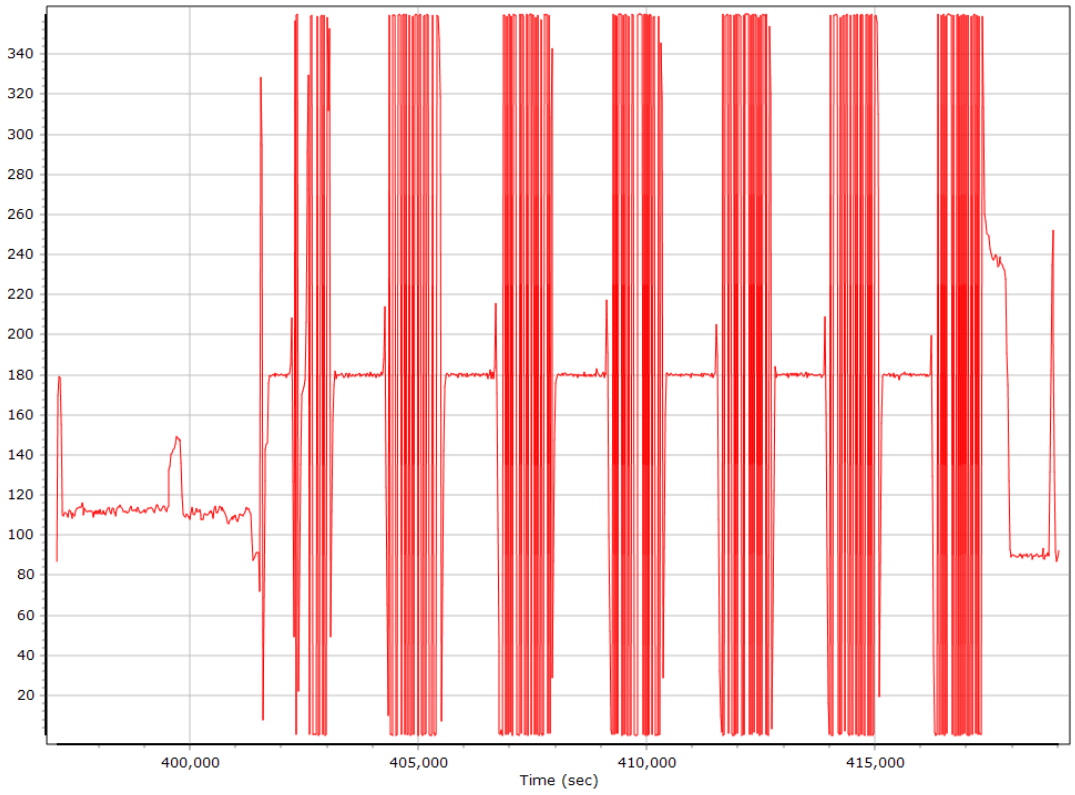
Altitude



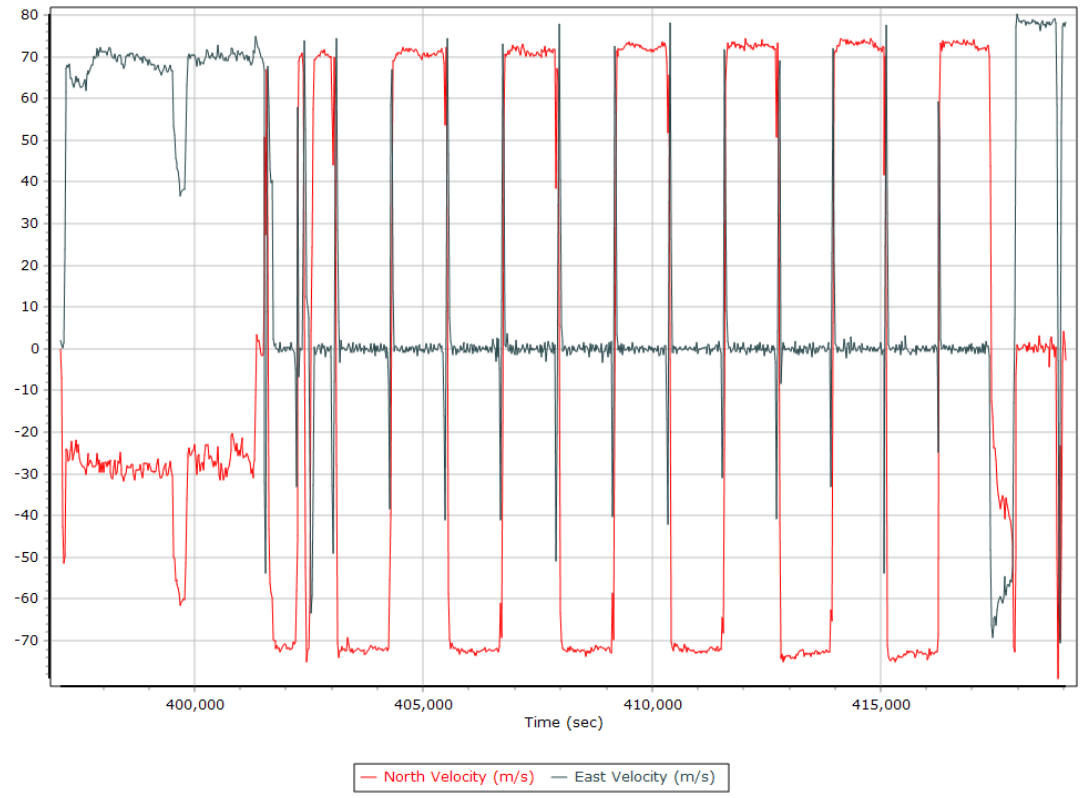
Roll/Pitch



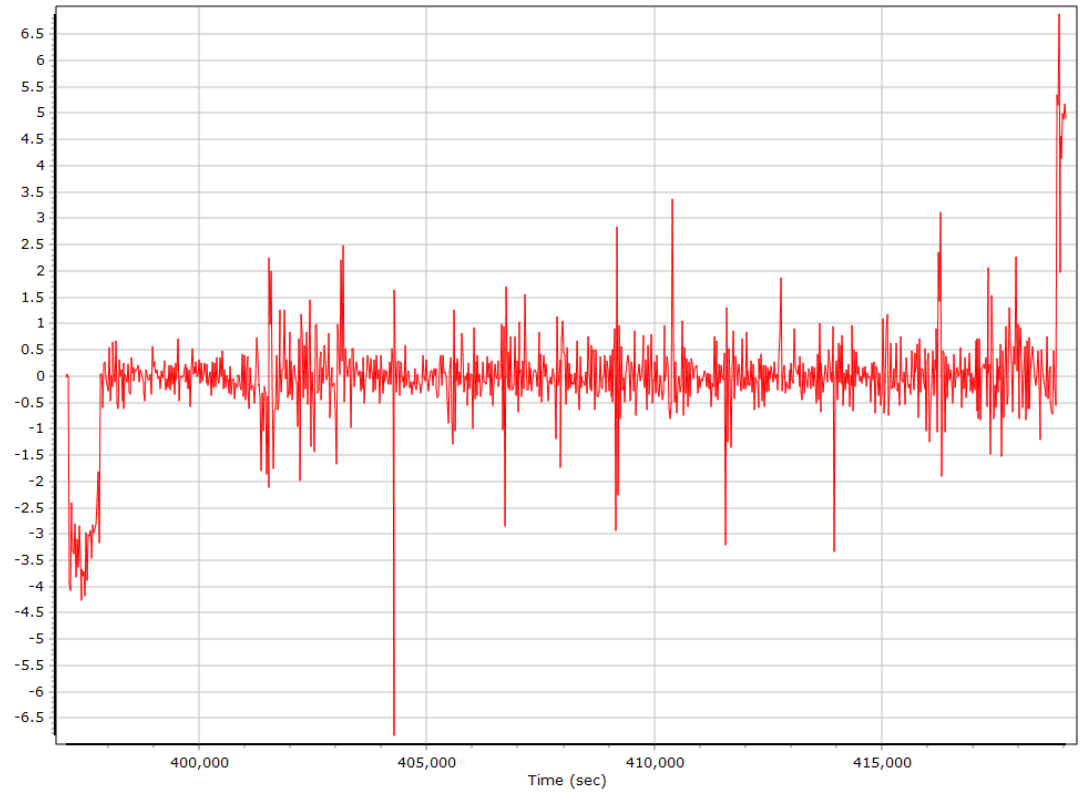
Heading



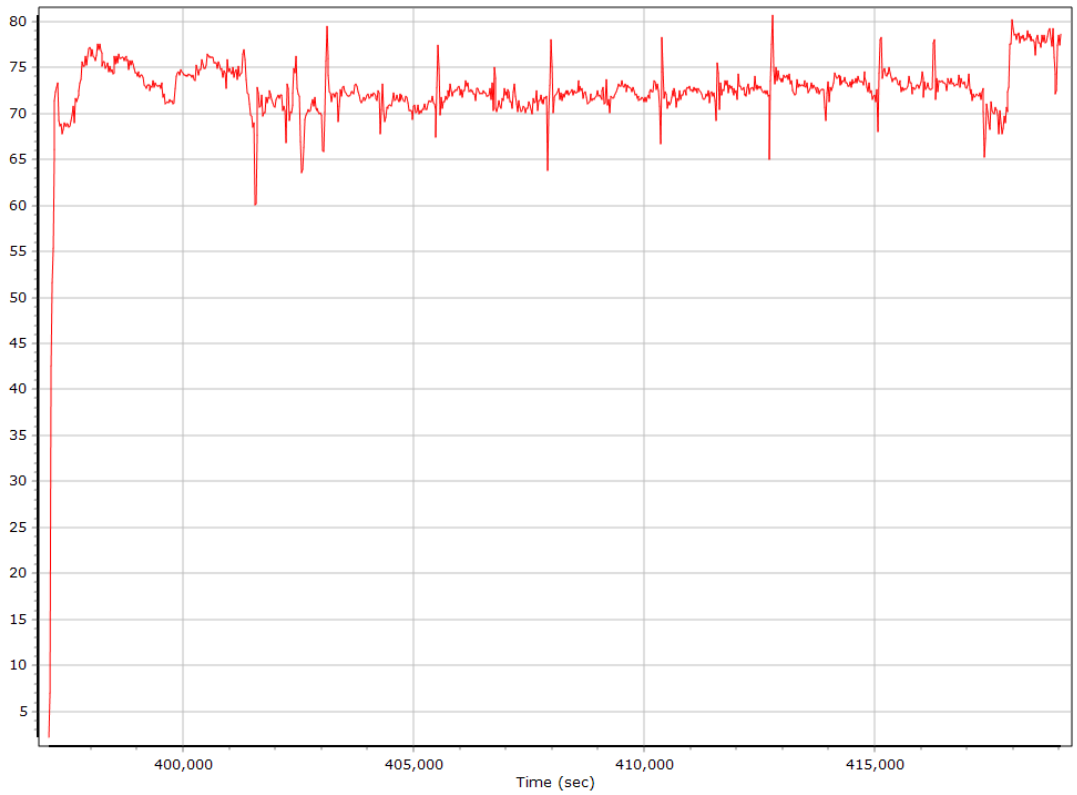
North/East Velocity



Down Velocity



Total Speed



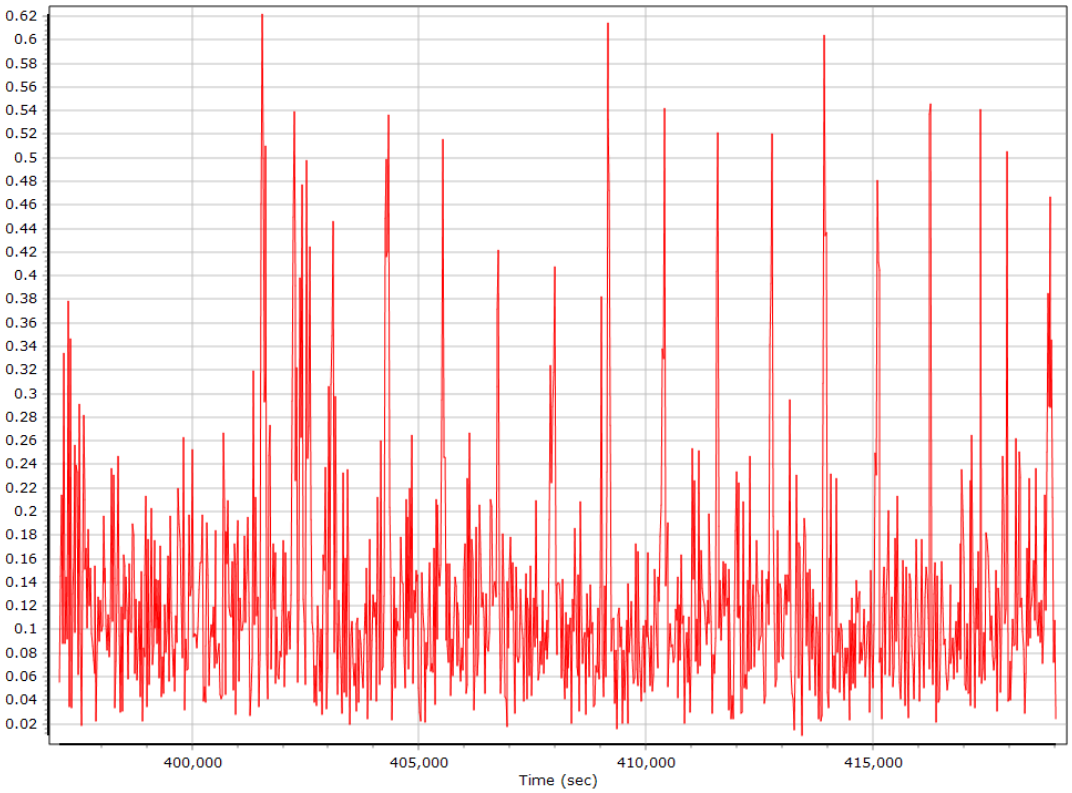
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

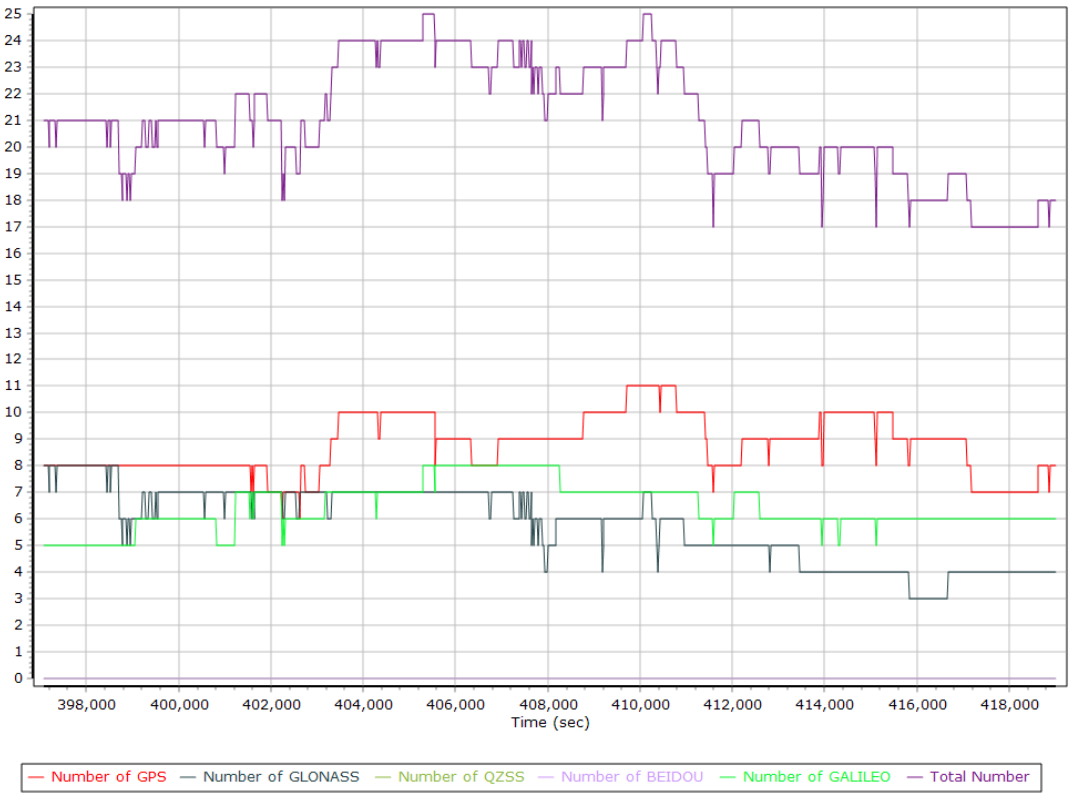


GNSS QC

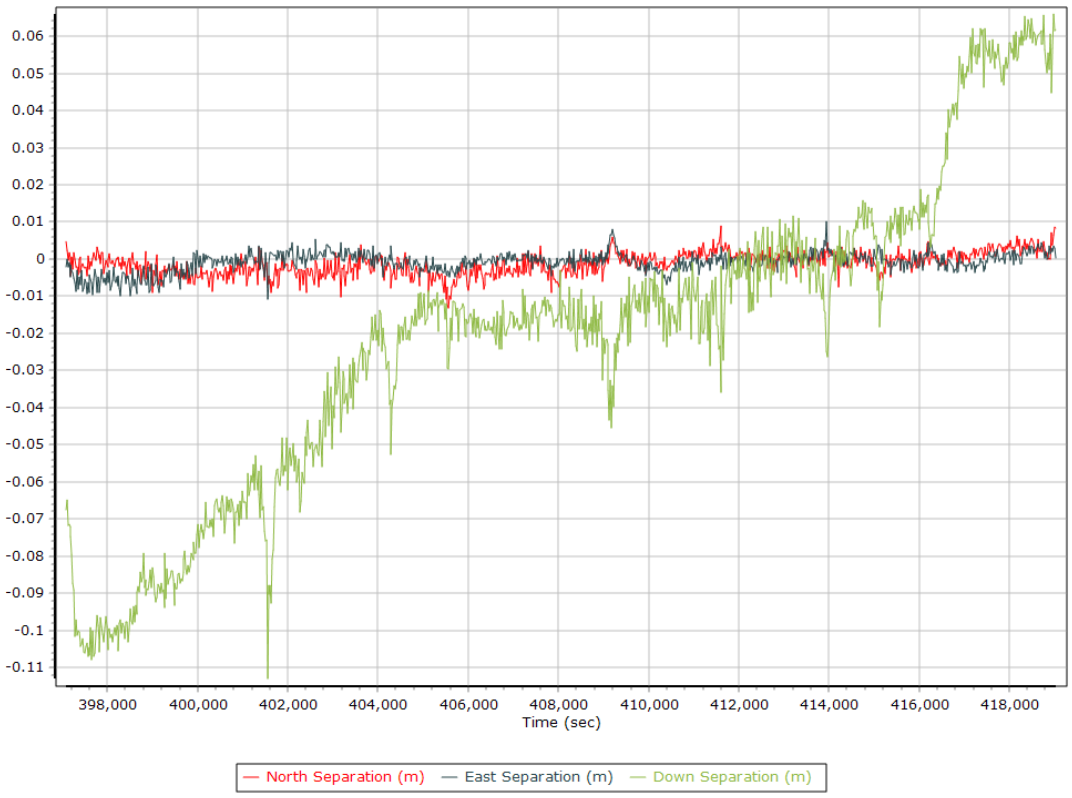
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	11	9
Number of GLONASS SV	3	8	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	8	6
Total number of SV	16	25	21
PDOP	0.99	1.81	1.19
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	22011.00	0.00	0.00
Percentage	100.00	0.00	0.00

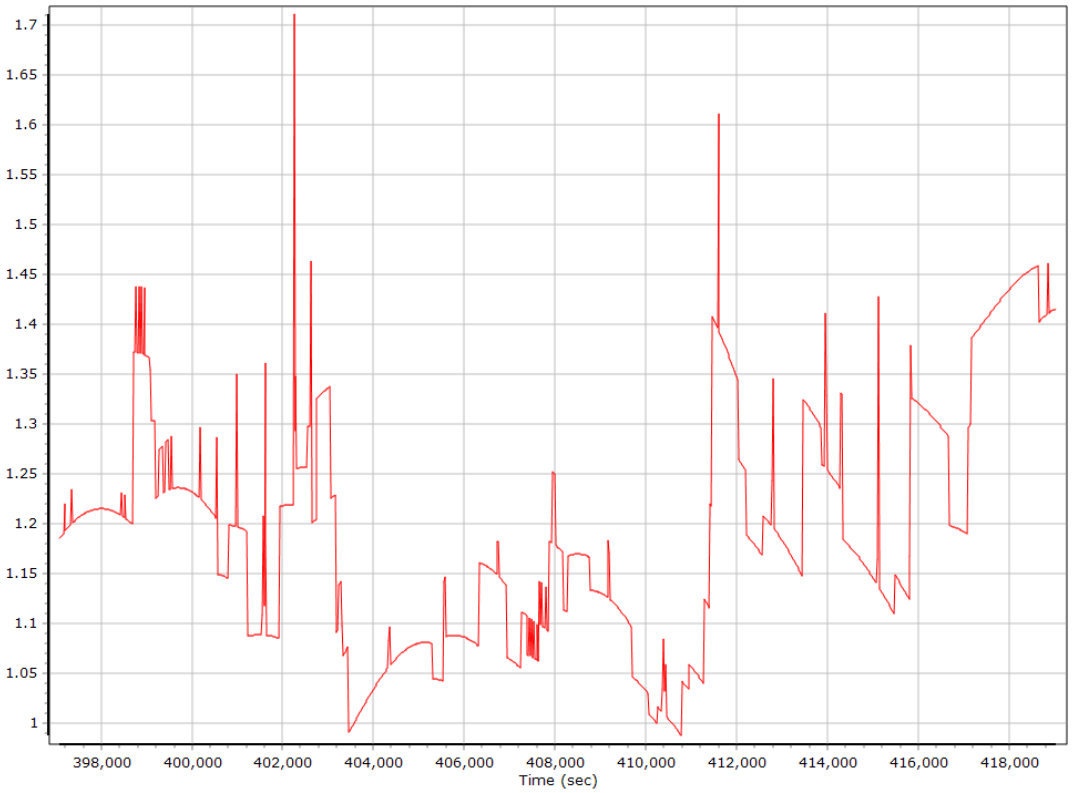
Num SVs in solution



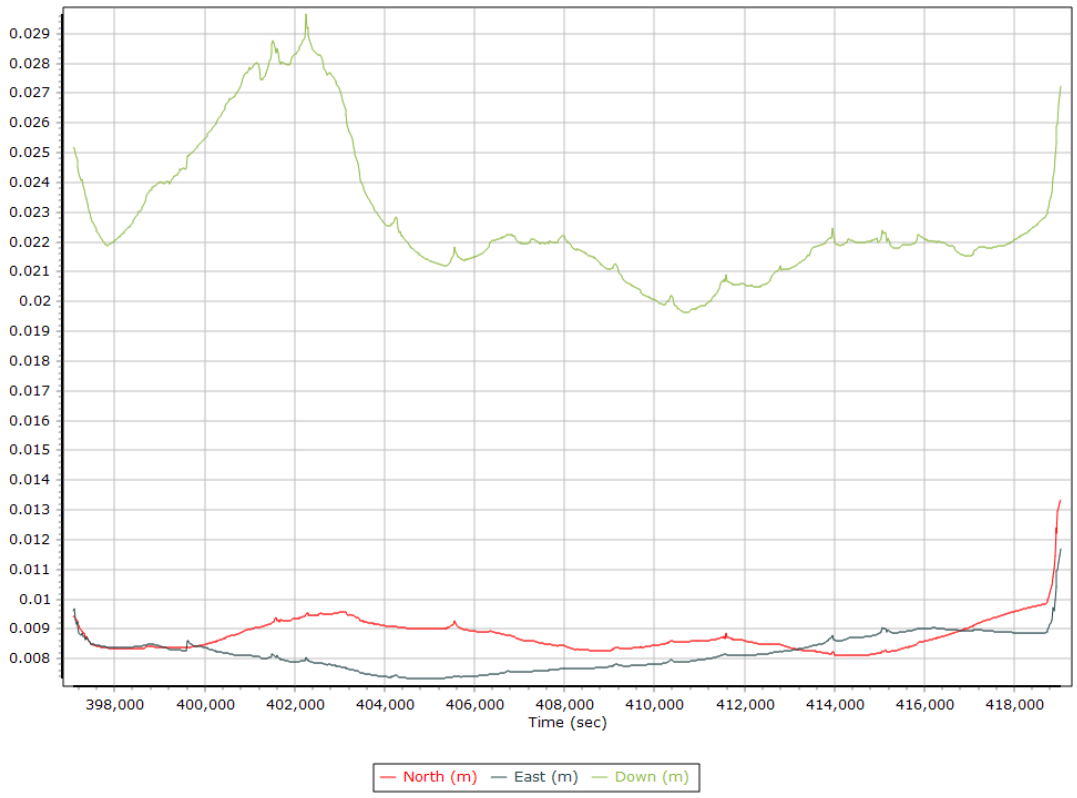
Forward/Reverse Separation



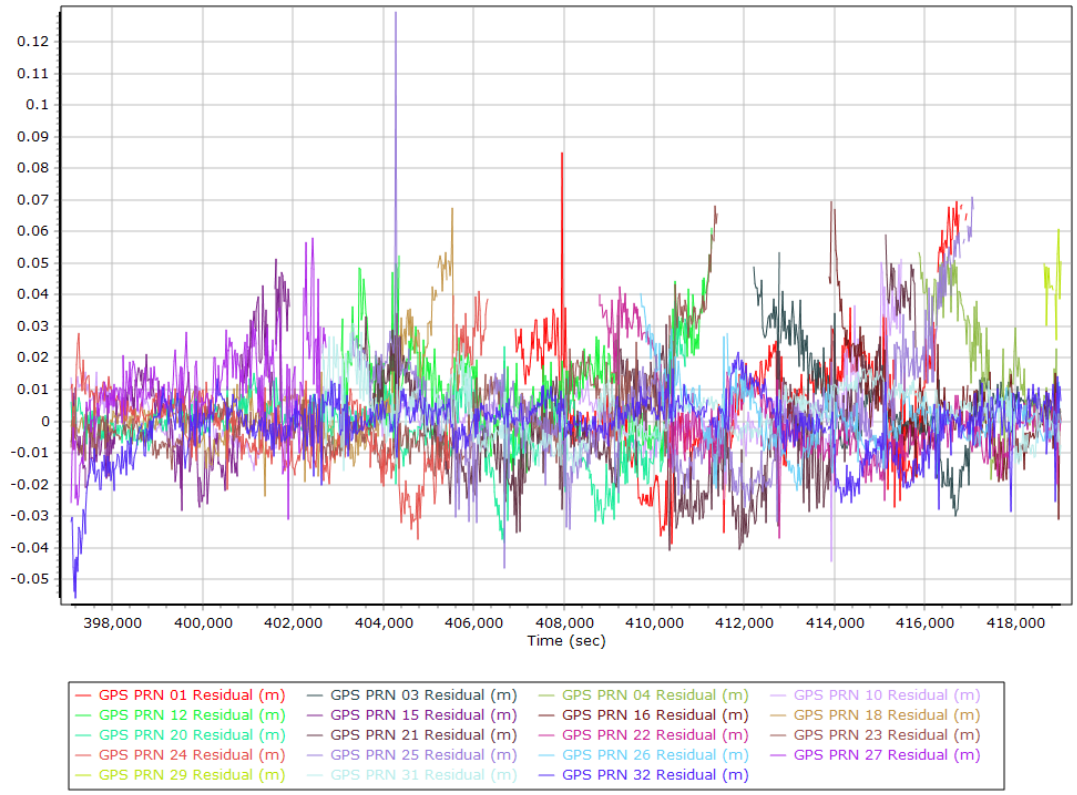
PDOP



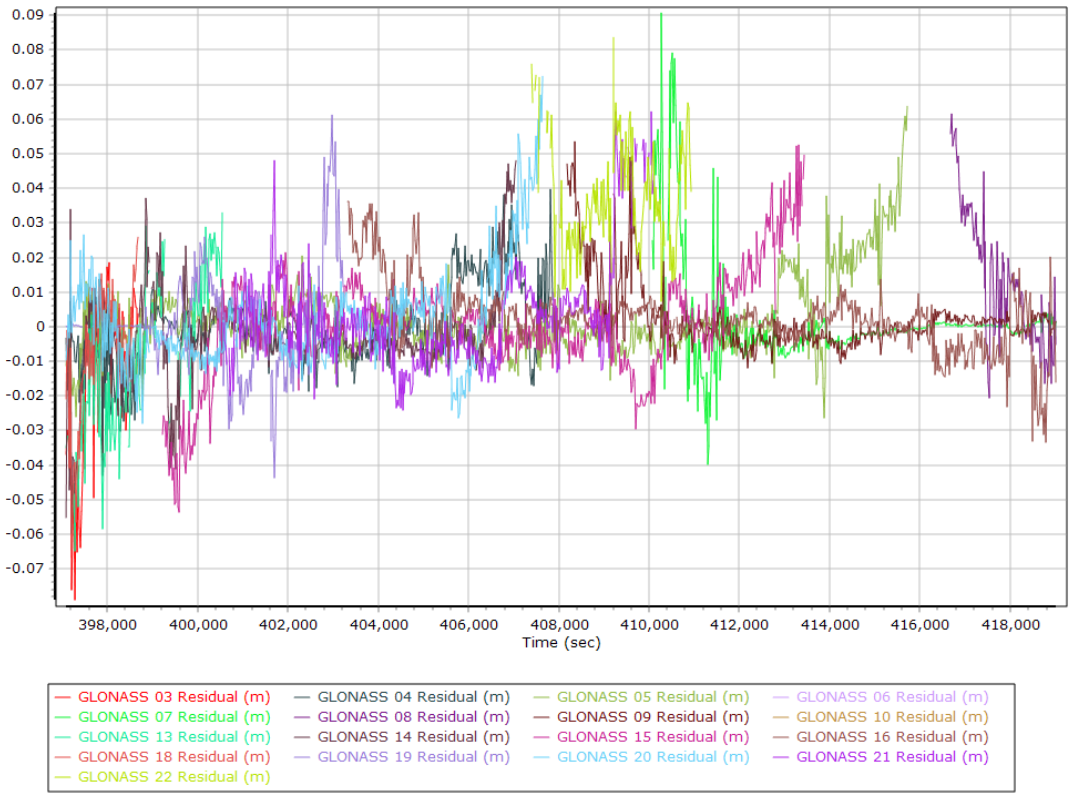
Estimated Position Accuracy



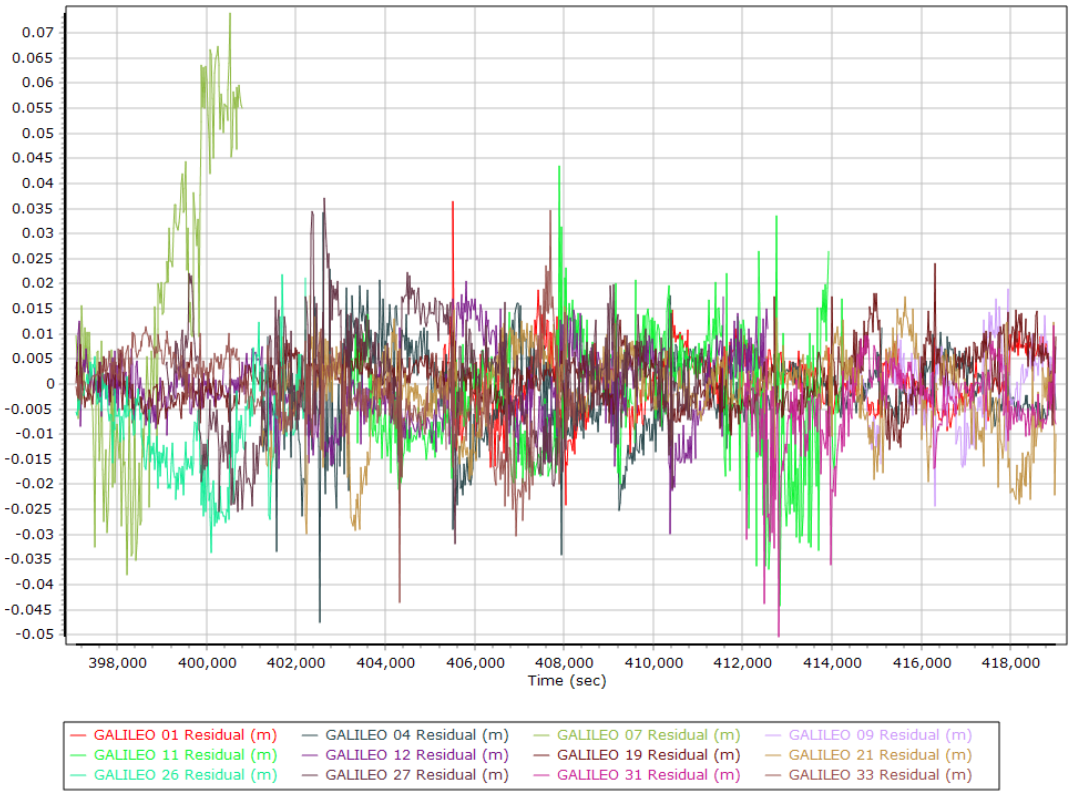
GPS Residuals



GLONASS Residuals



GALILEO Residuals



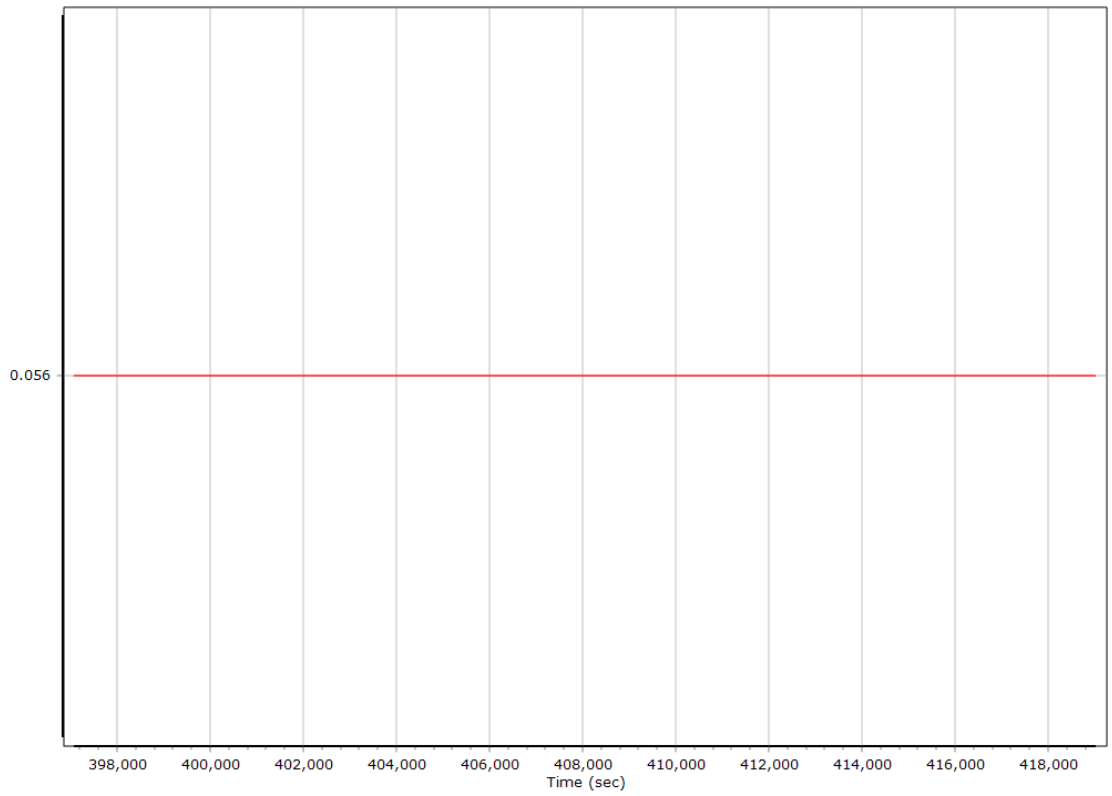
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	396995.000 (12/10/2020 2:16:35 PM)		
Processing end time	419058.000 (12/10/2020 8:24:18 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

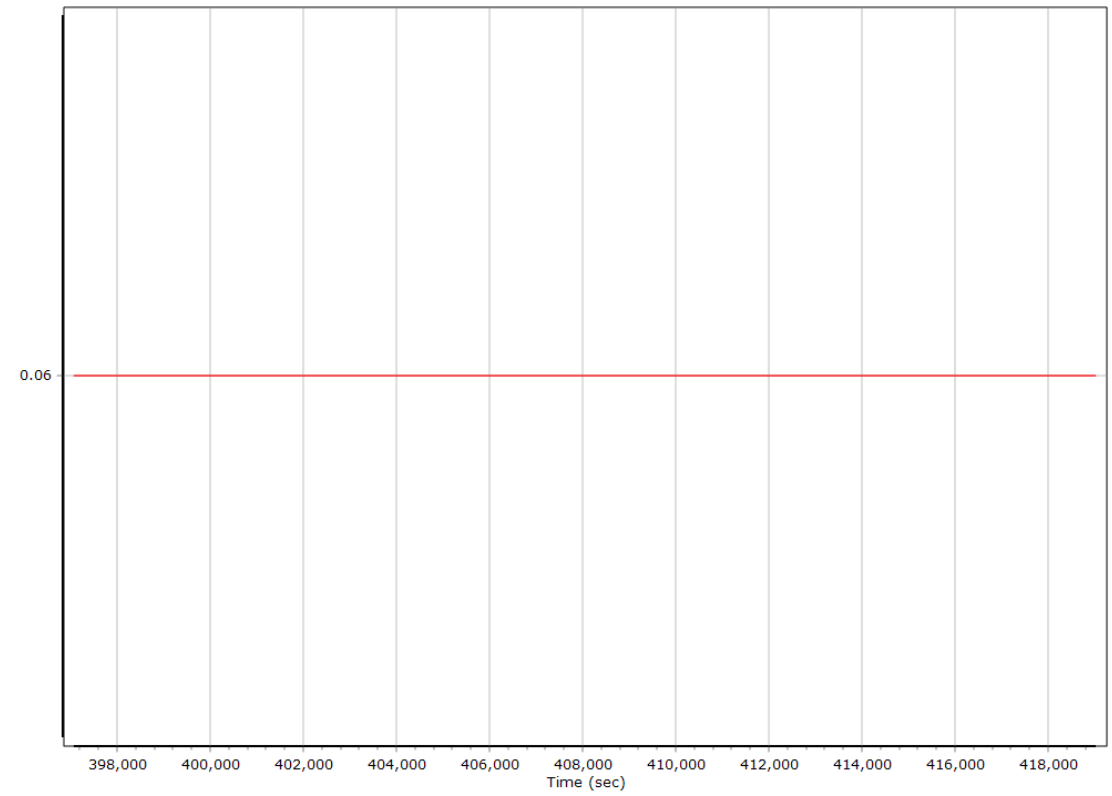
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

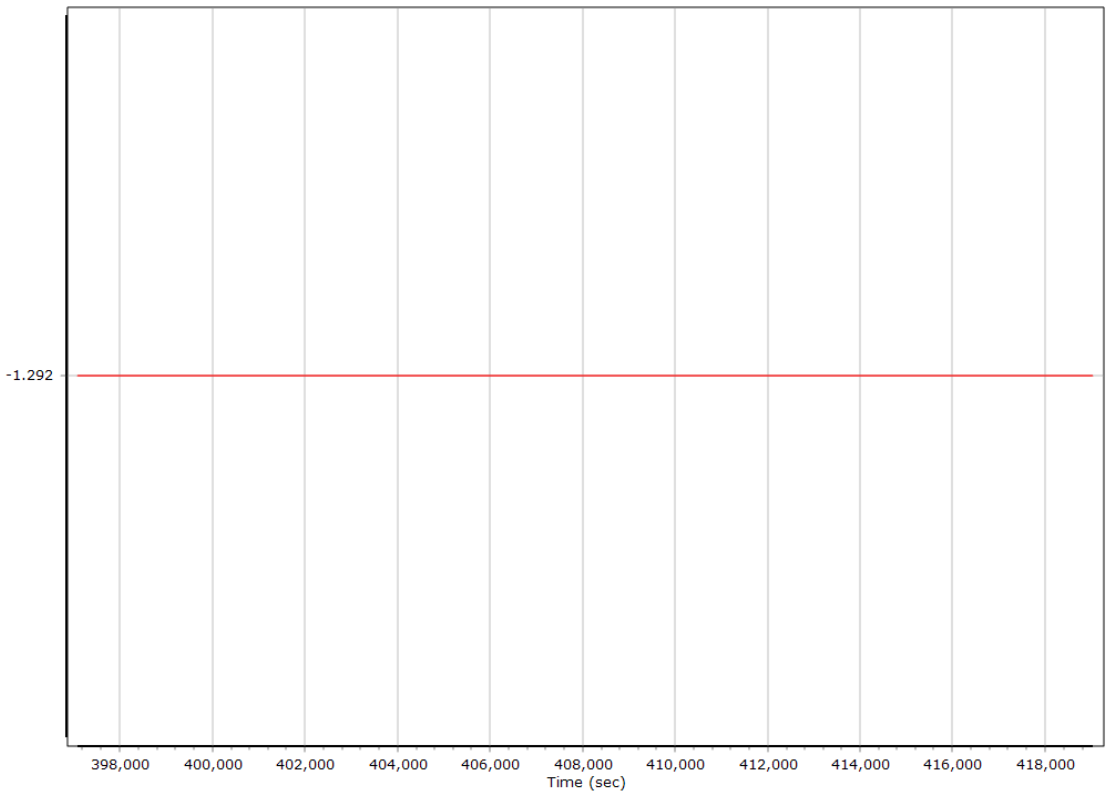
X Reference-Primary GNSS Lever Arm (m)



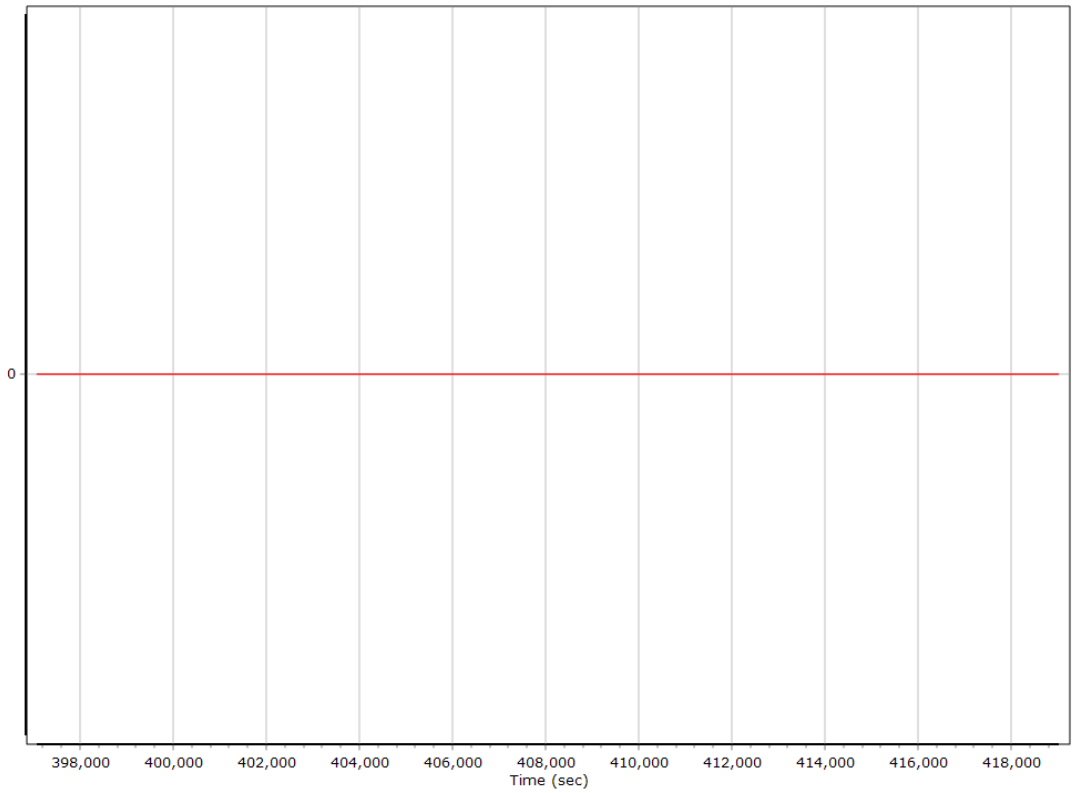
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



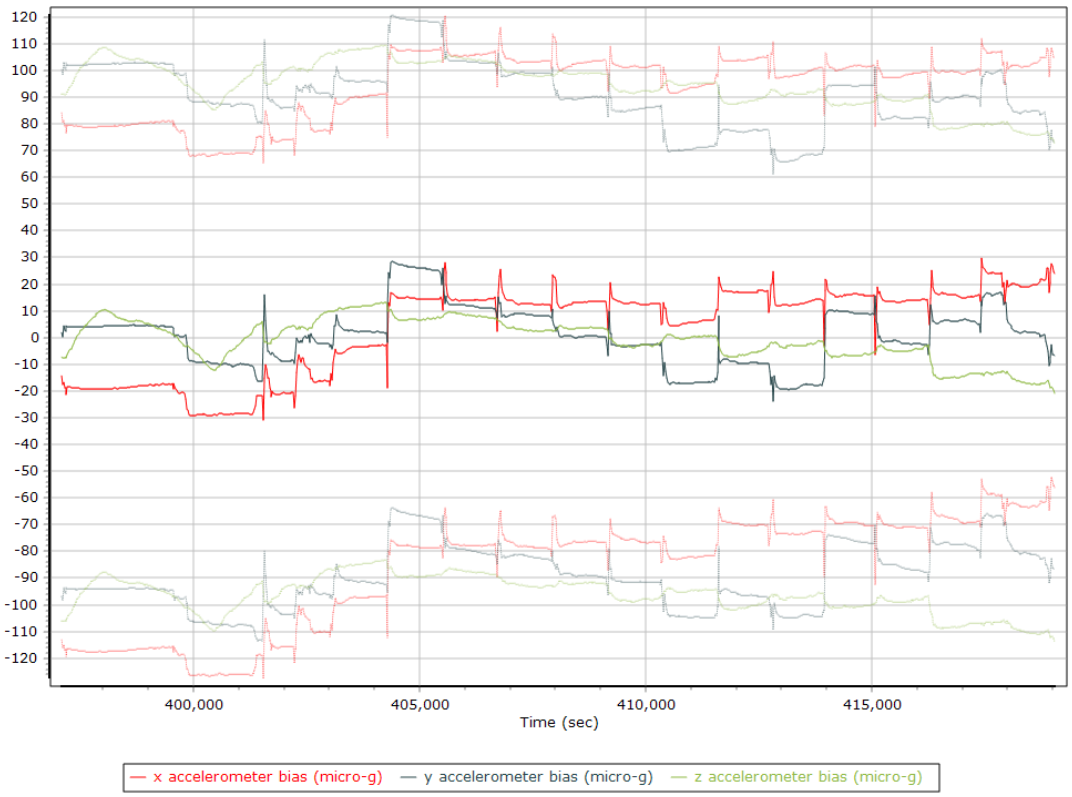
Reference-Primary GNSS Lever Arm Figure of Merit



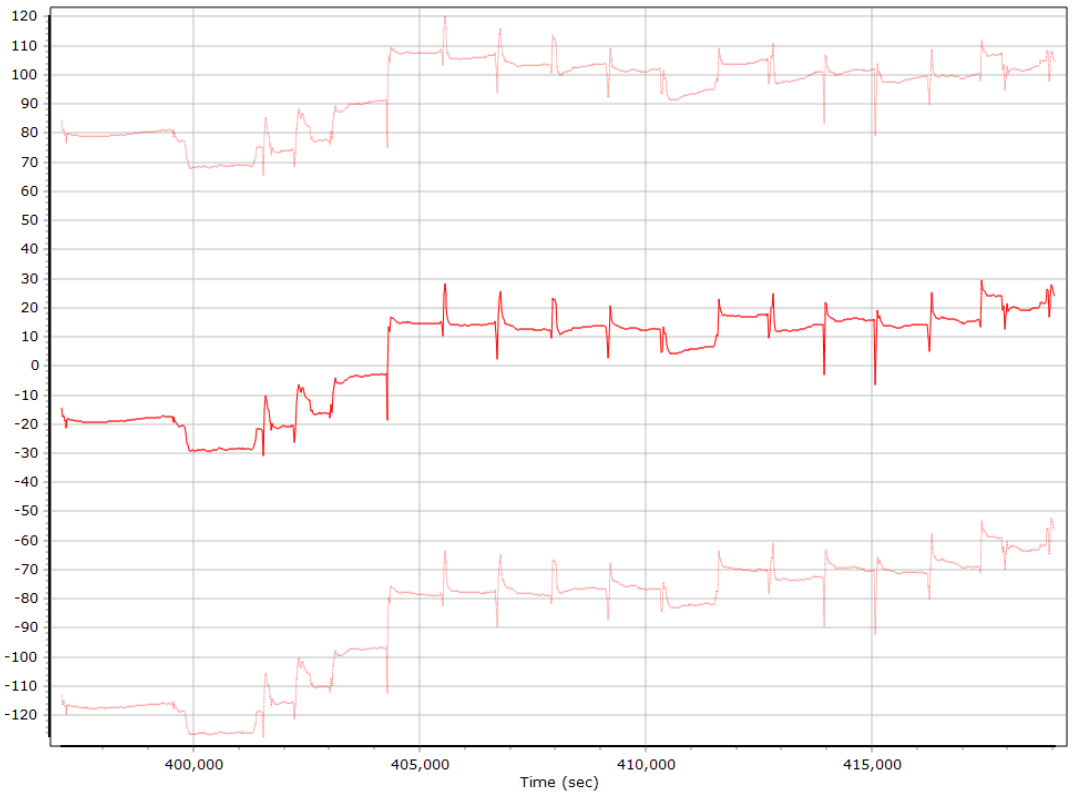
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

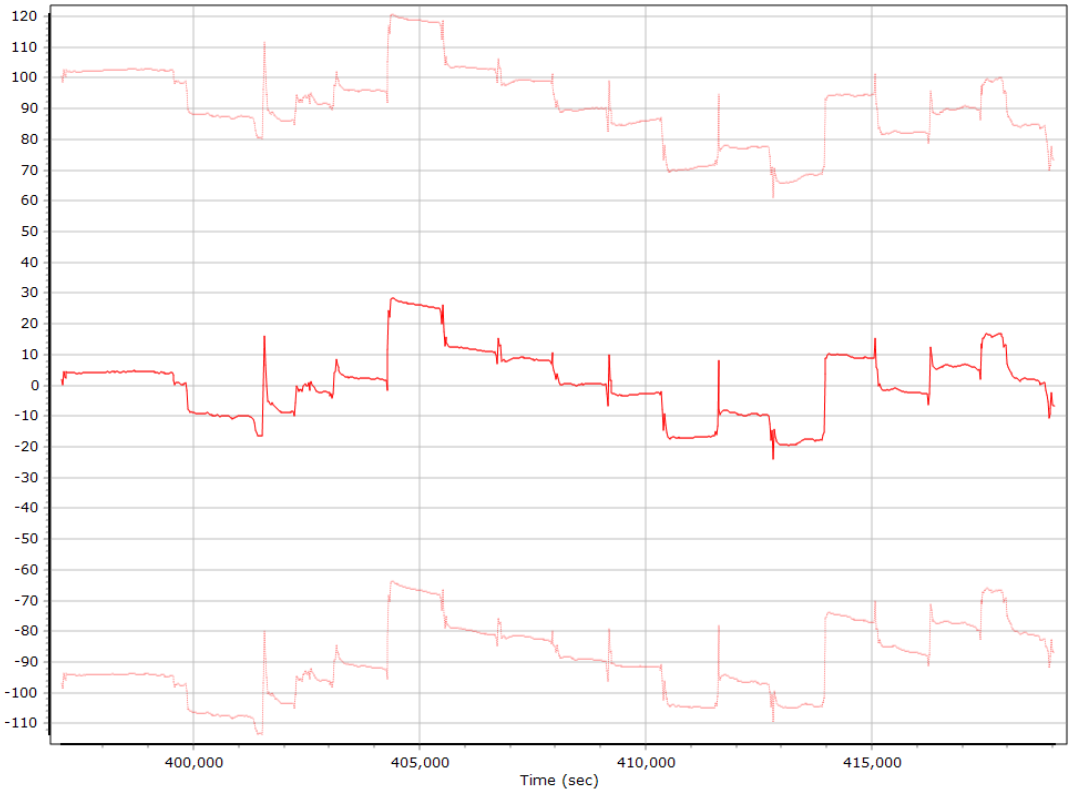
Accelerometer Bias (micro-g)



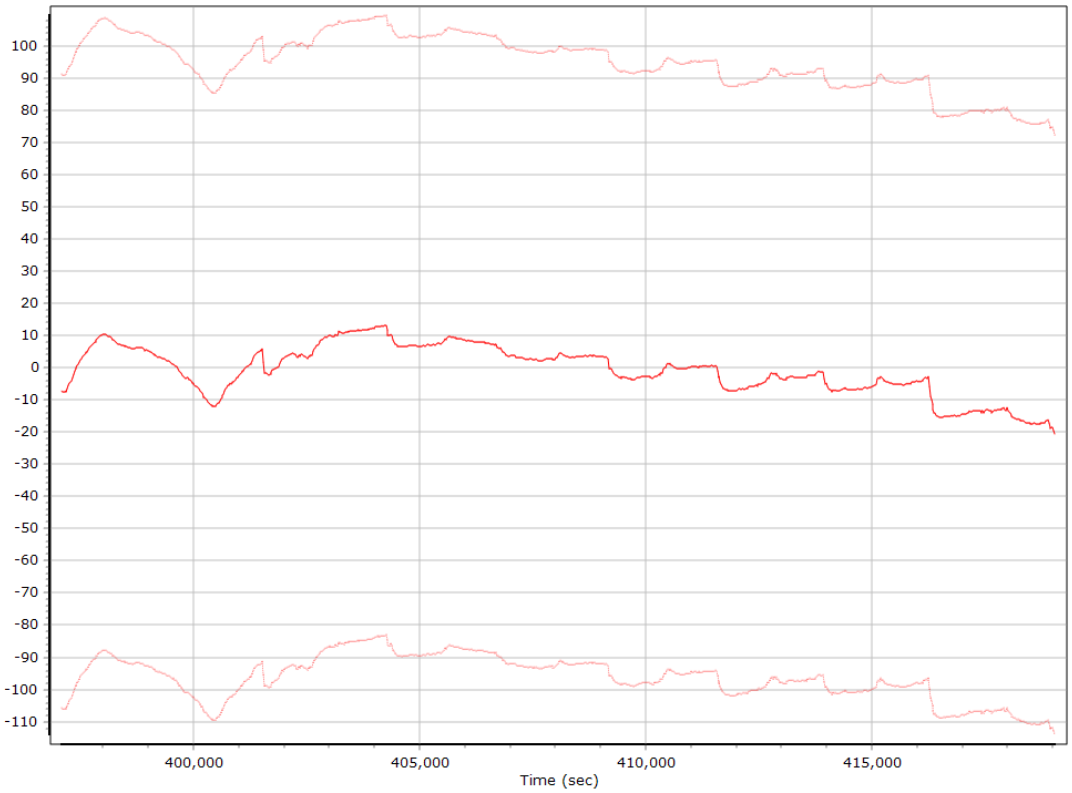
X Accelerometer Bias (micro-g)



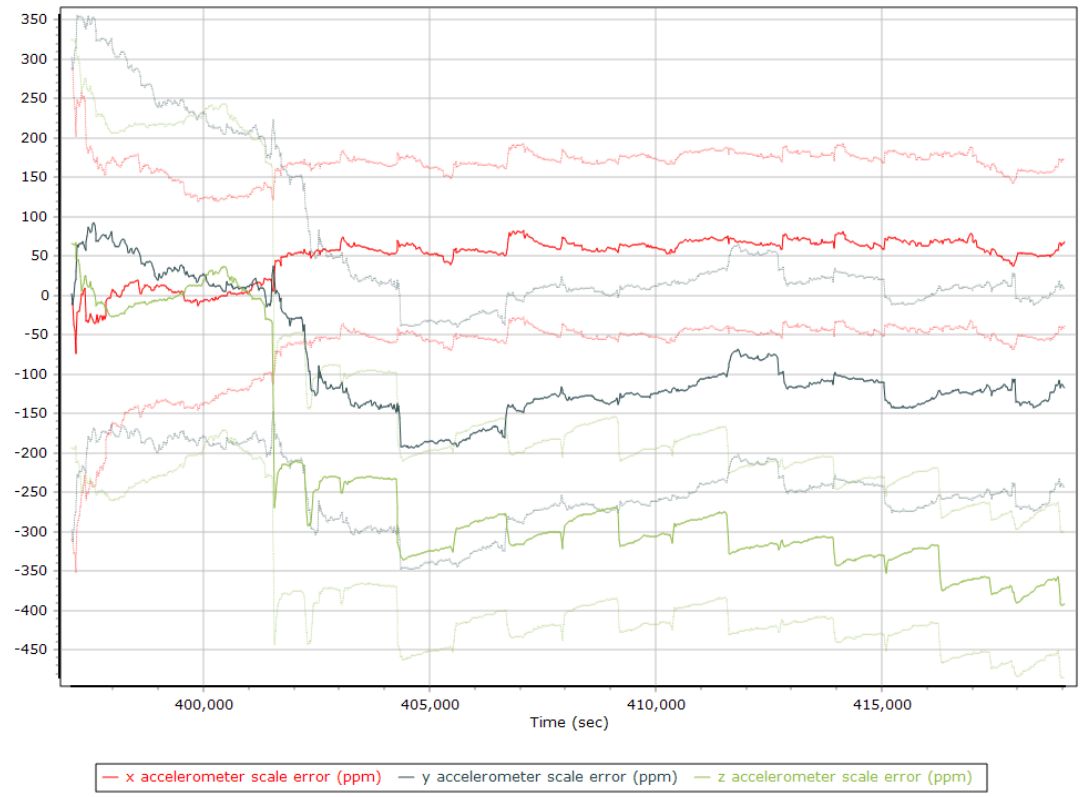
Y Accelerometer Bias (micro-g)



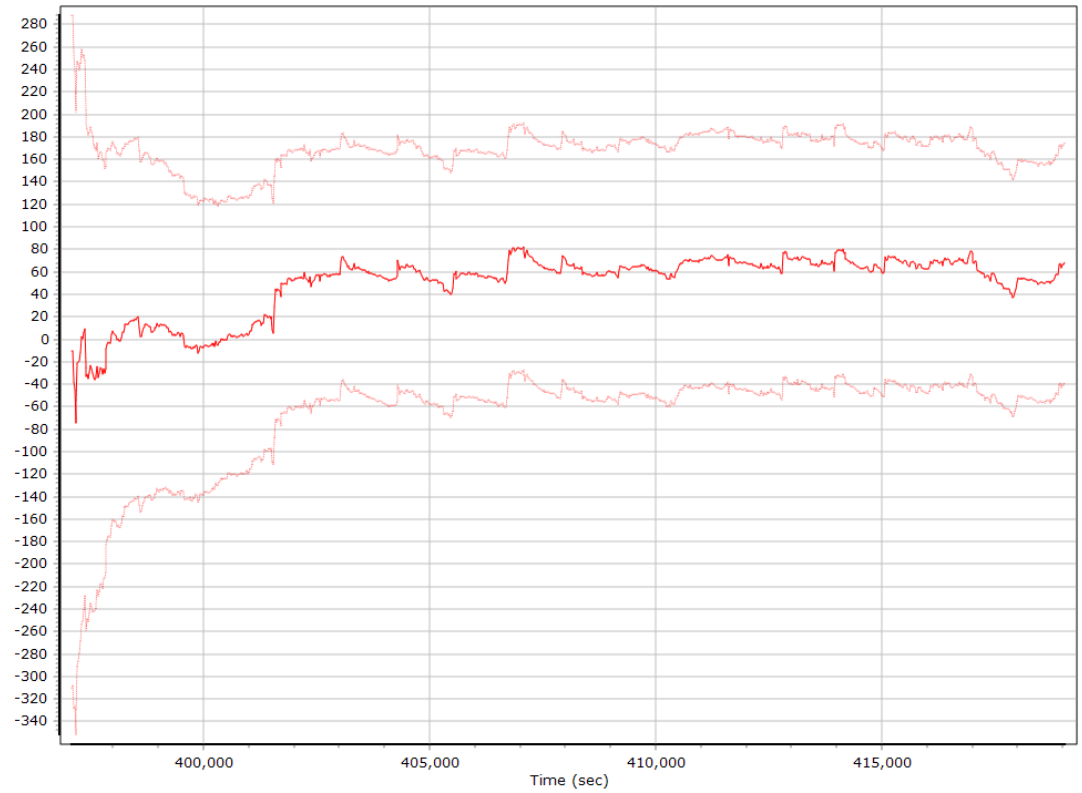
Z Accelerometer Bias (micro-g)



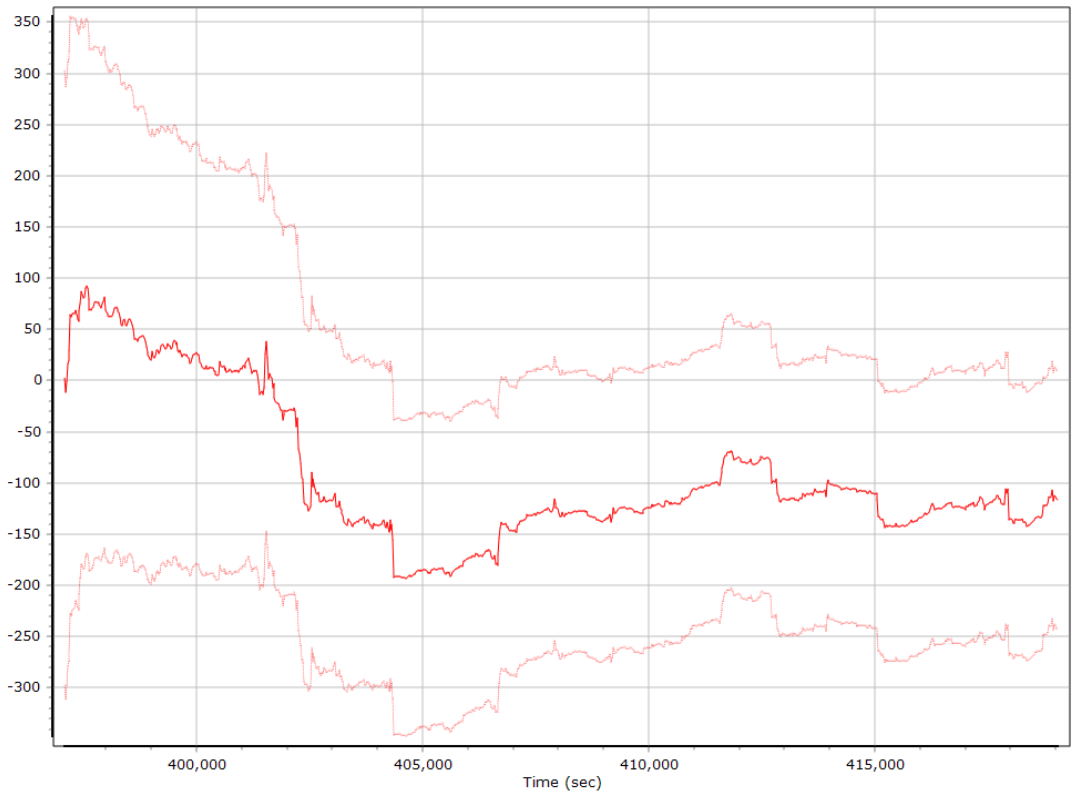
Accelerometer Scale Error (ppm)



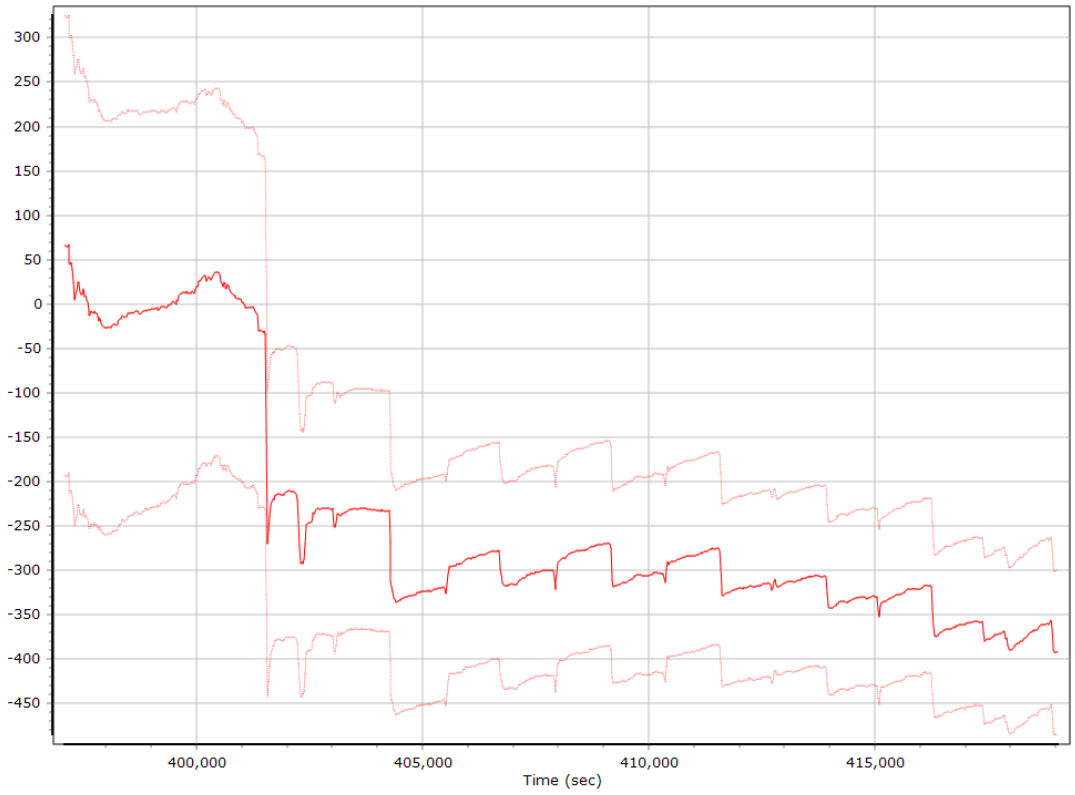
X Accelerometer Scale Error (ppm)



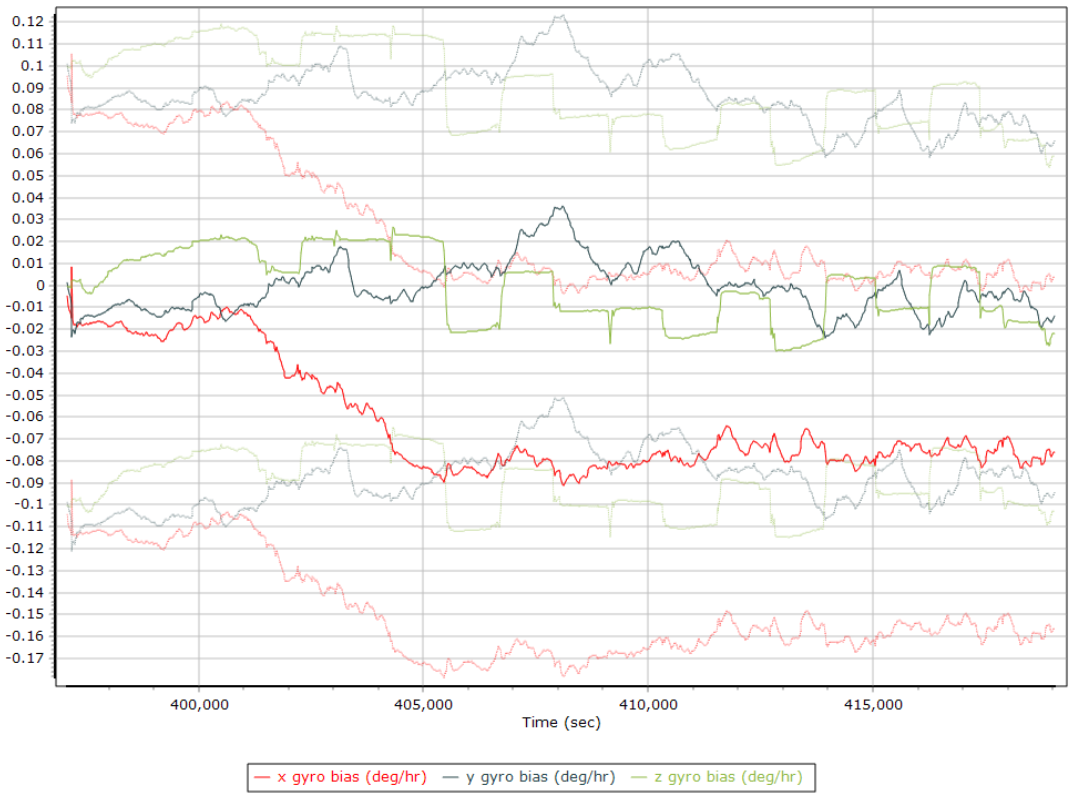
Y Accelerometer Scale Error (ppm)



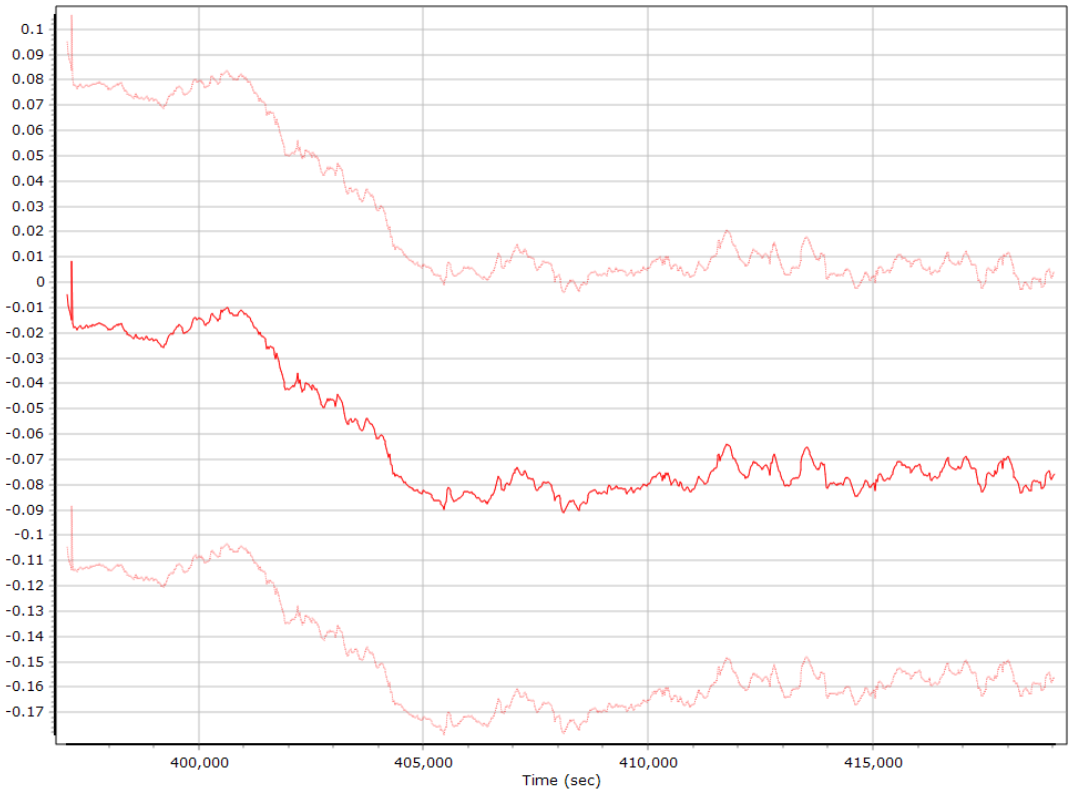
Z Accelerometer Scale Error (ppm)



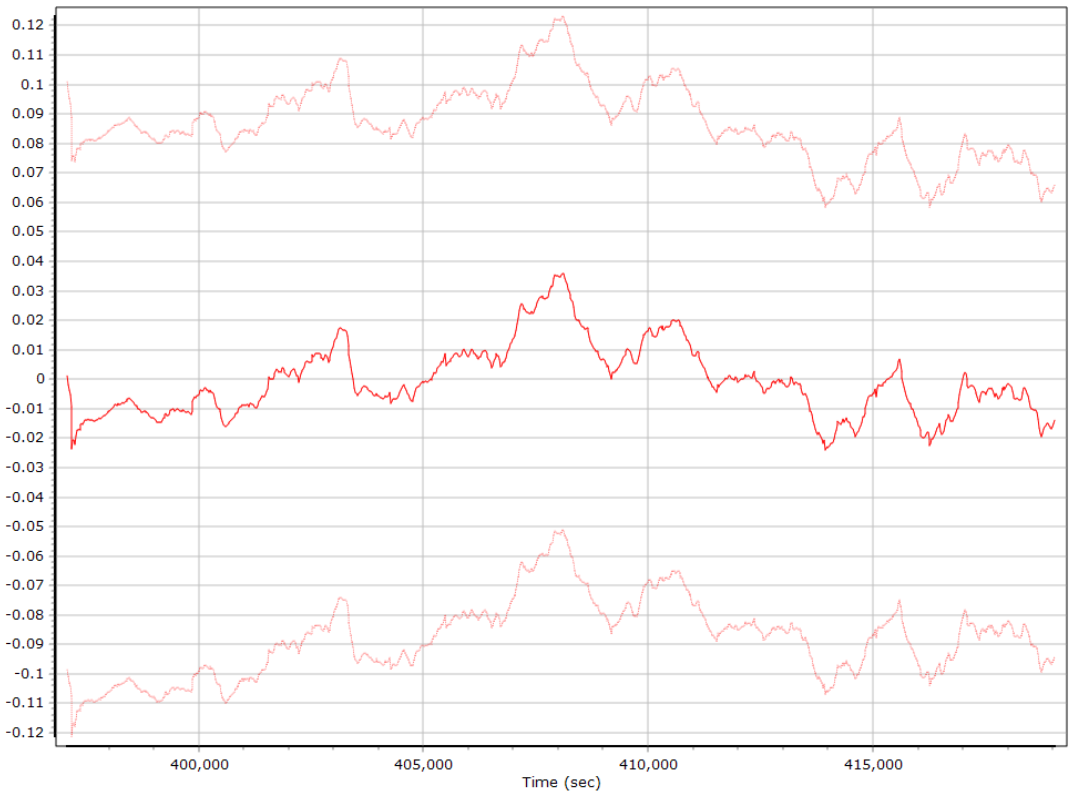
Gyro Bias (deg/h)



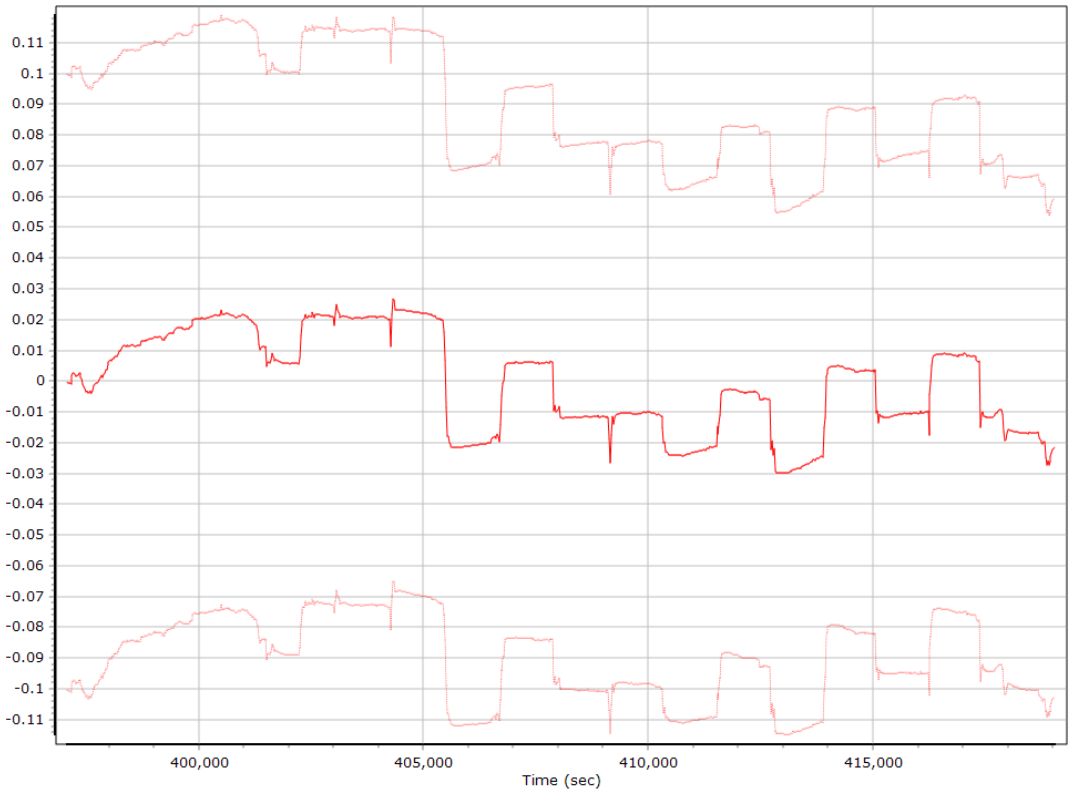
X Gyro Bias (deg/h)



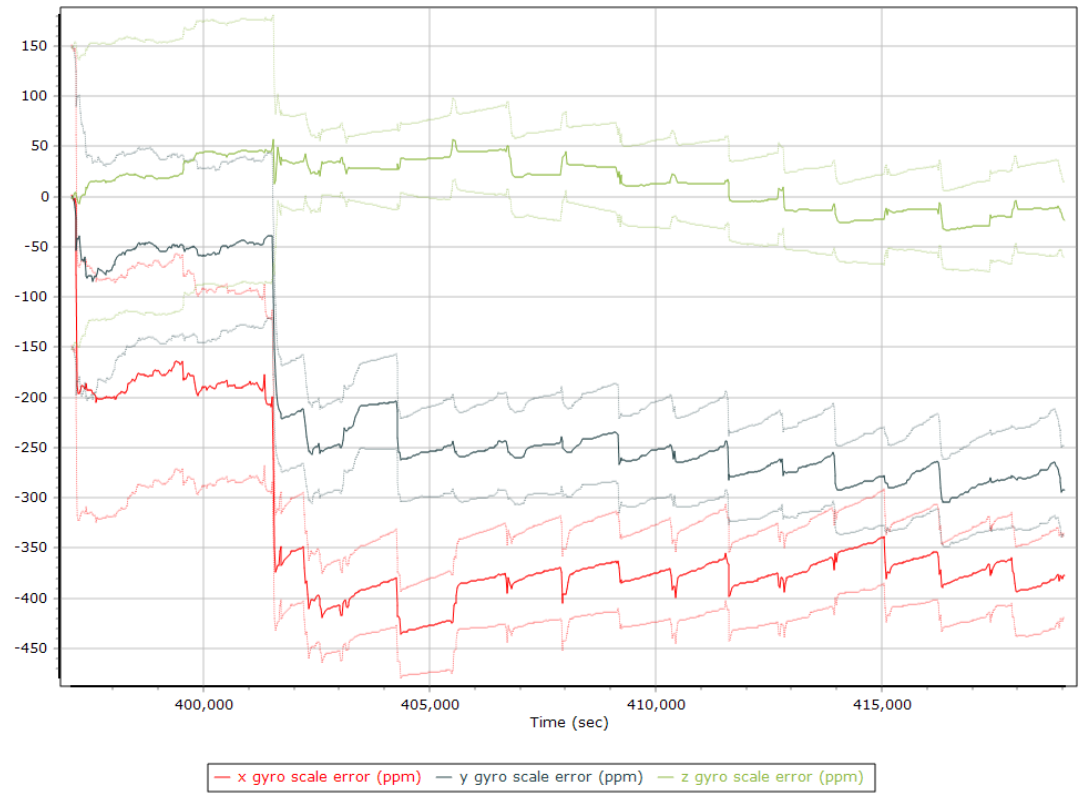
Y Gyro Bias (deg/h)



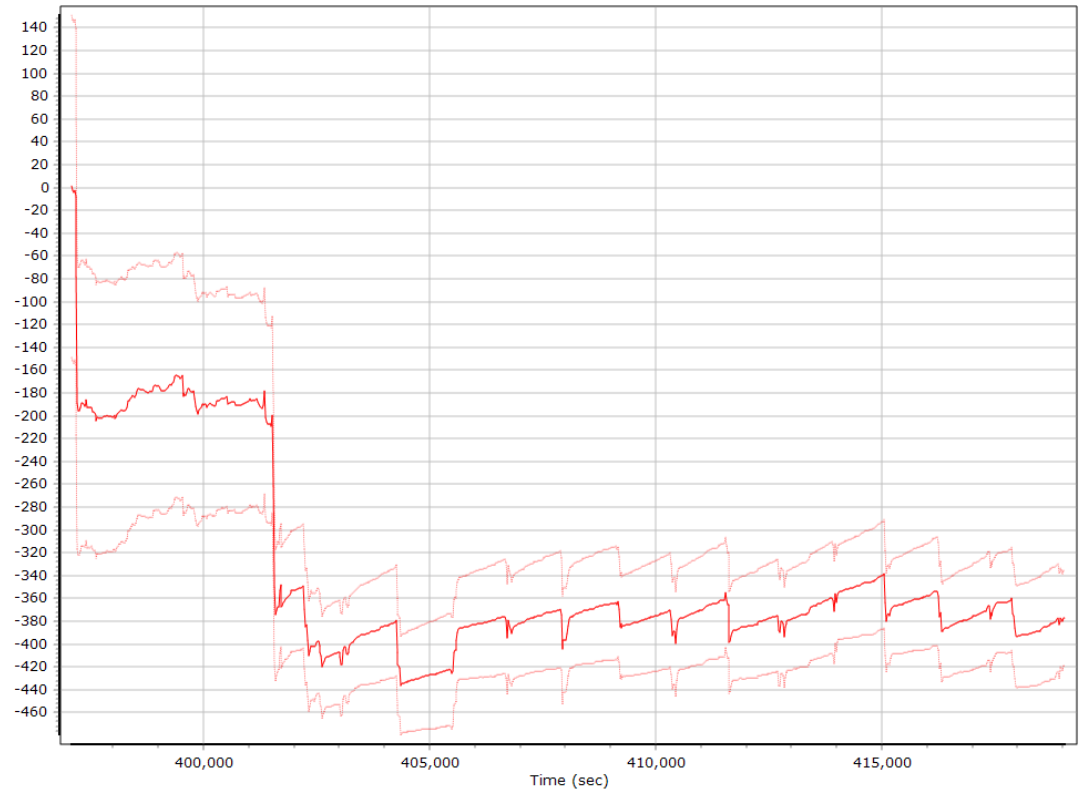
Z Gyro Bias (deg/h)



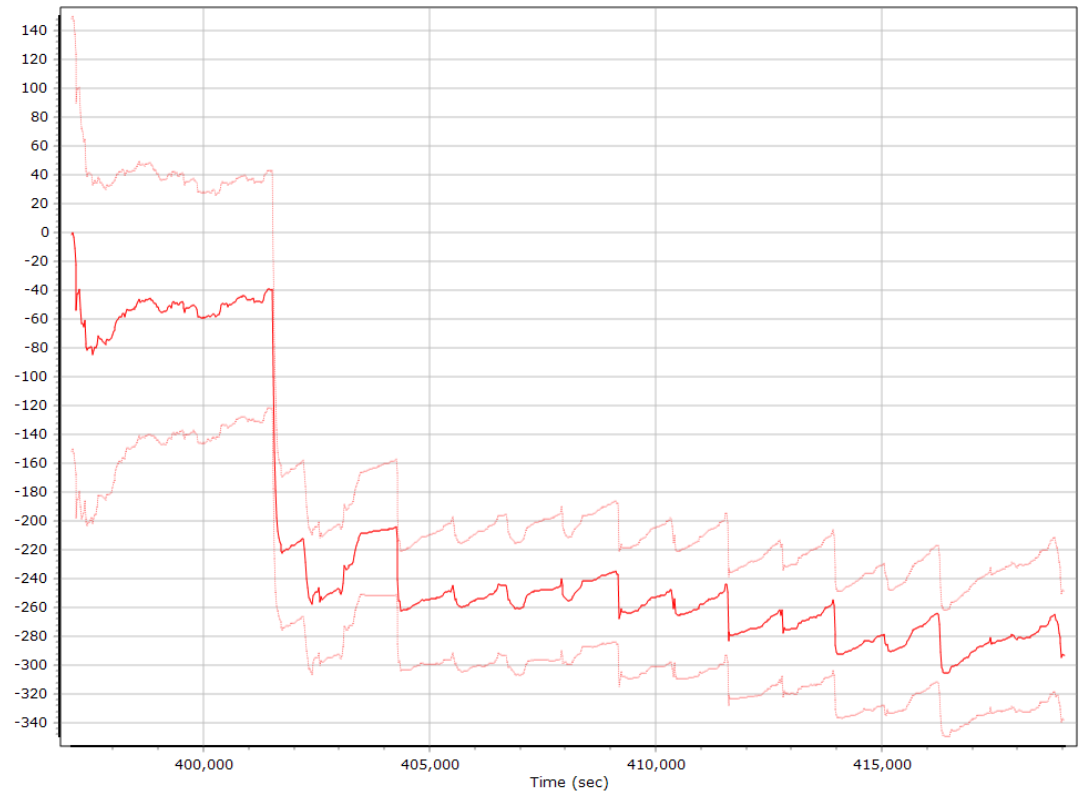
Gyro Scale Error (ppm)



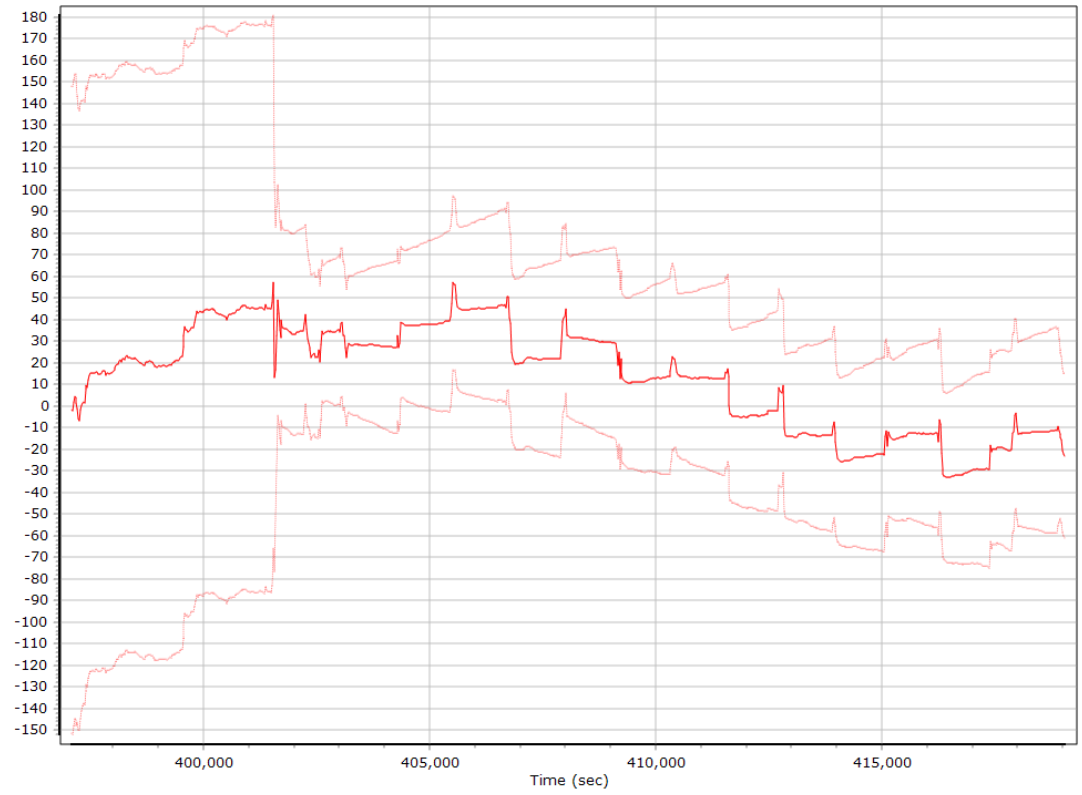
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

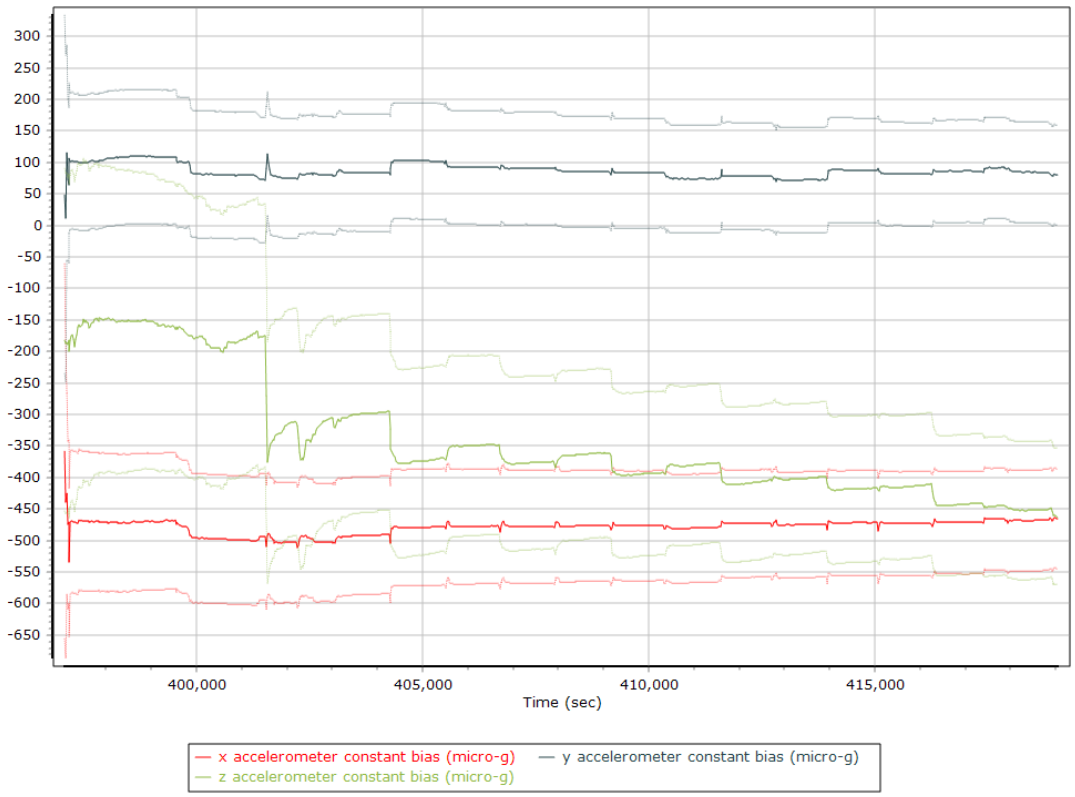


Z Gyro Scale Error (ppm)

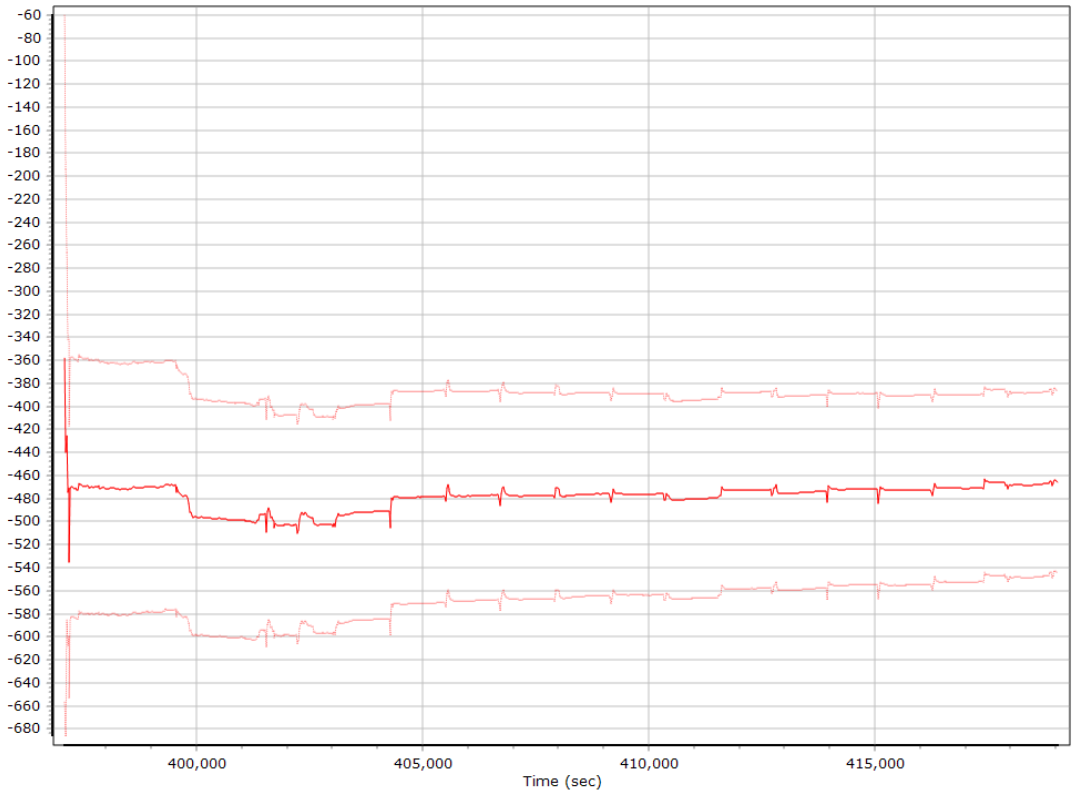


Forward Processed Estimated Constant Errors, Reference Frame

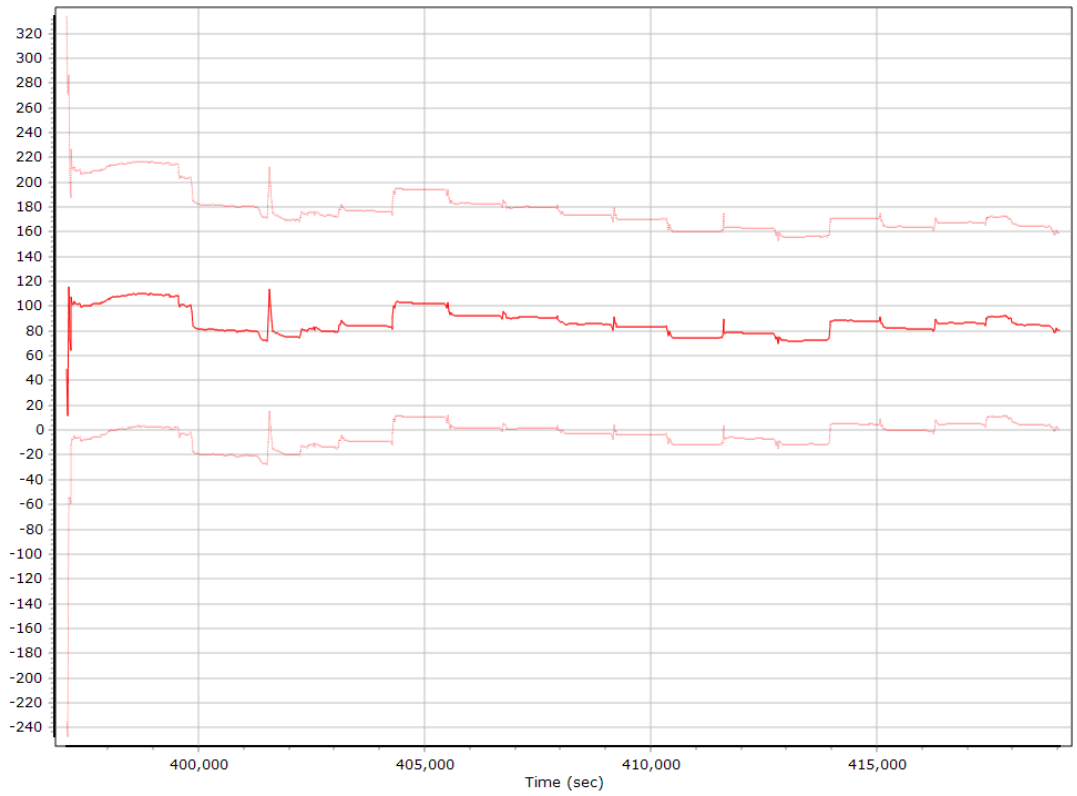
Accelerometer Bias (micro-g)



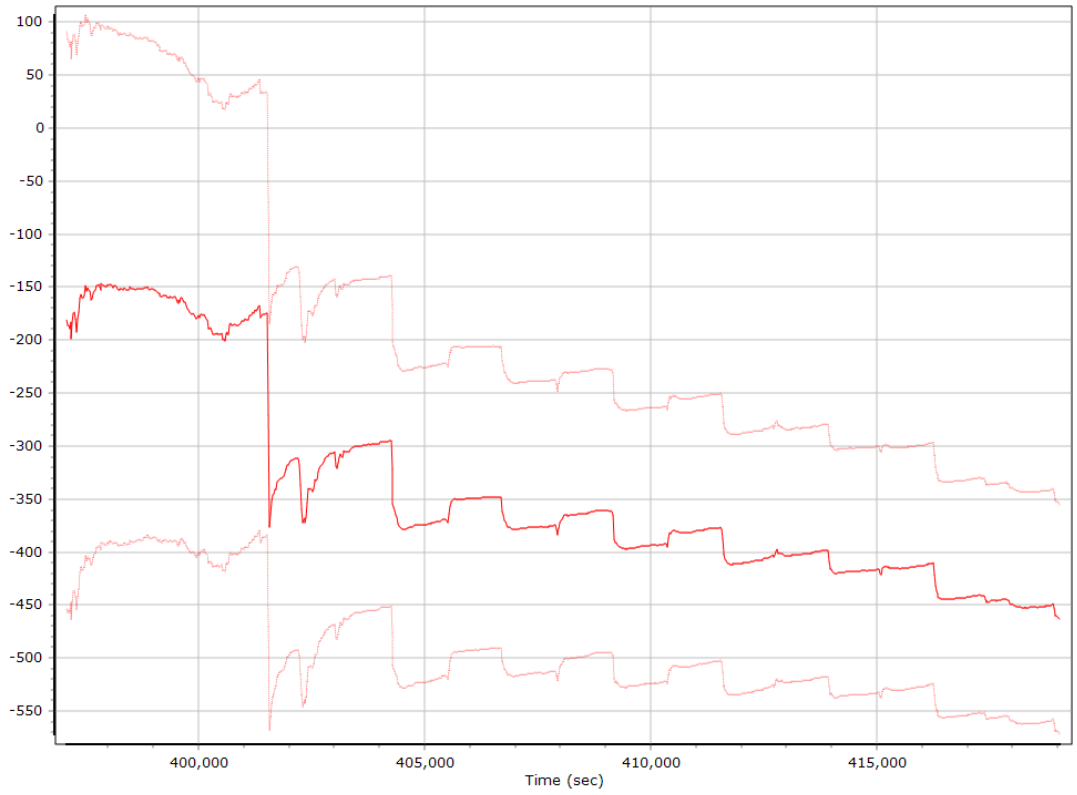
X Accelerometer Bias (micro-g)



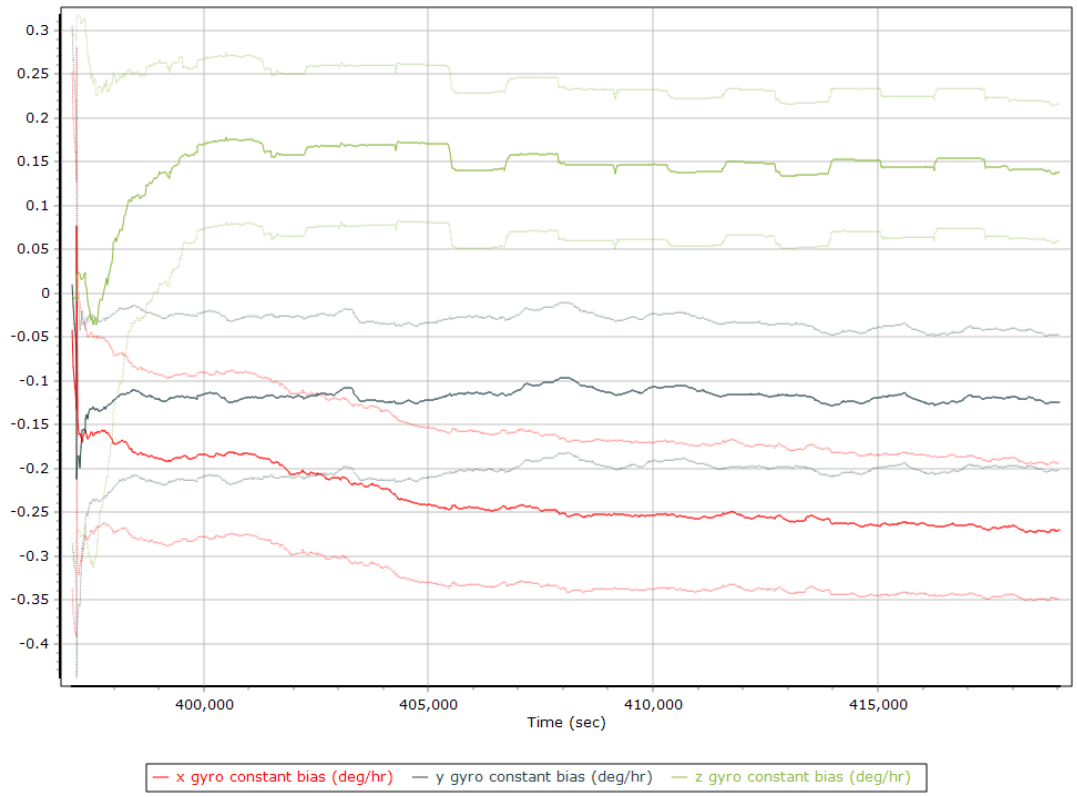
Y Accelerometer Bias (micro-g)



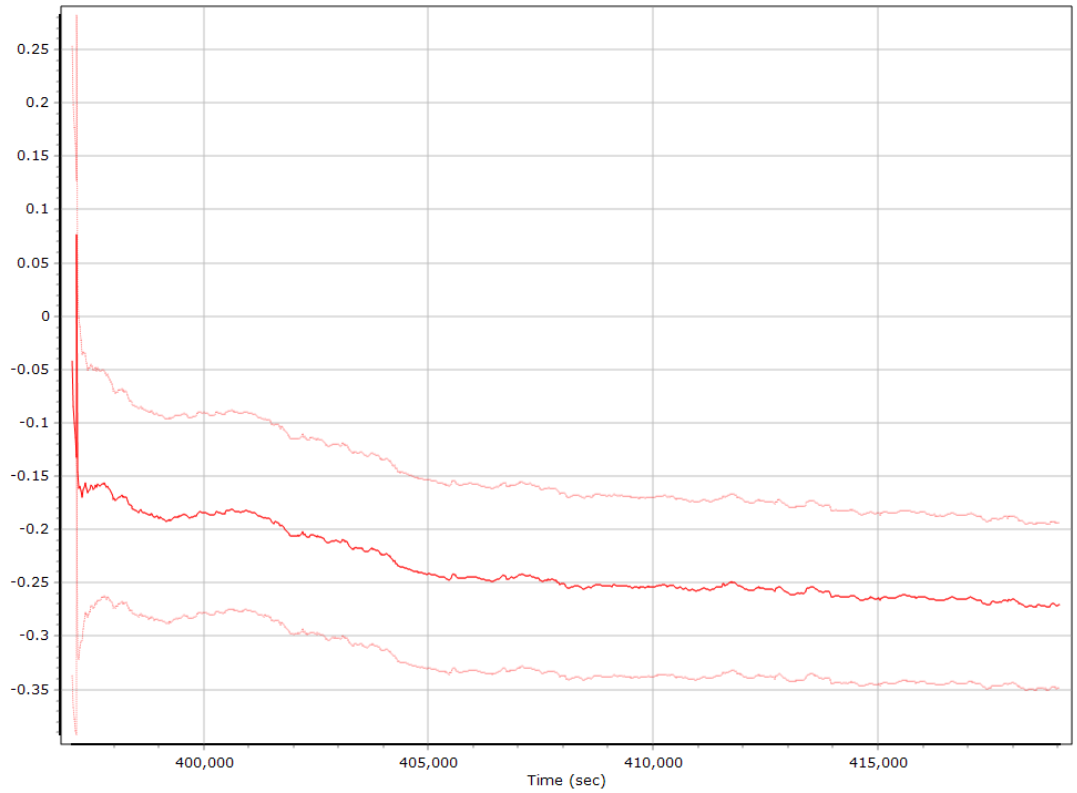
Z Accelerometer Bias (micro-g)



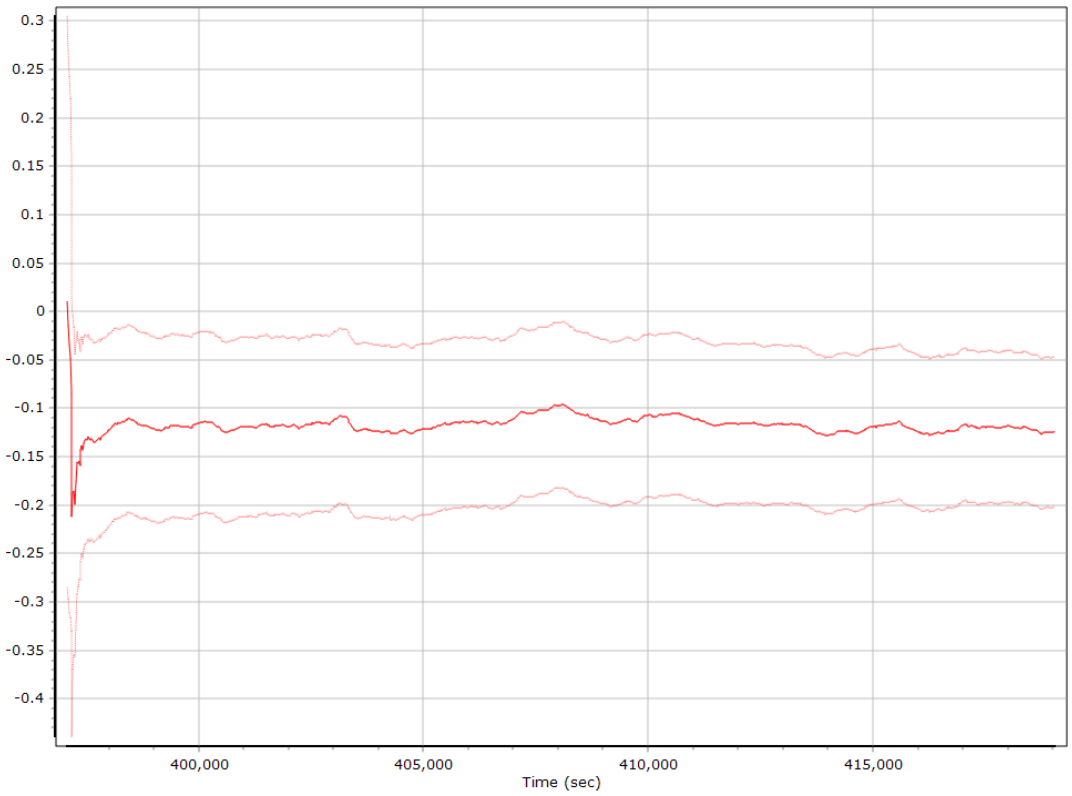
Gyro Bias (deg/h)



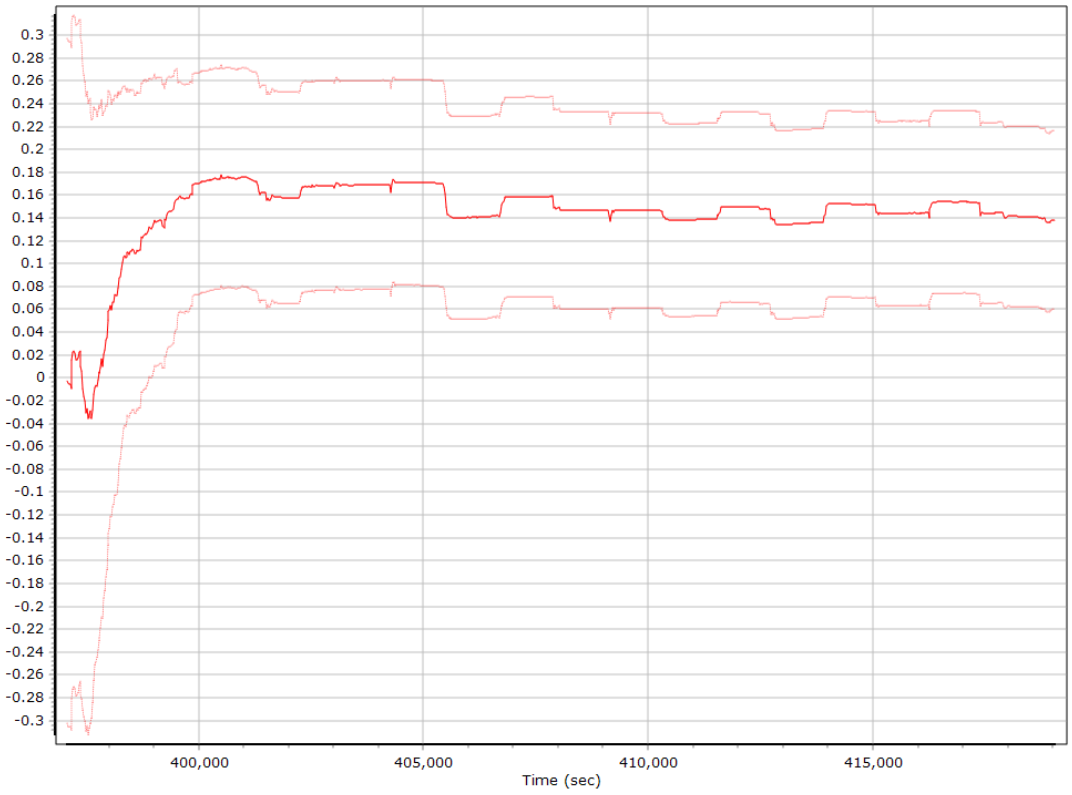
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

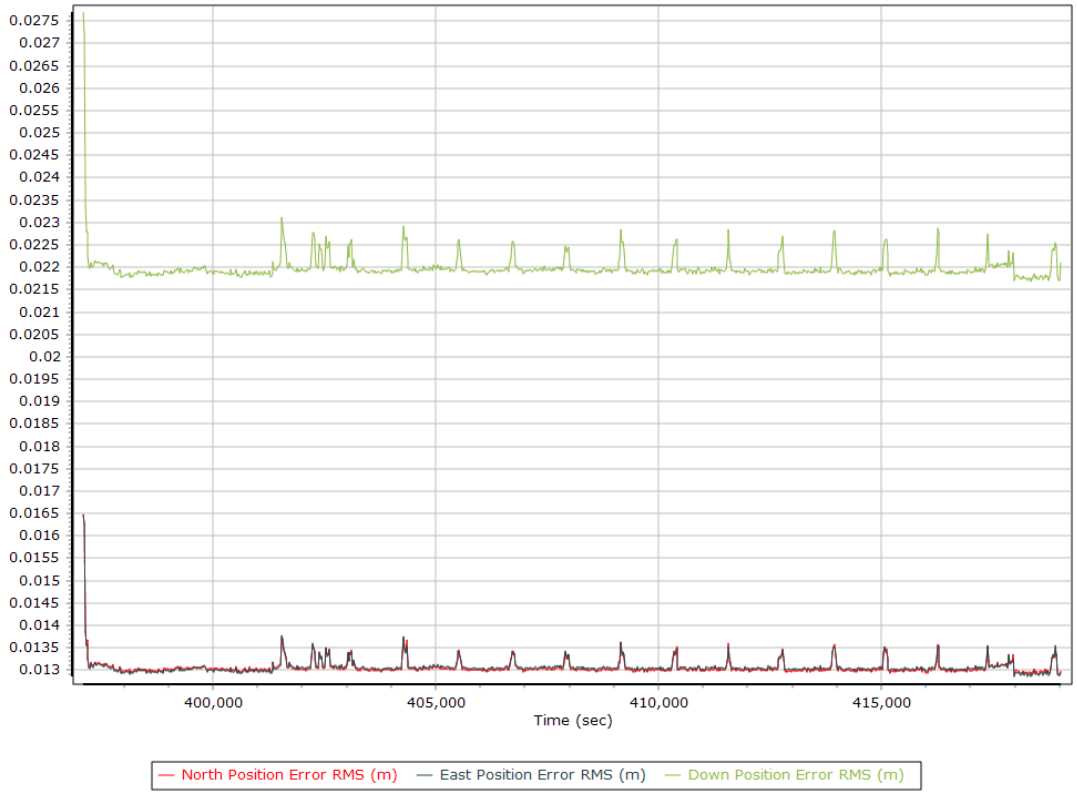


Z Gyro Bias (deg/h)

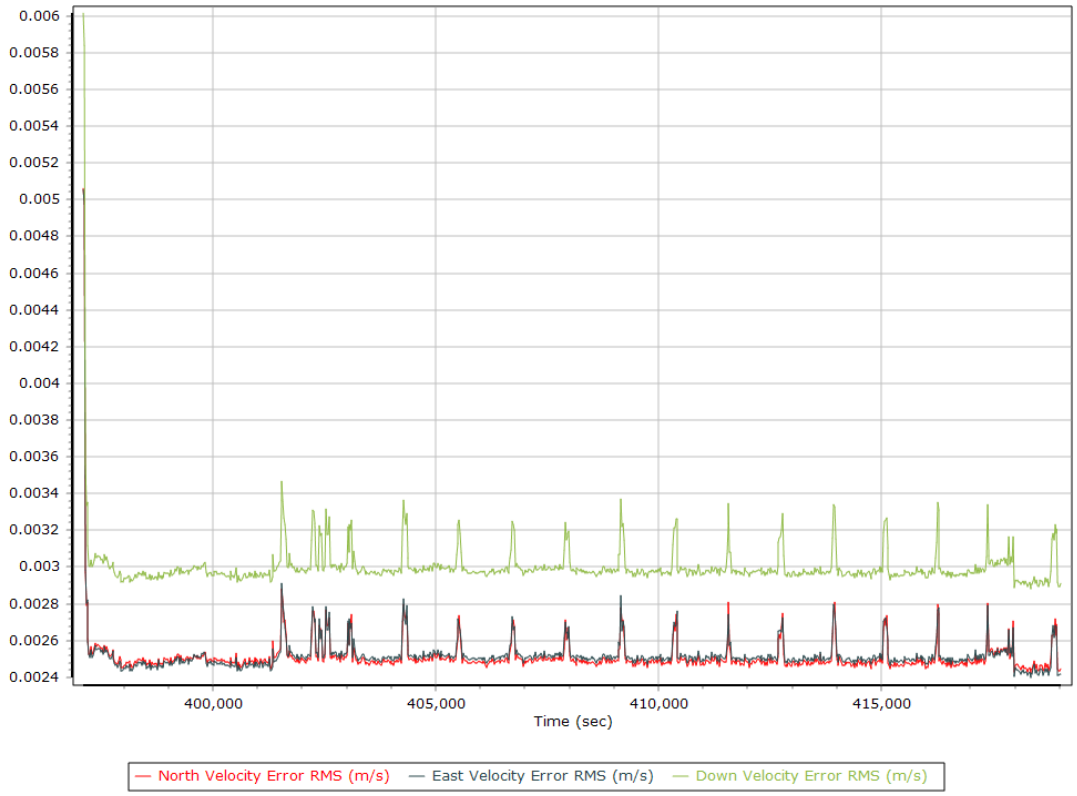


Smoothed Performance Metrics

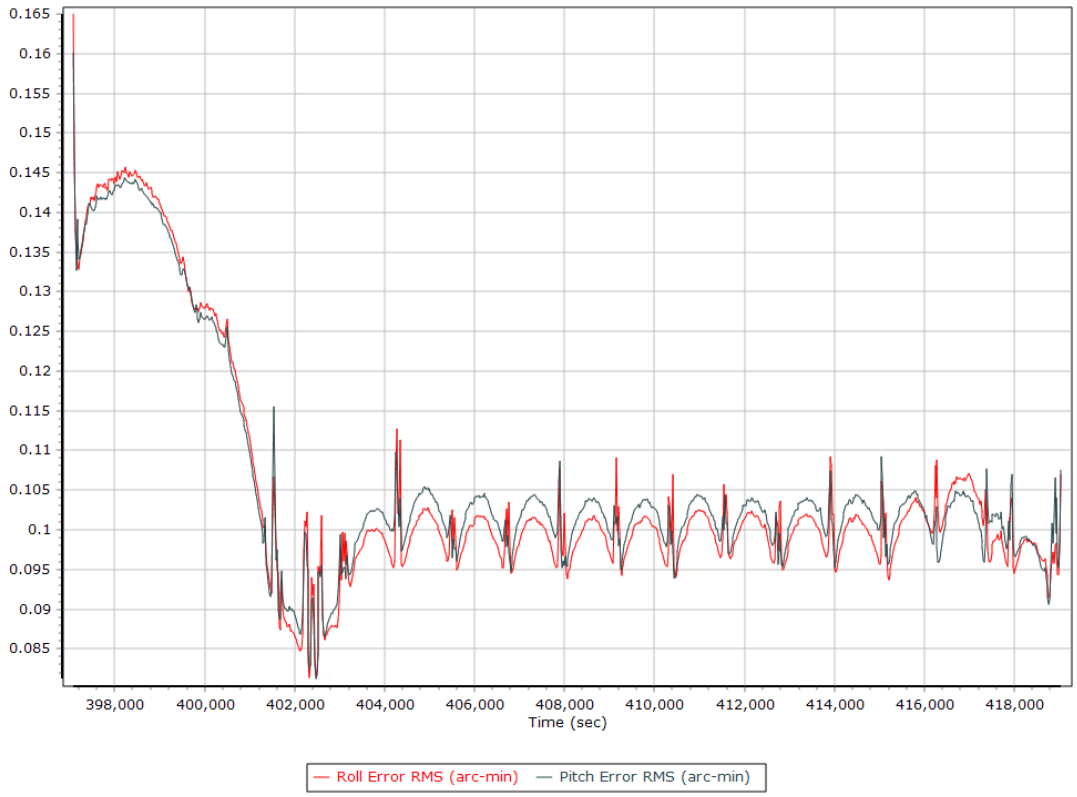
Position Error RMS (m)



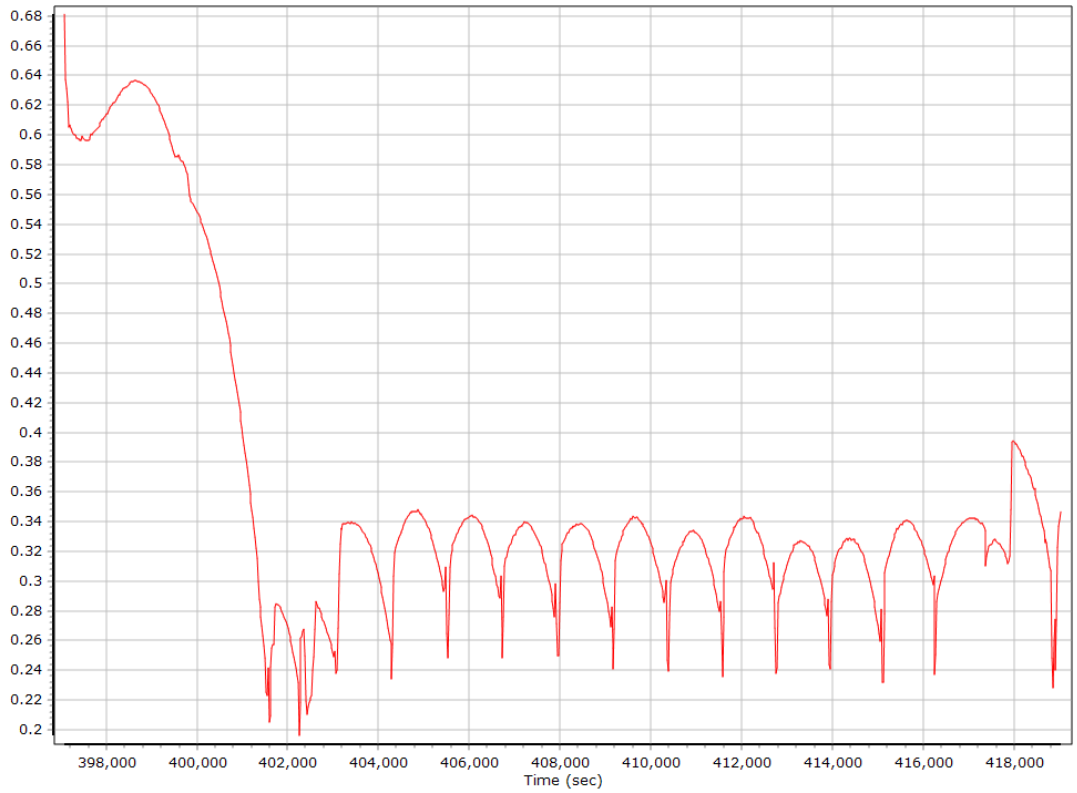
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

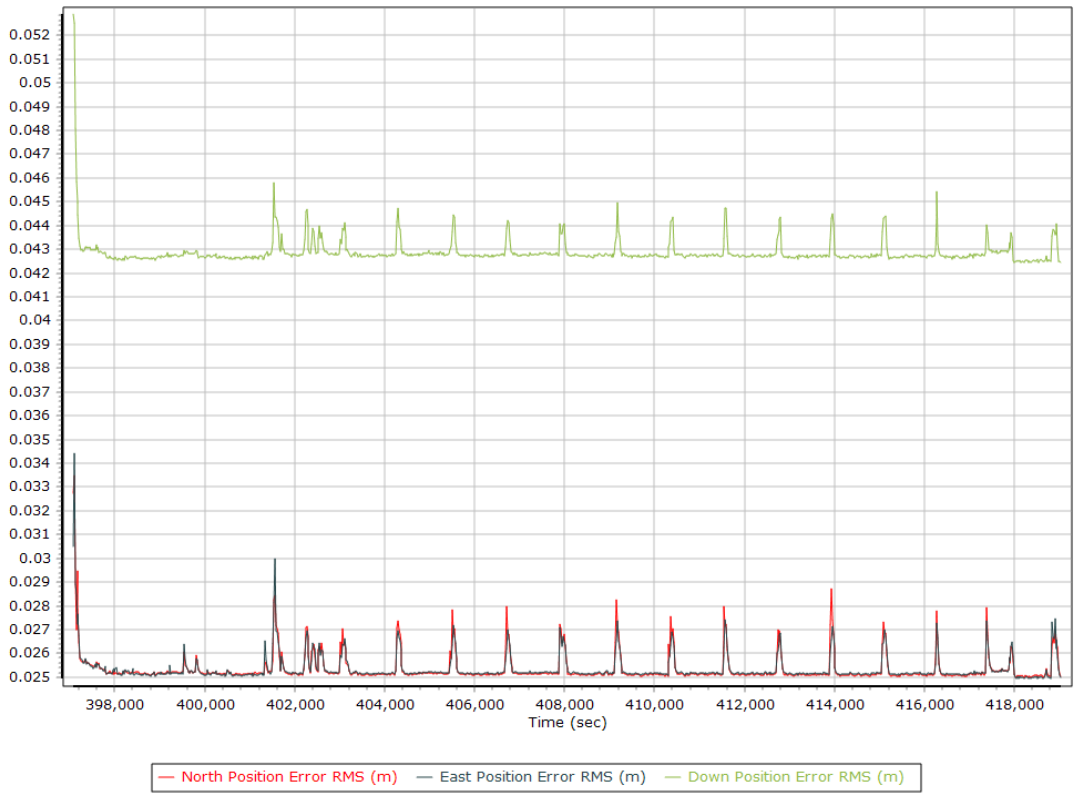


Heading Error RMS (arc-min)

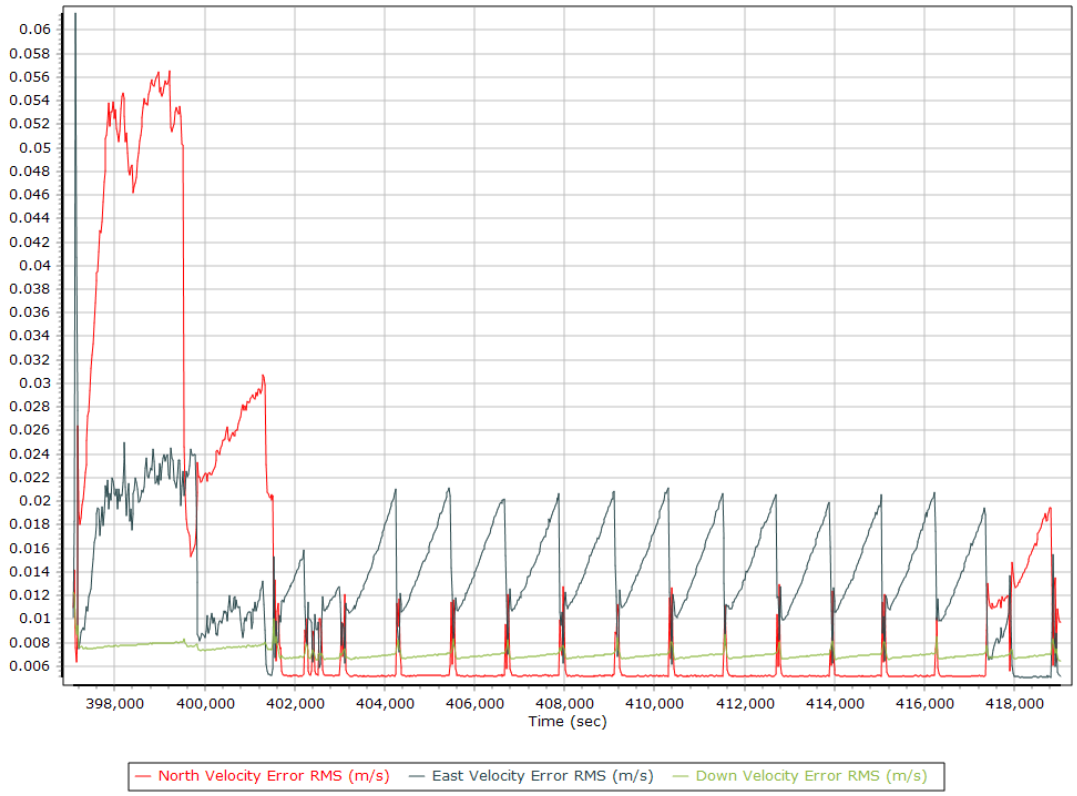


Forward Processed Performance Metrics

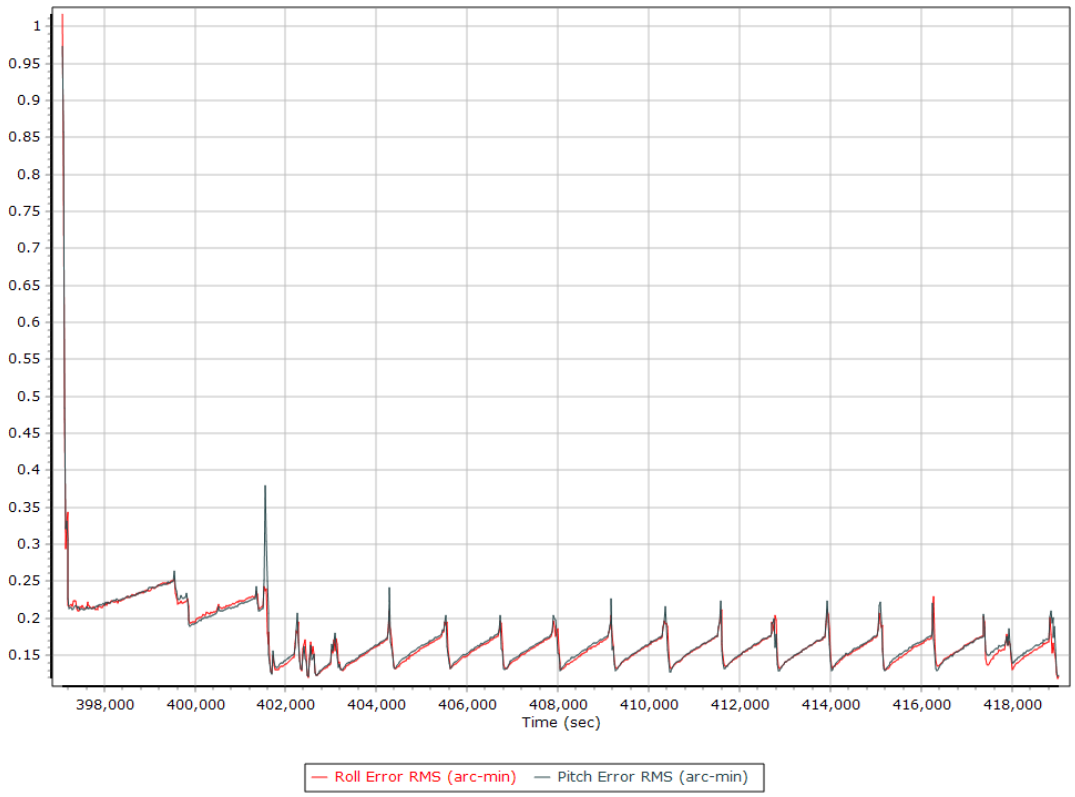
Position Error RMS (m)



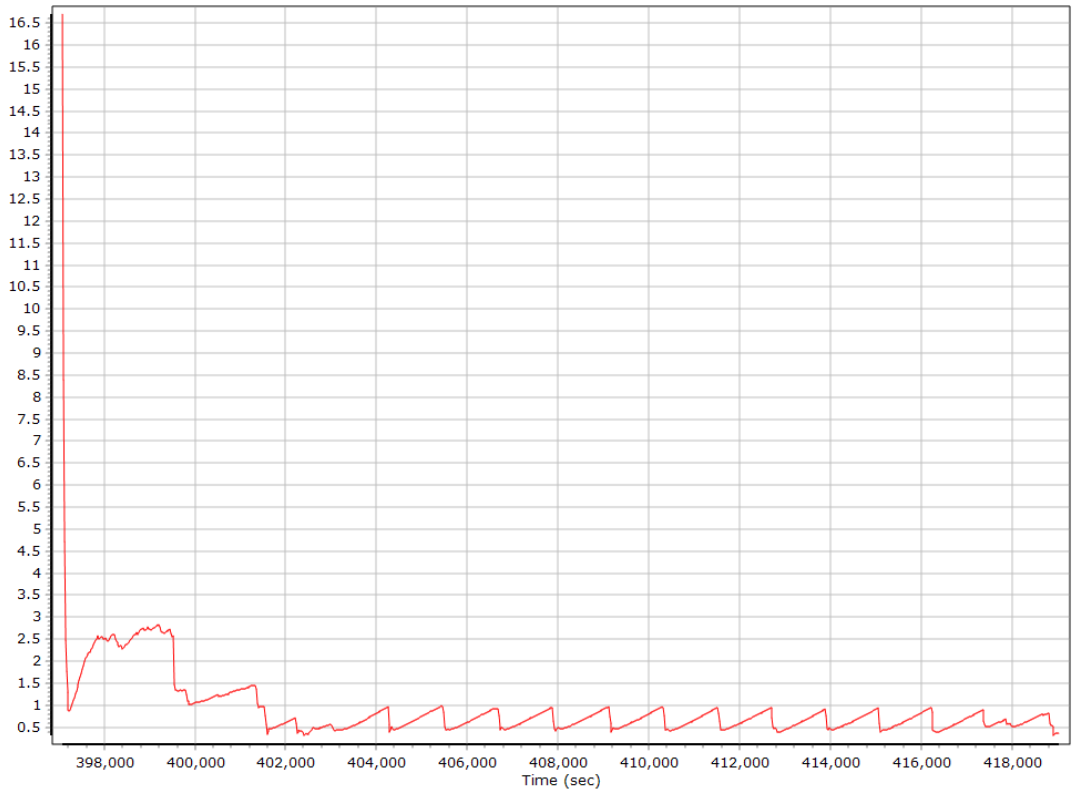
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

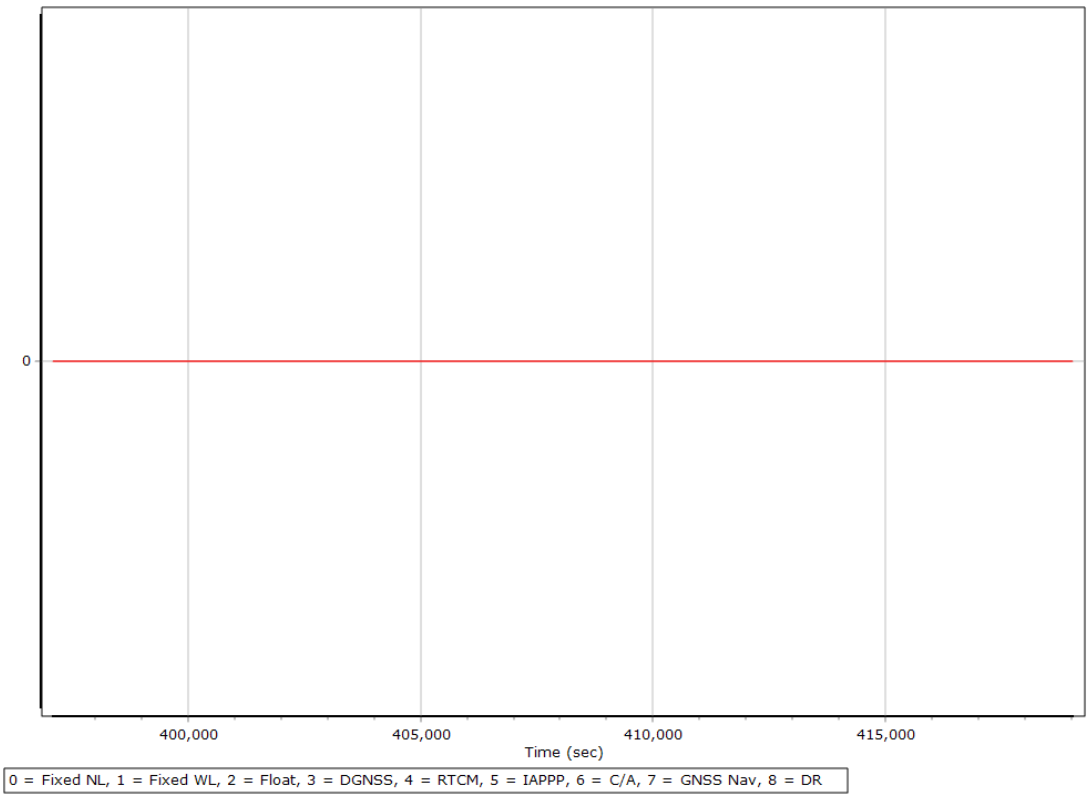


Heading Error RMS (arc-min)

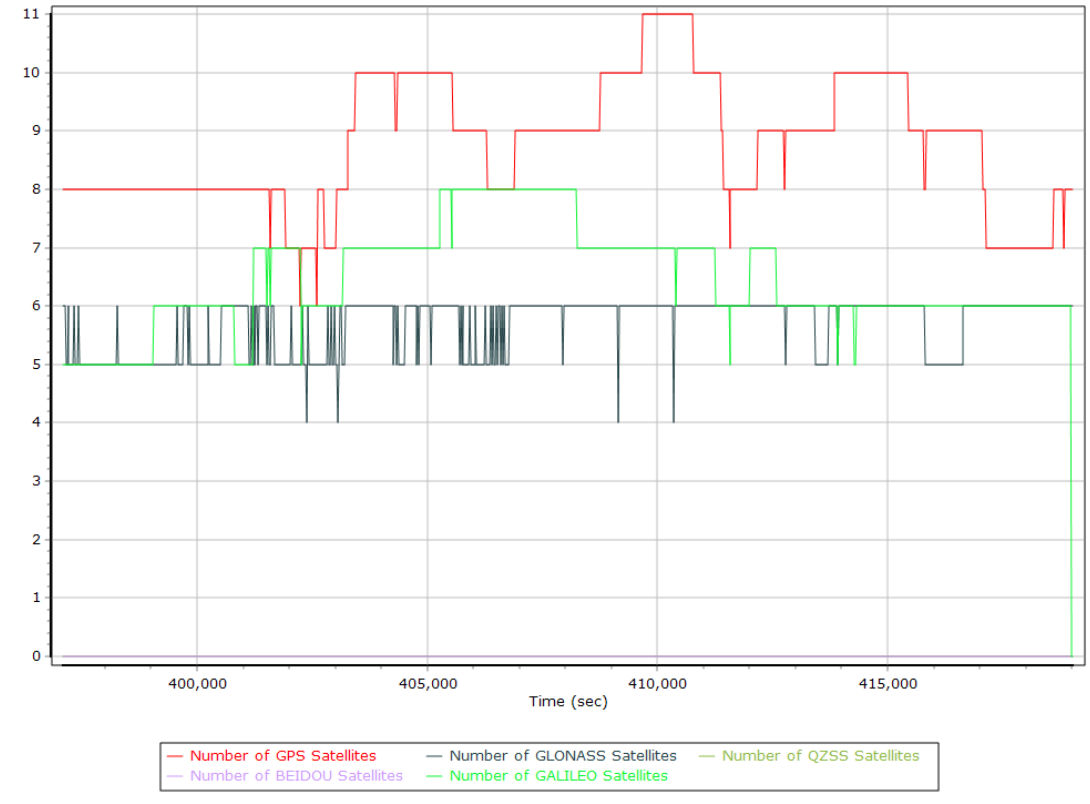


Forward Processed Solution Status

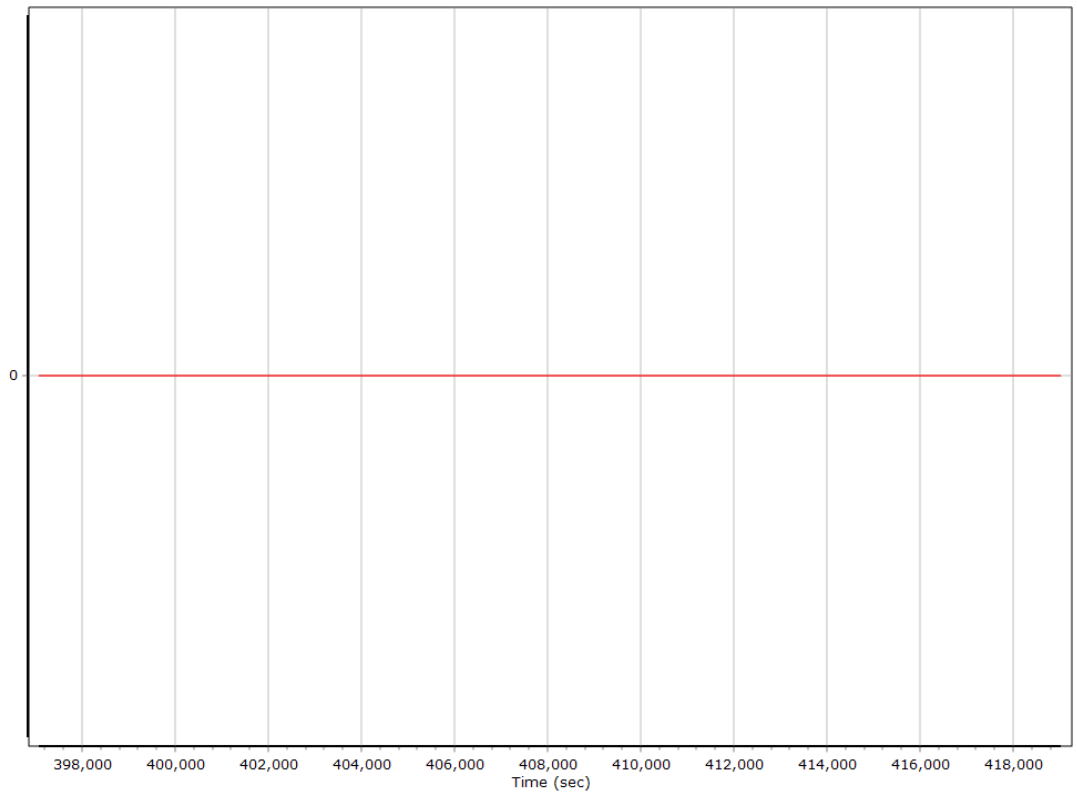
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12112020A_4040
Processing date	2022-01-05 15:05:00
Mission date	2020-12-11 14:41:12
Mission duration	05:02:57.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201211_144053_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3460.20g	GLONASS Broadcast Ephemeris
Ephm3460.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12112020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201211_144053_INS-GPS_1.raw		
Last raw data file	201211_144053_INS-GPS_1.raw		
Start GPS week	2135		
Start time	484853.507 (12/11/2020 2:40:53 PM)		
End time	503026.691 (12/11/2020 7:43:46 PM)		
Start of fine alignment	485121.560 (12/11/2020 2:45:21 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

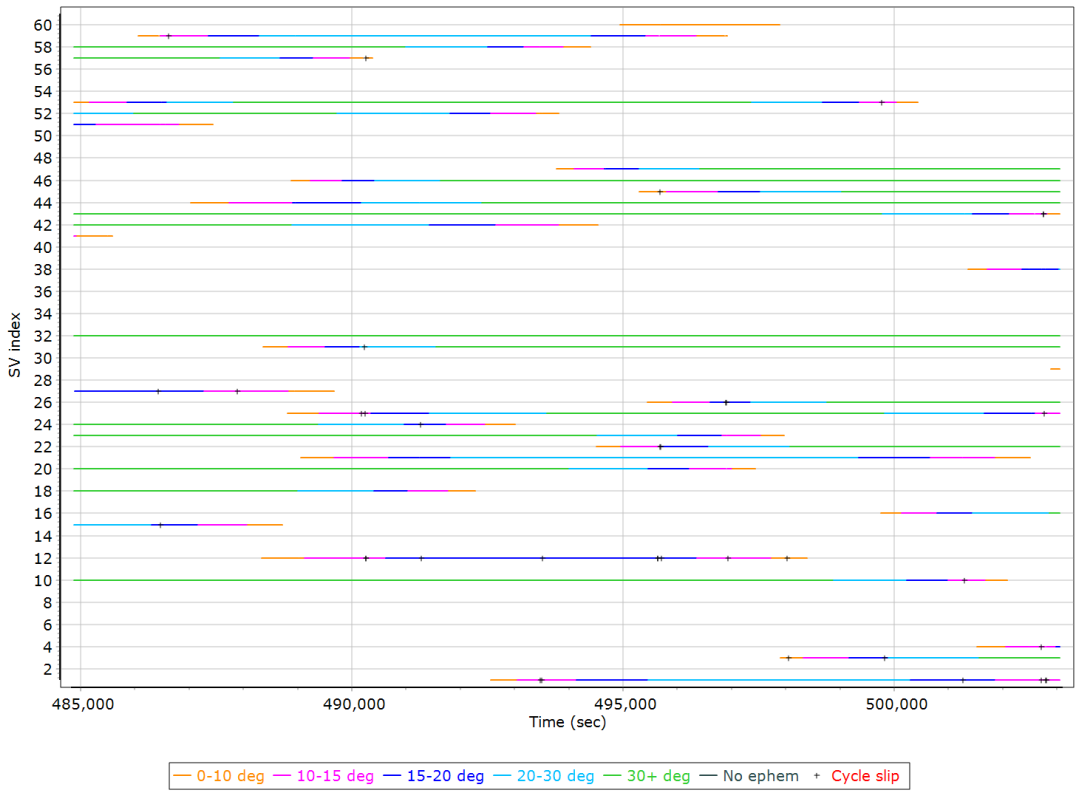
Rover Data QC

Raw IMU Import QC Summary

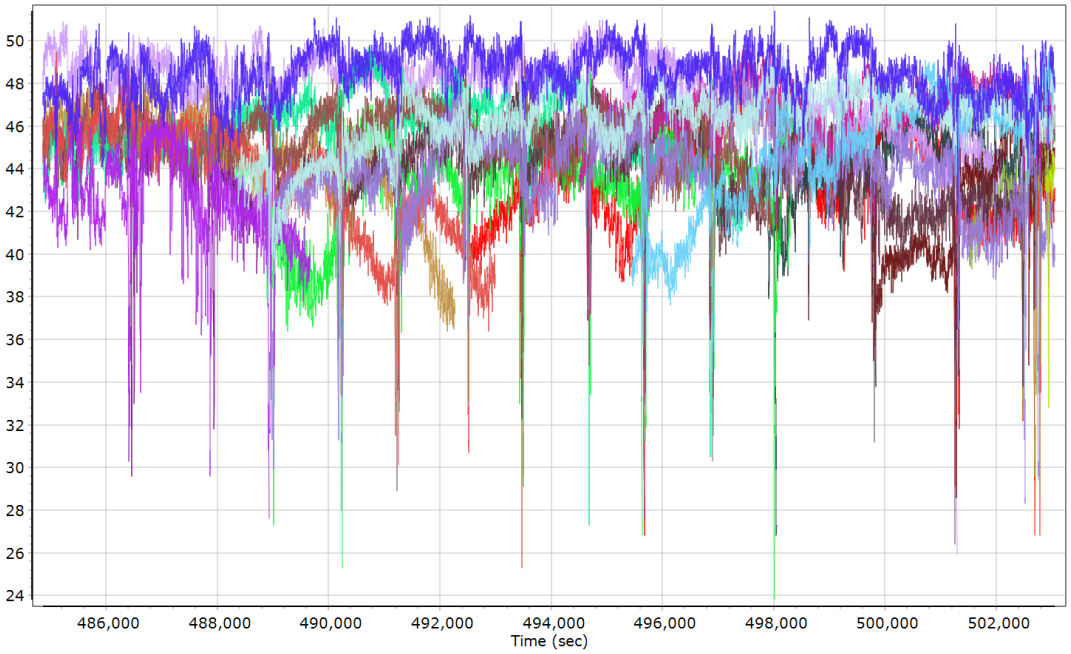
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12112020A_4040.log
IMU Records Processed	3634999
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

GPS/GLONASS L1 Satellite Lock/Elevation

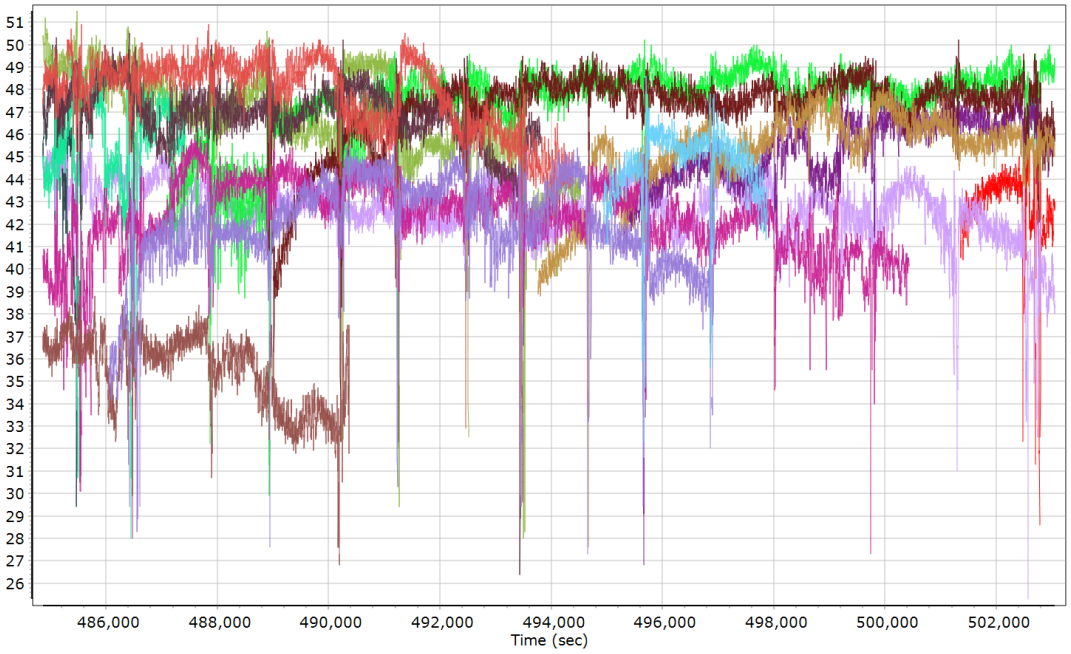


GPS L1 SNR



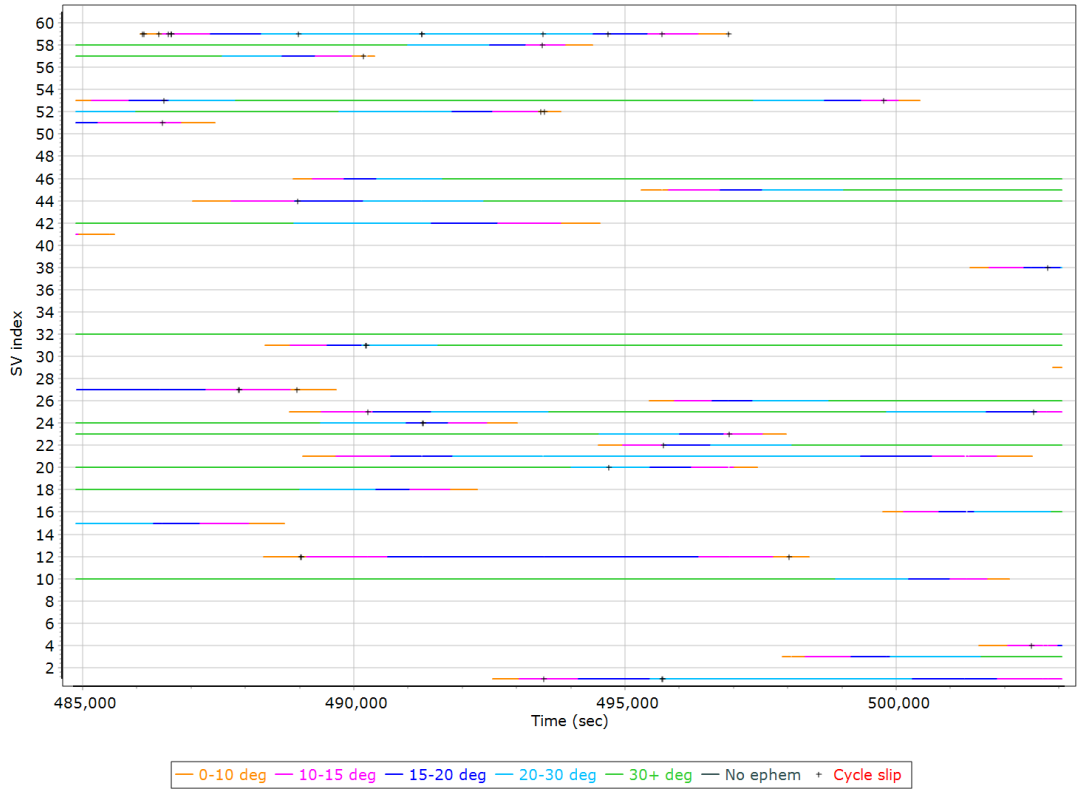
GPS PRN 01 L1 SNR (dB/Hz) GPS PRN 03 L1 SNR (dB/Hz) GPS PRN 04 L1 SNR (dB/Hz) GPS PRN 10 L1 SNR (dB/Hz)
GPS PRN 12 L1 SNR (dB/Hz) GPS PRN 15 L1 SNR (dB/Hz) GPS PRN 16 L1 SNR (dB/Hz) GPS PRN 18 L1 SNR (dB/Hz)
GPS PRN 20 L1 SNR (dB/Hz) GPS PRN 21 L1 SNR (dB/Hz) GPS PRN 22 L1 SNR (dB/Hz) GPS PRN 23 L1 SNR (dB/Hz)
GPS PRN 24 L1 SNR (dB/Hz) GPS PRN 25 L1 SNR (dB/Hz) GPS PRN 26 L1 SNR (dB/Hz) GPS PRN 27 L1 SNR (dB/Hz)
GPS PRN 29 L1 SNR (dB/Hz) GPS PRN 31 L1 SNR (dB/Hz) GPS PRN 32 L1 SNR (dB/Hz)

GLONASS L1 SNR

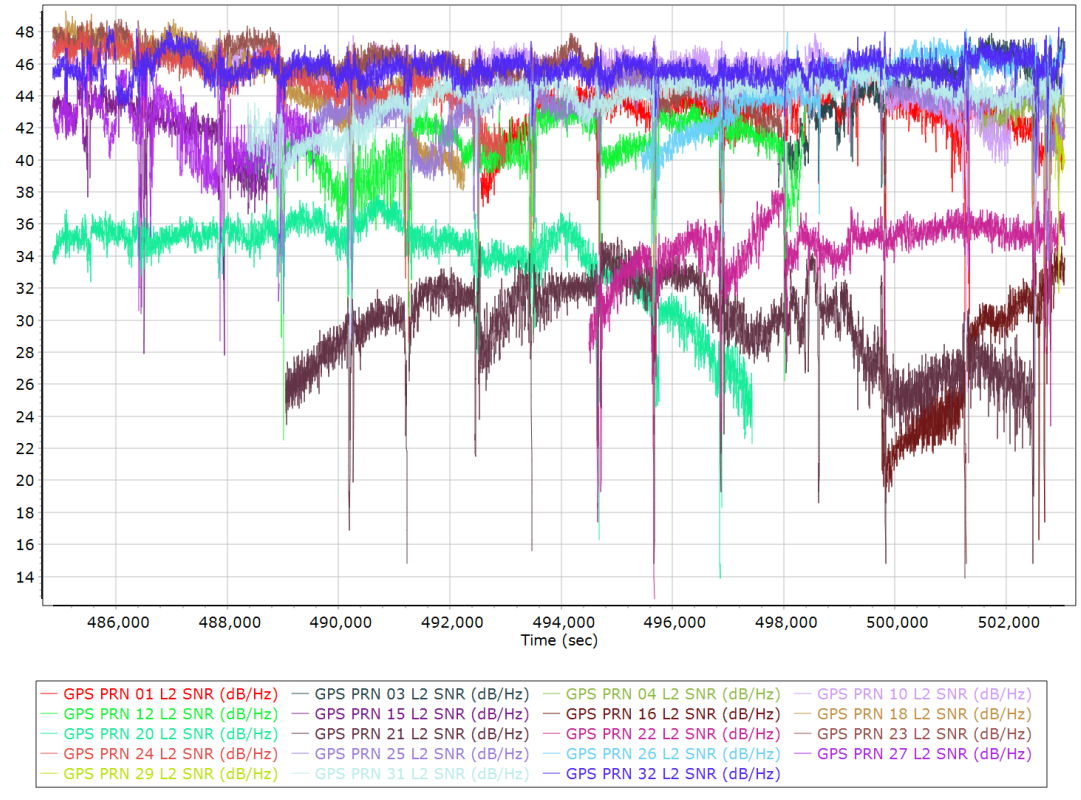


GLONASS 01 L1 SNR (dB/Hz) GLONASS 04 L1 SNR (dB/Hz) GLONASS 05 L1 SNR (dB/Hz)
GLONASS 06 L1 SNR (dB/Hz) GLONASS 07 L1 SNR (dB/Hz) GLONASS 08 L1 SNR (dB/Hz)
GLONASS 09 L1 SNR (dB/Hz) GLONASS 10 L1 SNR (dB/Hz) GLONASS 14 L1 SNR (dB/Hz)
GLONASS 15 L1 SNR (dB/Hz) GLONASS 16 L1 SNR (dB/Hz) GLONASS 20 L1 SNR (dB/Hz)
GLONASS 21 L1 SNR (dB/Hz) GLONASS 22 L1 SNR (dB/Hz) GLONASS 23 L1 SNR (dB/Hz)

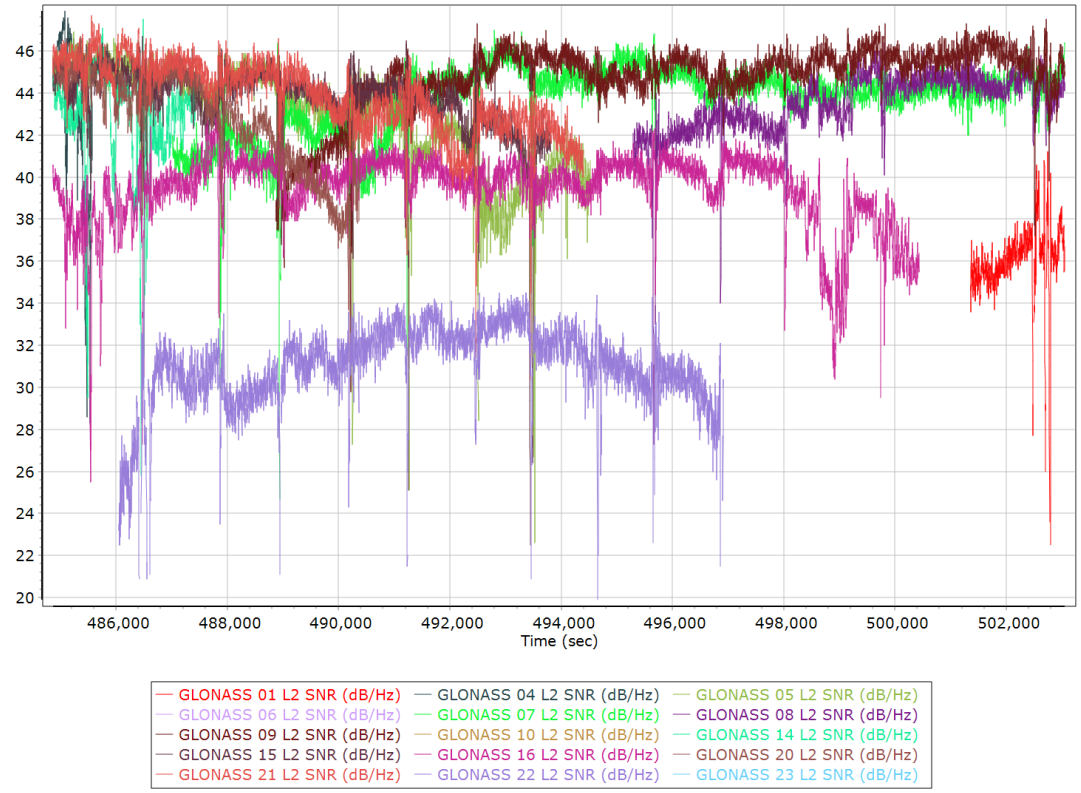
GPS/GLONASS L2 Satellite Lock/Elevation



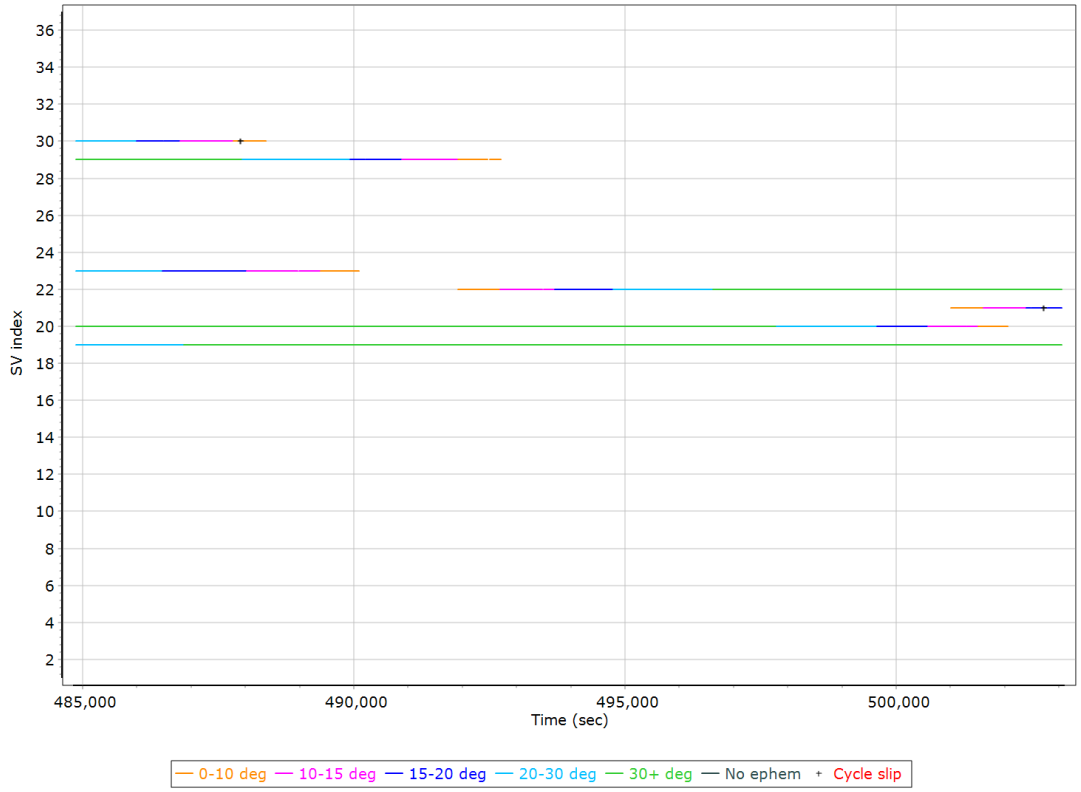
GPS L2 SNR



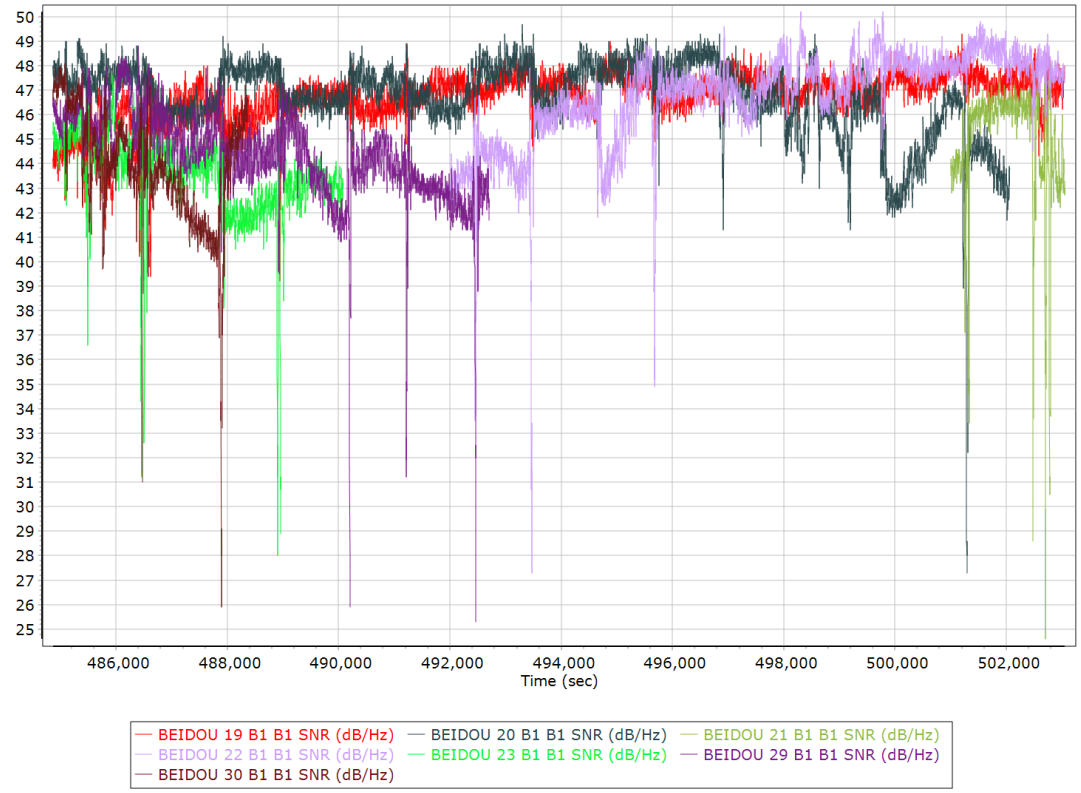
GLONASS L2 SNR



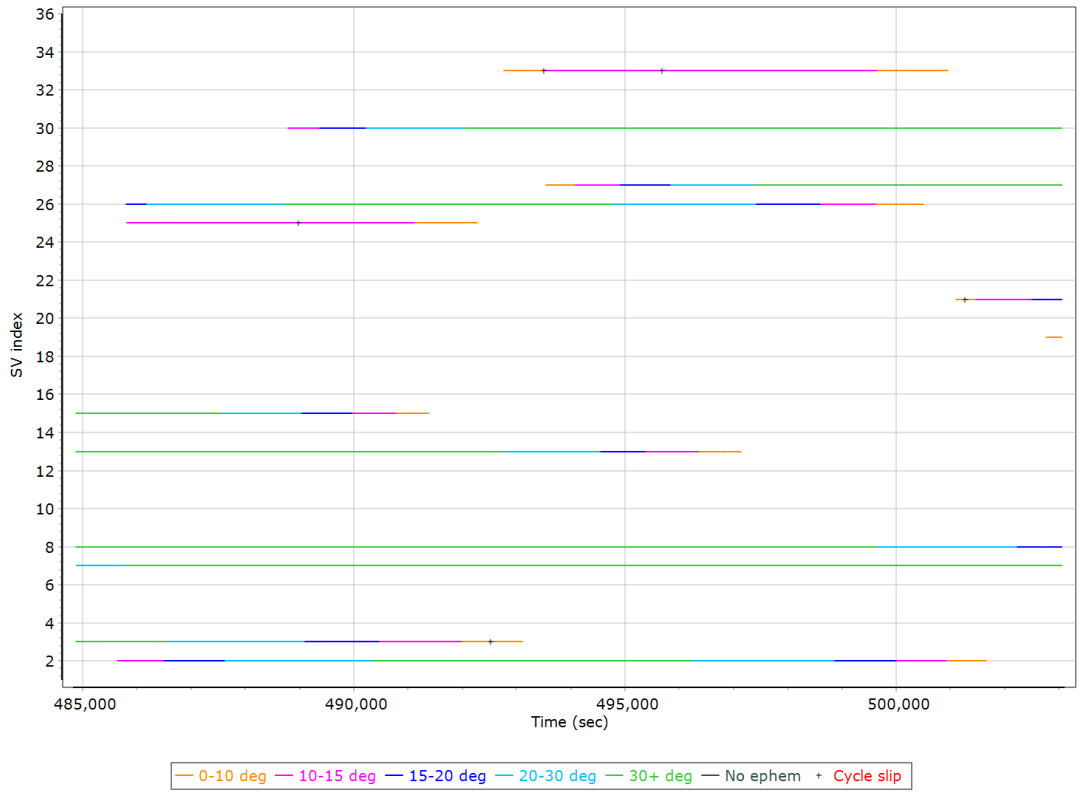
BEIDOU Satellite Lock/Elevation



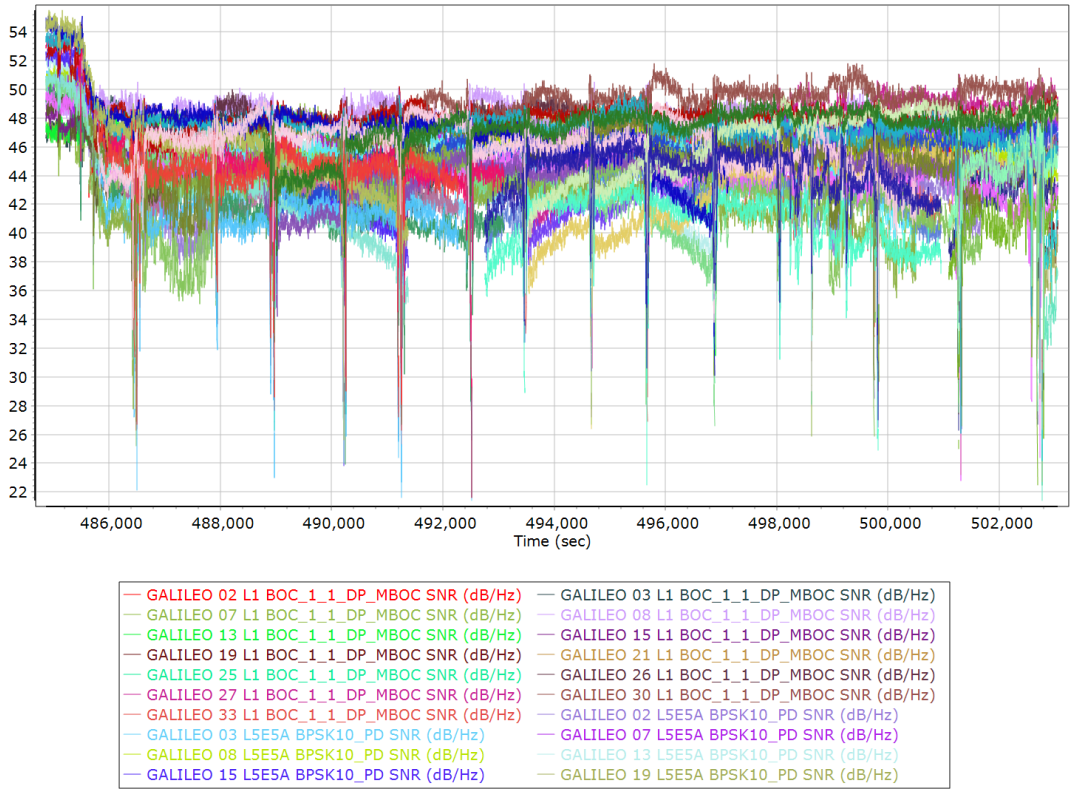
BEIDOU SNR



GALILEO Satellite Lock/Elevation

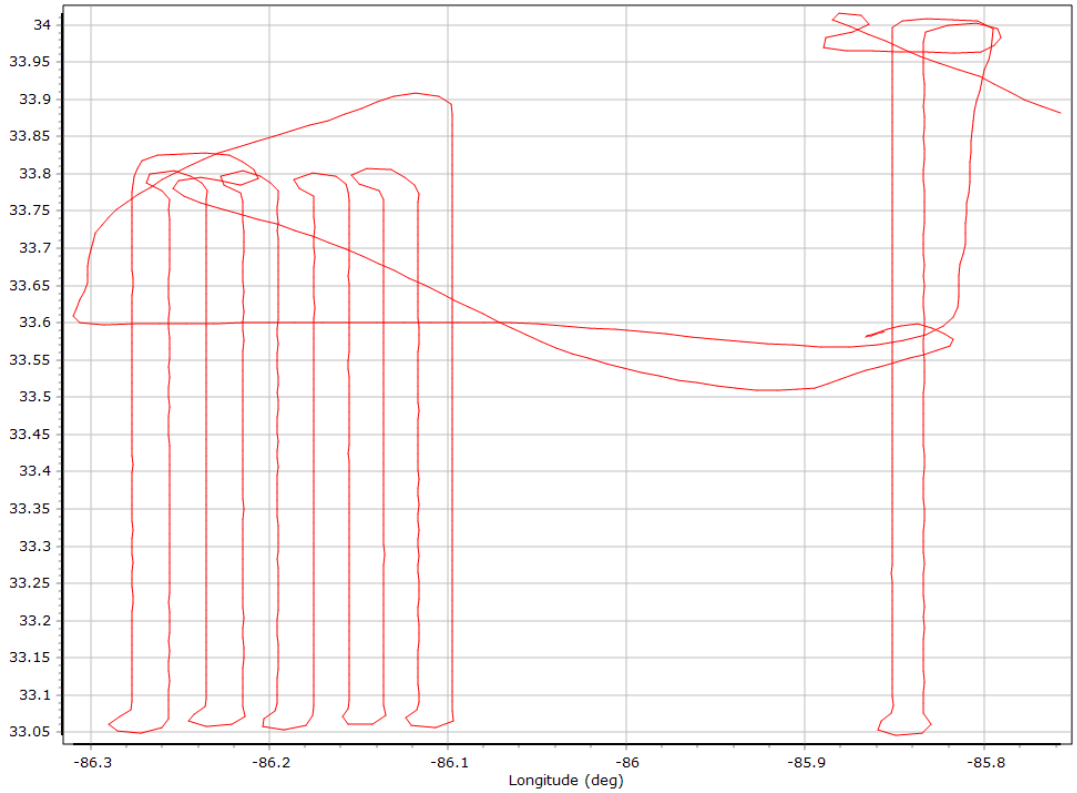


GALILEO SNR

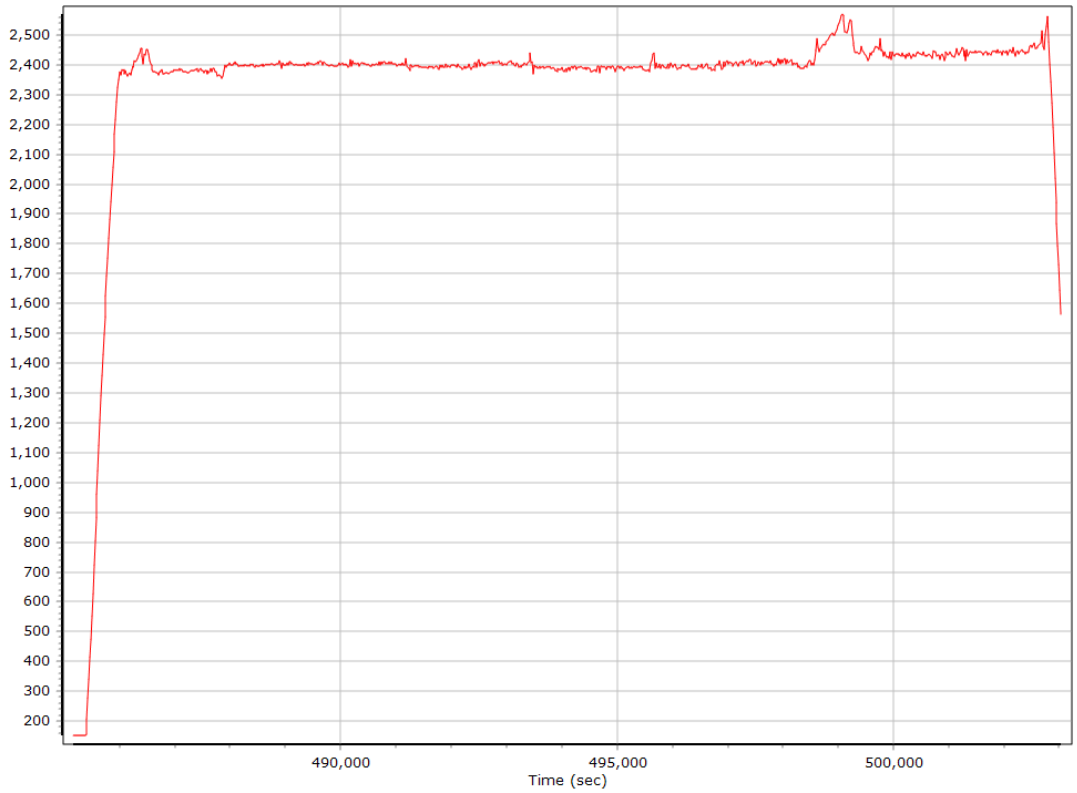

54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
486,000
488,000
490,000
492,000
494,000
496,000
498,000
500,000
502,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

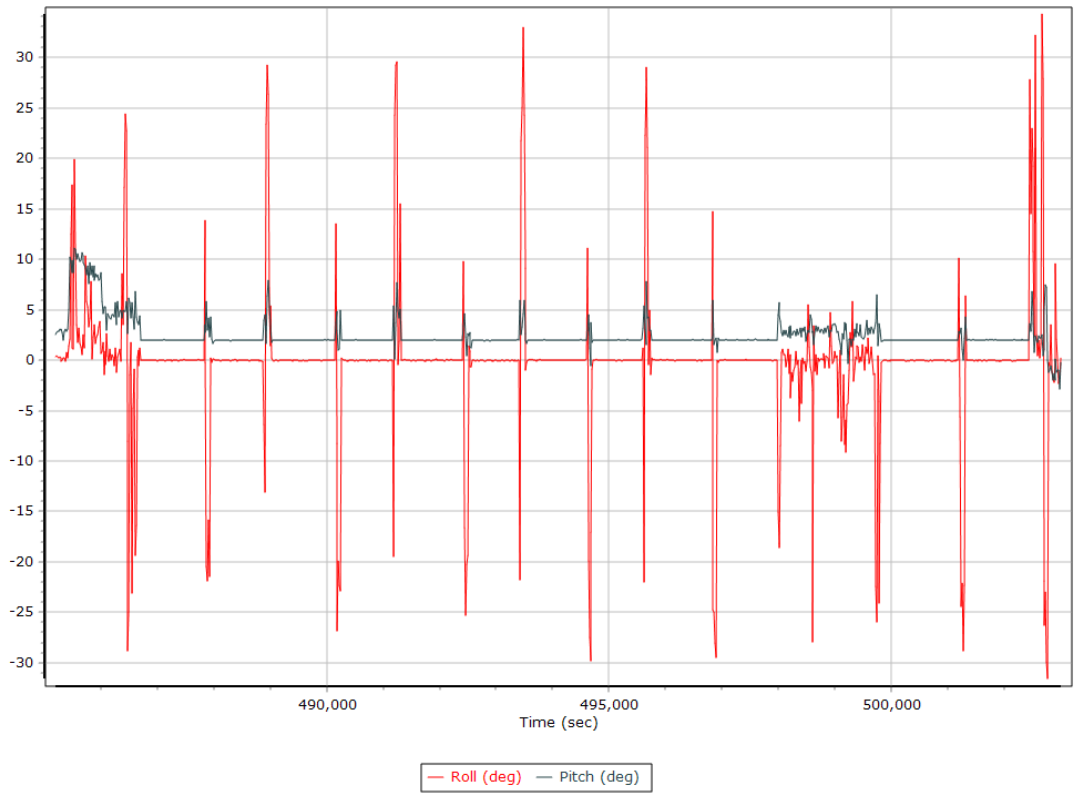
Top View



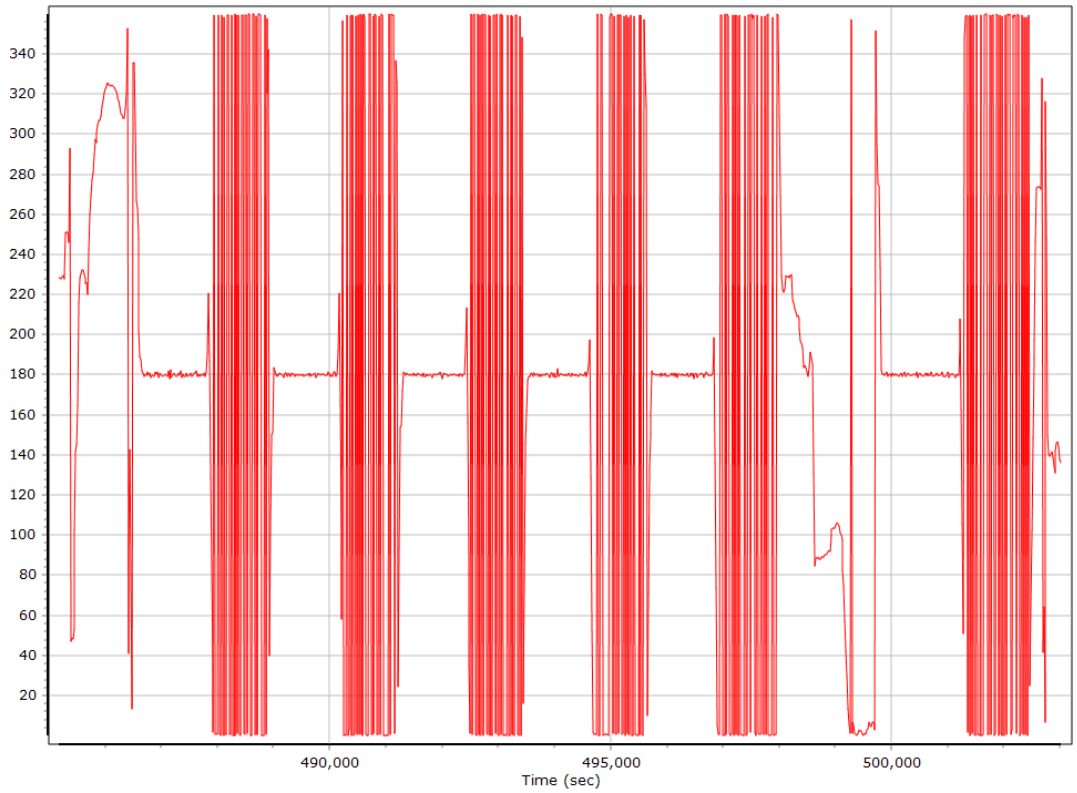
Altitude



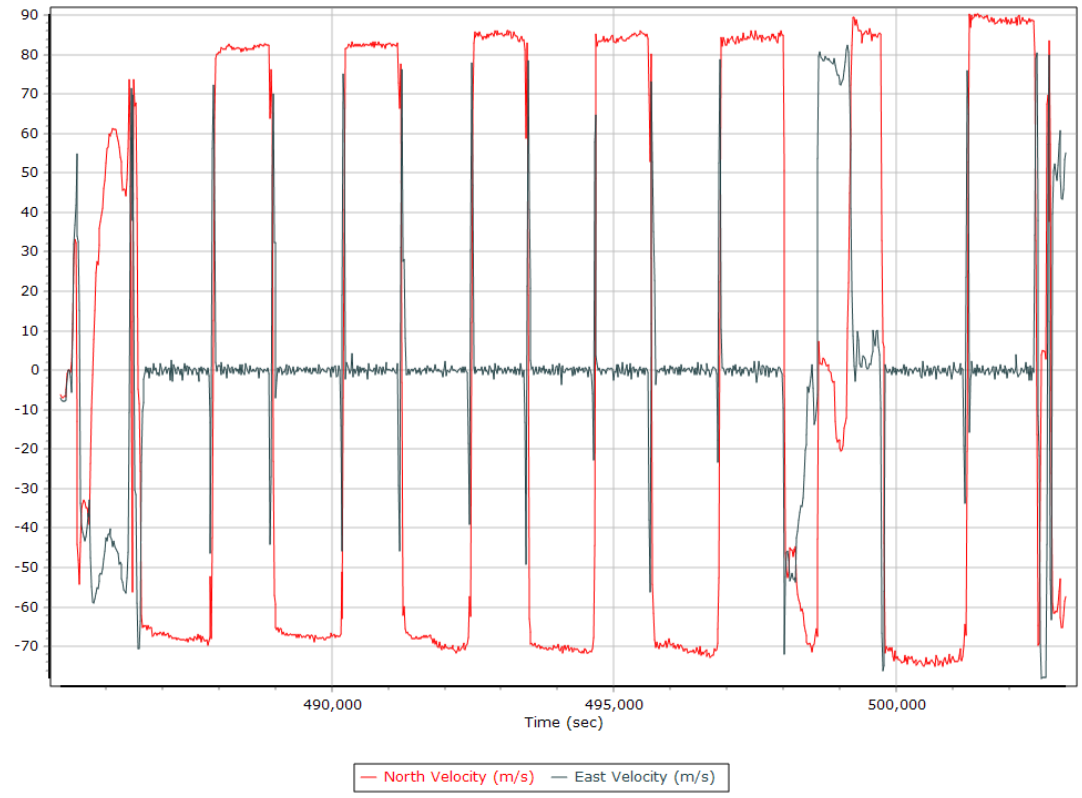
Roll/Pitch



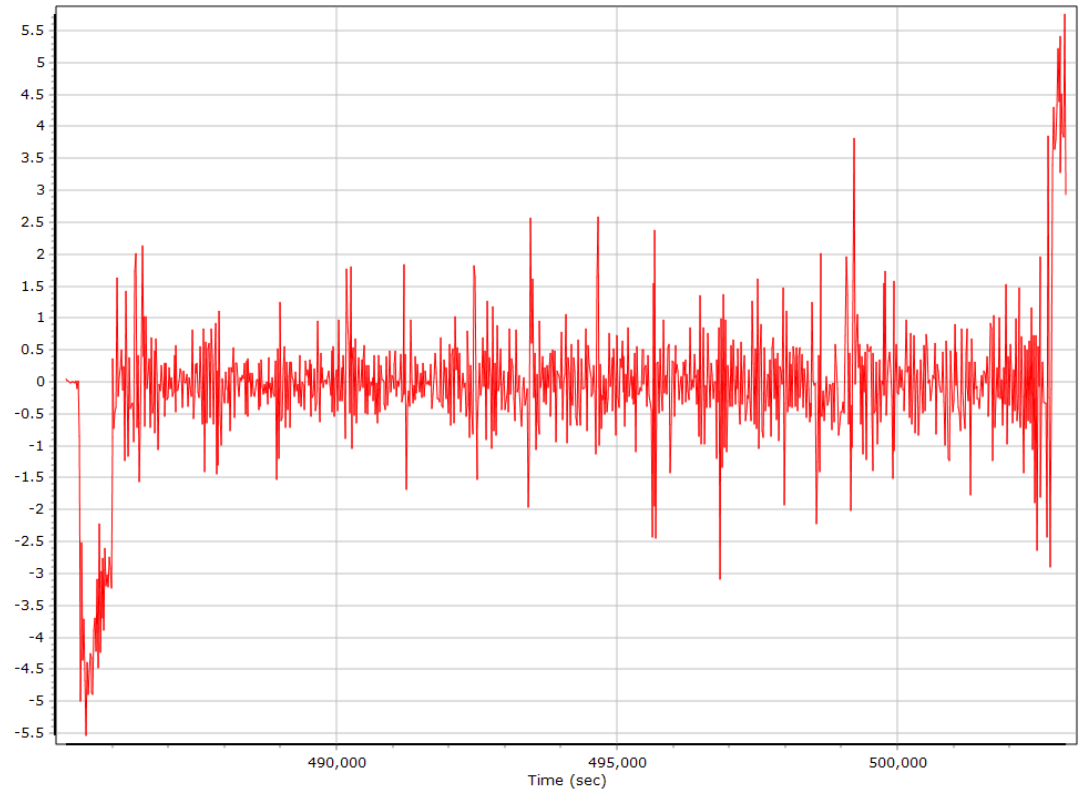
Heading



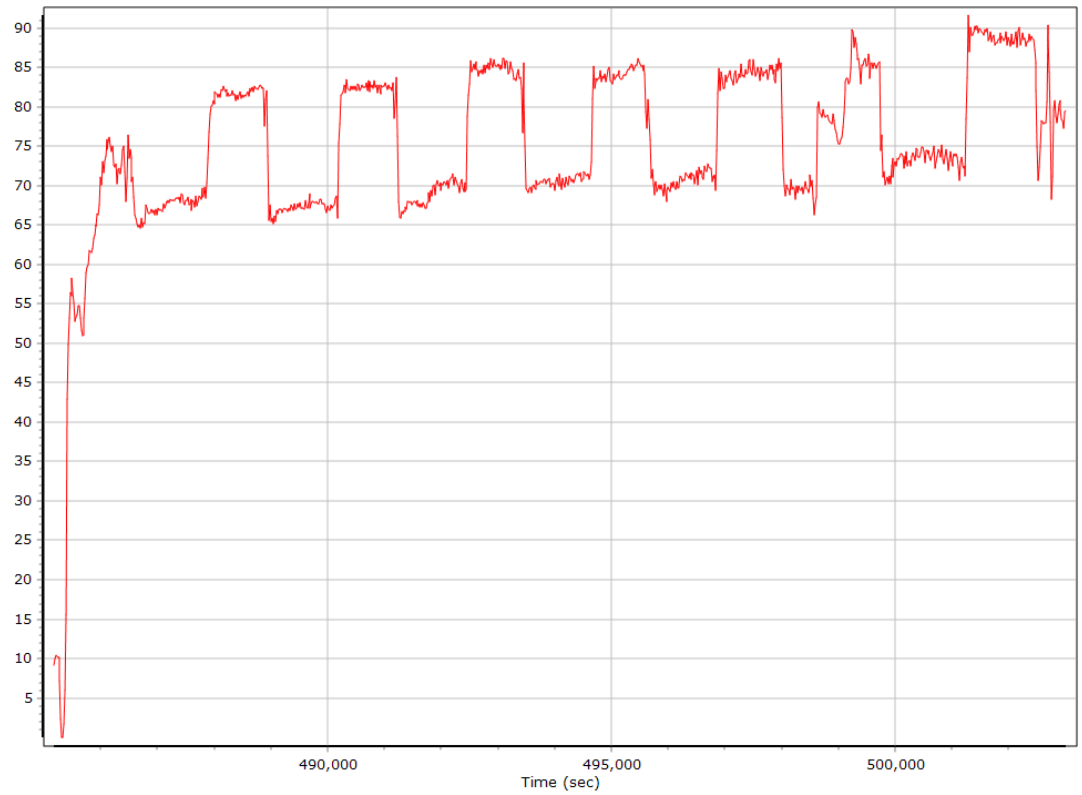
North/East Velocity



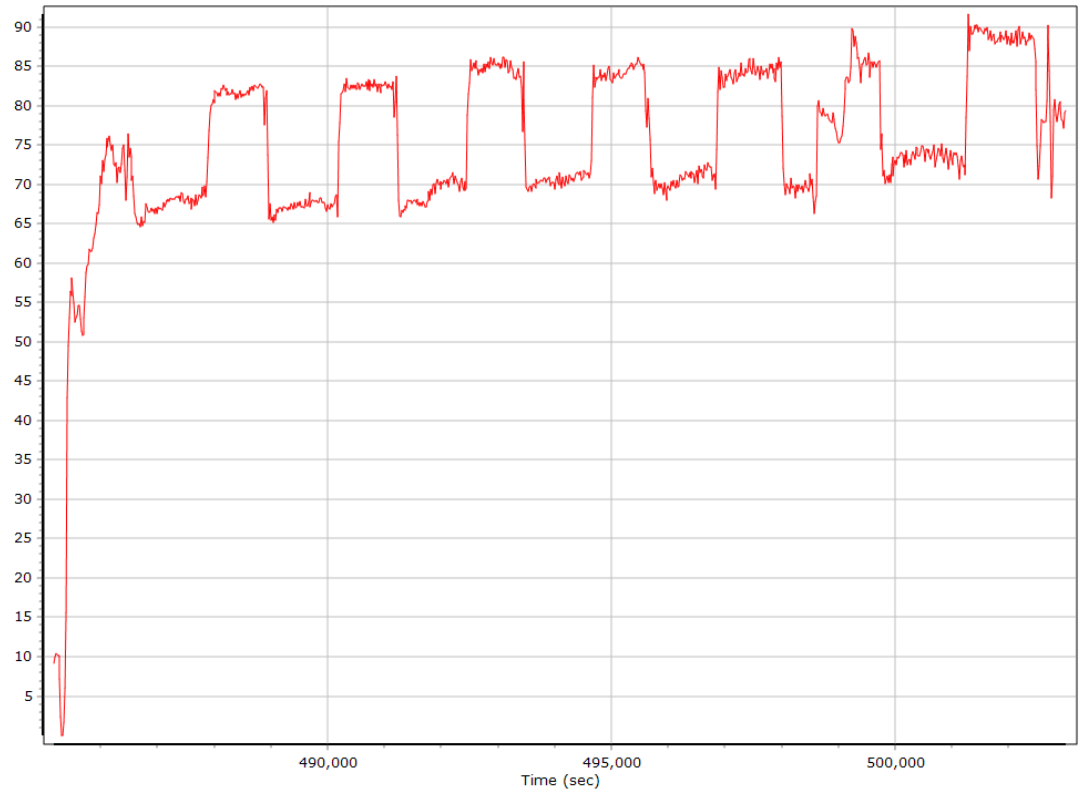
Down Velocity



Total Speed



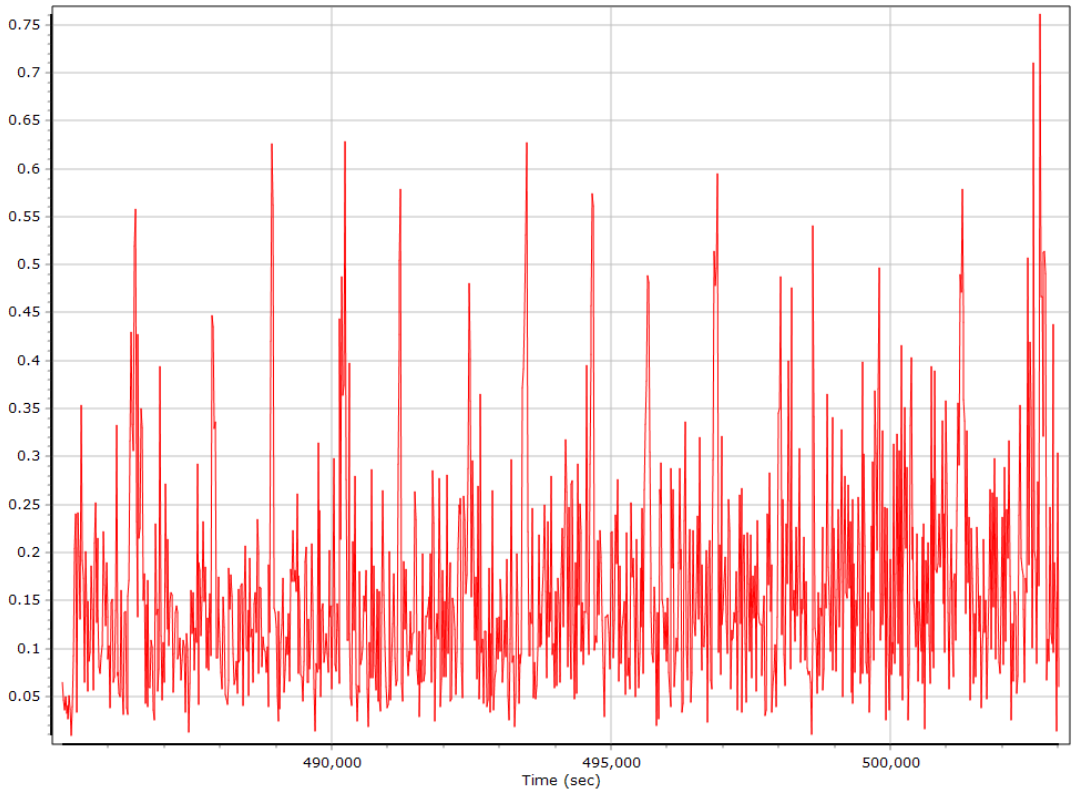
Ground Speed



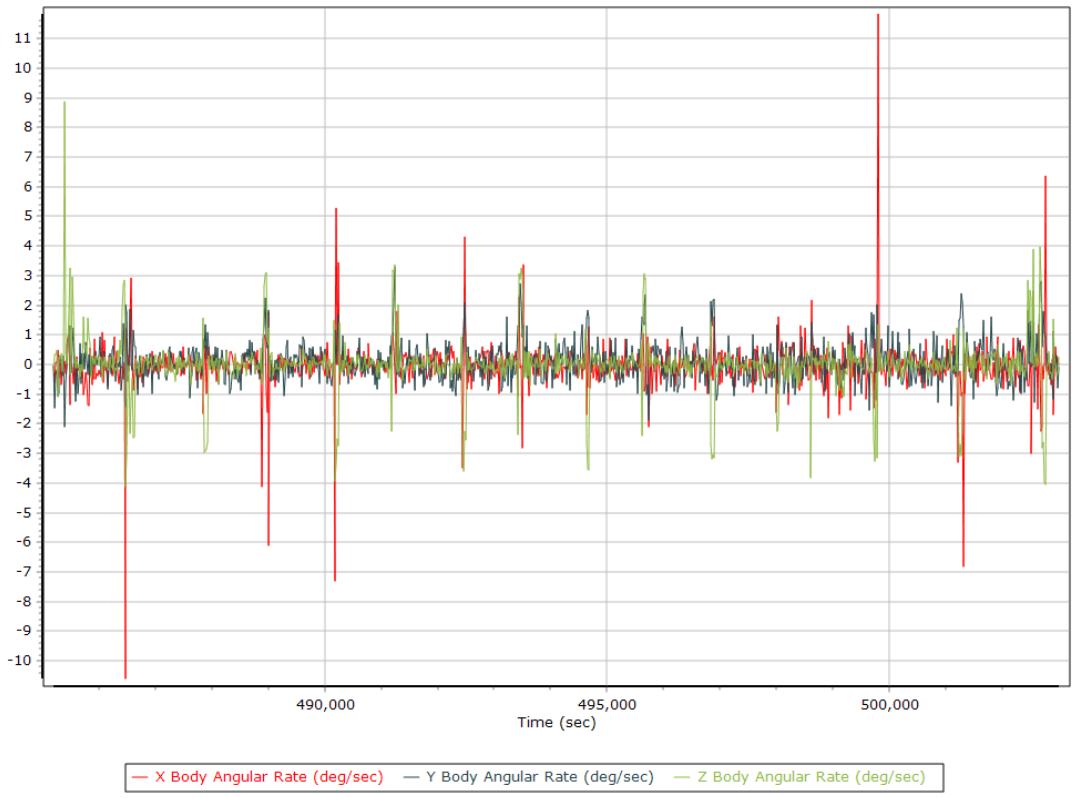
Body Acceleration



Total Body Acceleration

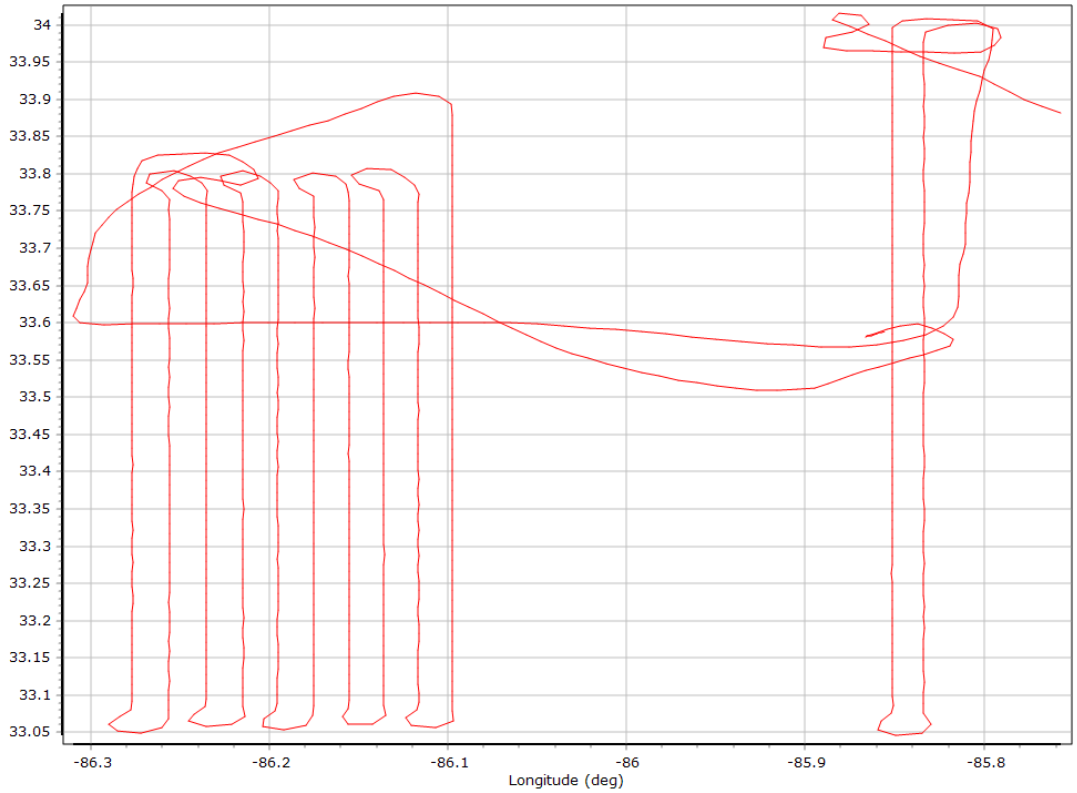


Body Angular Rate

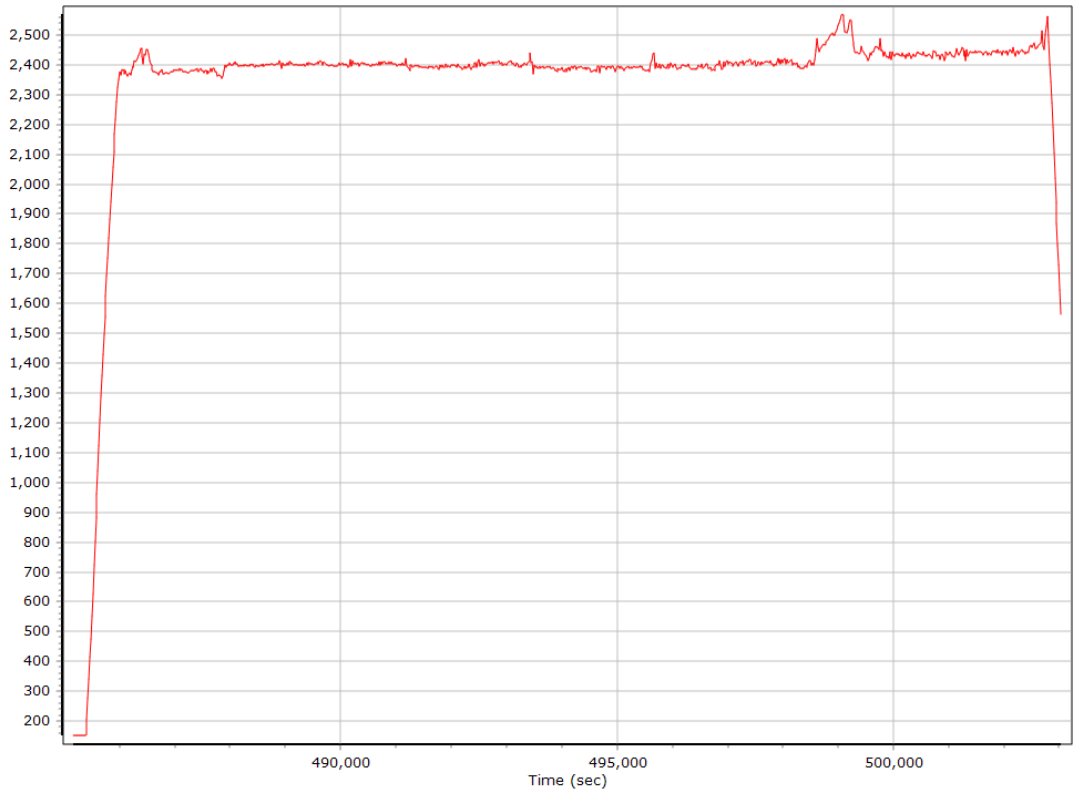


Forward Processed Trajectory Information

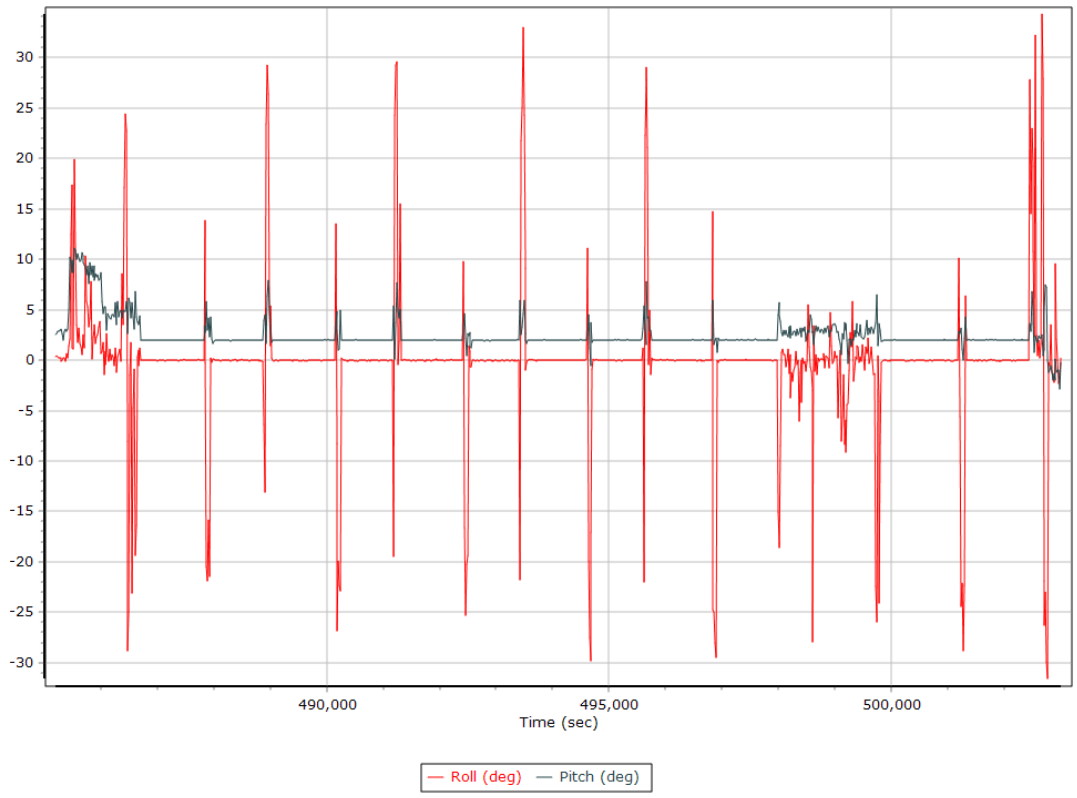
Top View



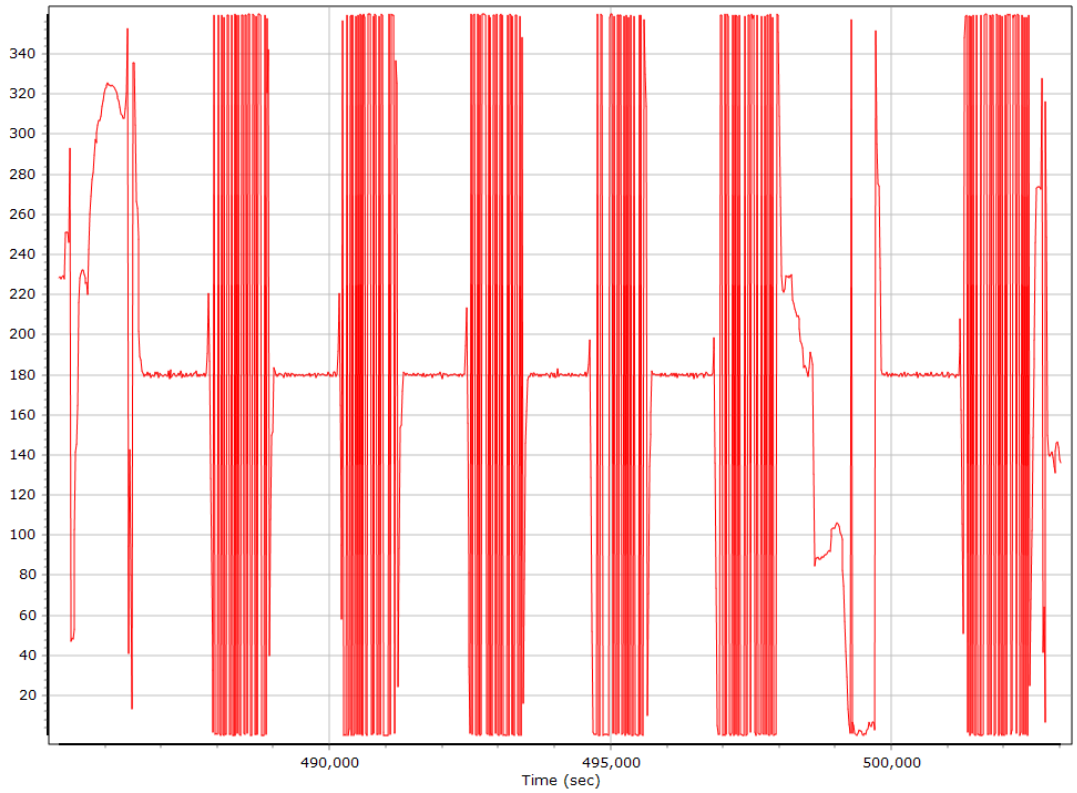
Altitude



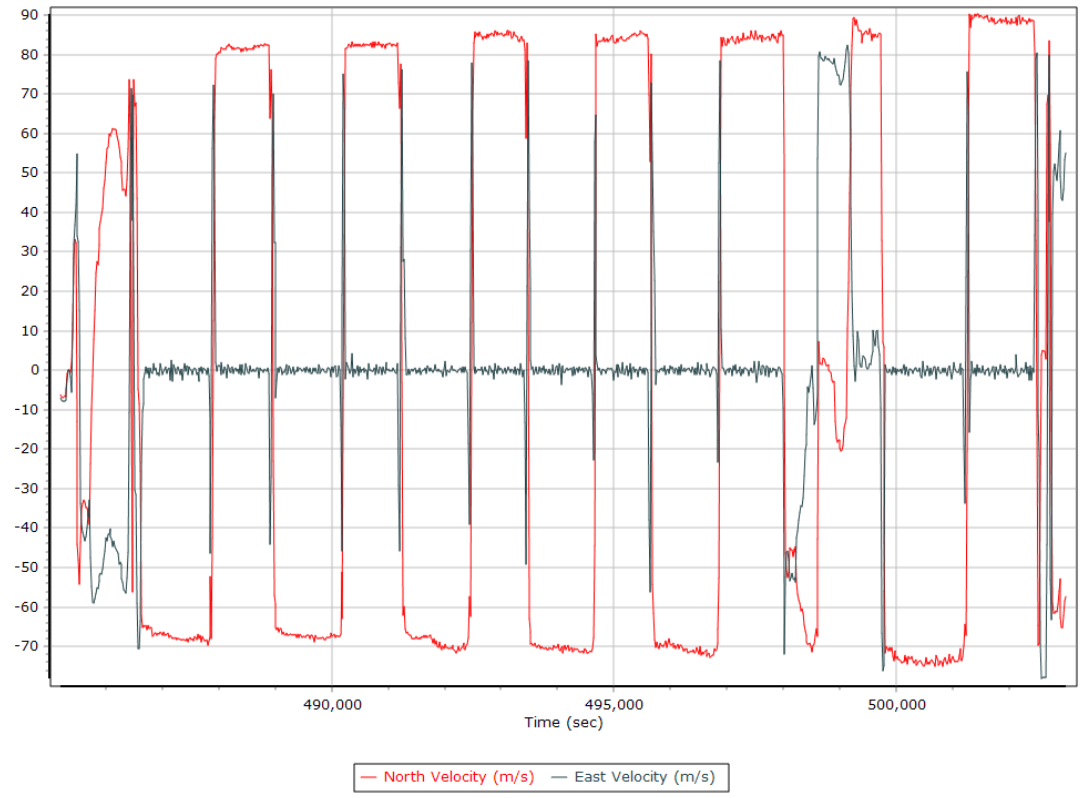
Roll/Pitch



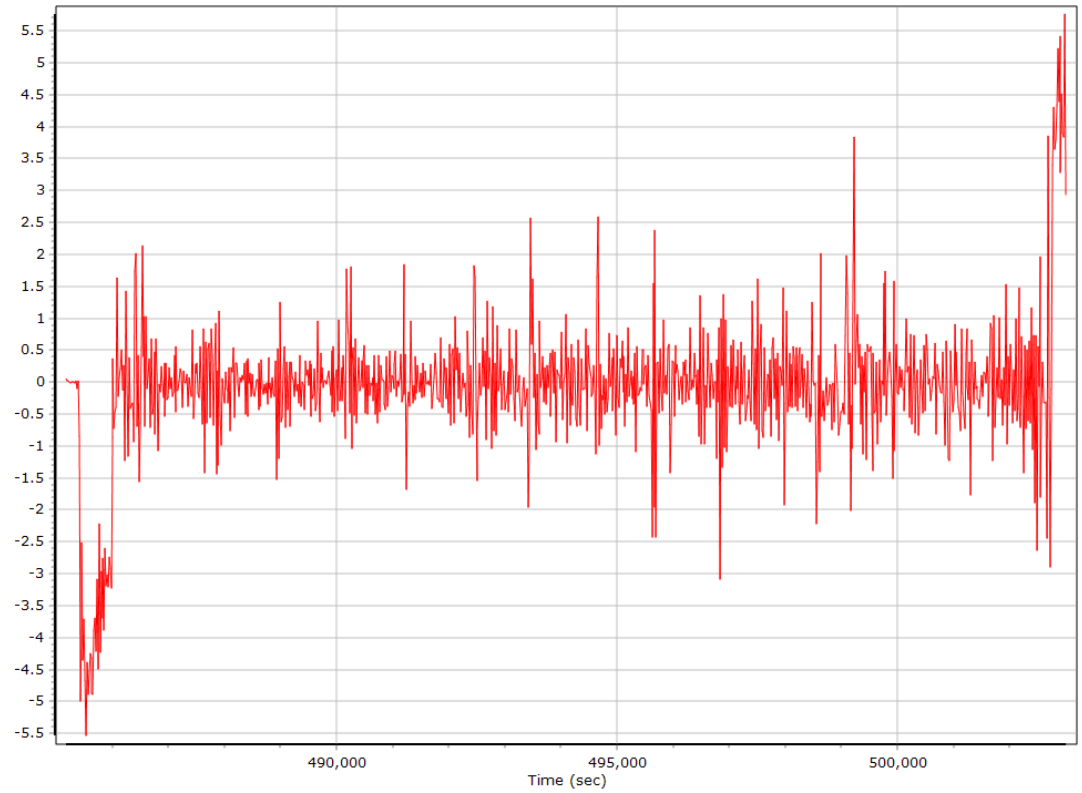
Heading



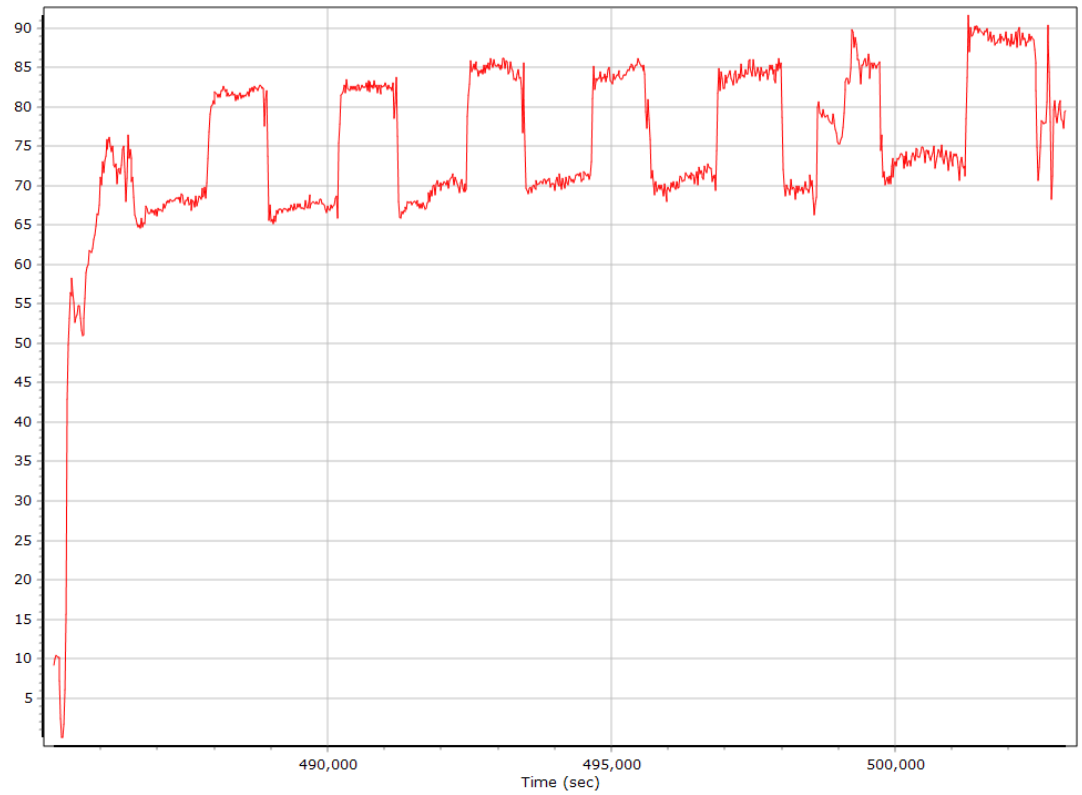
North/East Velocity



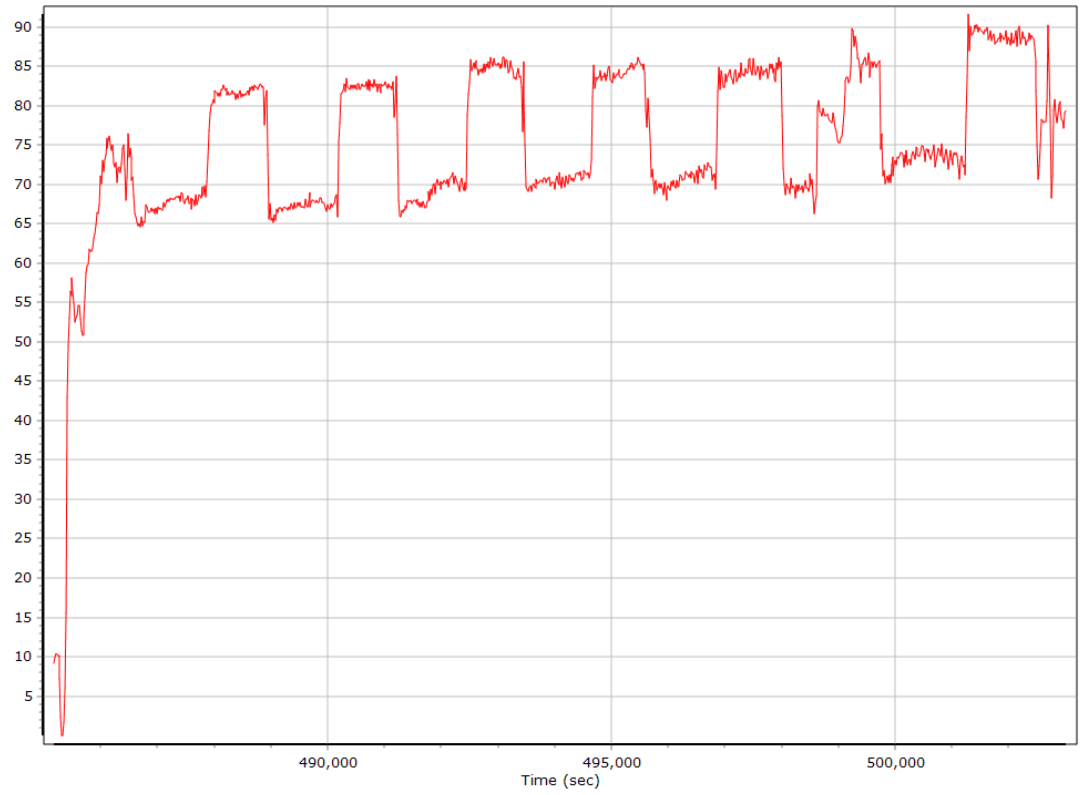
Down Velocity



Total Speed



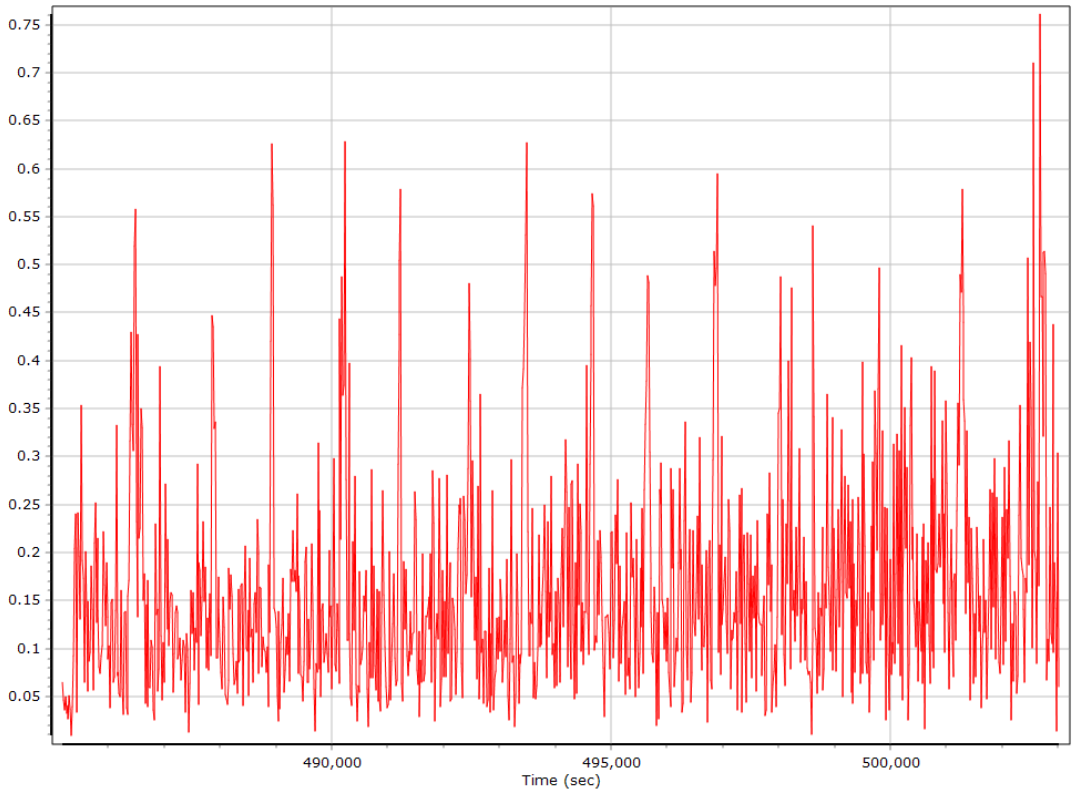
Ground Speed



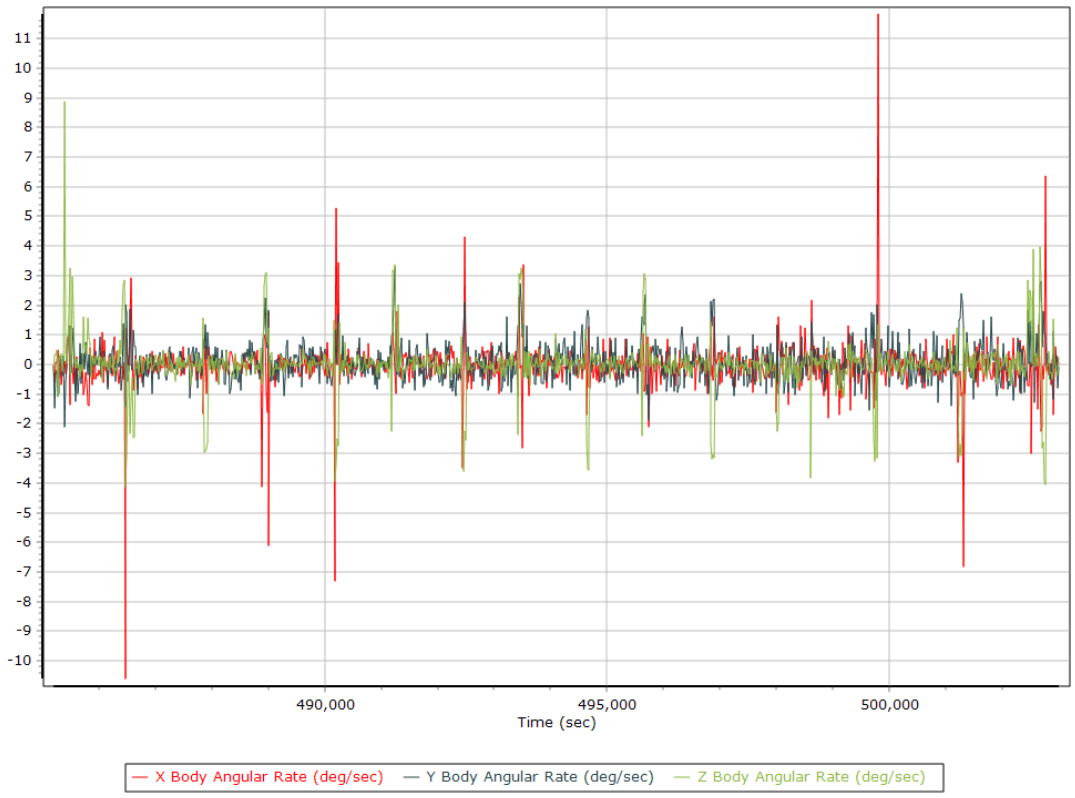
Body Acceleration



Total Body Acceleration



Body Angular Rate

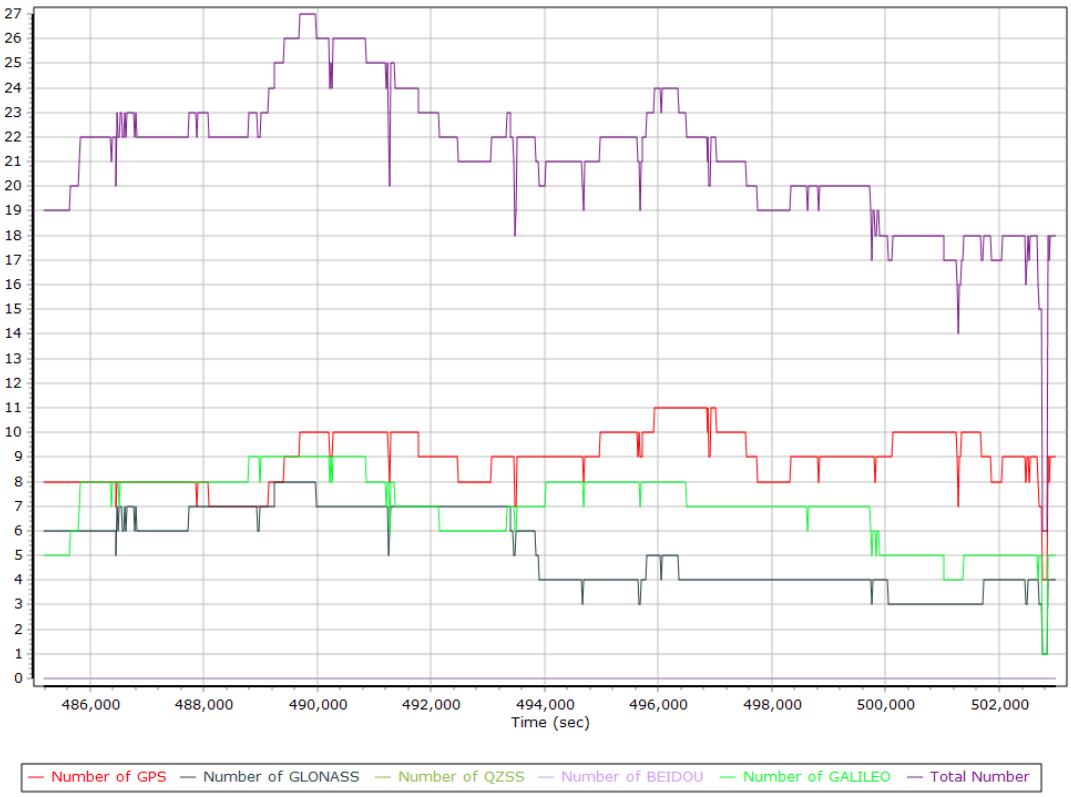


GNSS QC

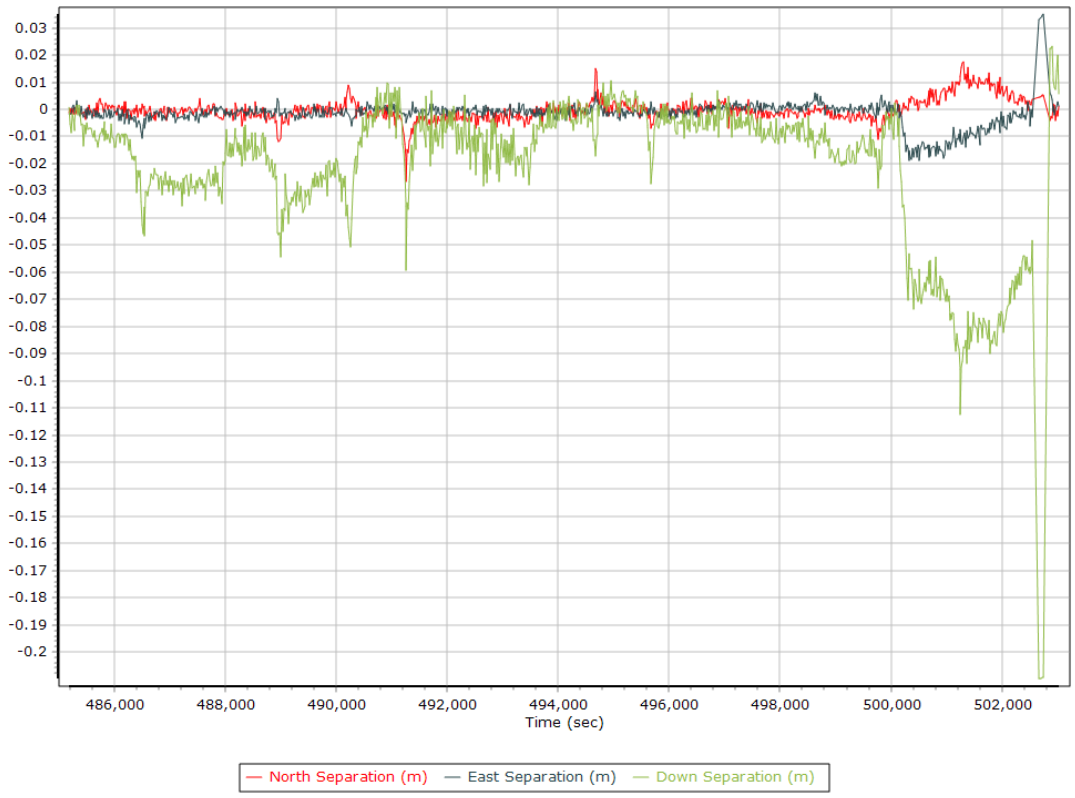
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	4	11	9
Number of GLONASS SV	0	8	5
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	0	9	7
Total number of SV	4	27	21
PDOP	0.98	3.20	1.19
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	18142.00	0.00	0.00
Percentage	100.00	0.00	0.00

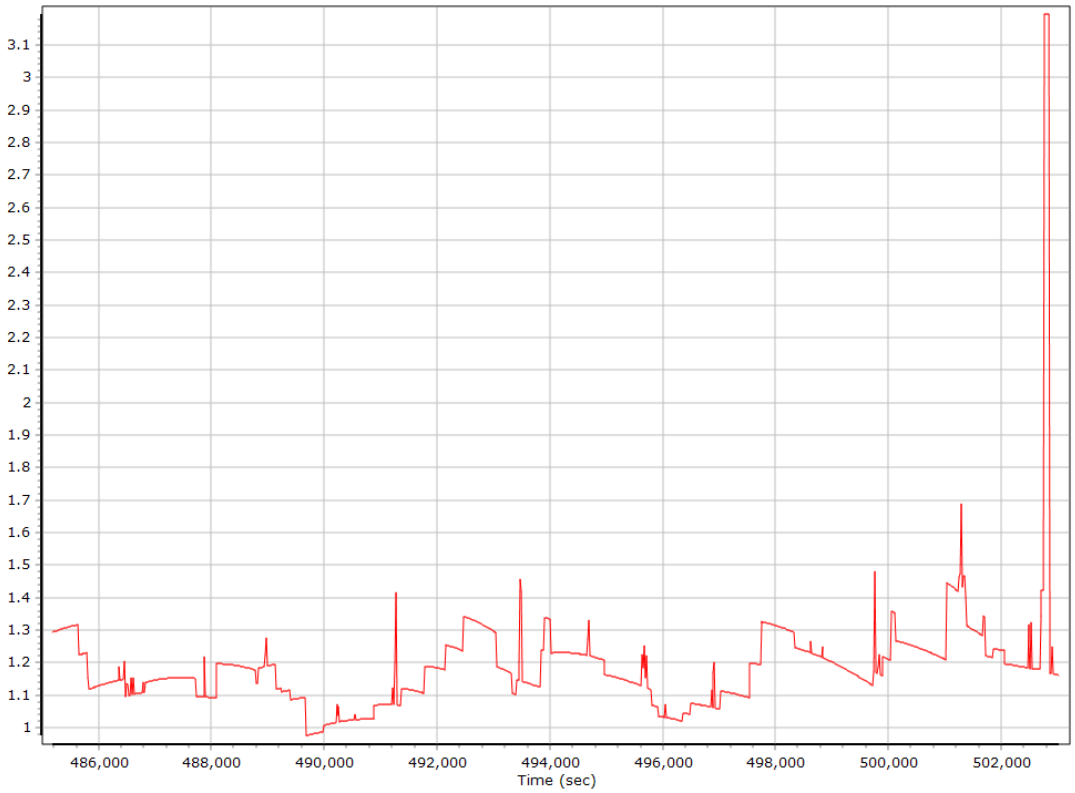
Num SVs in solution



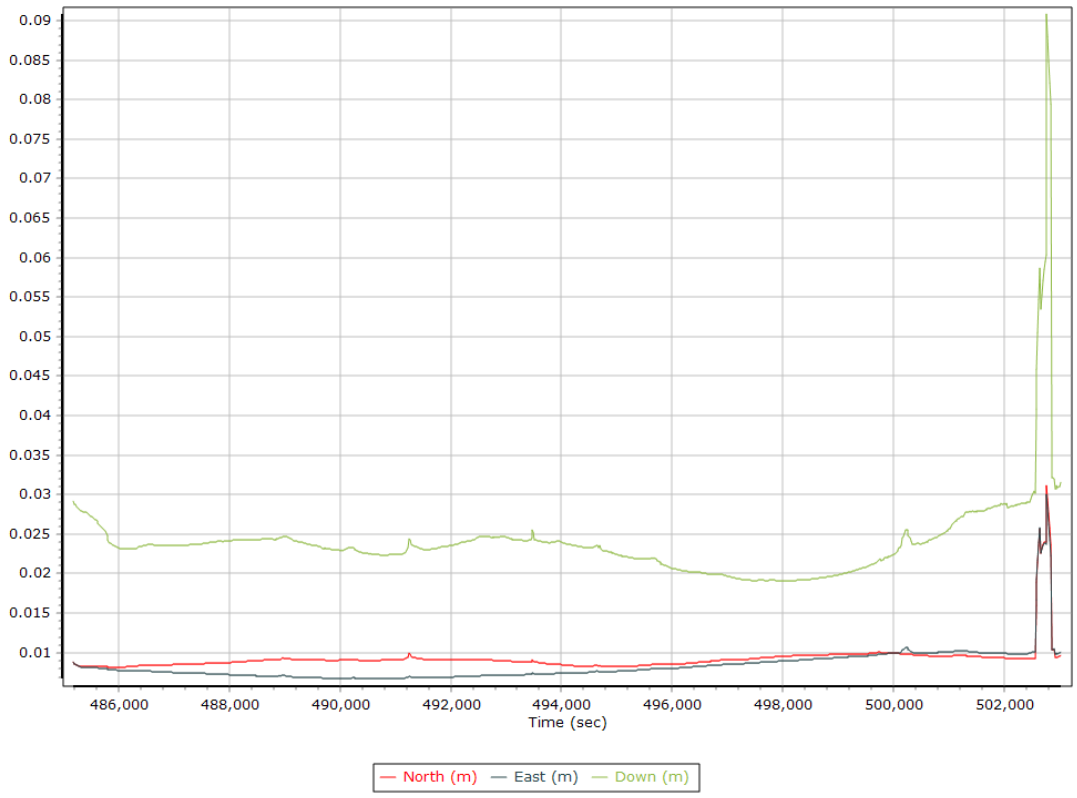
Forward/Reverse Separation



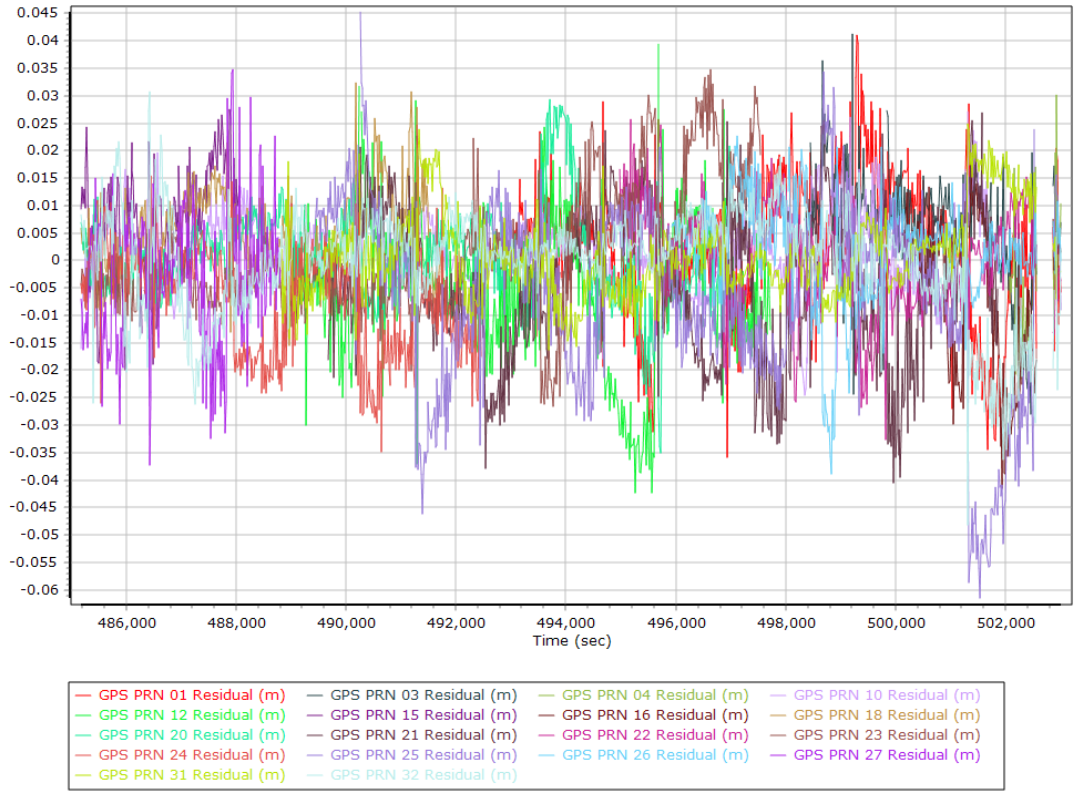
PDOP



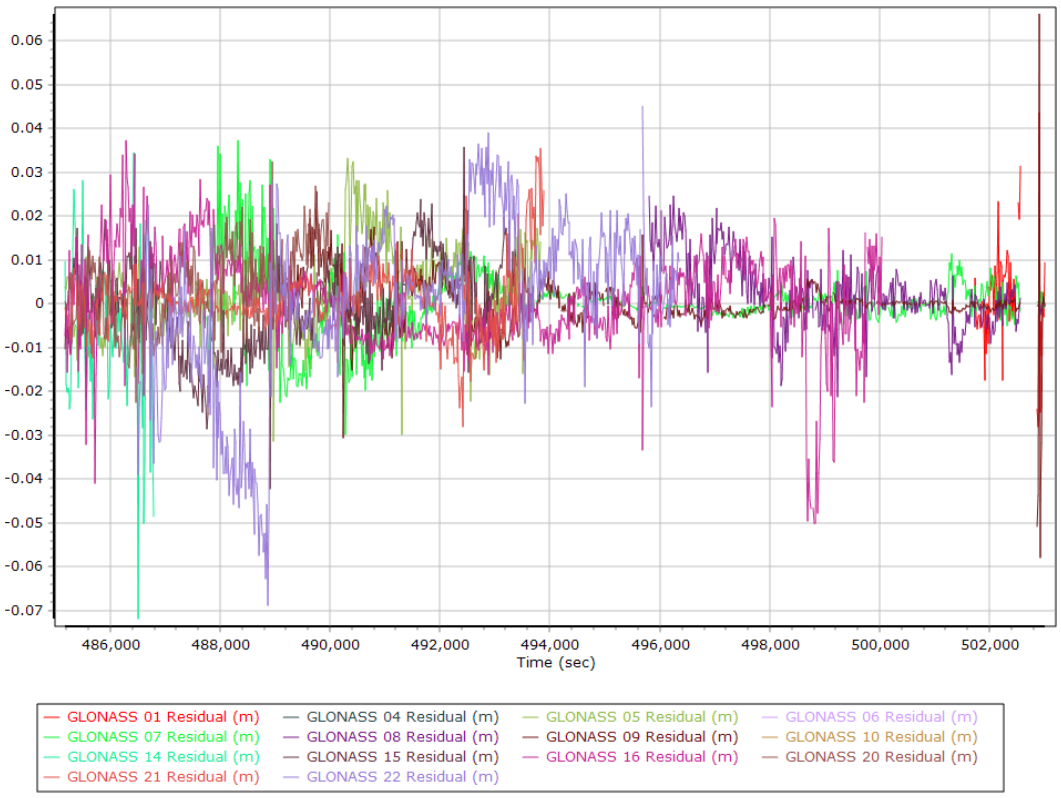
Estimated Position Accuracy



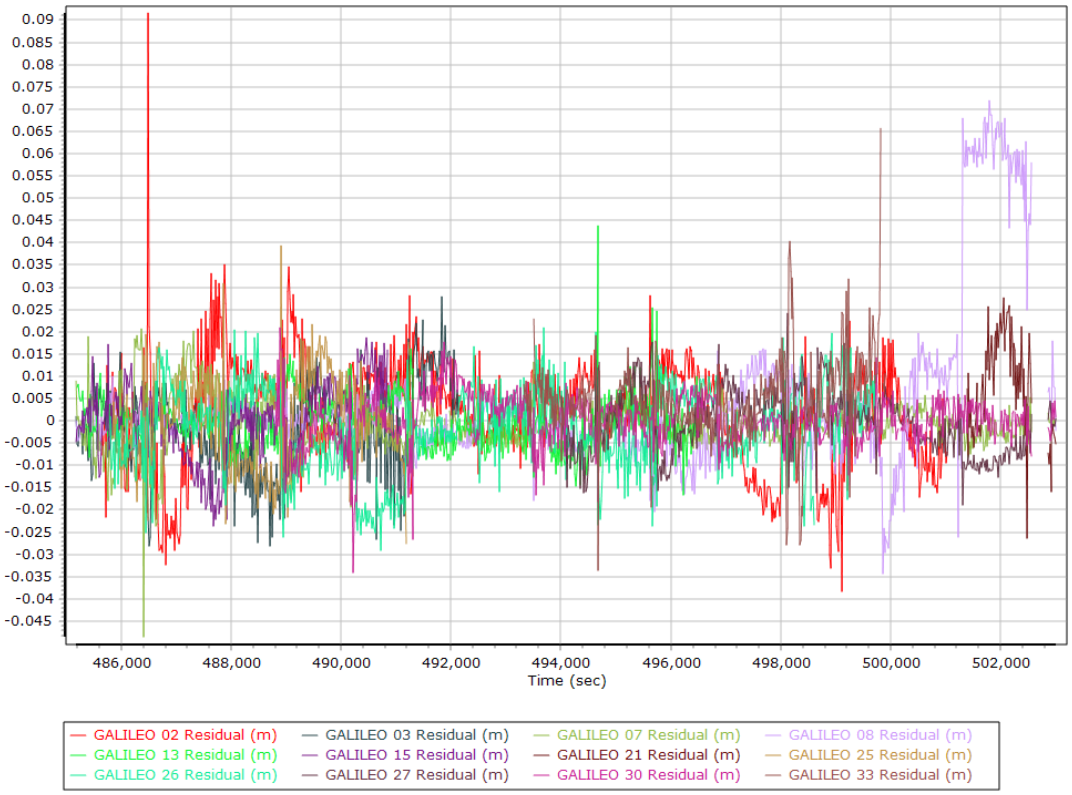
GPS Residuals



GLONASS Residuals



GALILEO Residuals



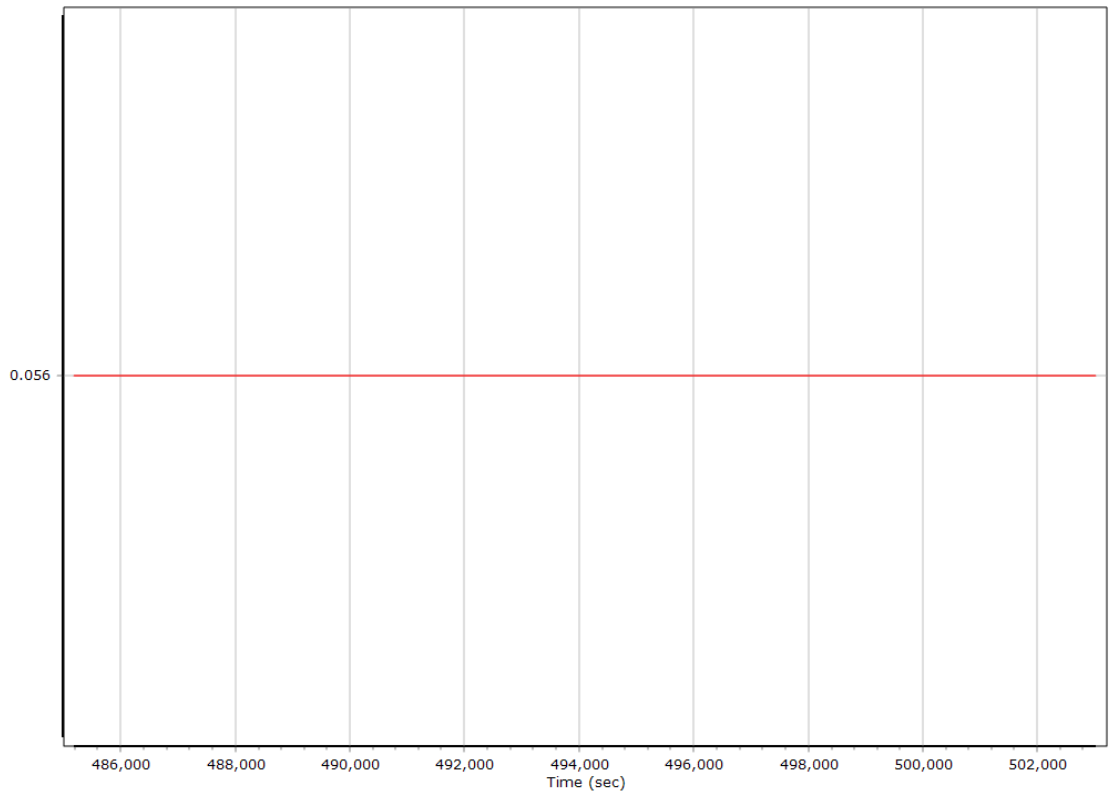
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	484854.000 (12/11/2020 2:40:54 PM)		
Processing end time	503031.000 (12/11/2020 7:43:51 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

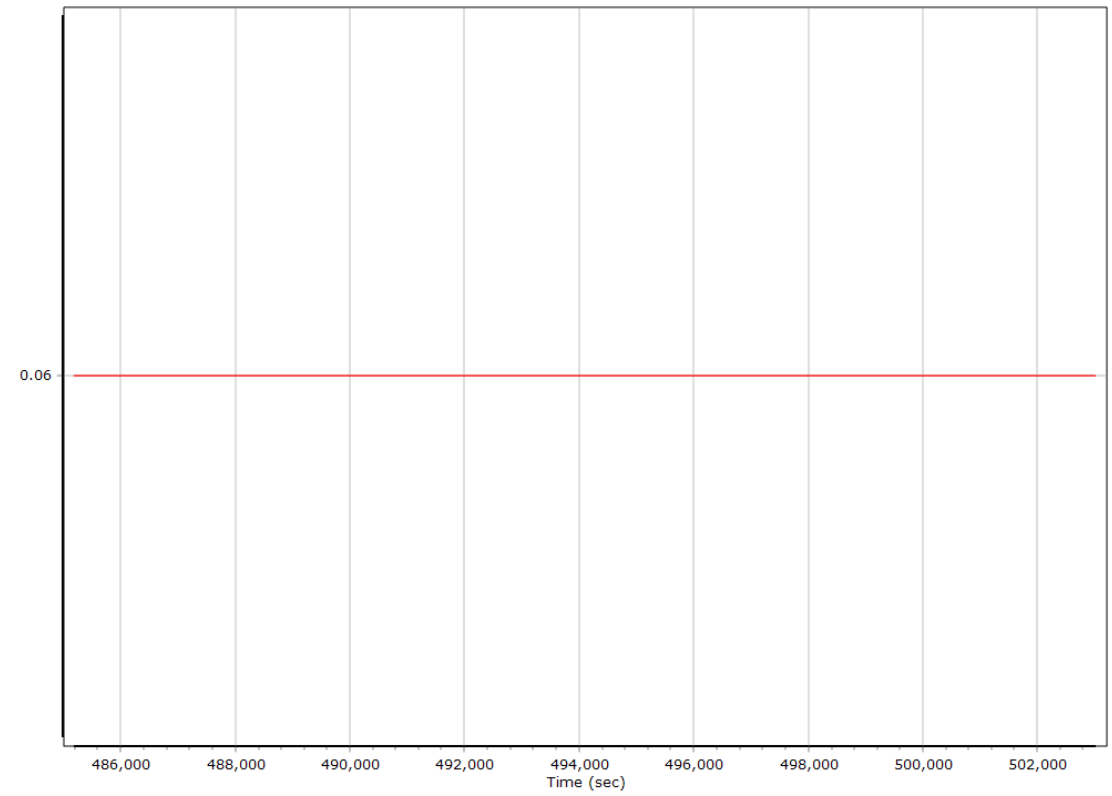
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

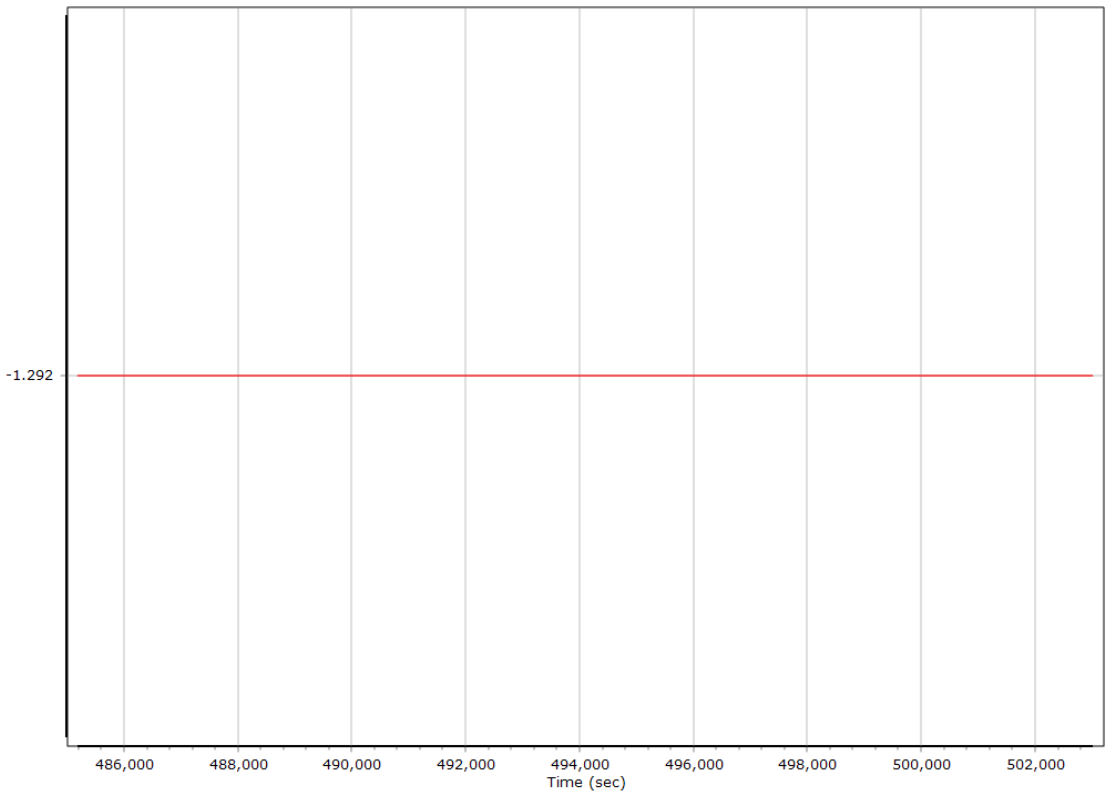
X Reference-Primary GNSS Lever Arm (m)



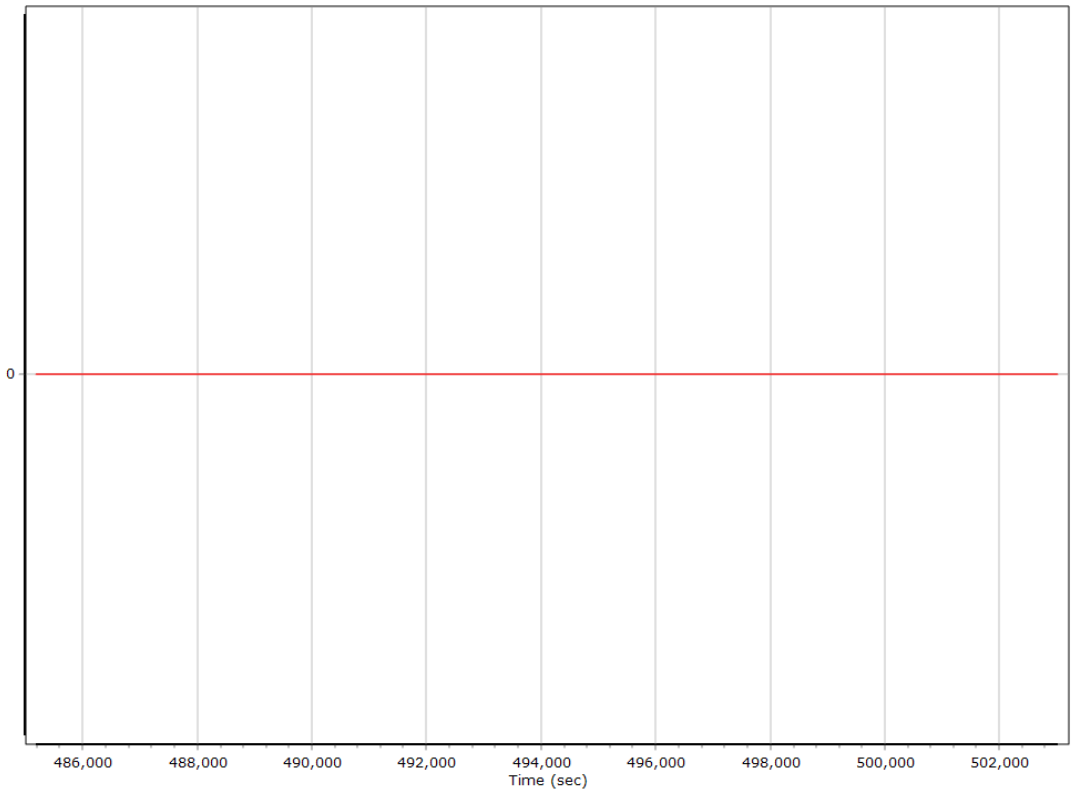
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



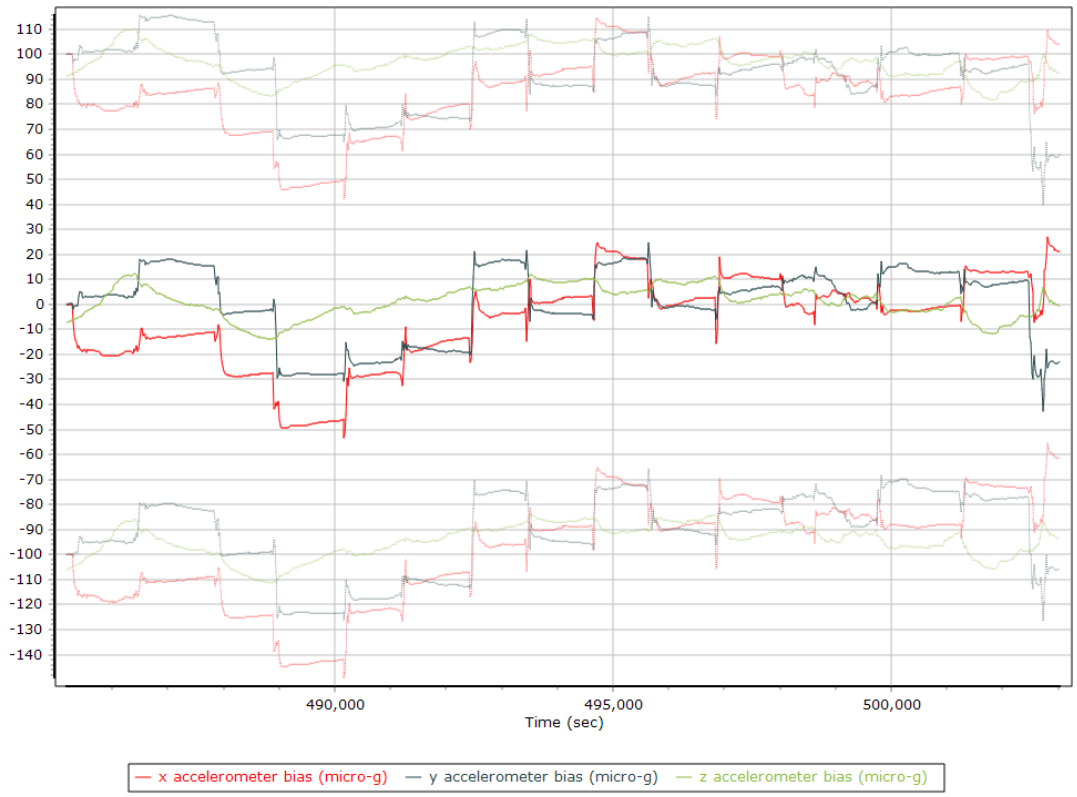
Reference-Primary GNSS Lever Arm Figure of Merit



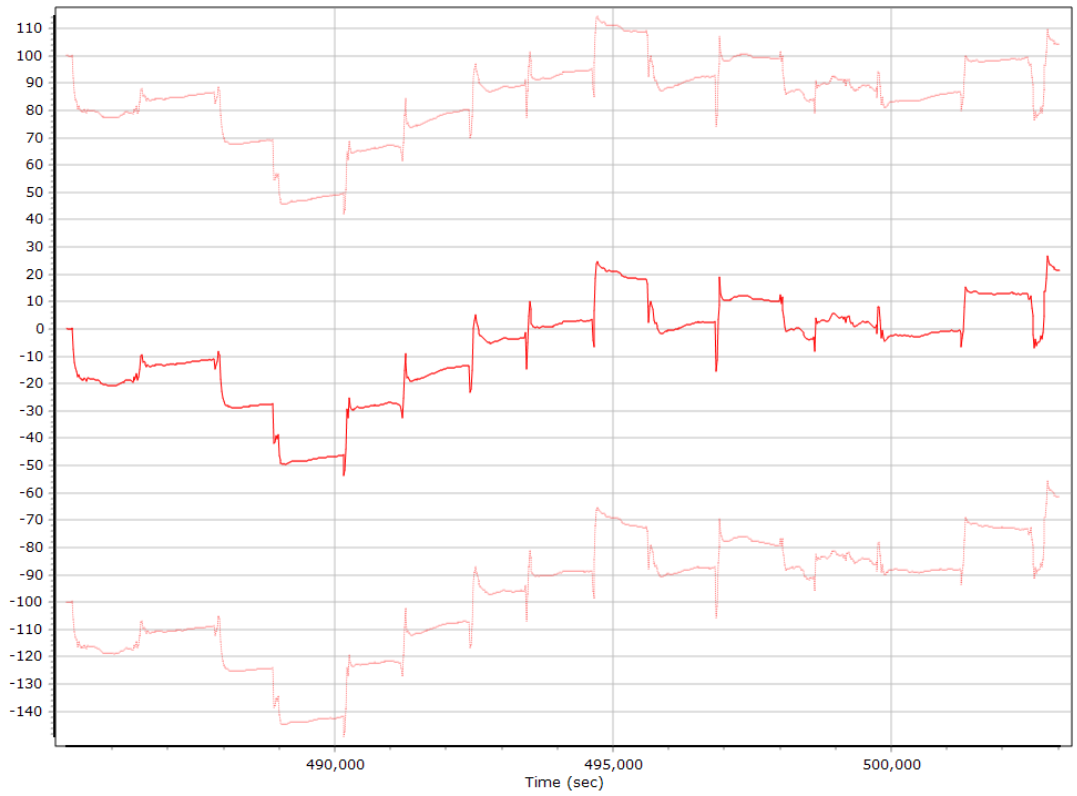
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

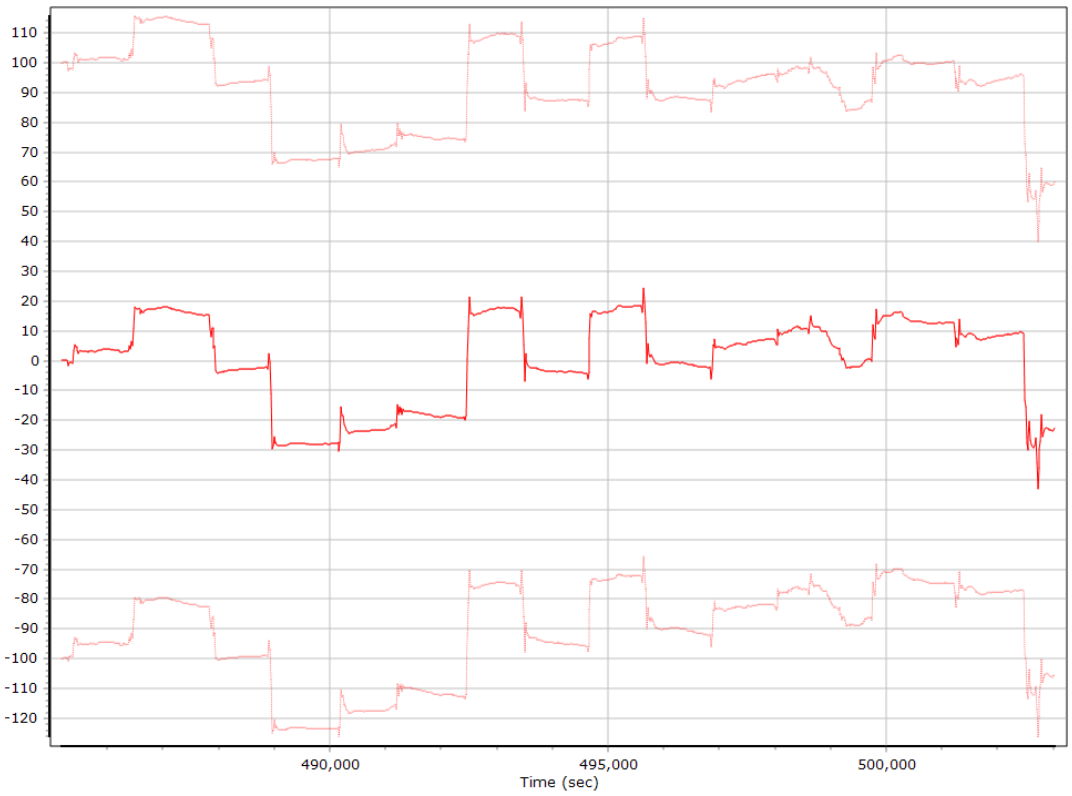
Accelerometer Bias (micro-g)



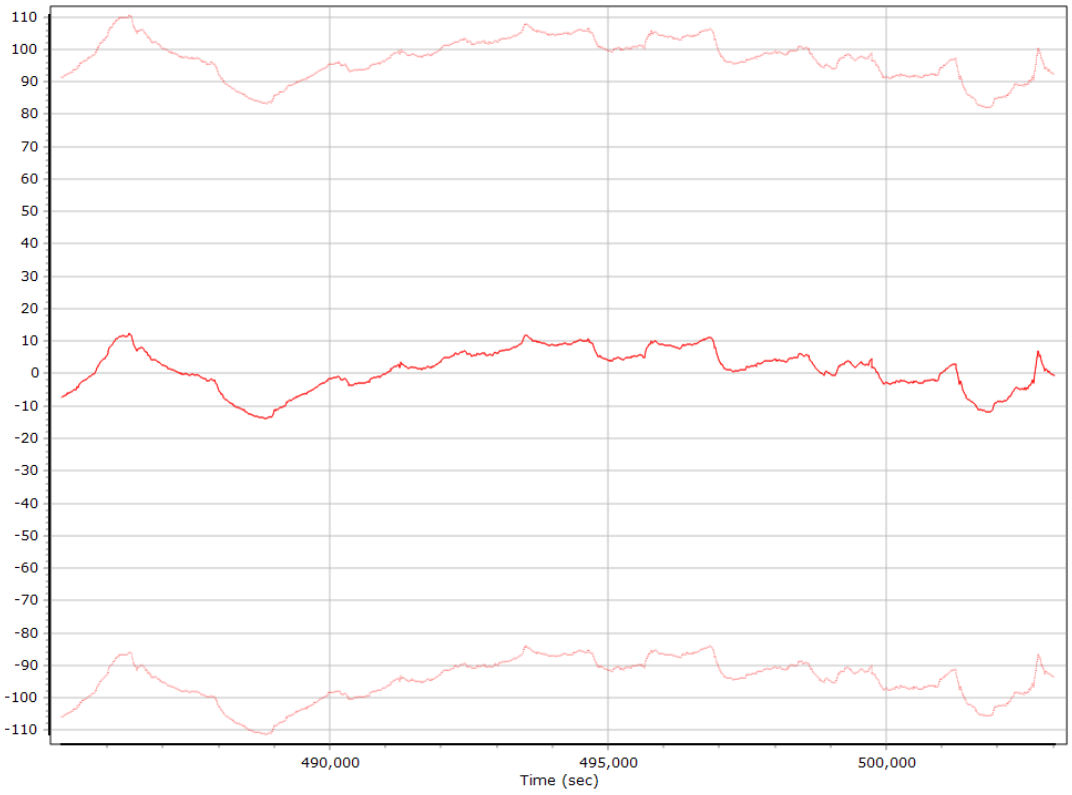
X Accelerometer Bias (micro-g)



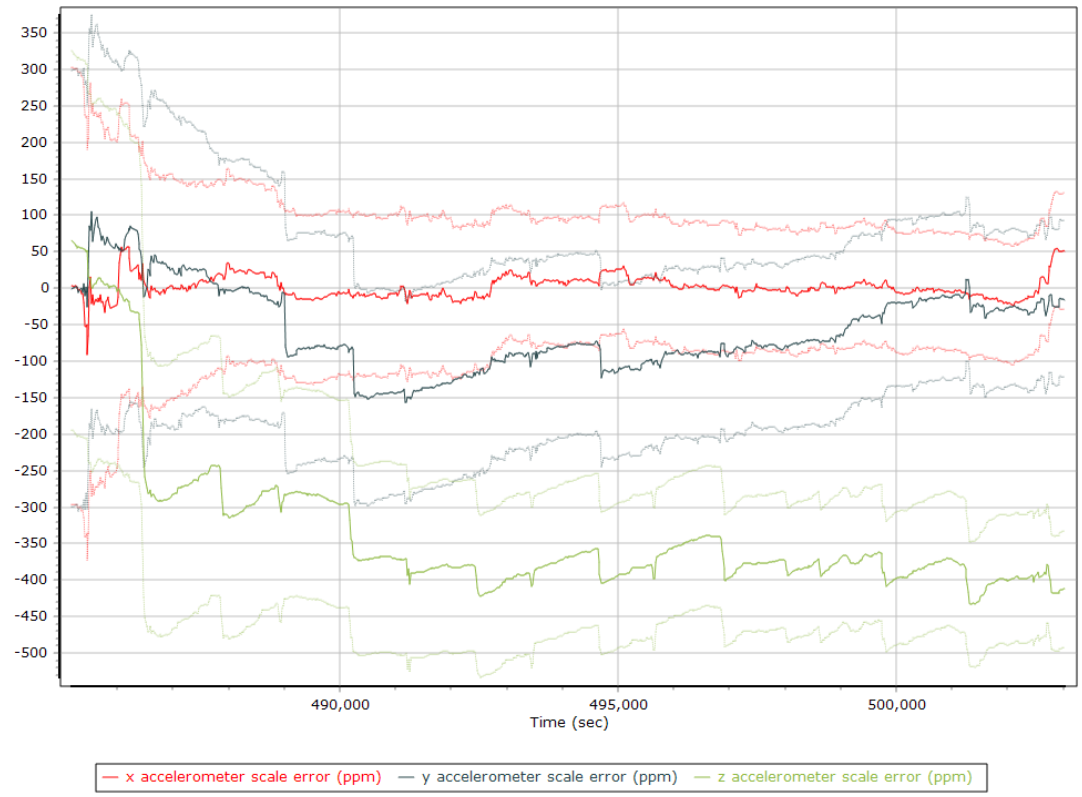
Y Accelerometer Bias (micro-g)



Z Accelerometer Bias (micro-g)



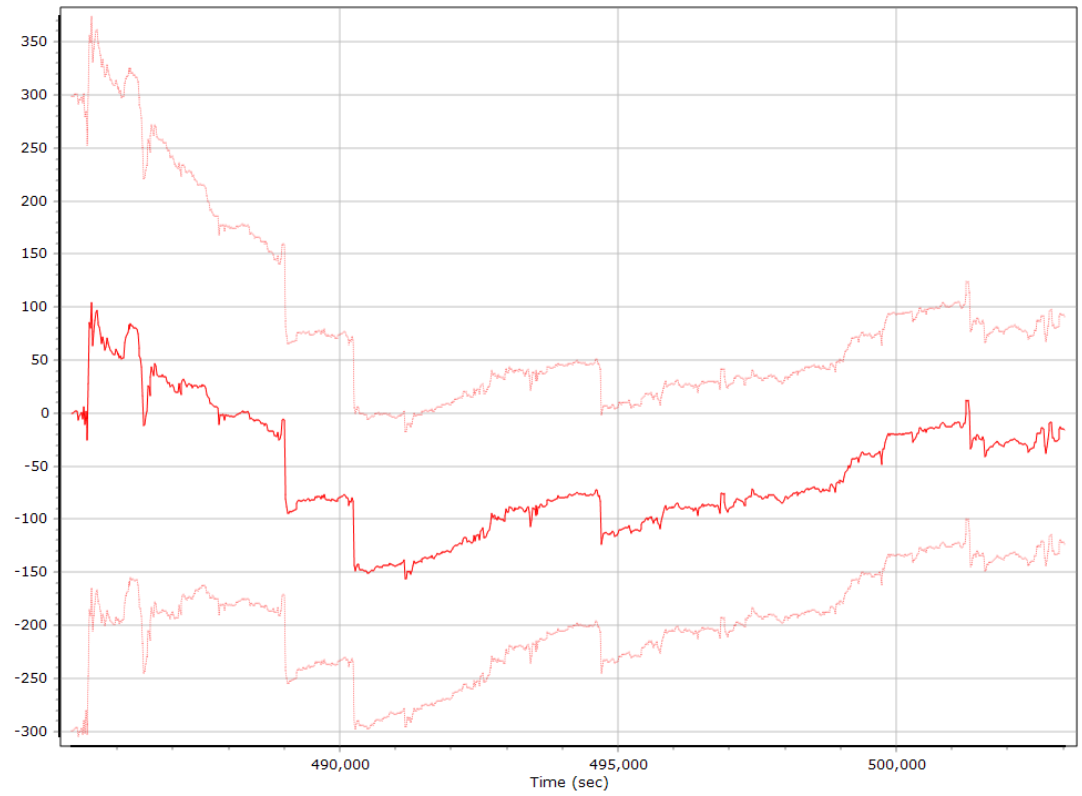
Accelerometer Scale Error (ppm)



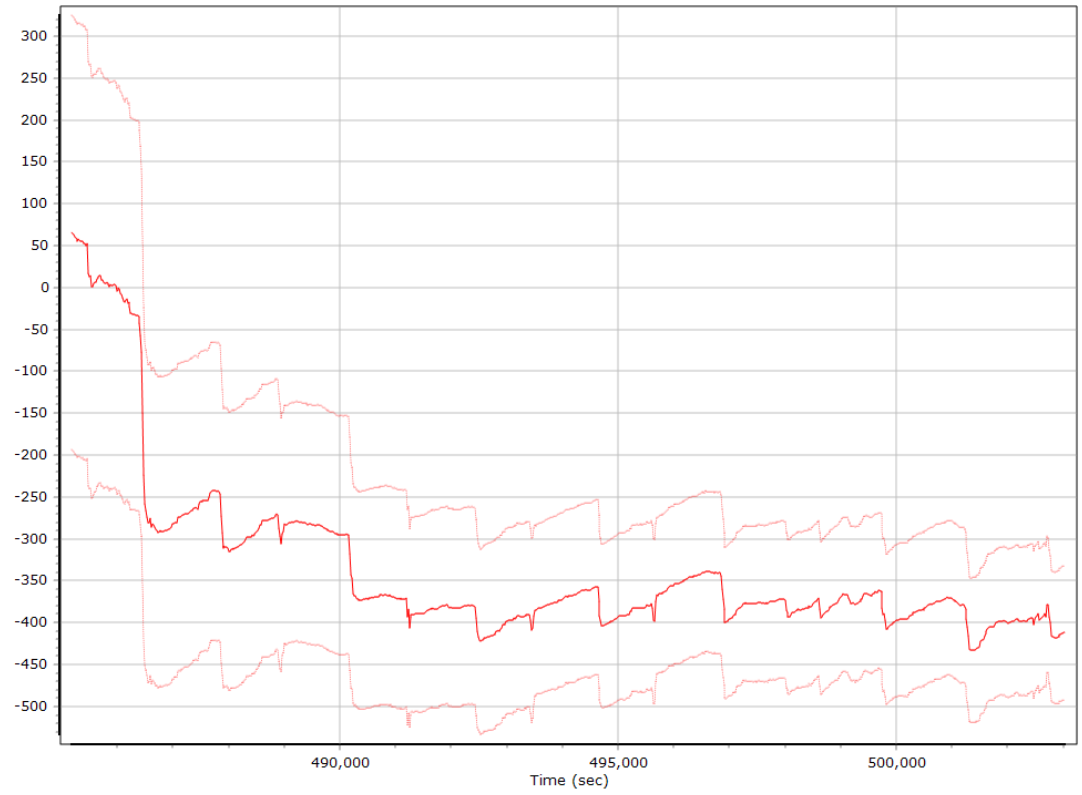
X Accelerometer Scale Error (ppm)



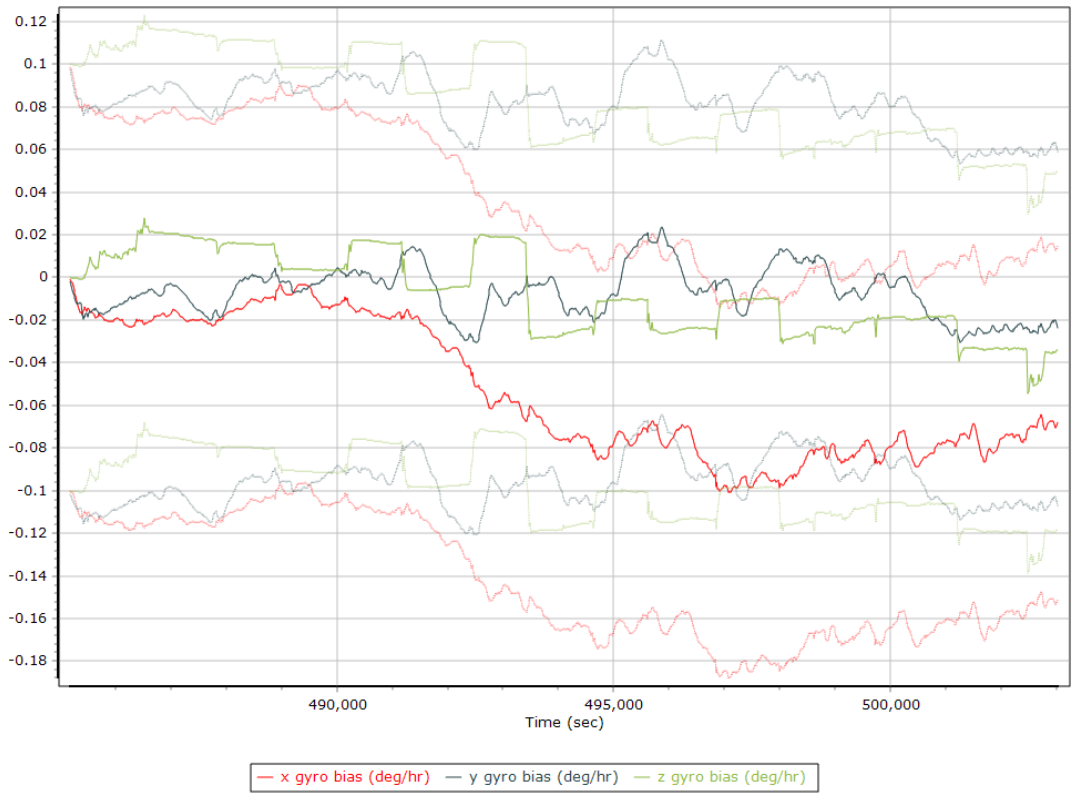
Y Accelerometer Scale Error (ppm)



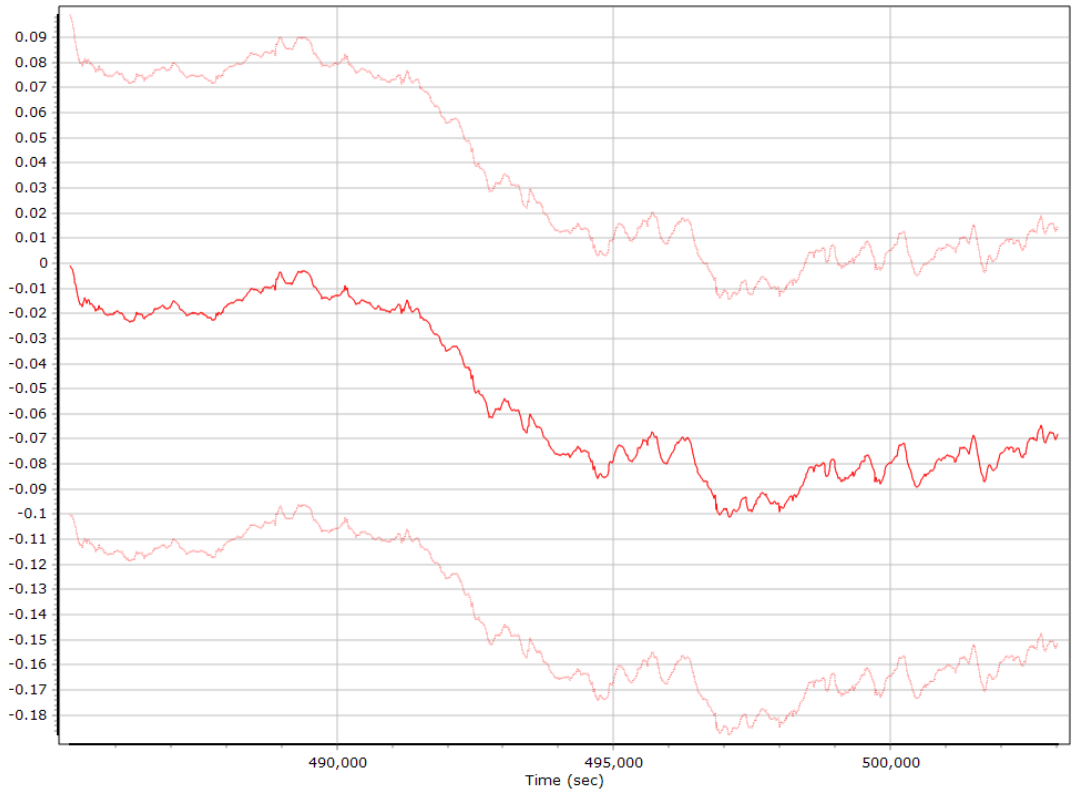
Z Accelerometer Scale Error (ppm)



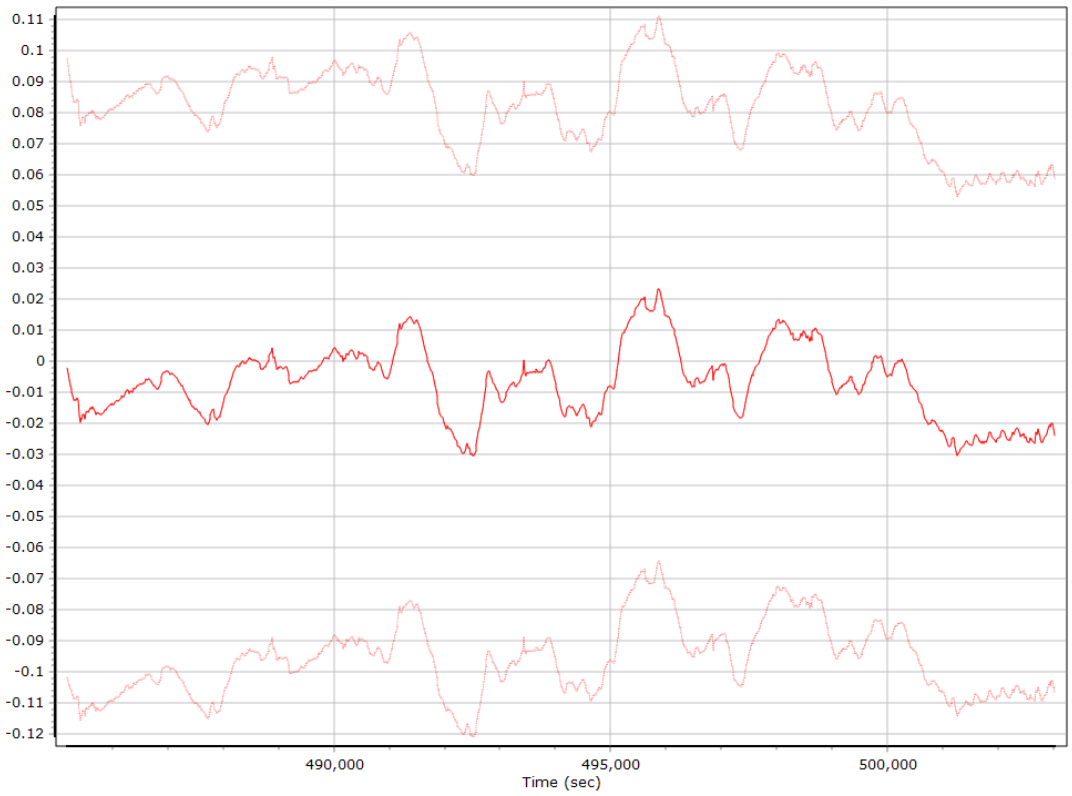
Gyro Bias (deg/h)



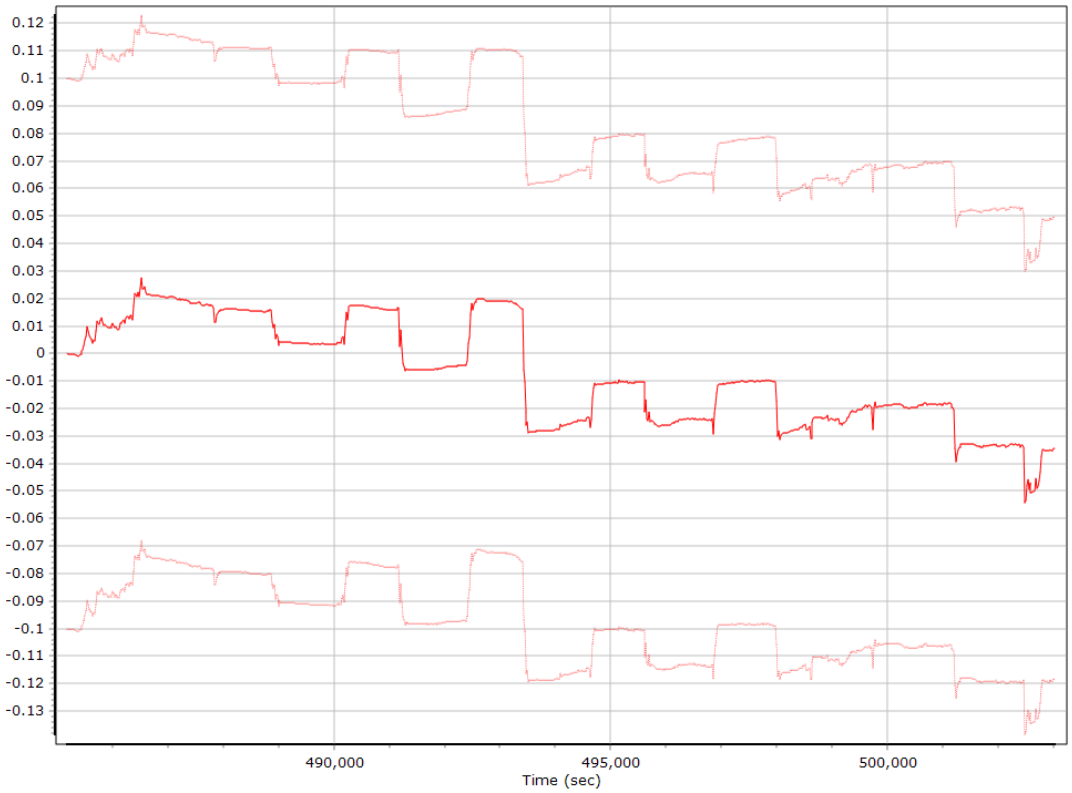
X Gyro Bias (deg/h)



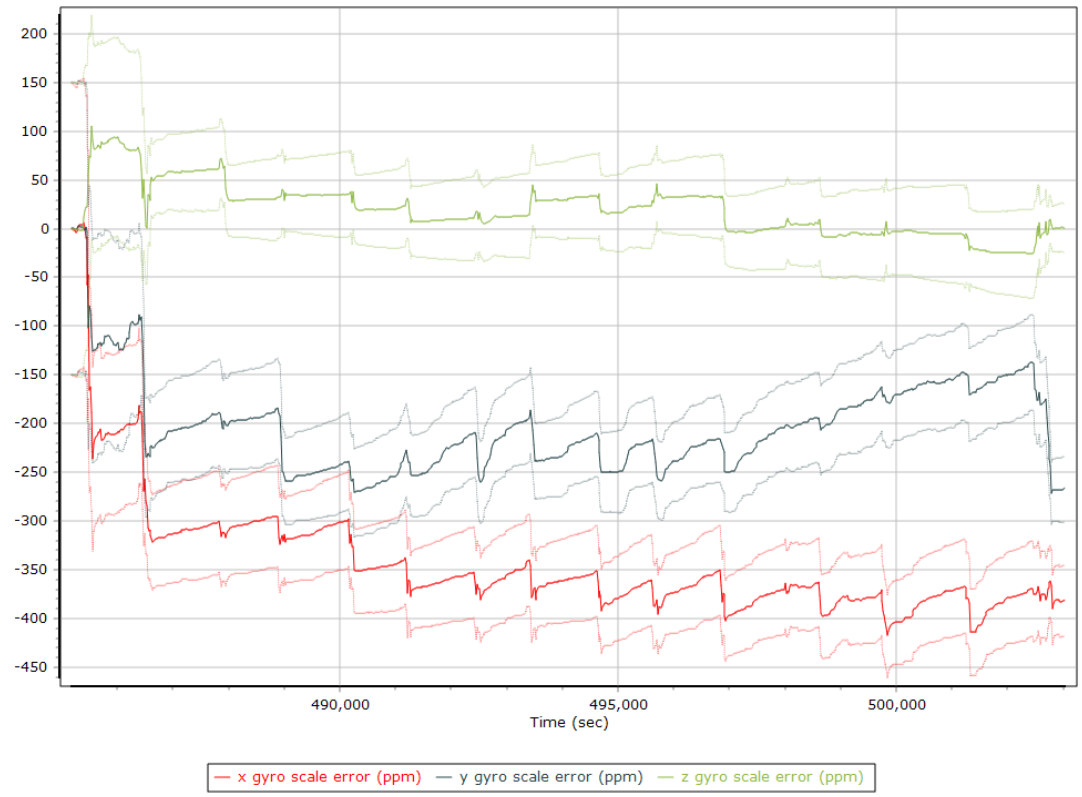
Y Gyro Bias (deg/h)



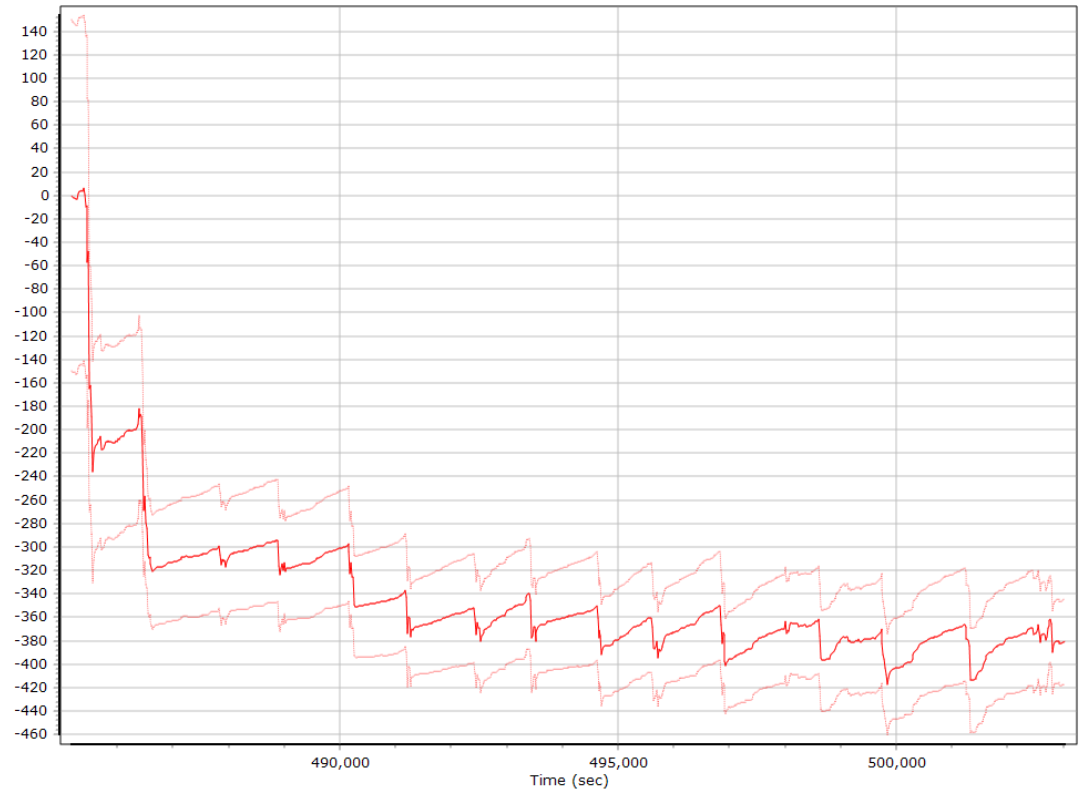
Z Gyro Bias (deg/h)



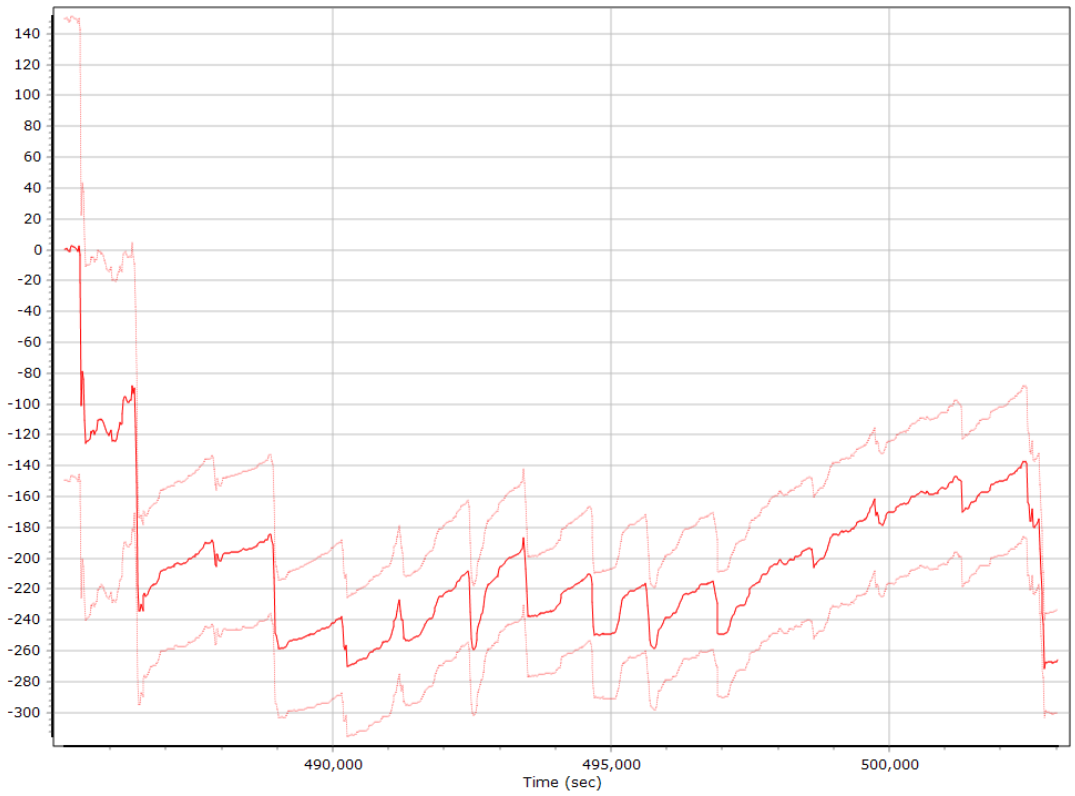
Gyro Scale Error (ppm)



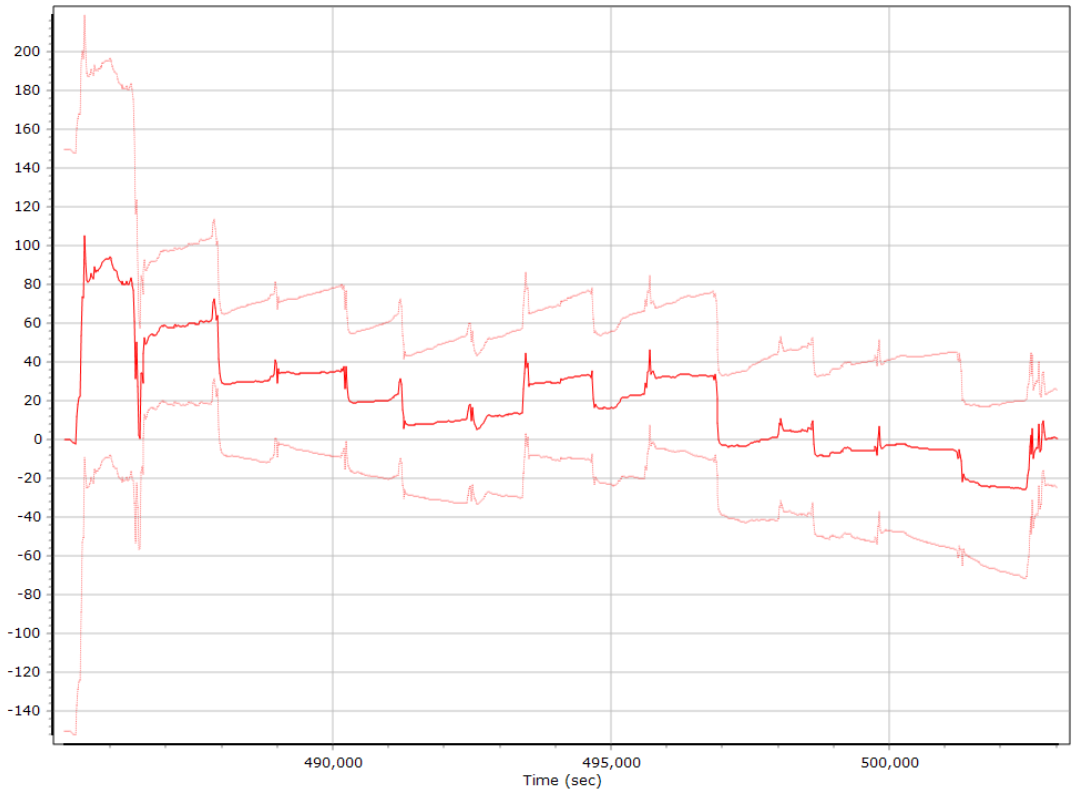
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

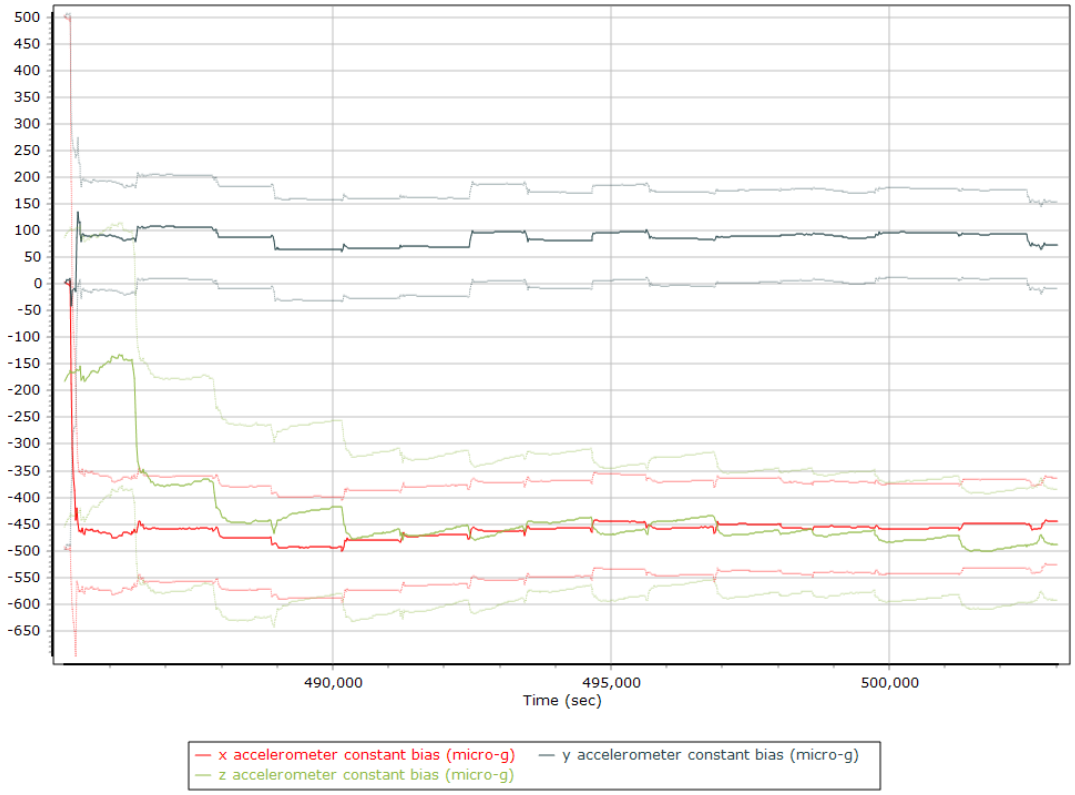


Z Gyro Scale Error (ppm)

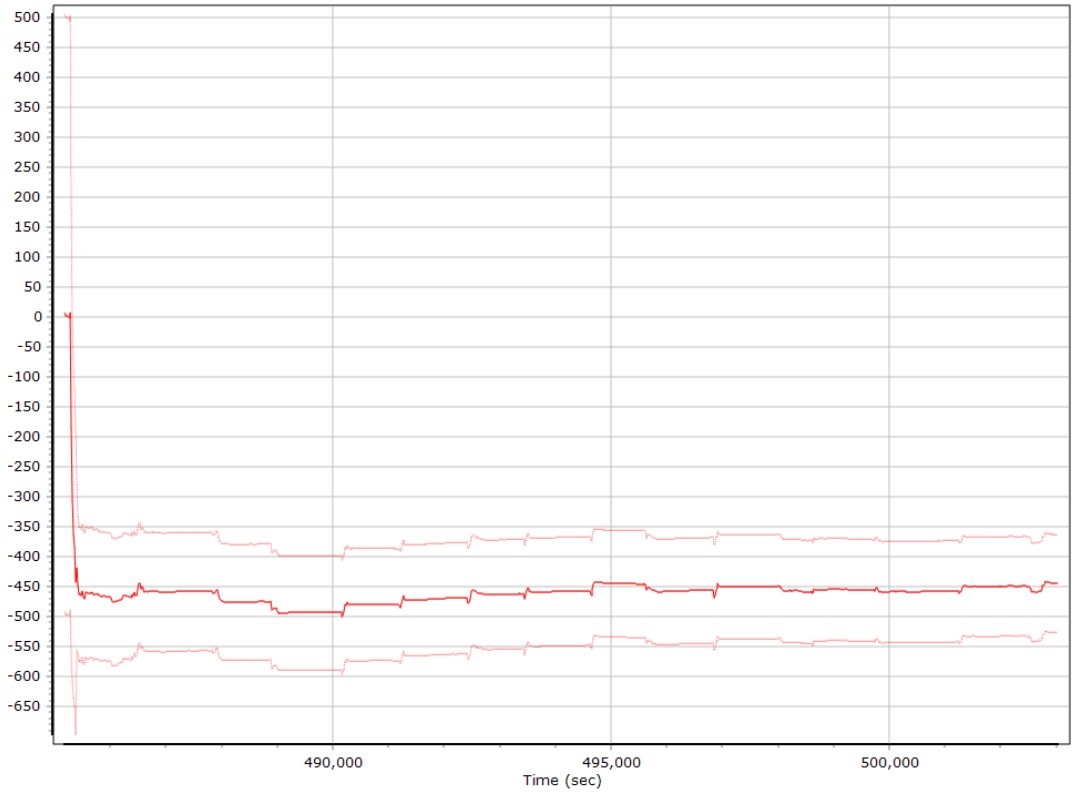


Forward Processed Estimated Constant Errors, Reference Frame

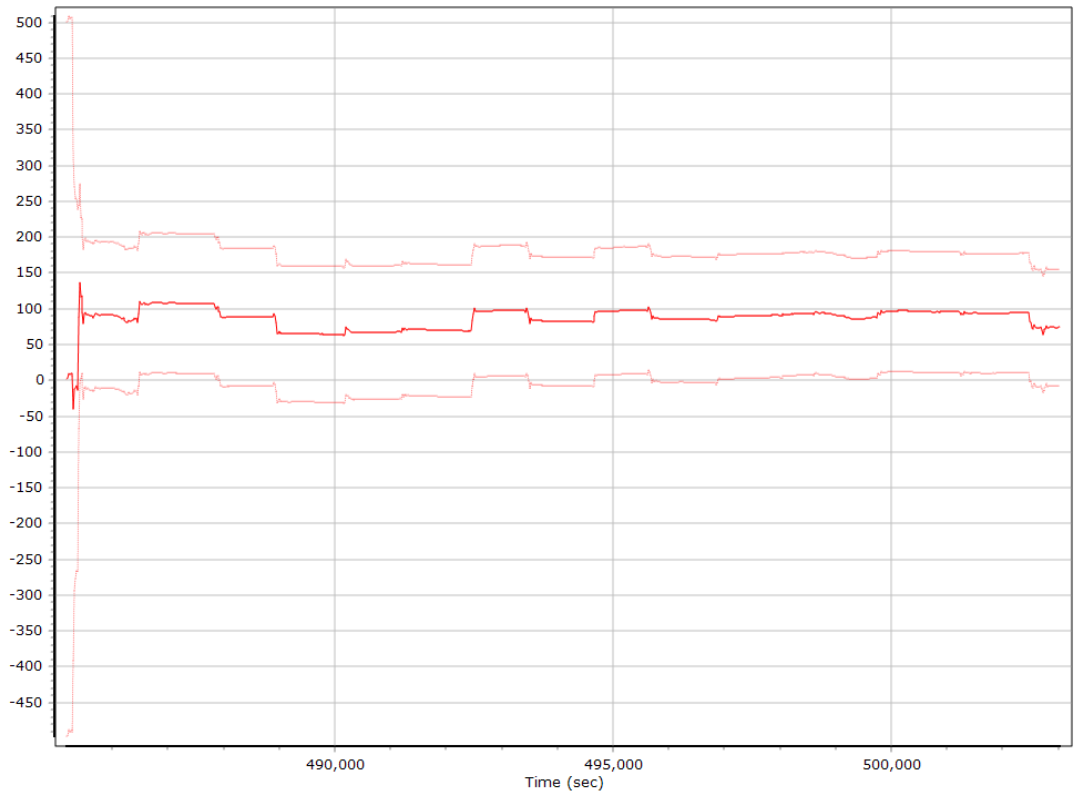
Accelerometer Bias (micro-g)



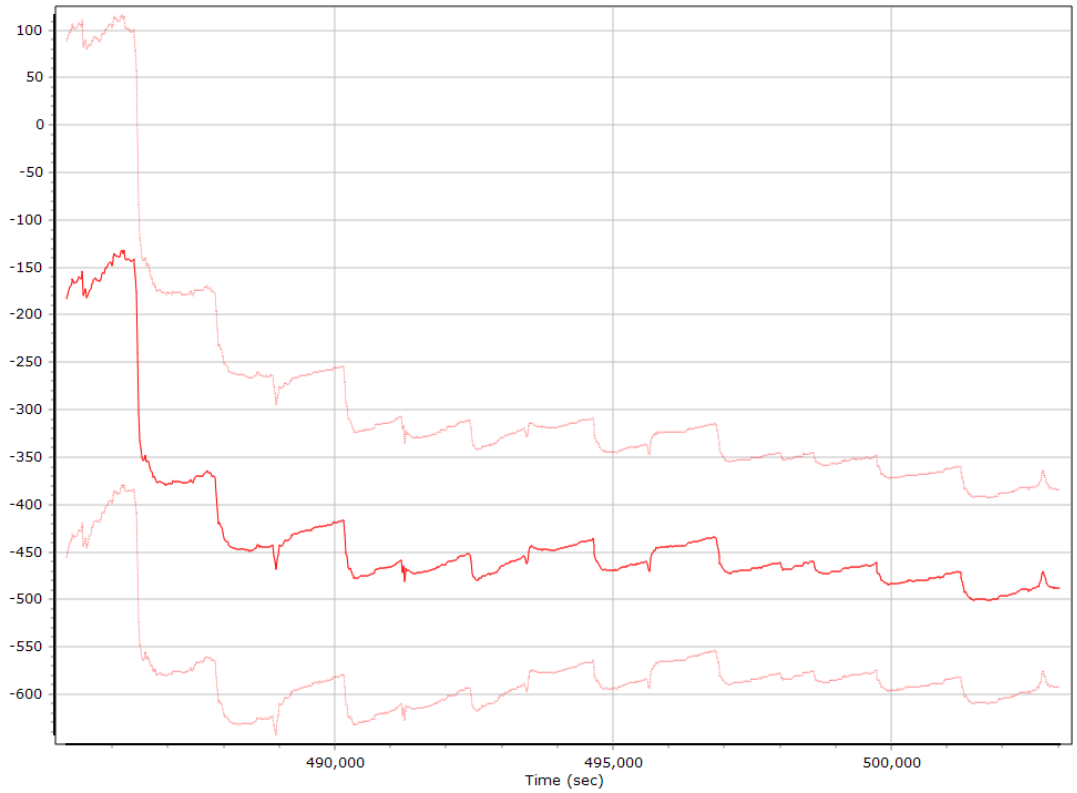
X Accelerometer Bias (micro-g)



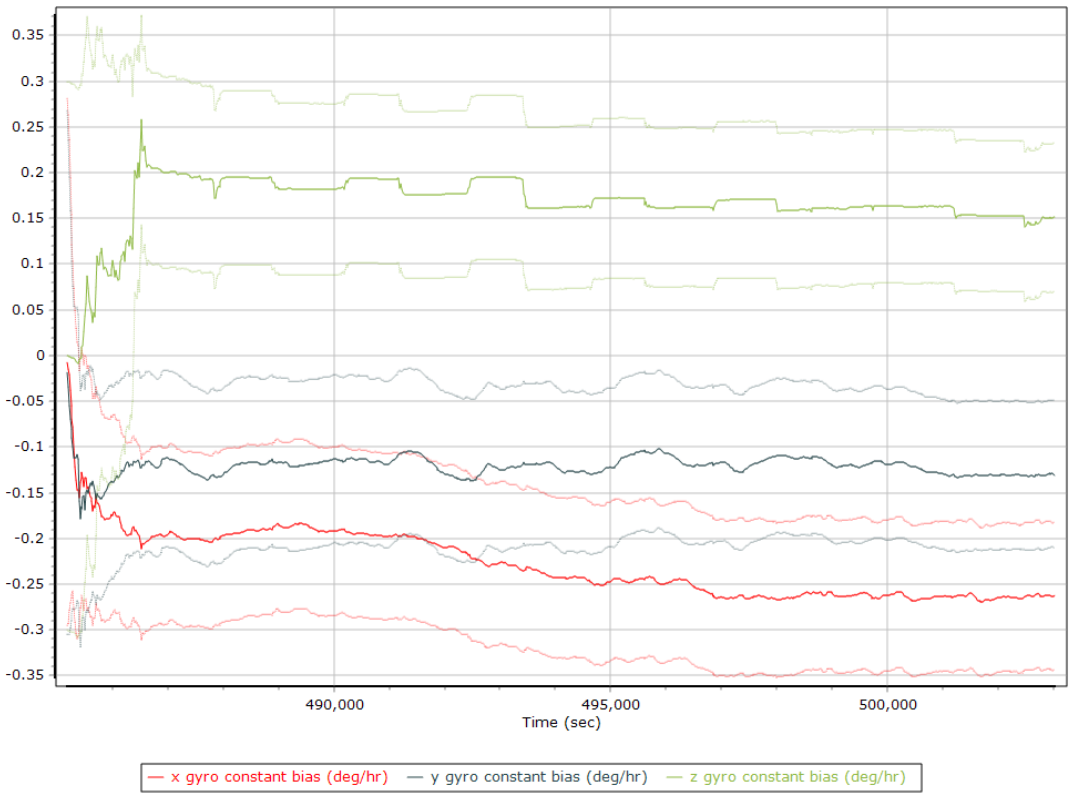
Y Accelerometer Bias (micro-g)



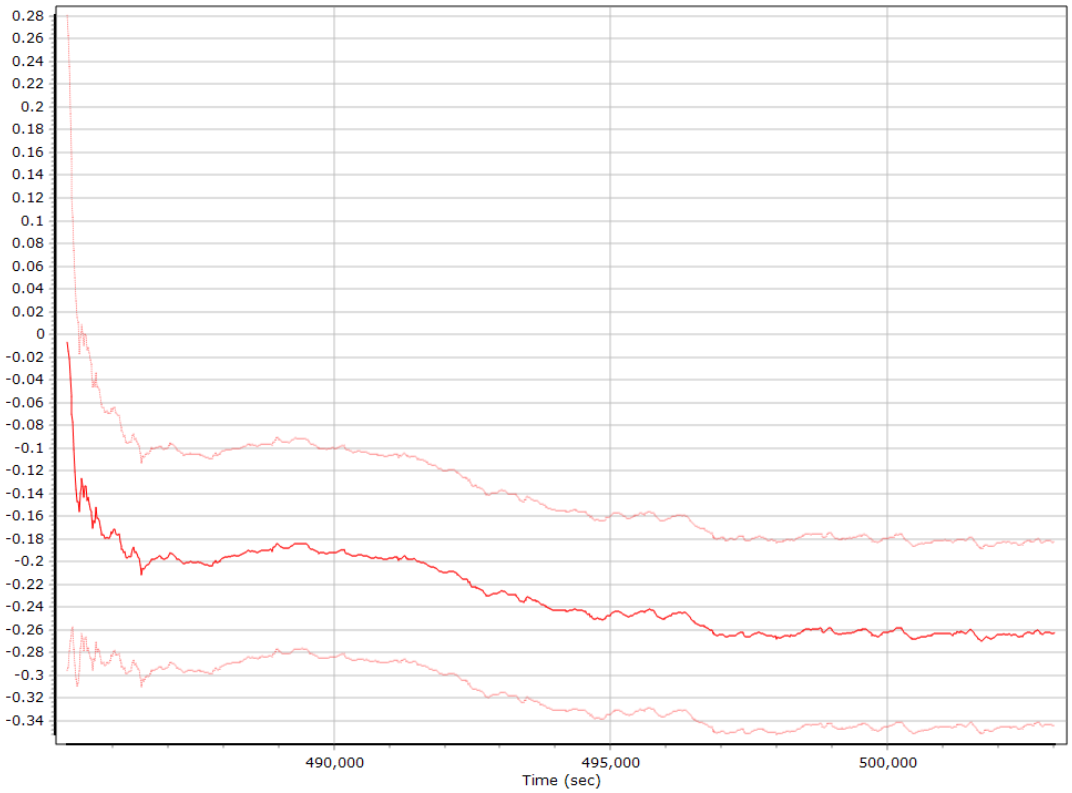
Z Accelerometer Bias (micro-g)



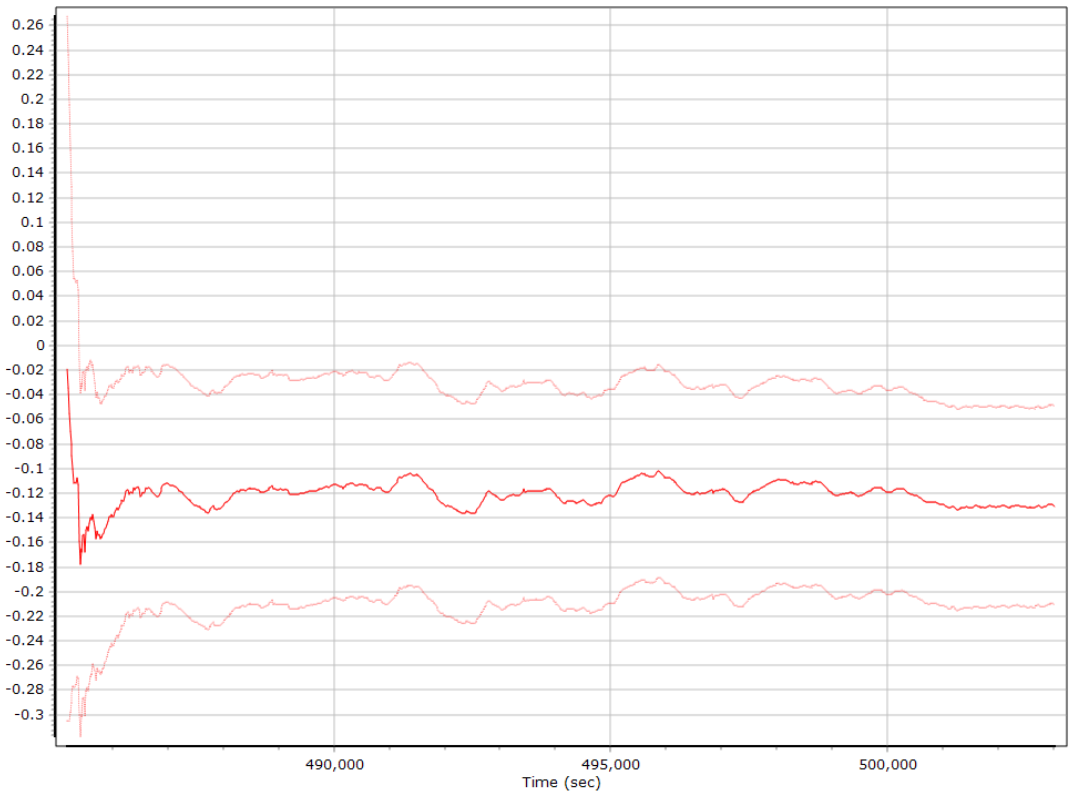
Gyro Bias (deg/h)



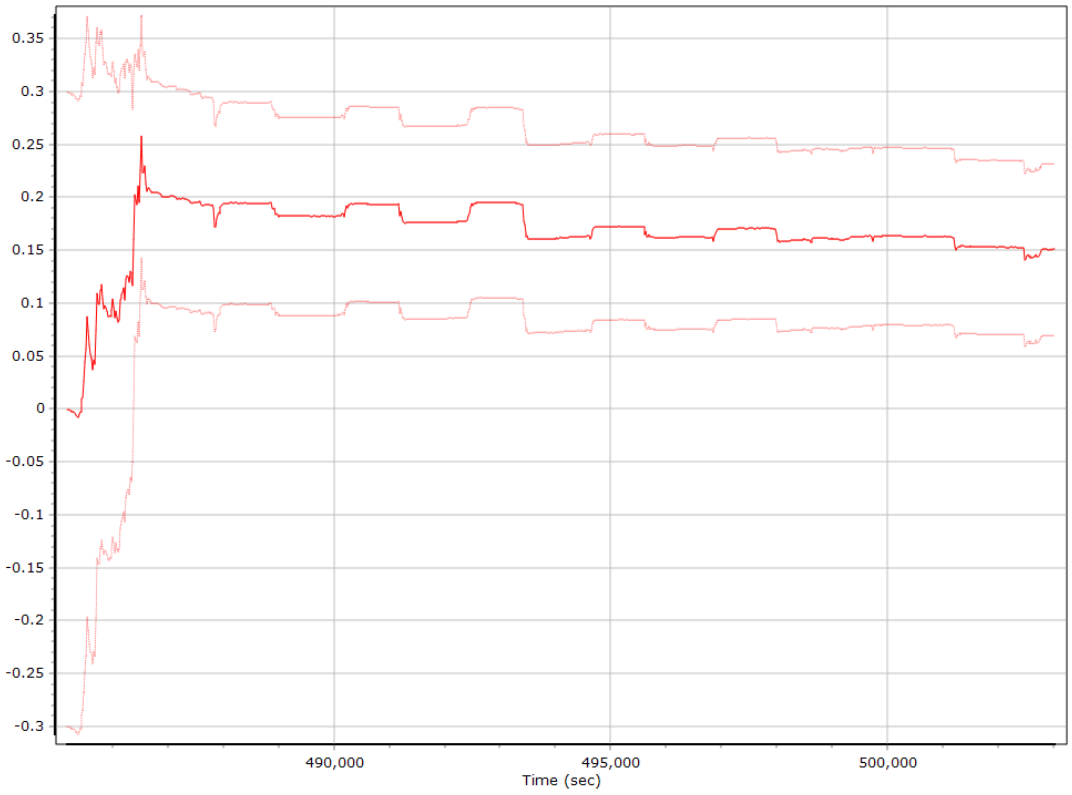
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

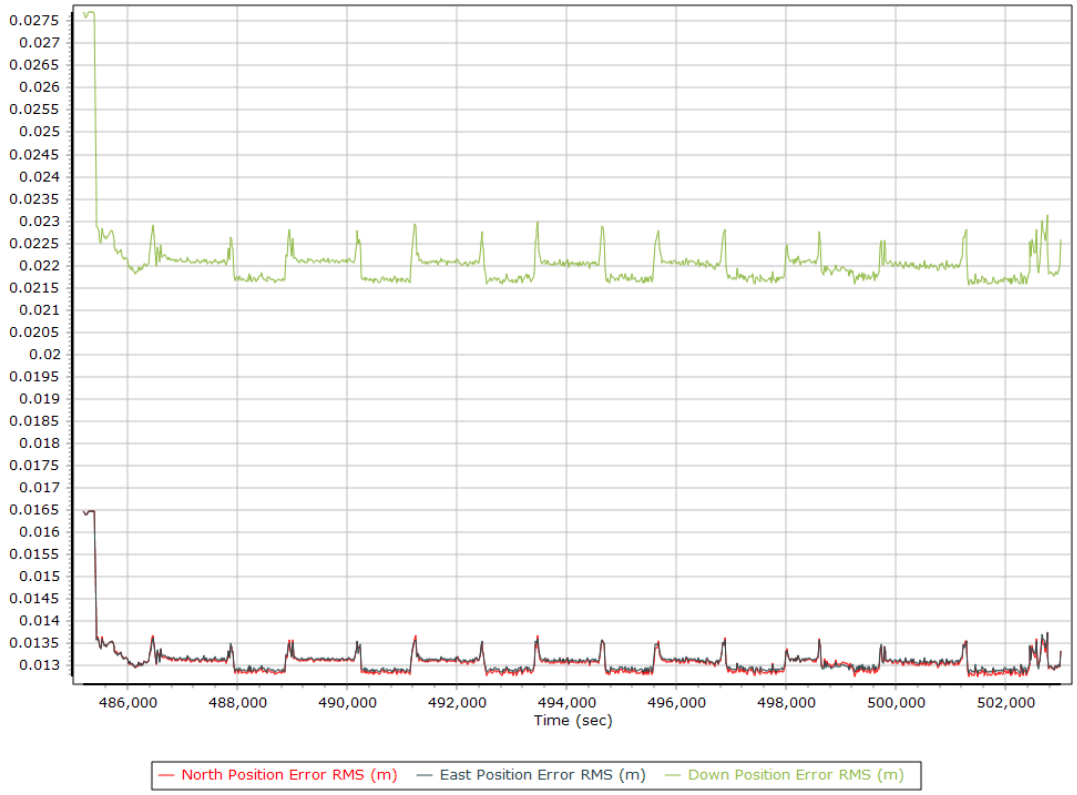


Z Gyro Bias (deg/h)

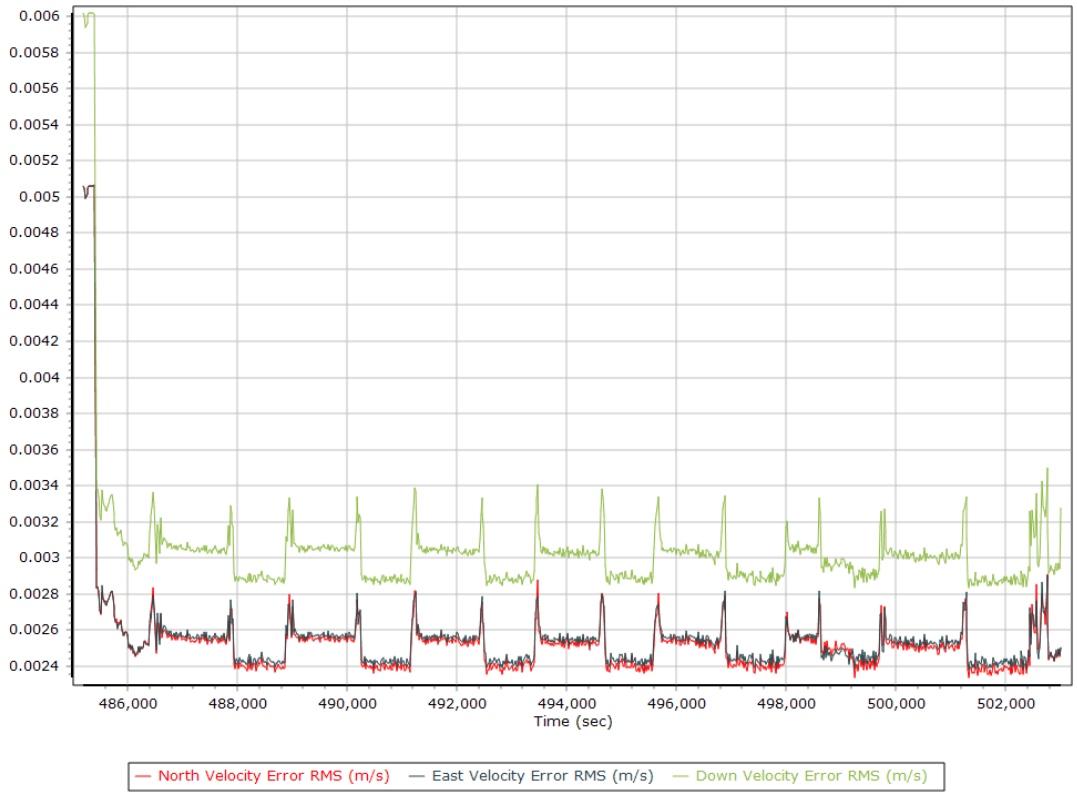


Smoothed Performance Metrics

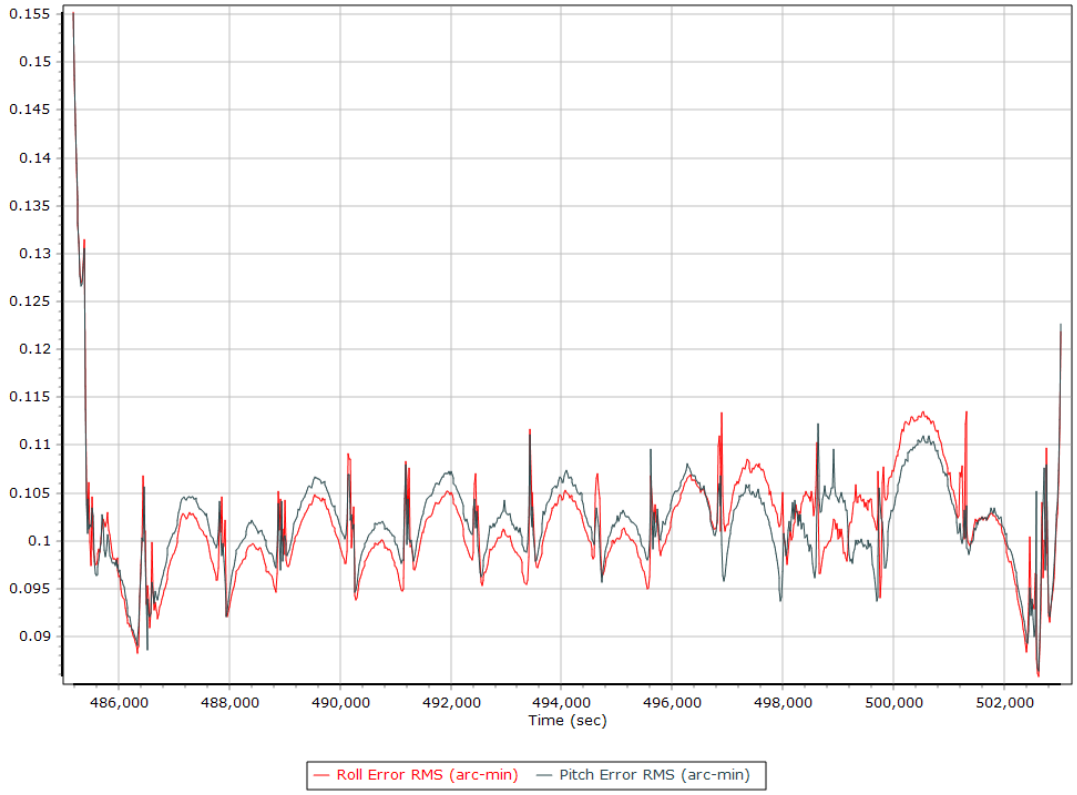
Position Error RMS (m)



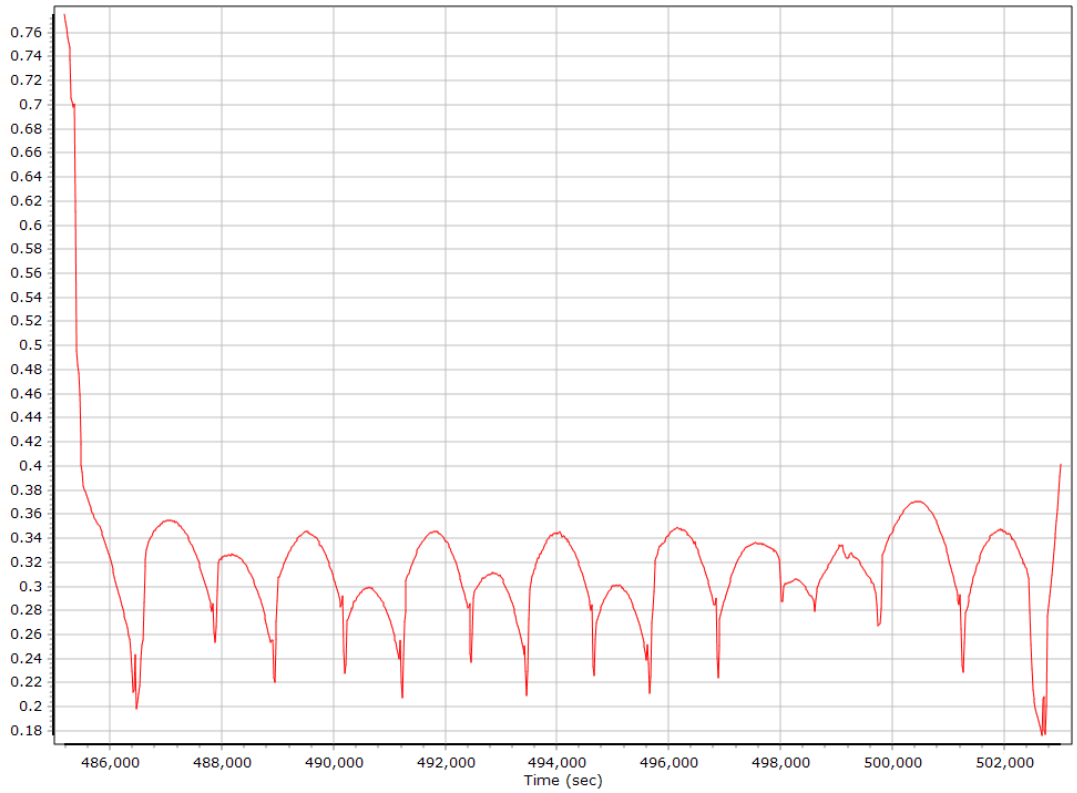
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

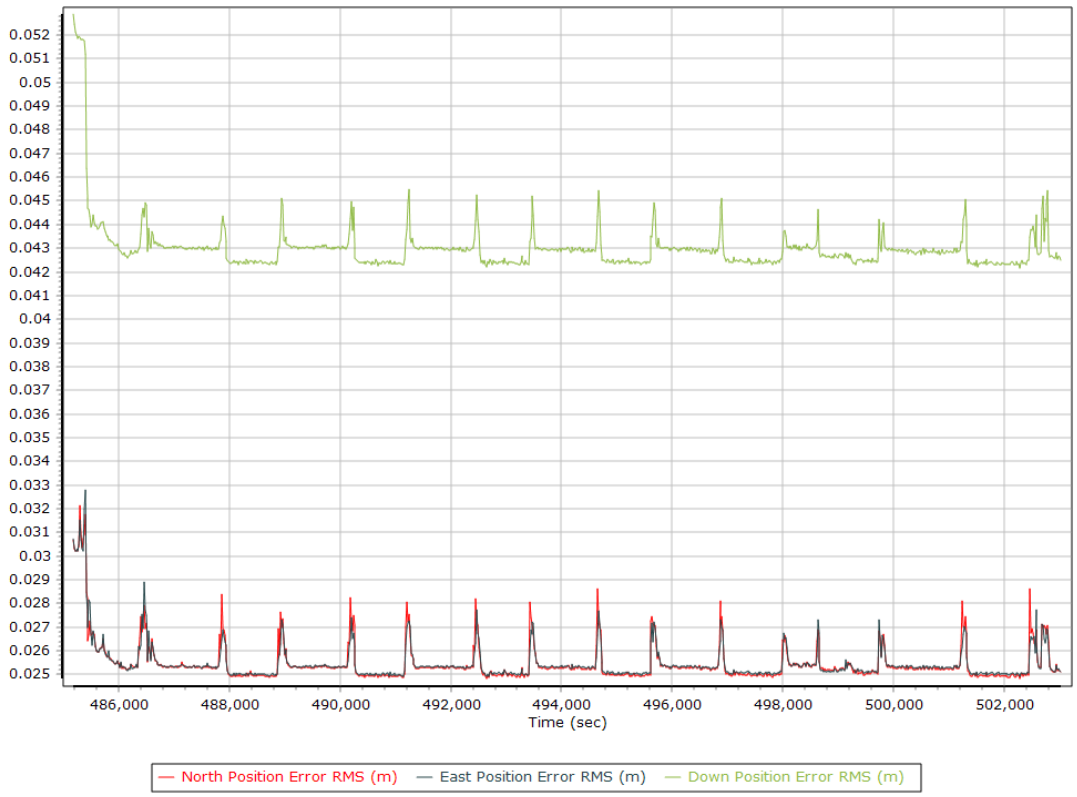


Heading Error RMS (arc-min)

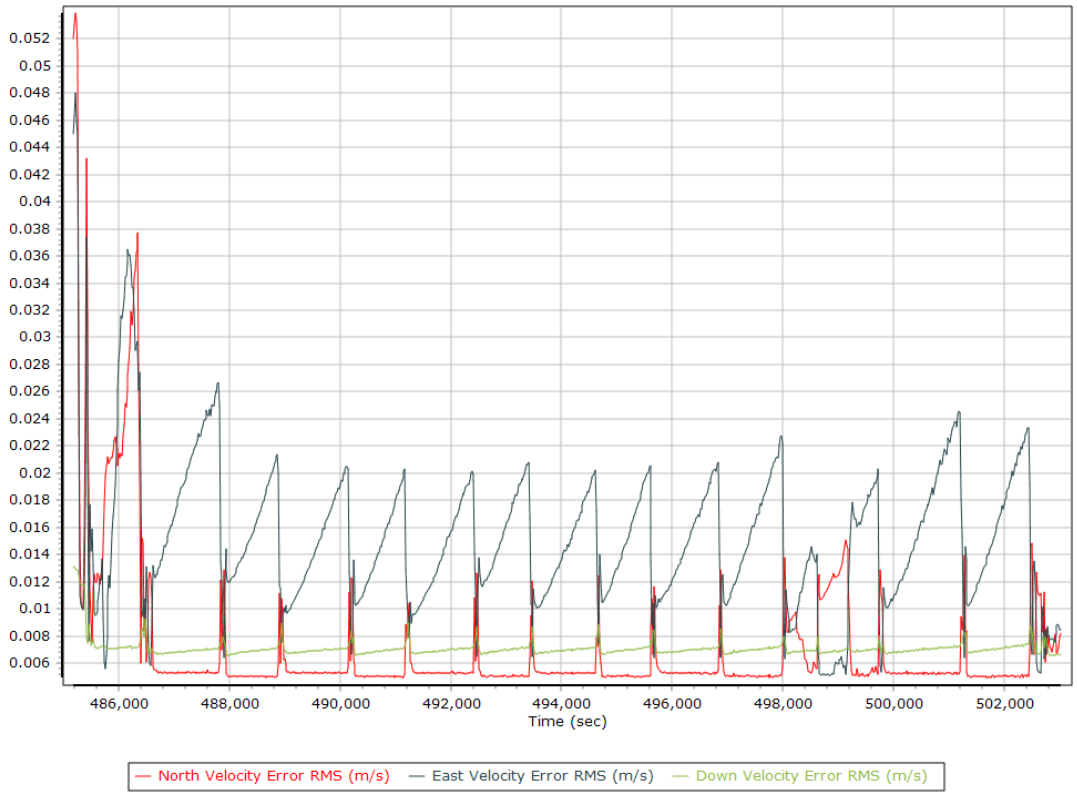


Forward Processed Performance Metrics

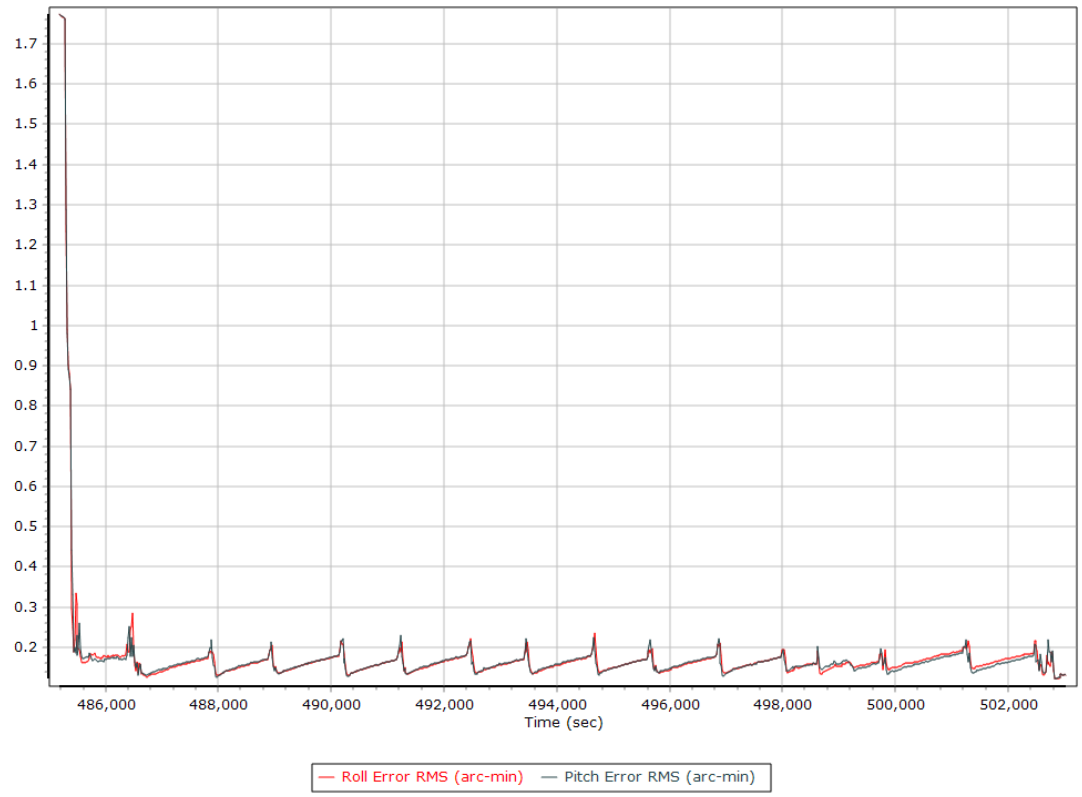
Position Error RMS (m)



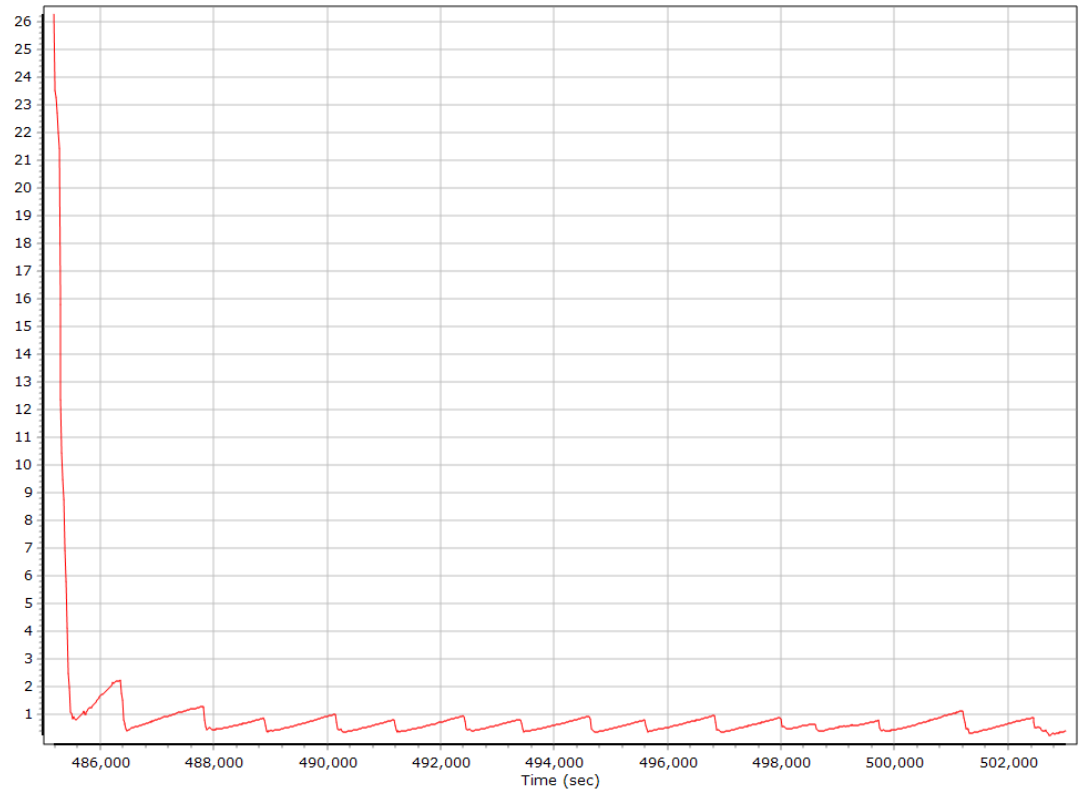
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

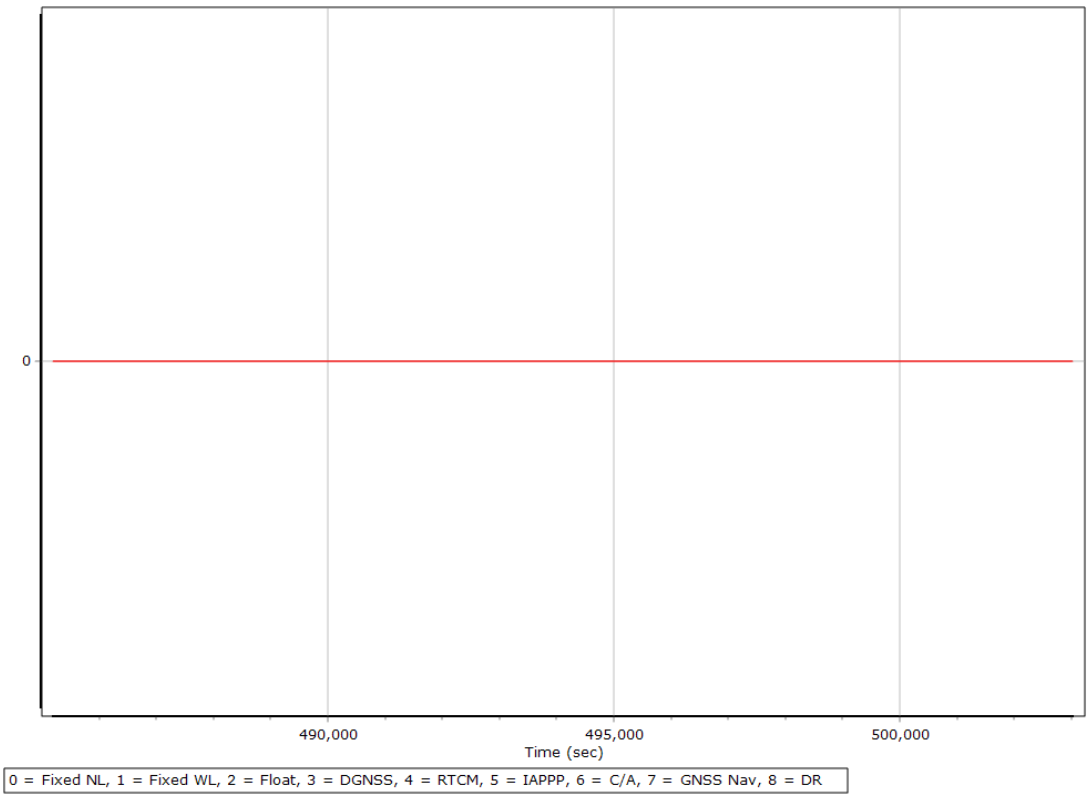


Heading Error RMS (arc-min)

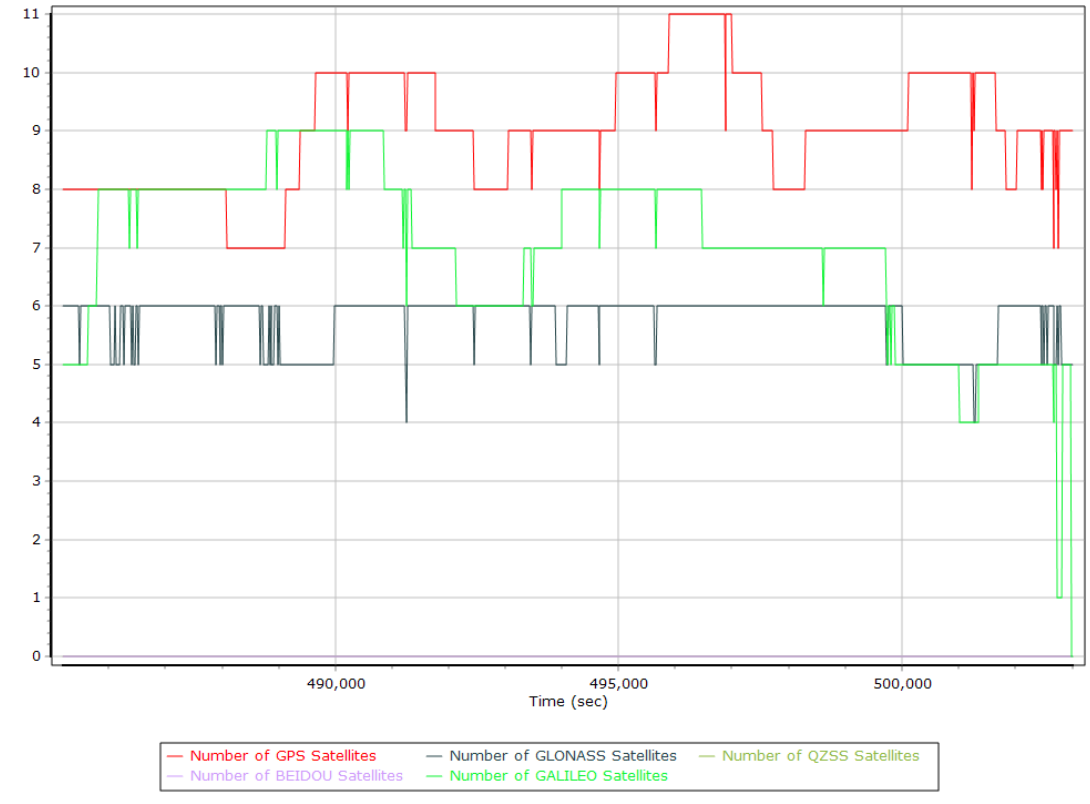


Forward Processed Solution Status

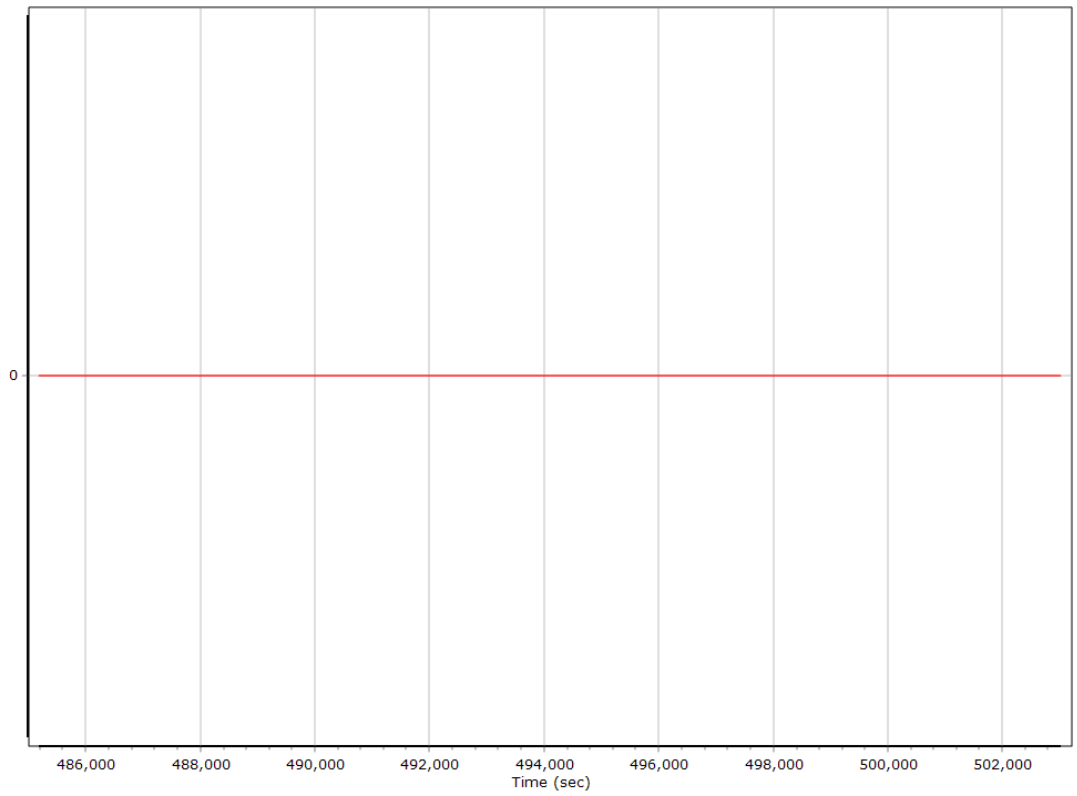
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12132020A_4040
Processing date	2022-01-05 15:07:18
Mission date	2020-12-13 18:32:13
Mission duration	03:13:28.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201213_183154_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3480.20g	GLONASS Broadcast Ephemeris
Ephm3480.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12132020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201213_183154_INS-GPS_1.raw		
Last raw data file	201213_183154_INS-GPS_1.raw		
Start GPS week	2136		
Start time	66714.681 (12/13/2020 6:31:54 PM)		
End time	78322.721 (12/13/2020 9:45:22 PM)		
Start of fine alignment	66928.126 (12/13/2020 6:35:28 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

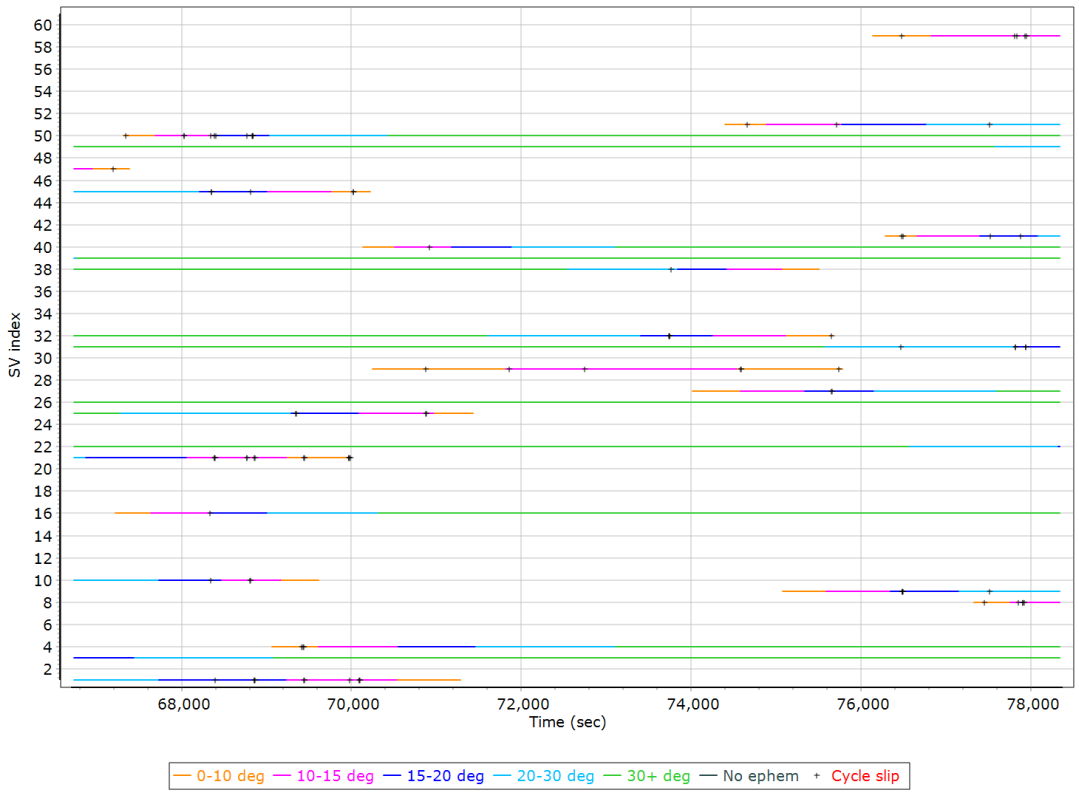
Rover Data QC

Raw IMU Import QC Summary

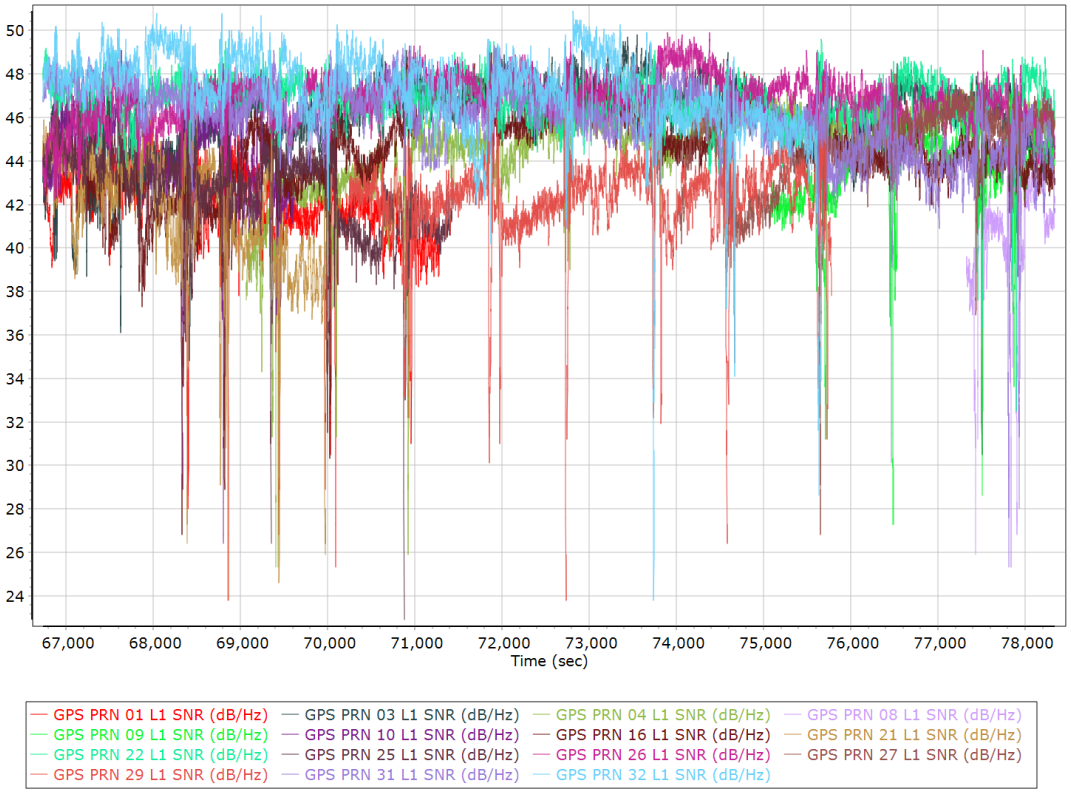
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12132020A_4040.log
IMU Records Processed	2321318
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

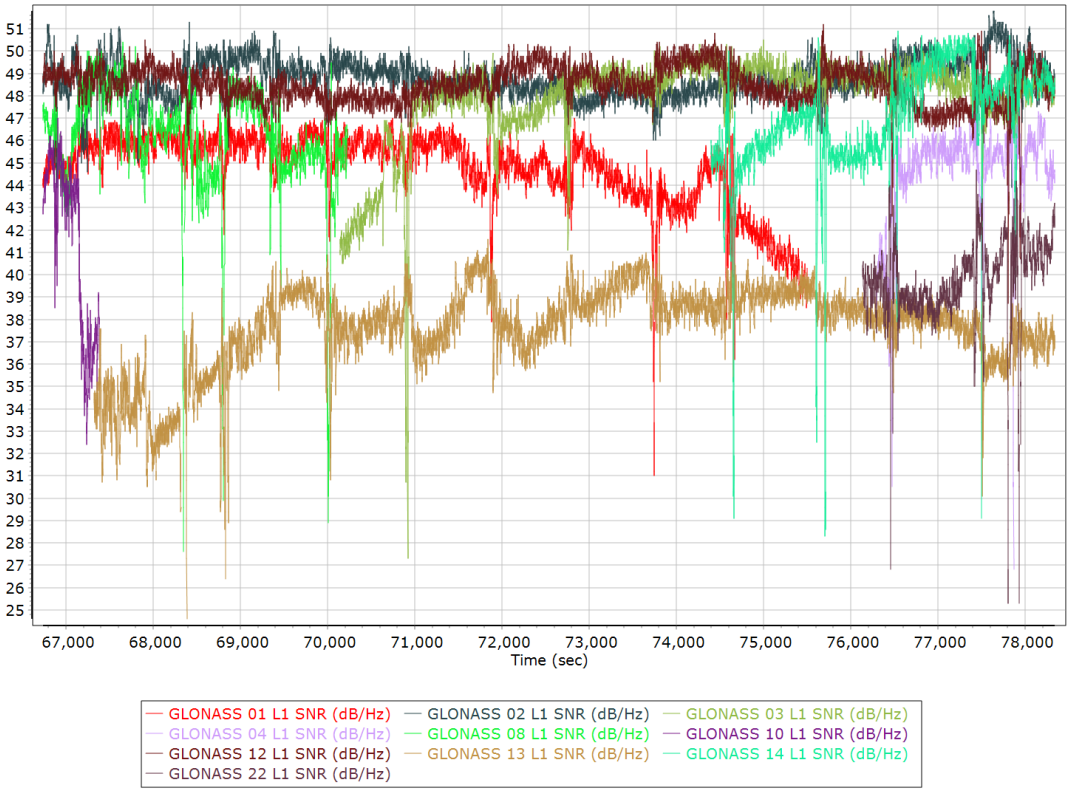
GPS/GLONASS L1 Satellite Lock/Elevation



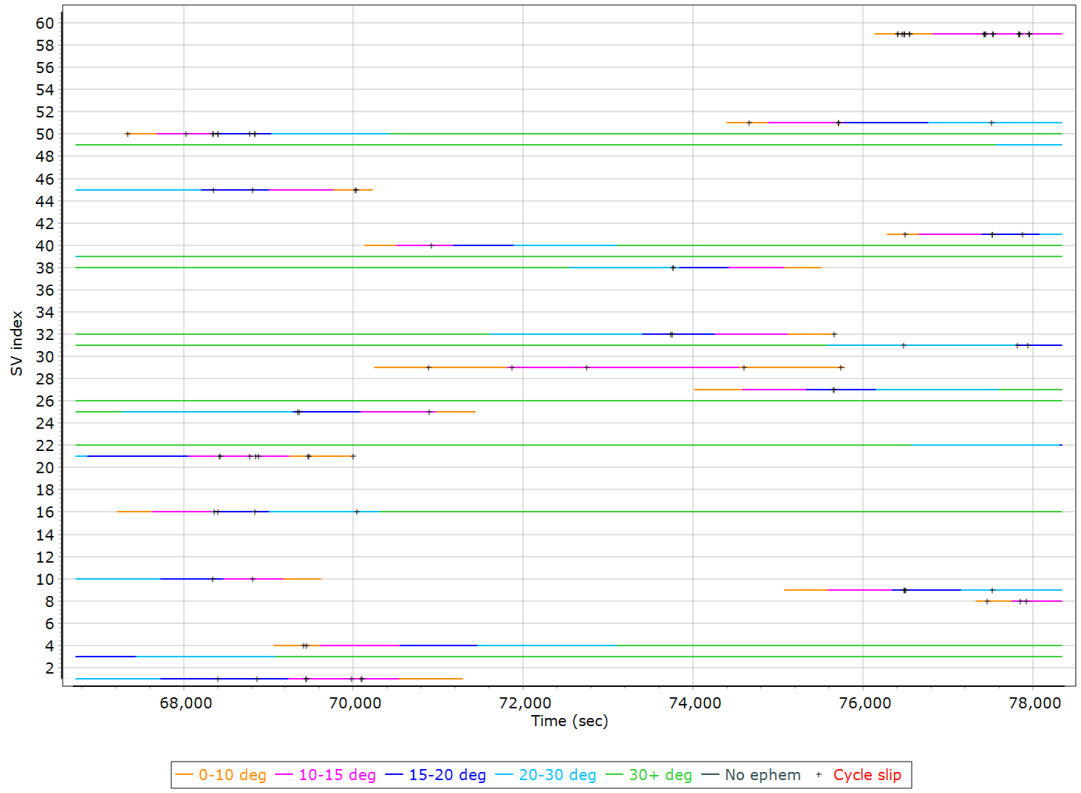
GPS L1 SNR



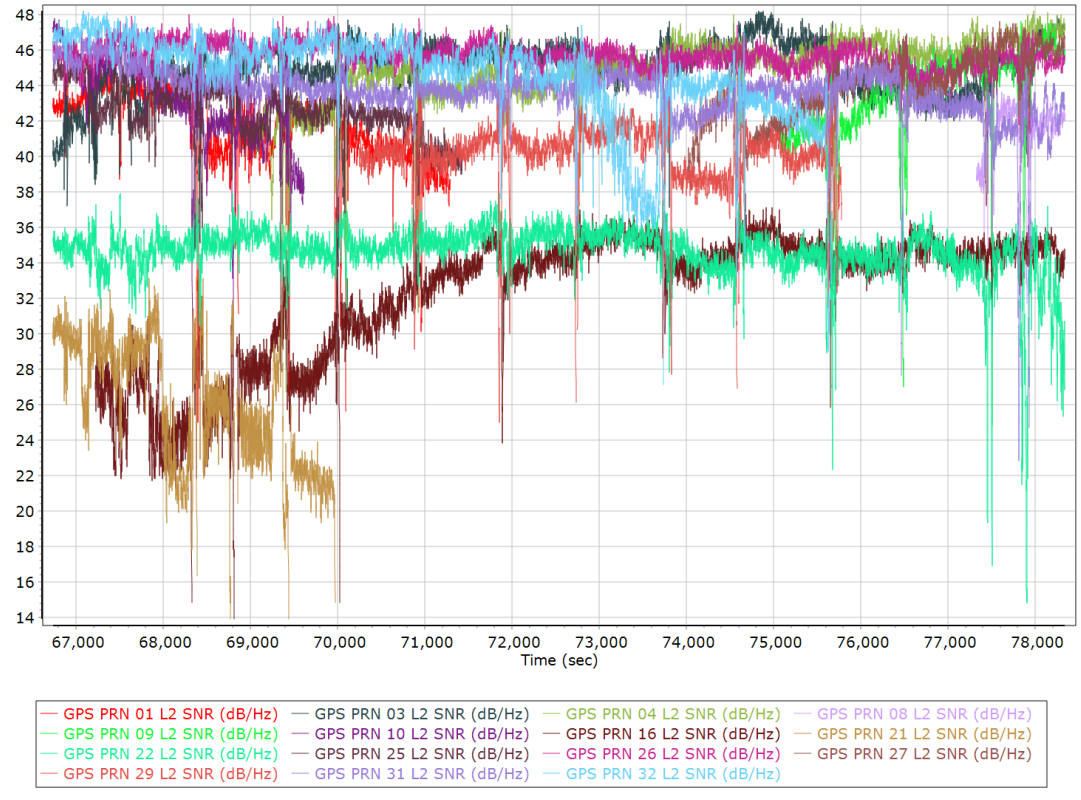
GLONASS L1 SNR



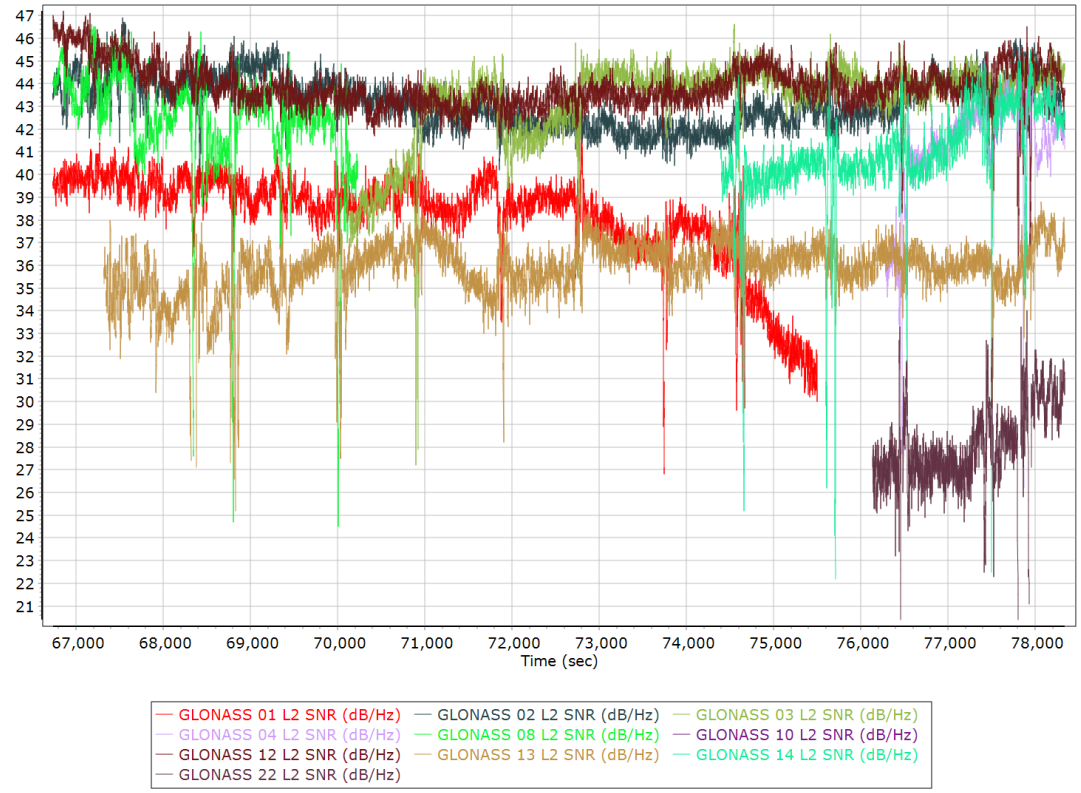
GPS/GLONASS L2 Satellite Lock/Elevation



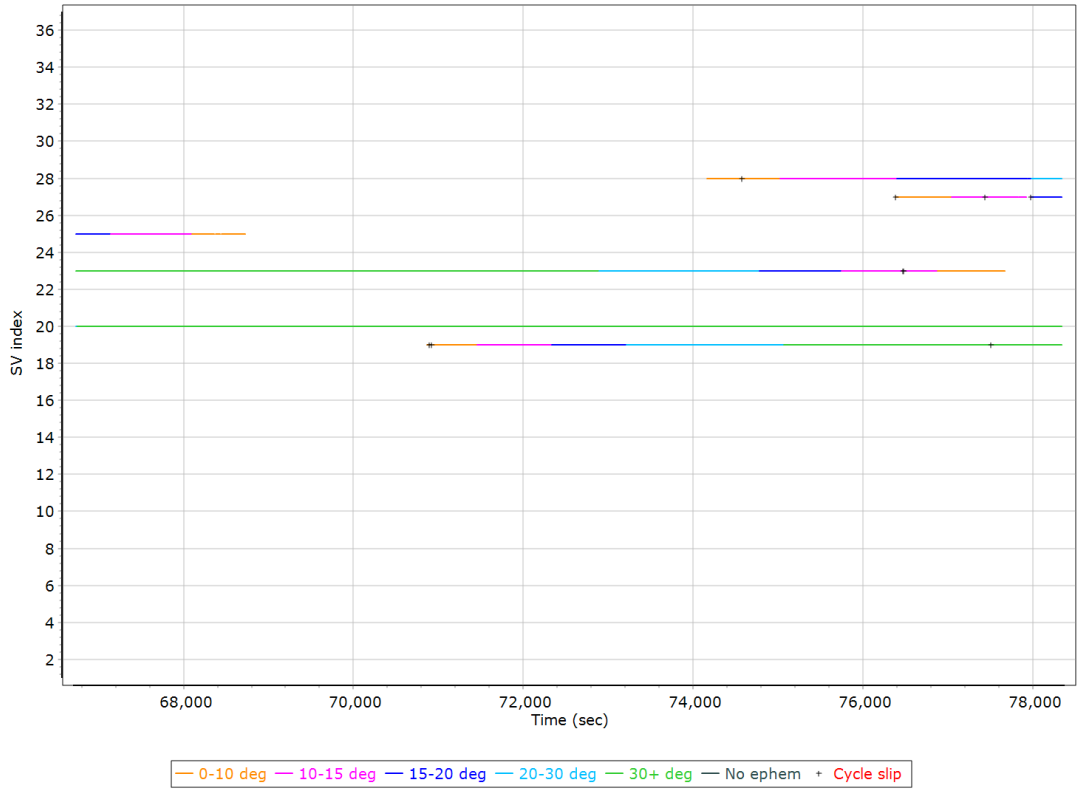
GPS L2 SNR



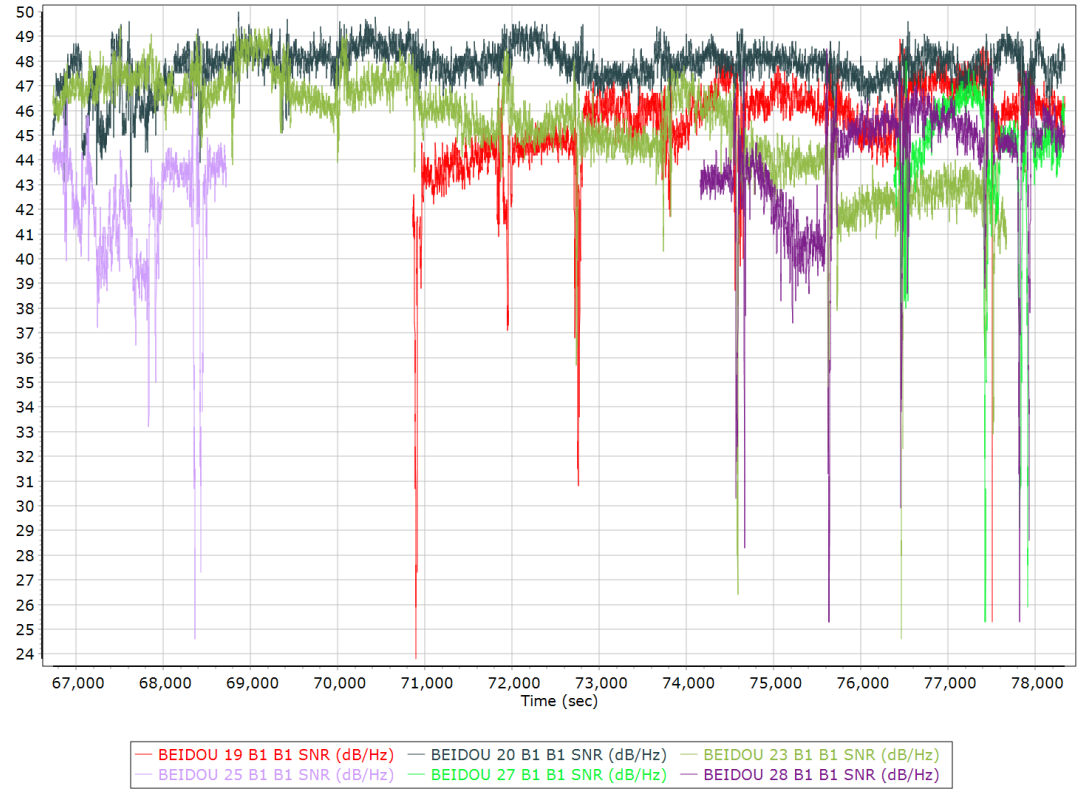
GLONASS L2 SNR



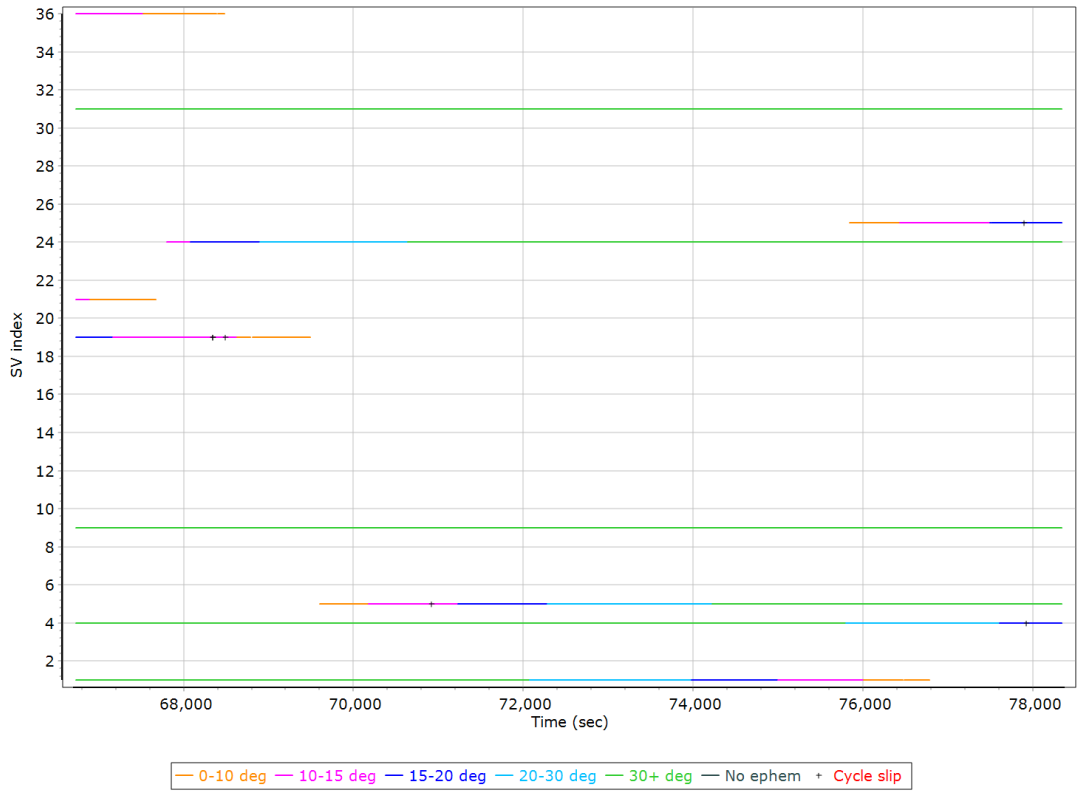
BEIDOU Satellite Lock/Elevation



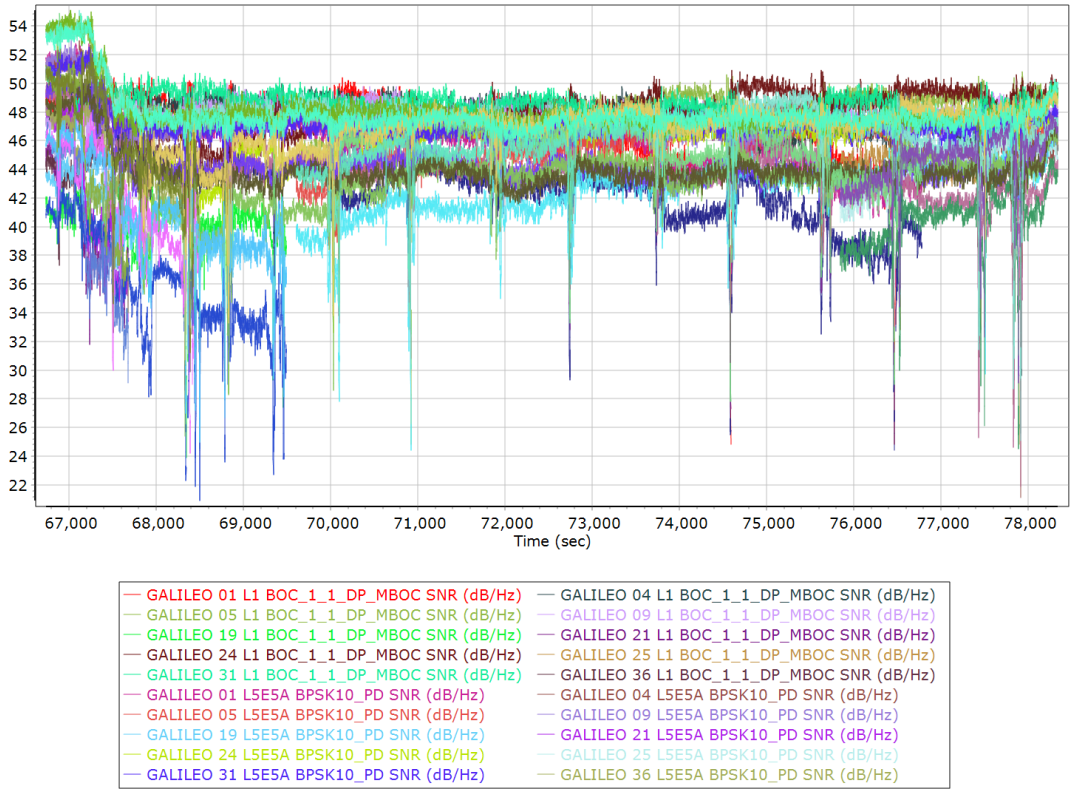
BEIDOU SNR



GALILEO Satellite Lock/Elevation

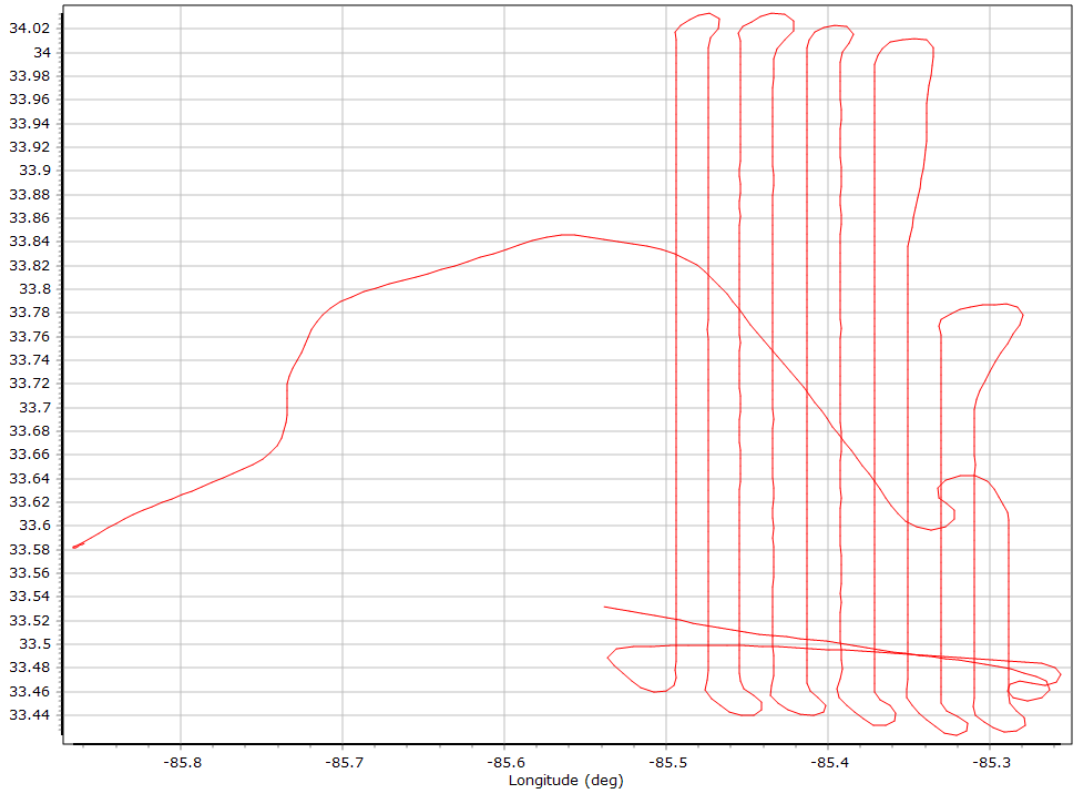


GALILEO SNR

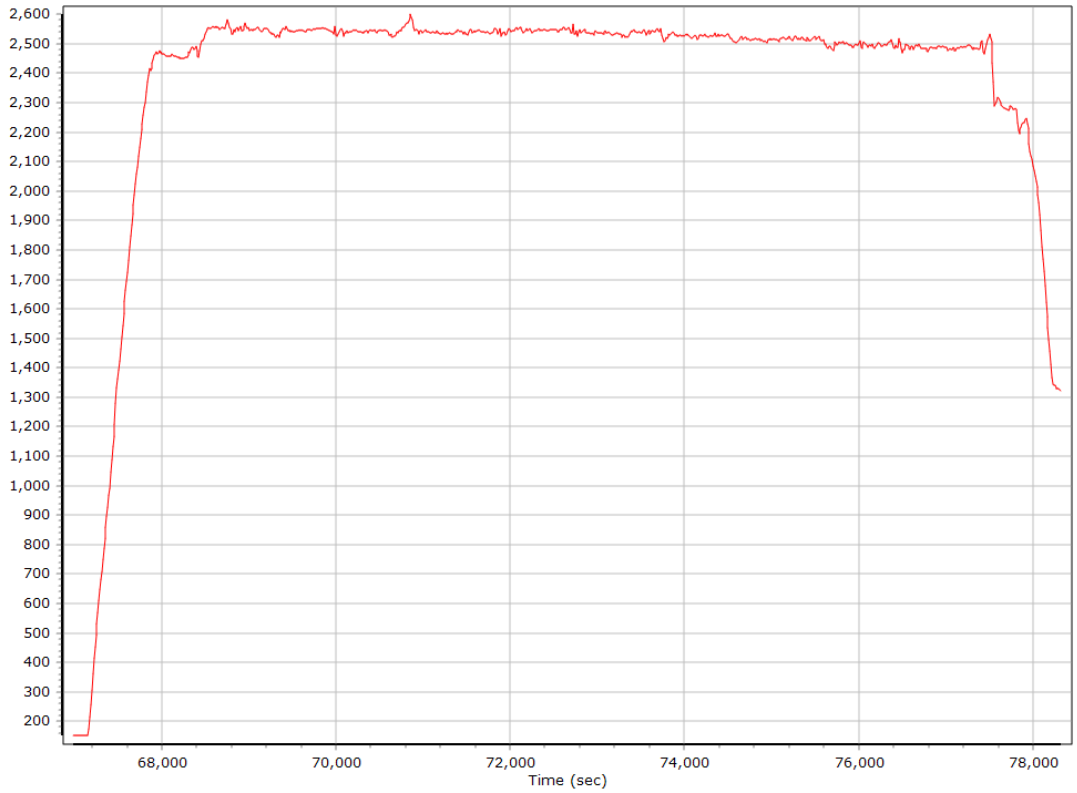

54
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67,000
68,000
69,000
70,000
71,000
72,000
73,000
74,000
75,000
76,000
77,000
78,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 36 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 25 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 31 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 36 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

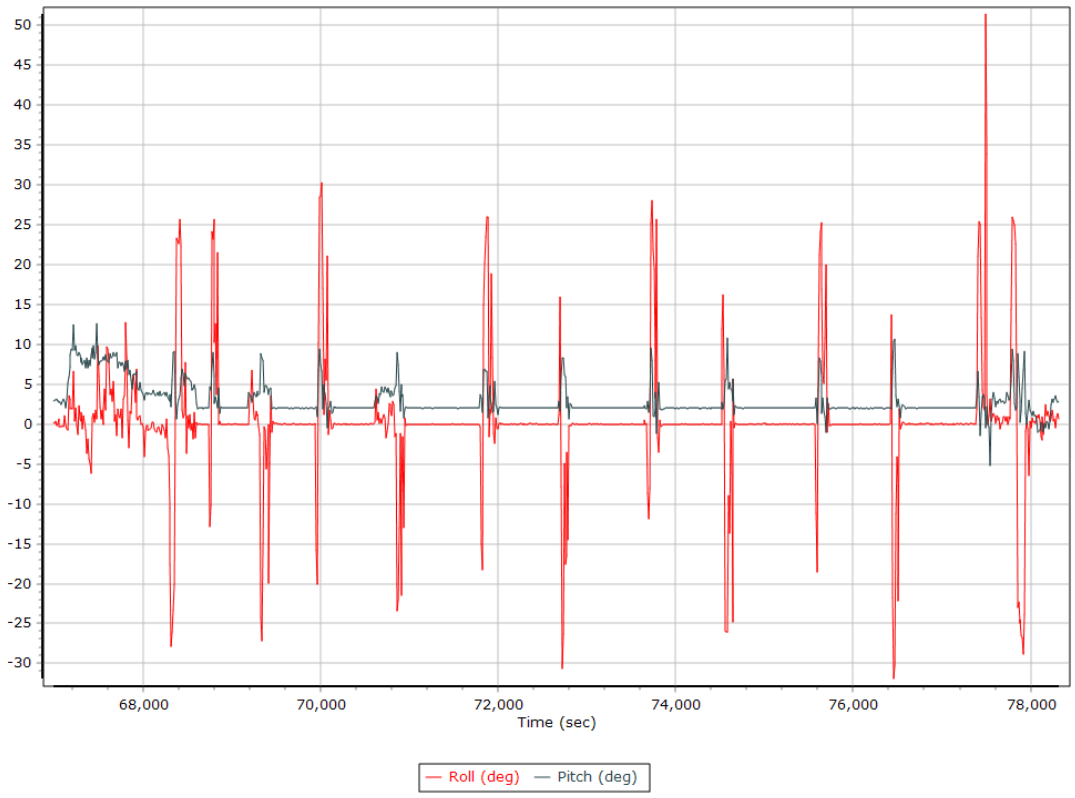
Top View



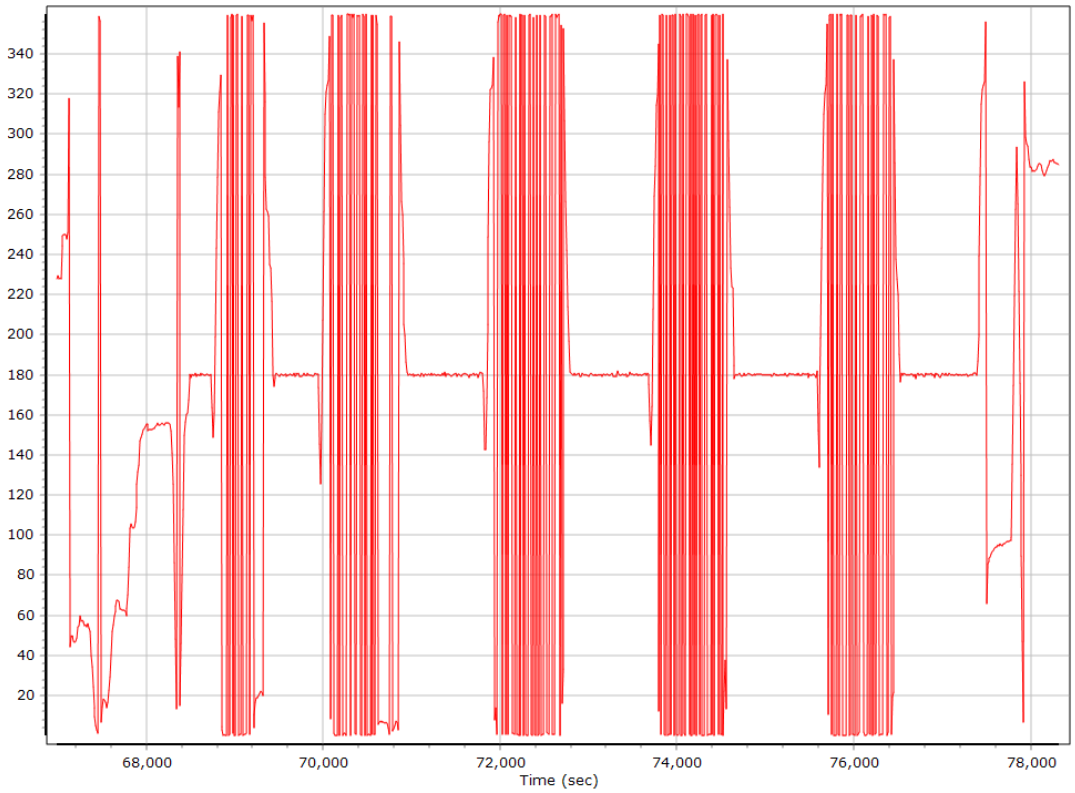
Altitude



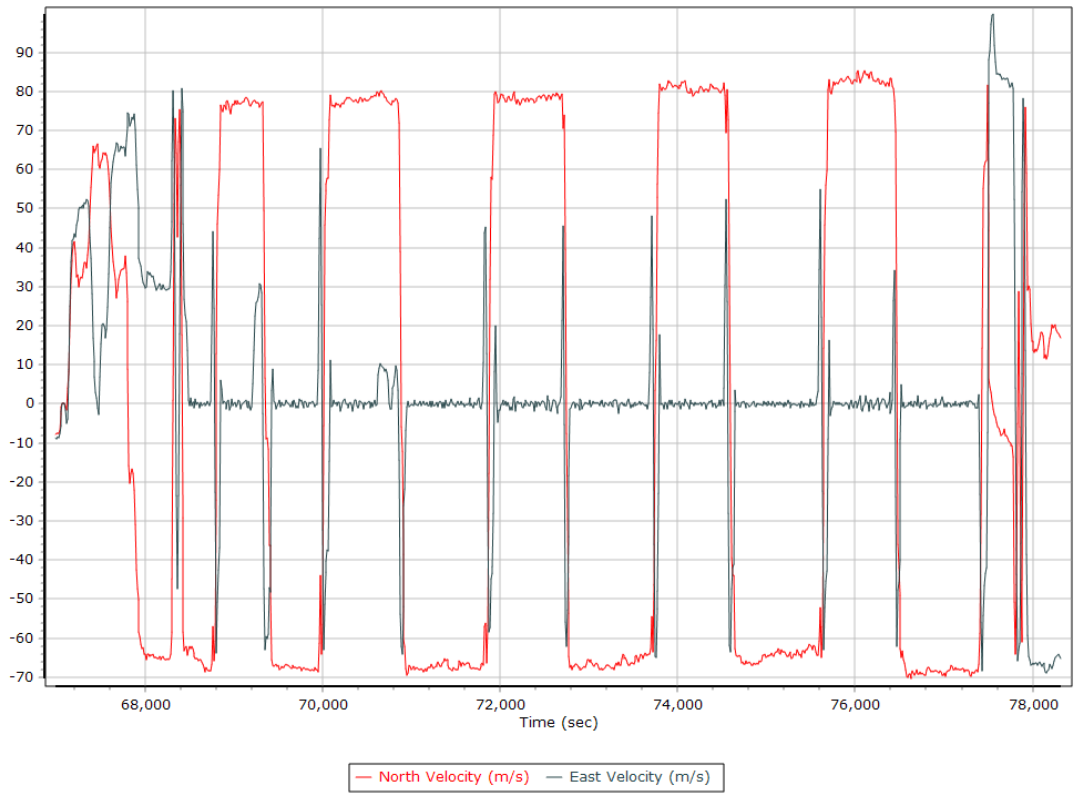
Roll/Pitch



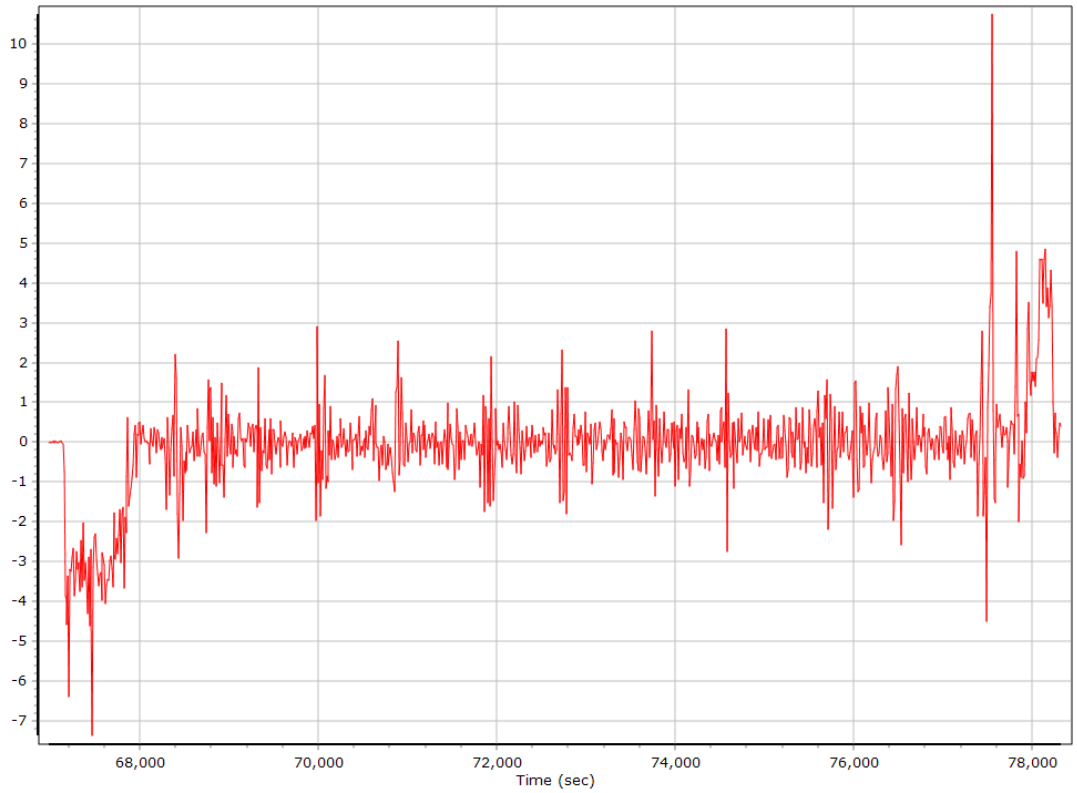
Heading



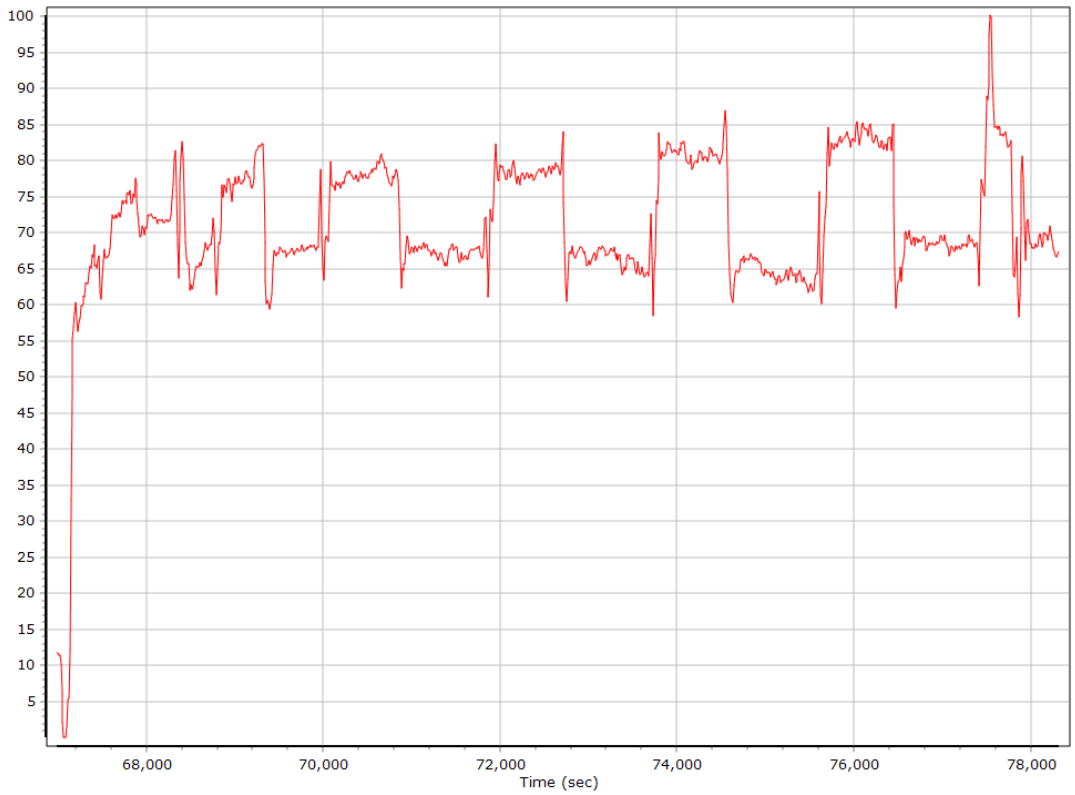
North/East Velocity



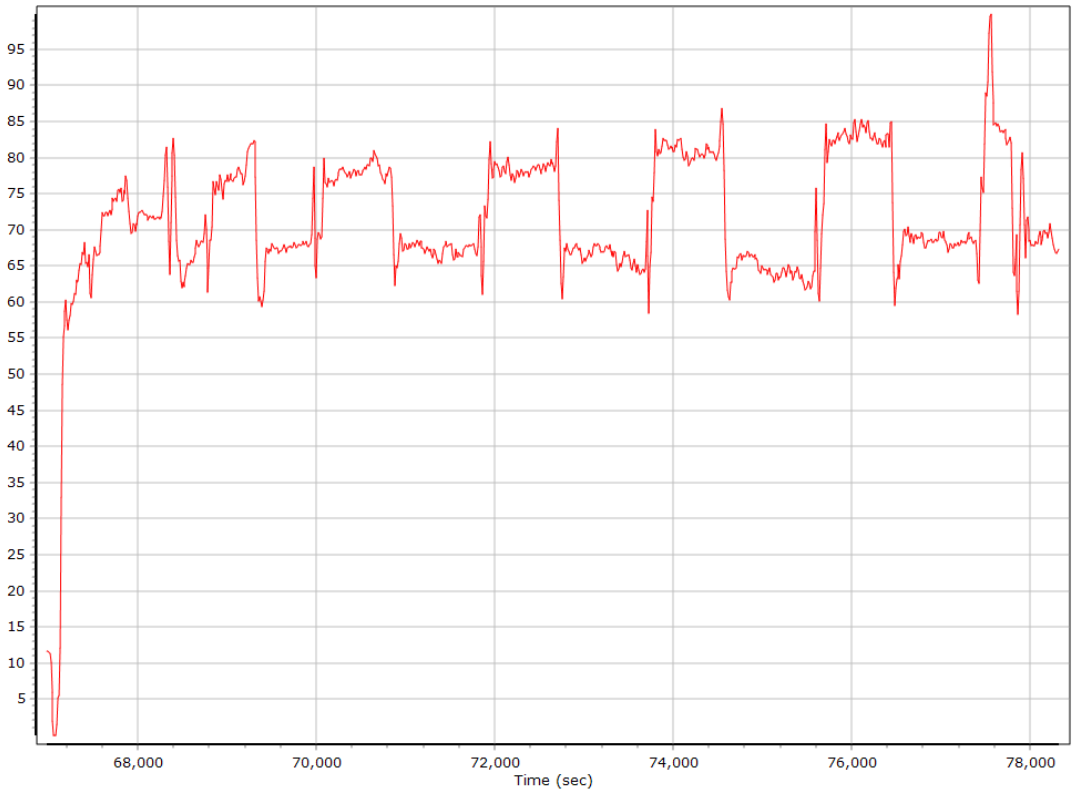
Down Velocity



Total Speed



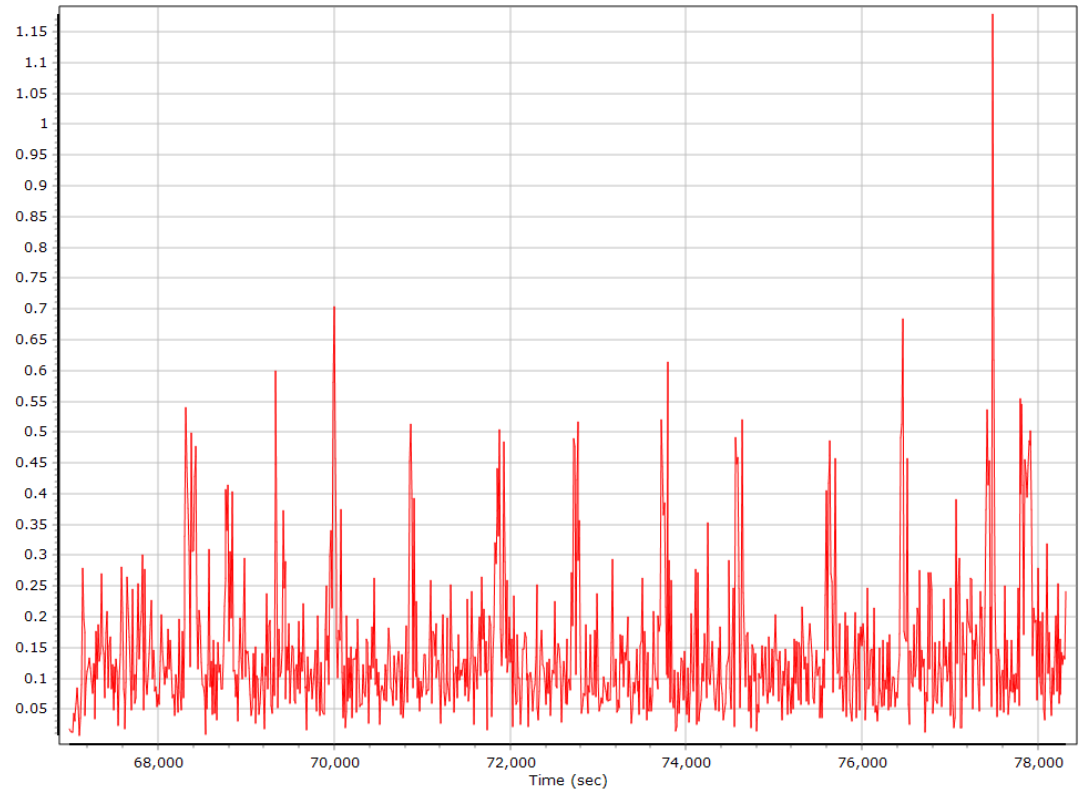
Ground Speed



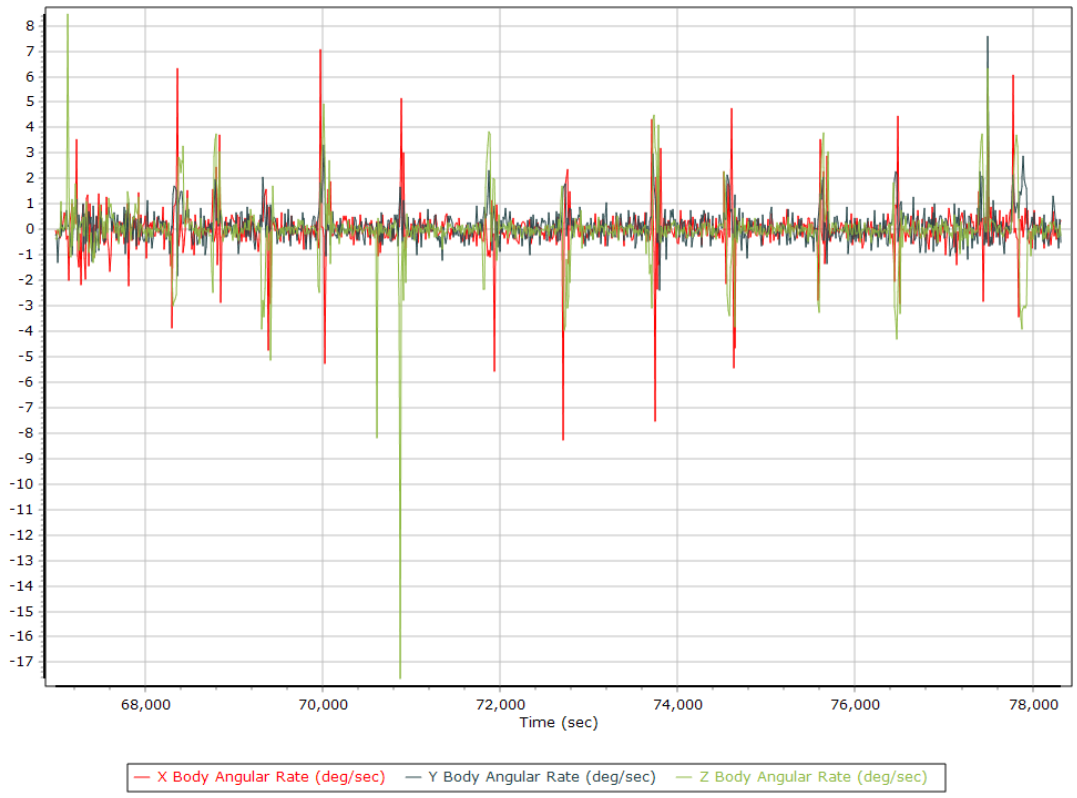
Body Acceleration



Total Body Acceleration

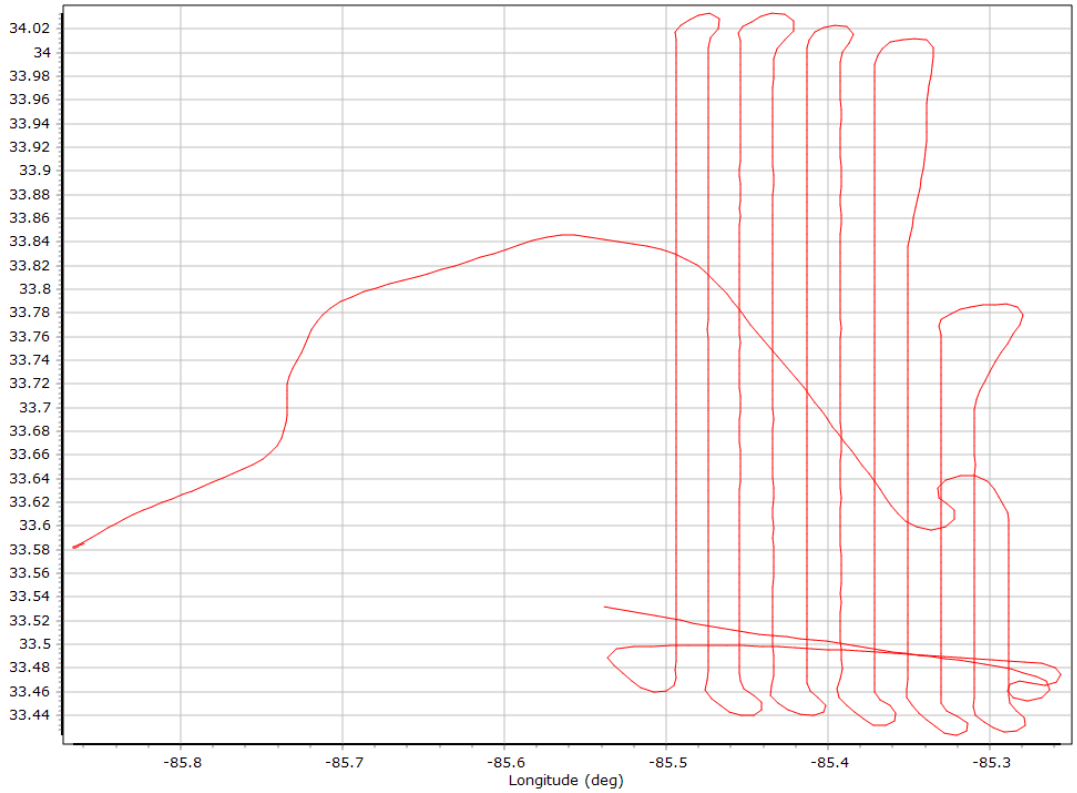


Body Angular Rate

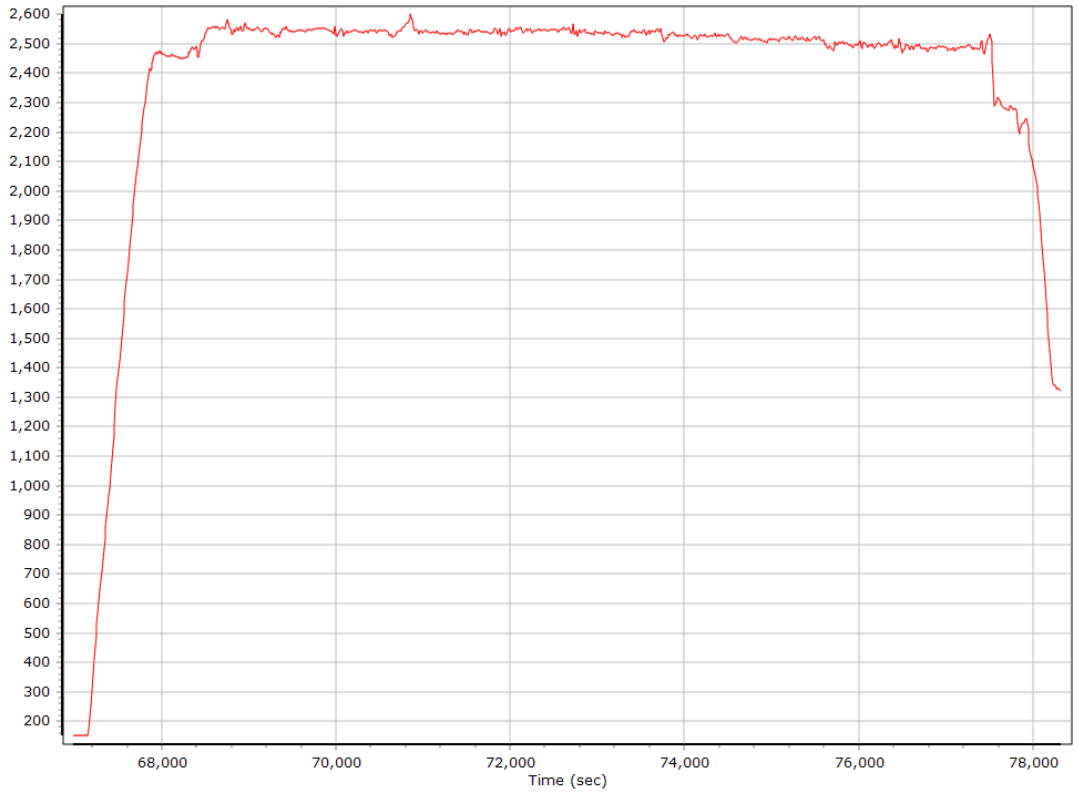


Forward Processed Trajectory Information

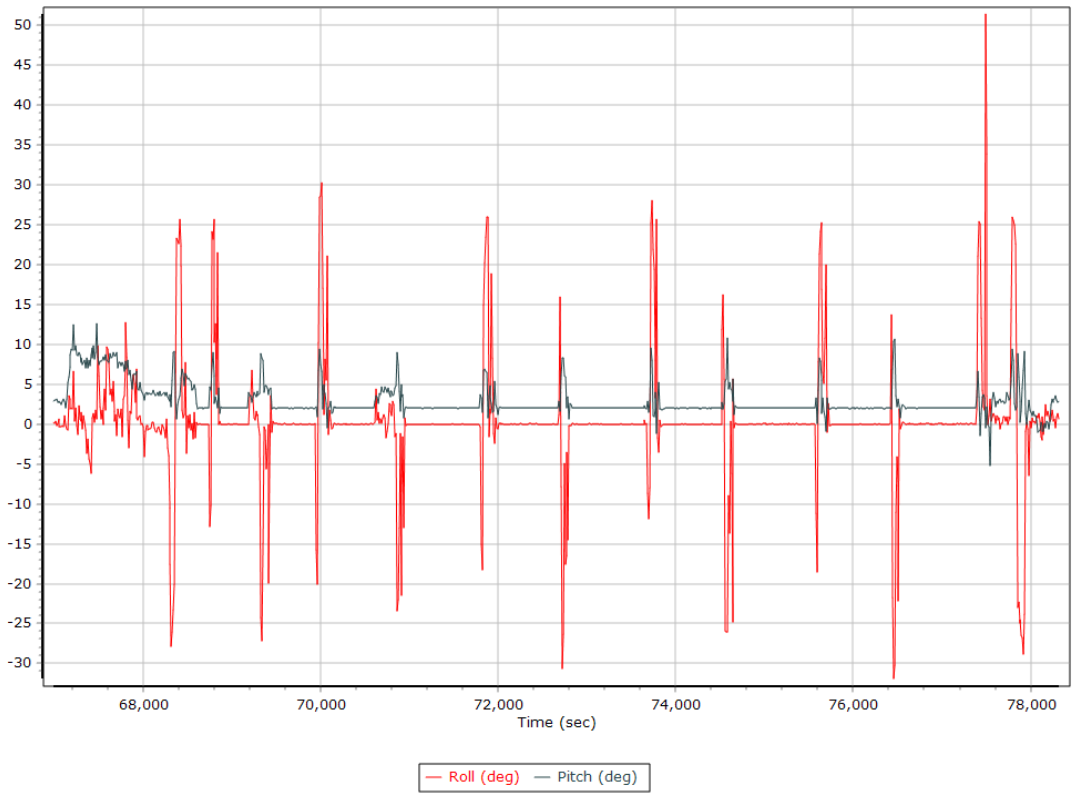
Top View



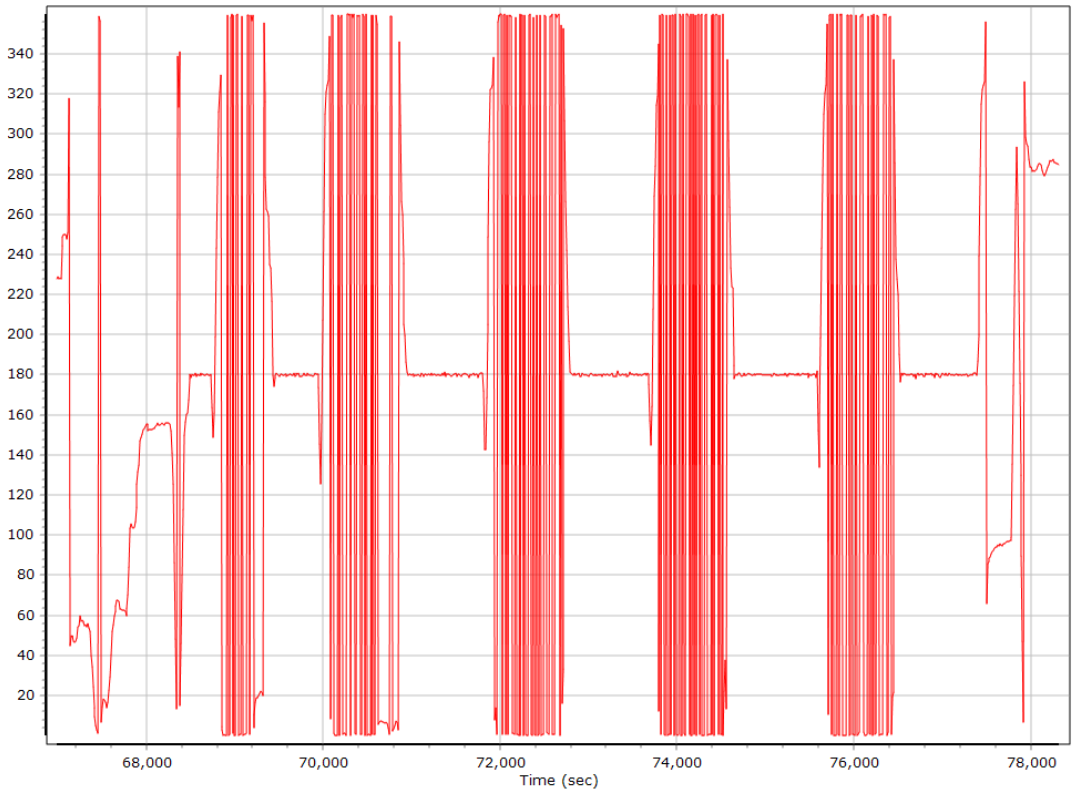
Altitude



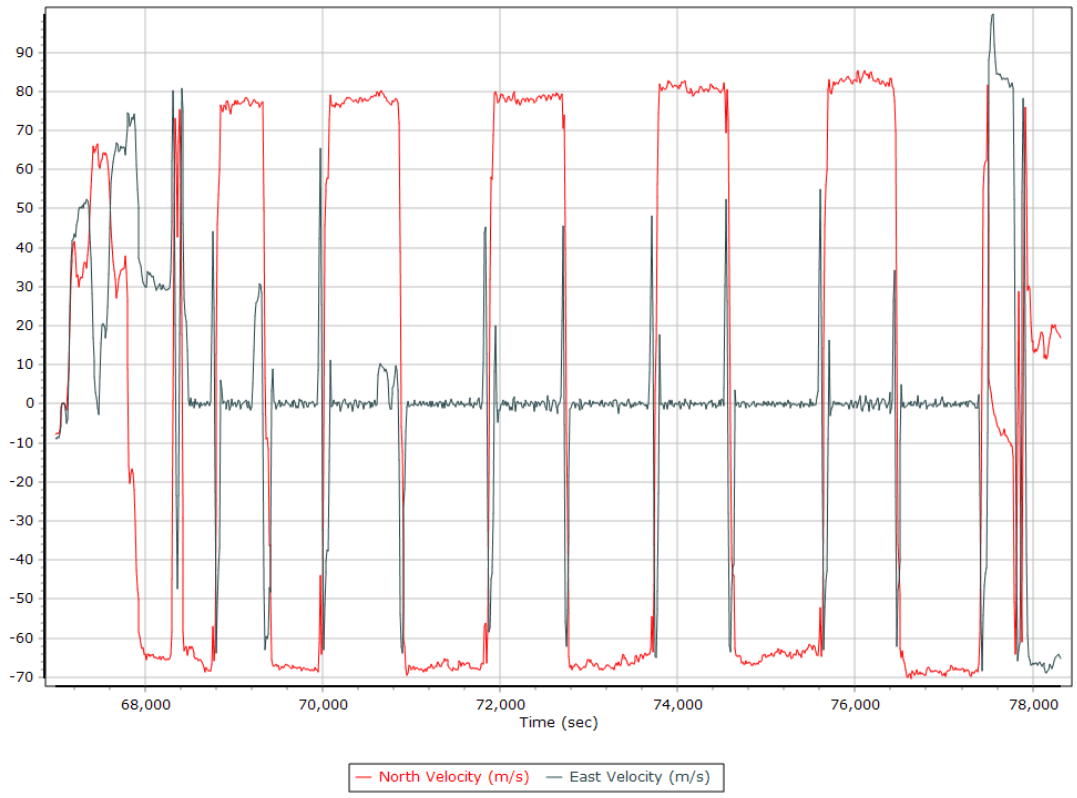
Roll/Pitch



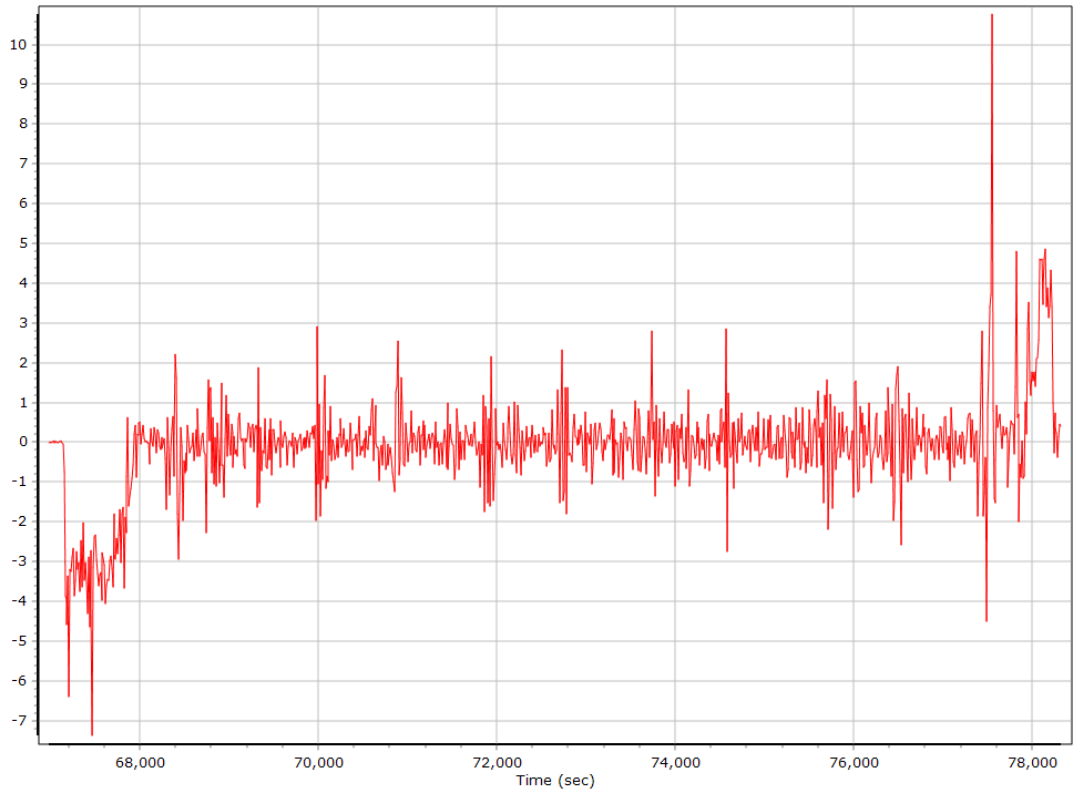
Heading



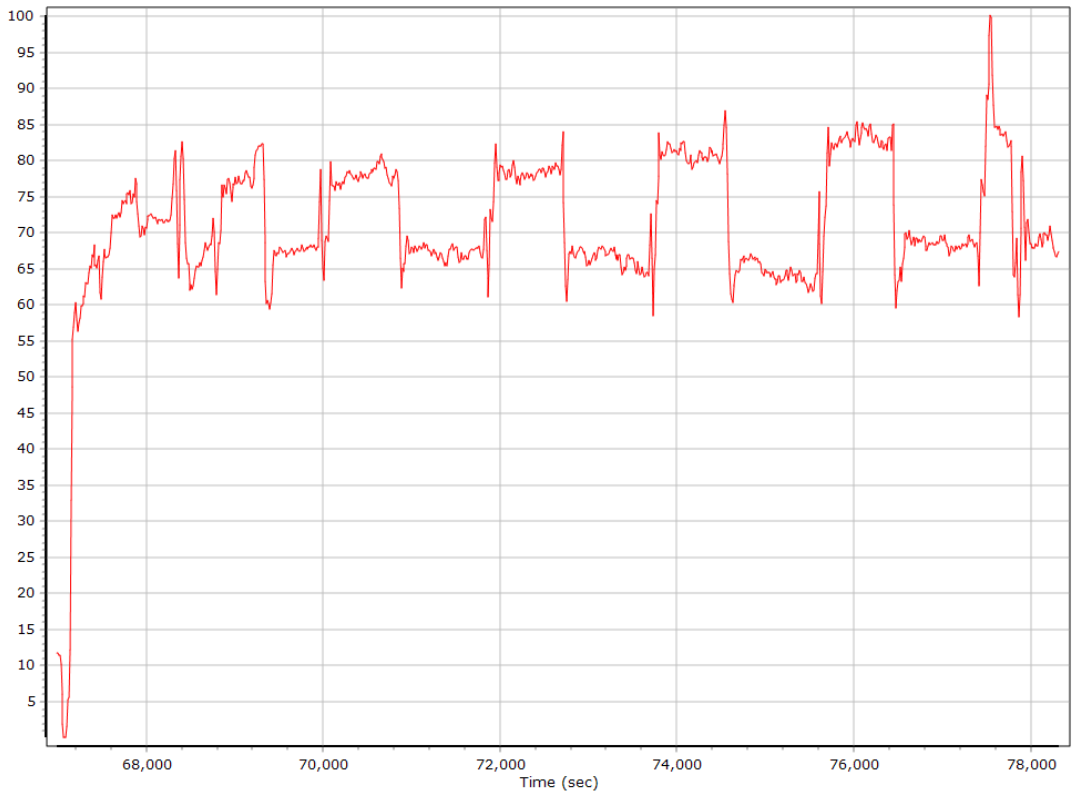
North/East Velocity



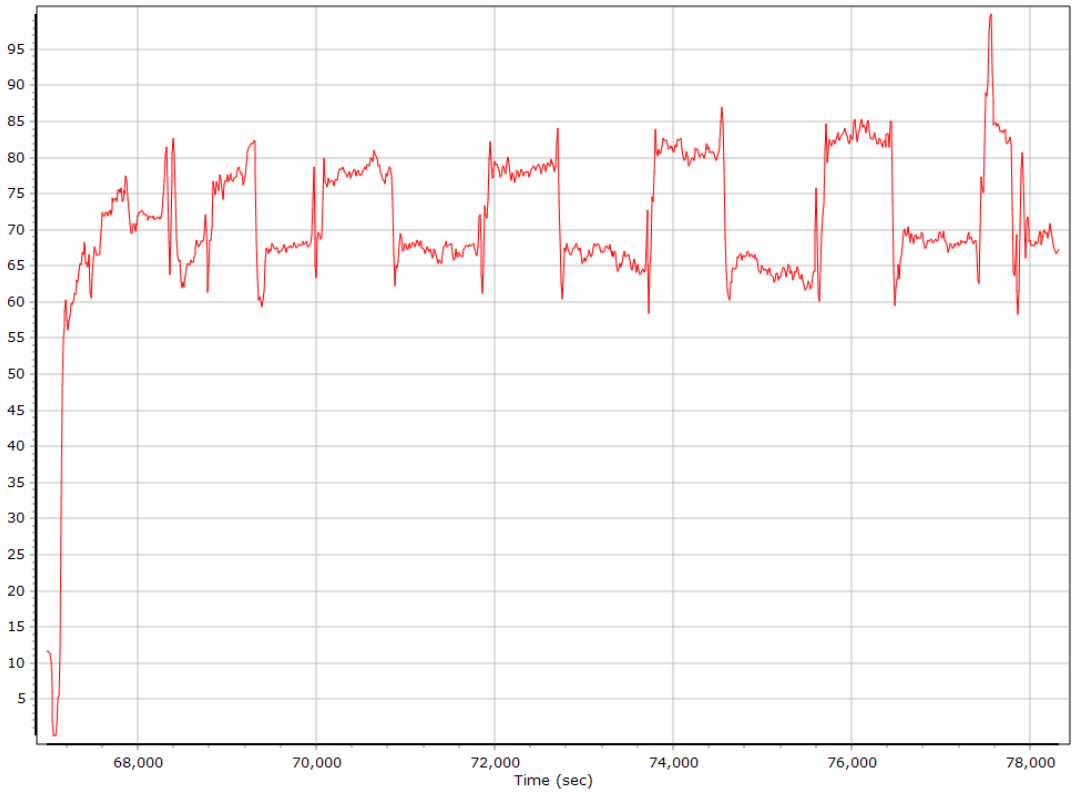
Down Velocity



Total Speed



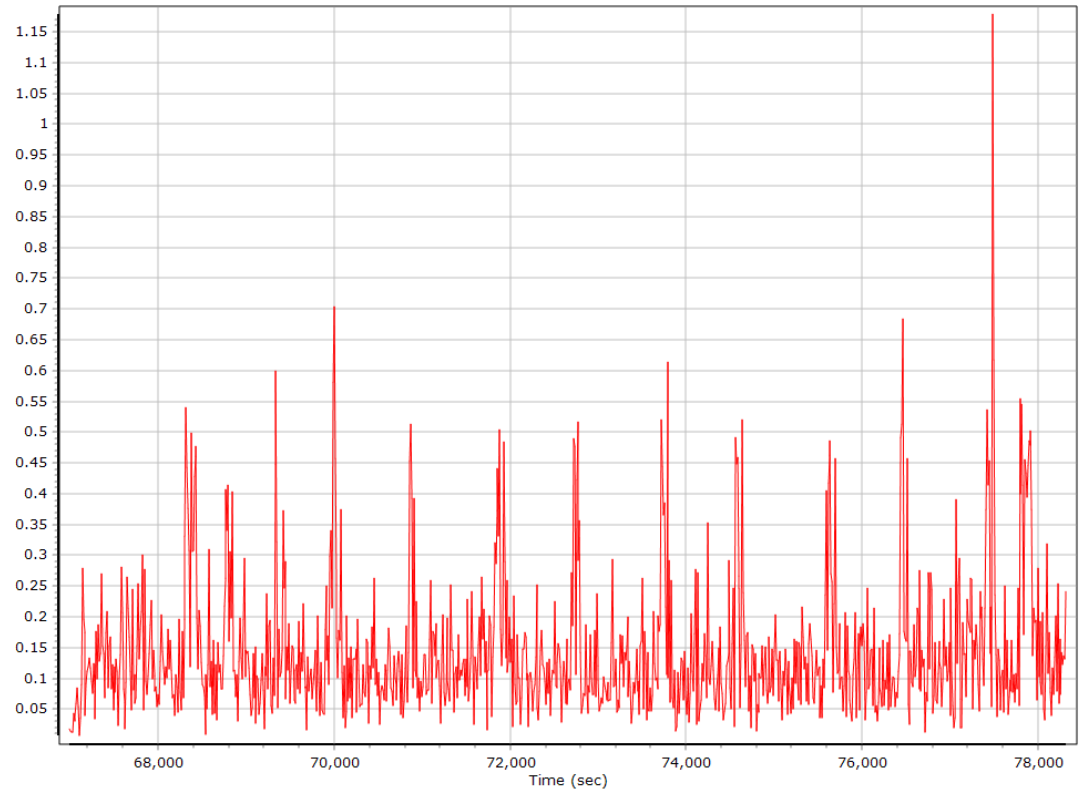
Ground Speed



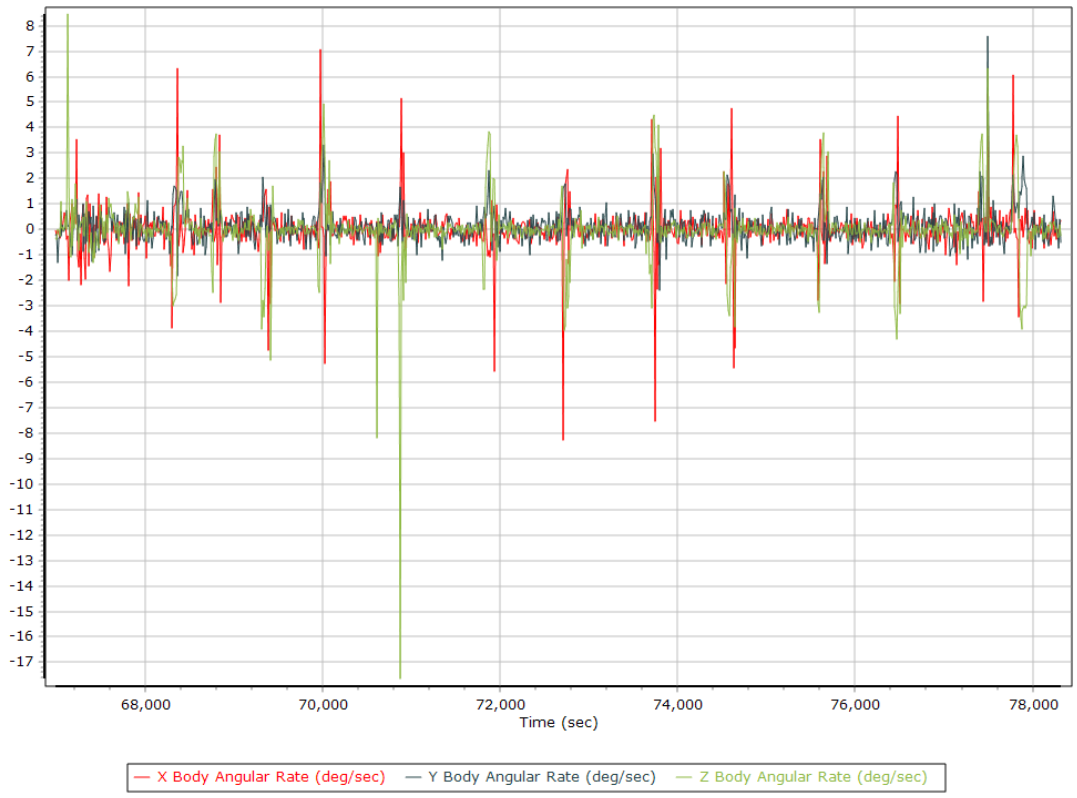
Body Acceleration



Total Body Acceleration



Body Angular Rate

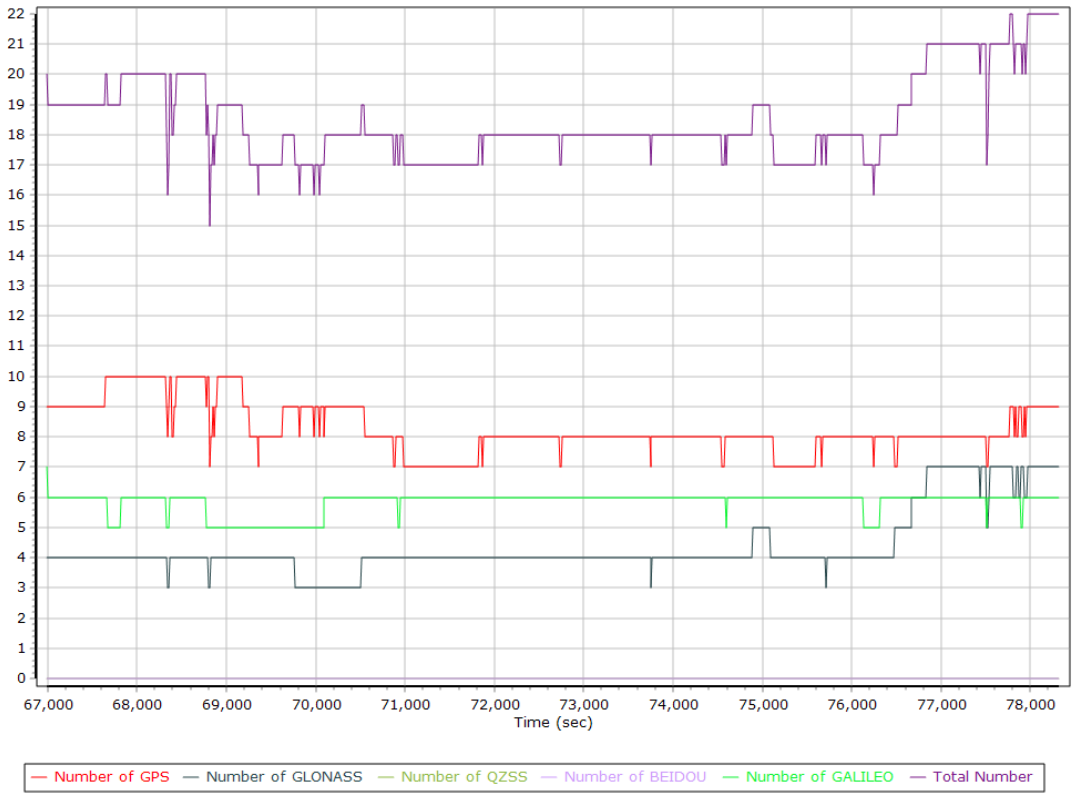


GNSS QC

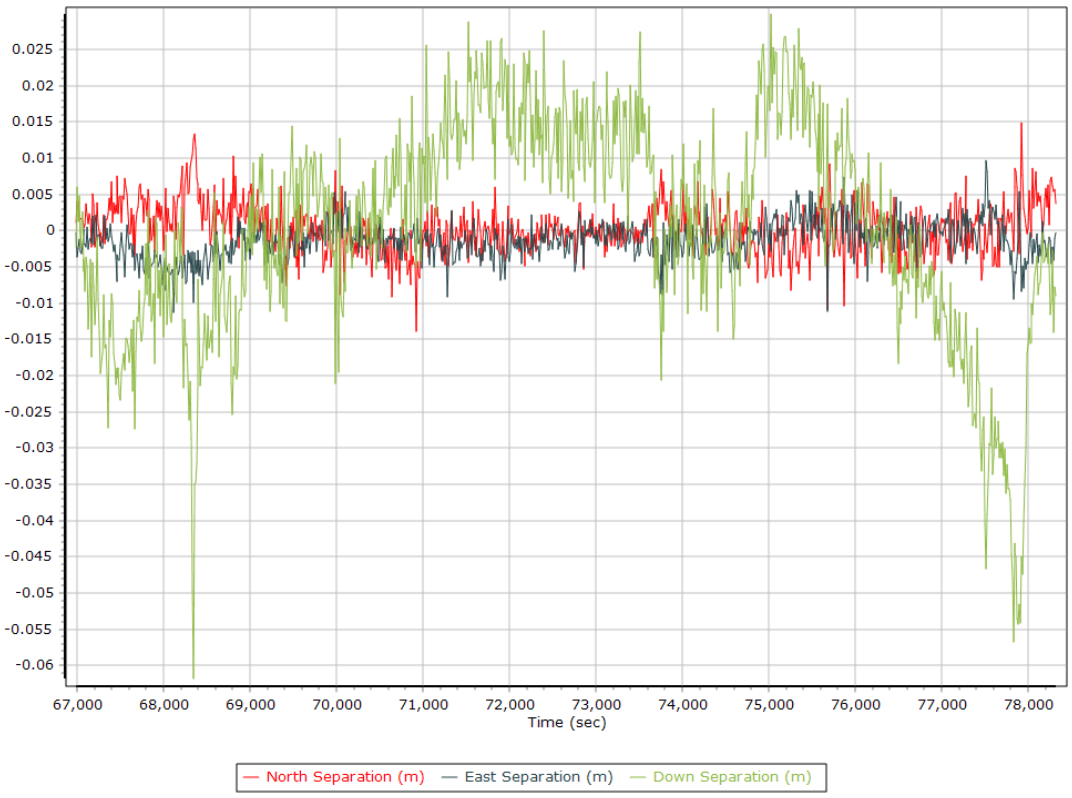
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	3	10	8
Number of GLONASS SV	3	7	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	3	7	6
Total number of SV	10	22	19
PDOP	1.03	2.86	1.23
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	11600.00	0.00	0.00
Percentage	100.00	0.00	0.00

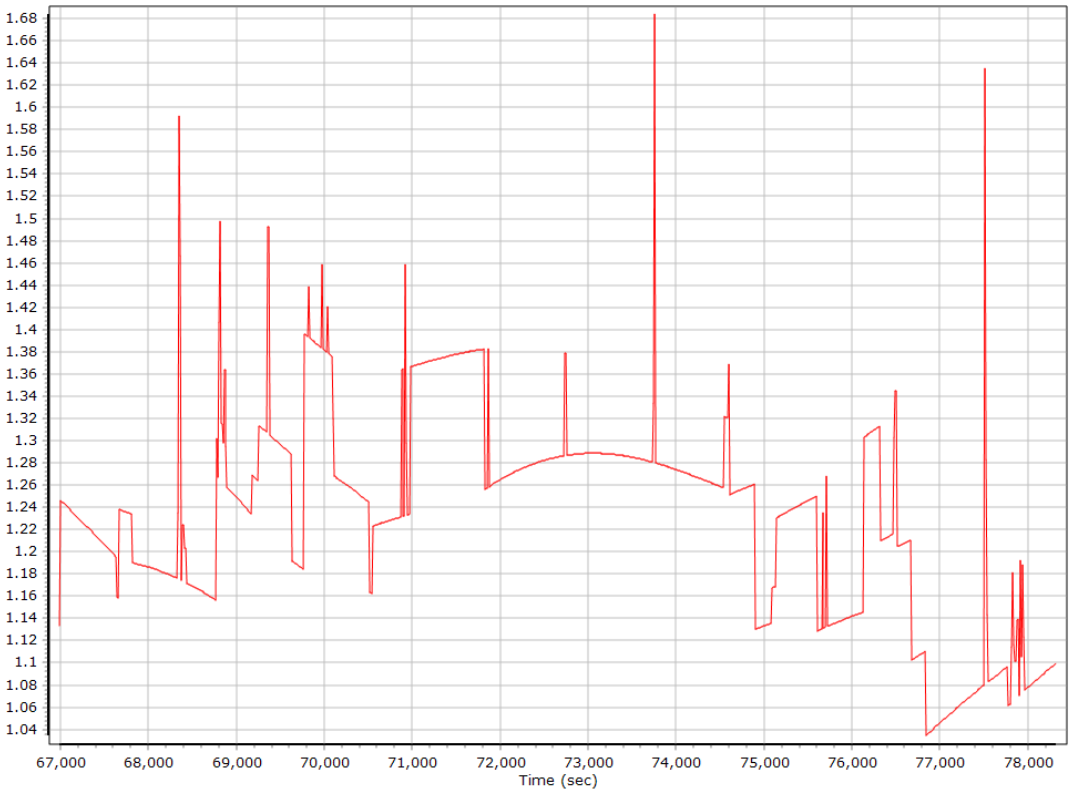
Num SVs in solution



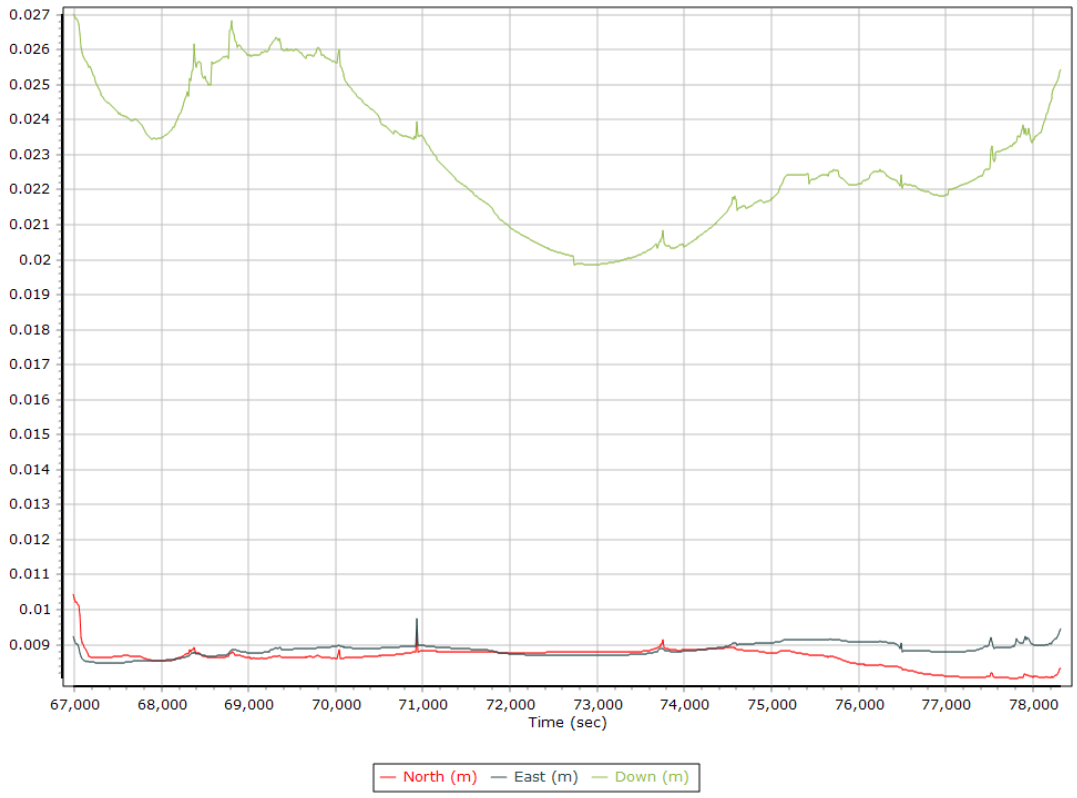
Forward/Reverse Separation



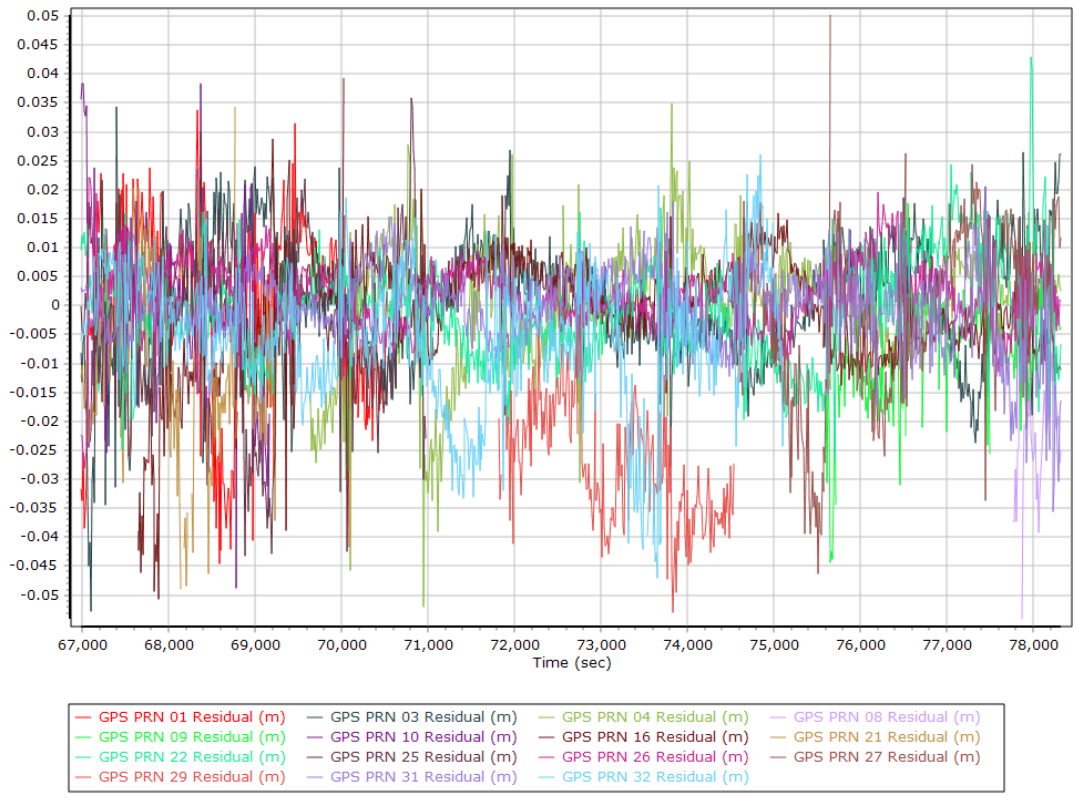
PDOP



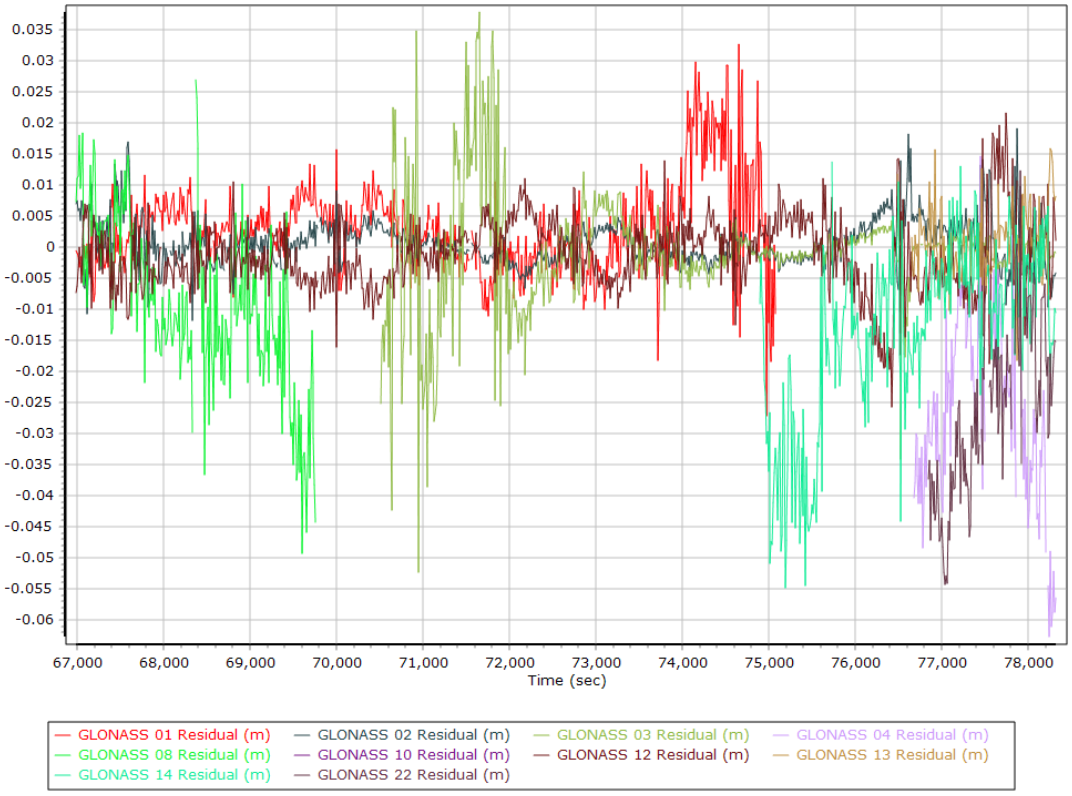
Estimated Position Accuracy



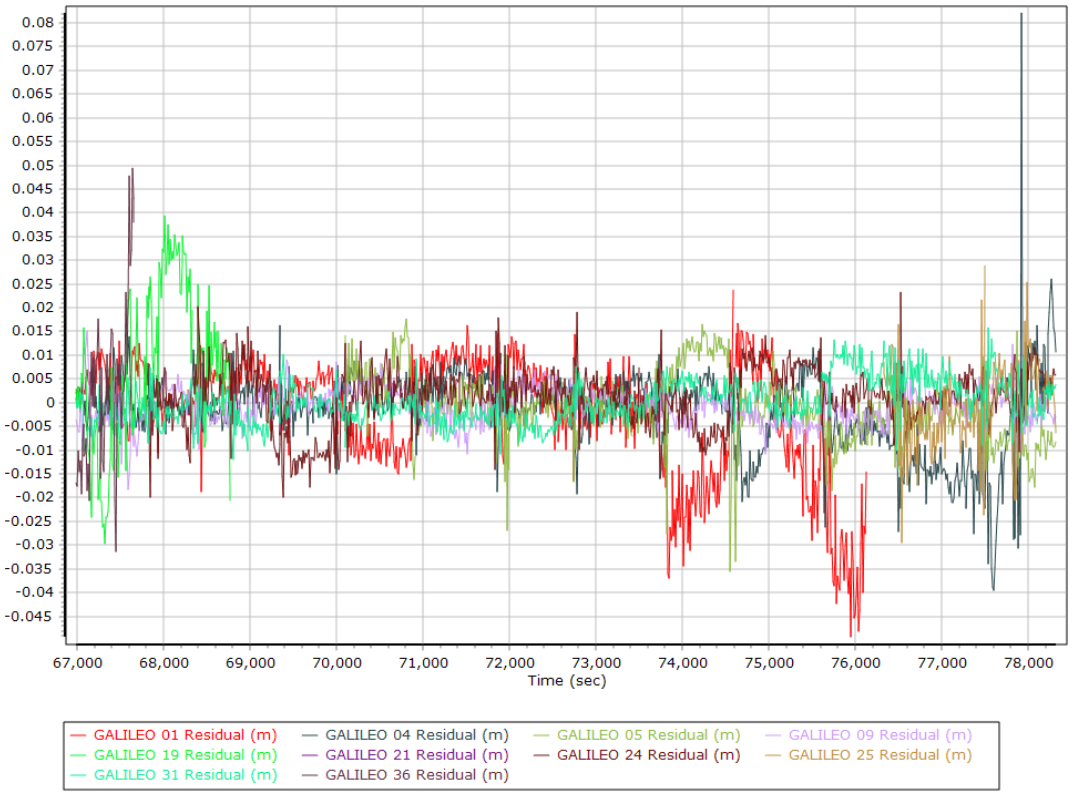
GPS Residuals



GLONASS Residuals



GALILEO Residuals



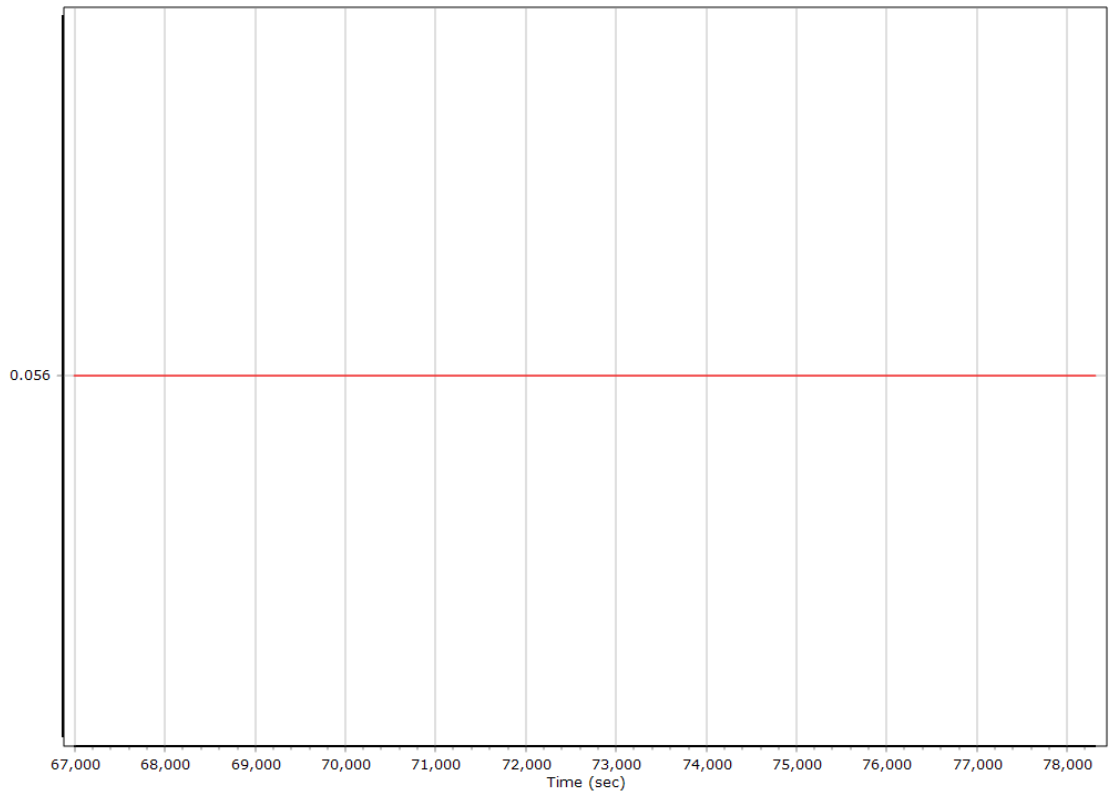
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	66715.000 (12/13/2020 6:31:55 PM)		
Processing end time	78323.000 (12/13/2020 9:45:23 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

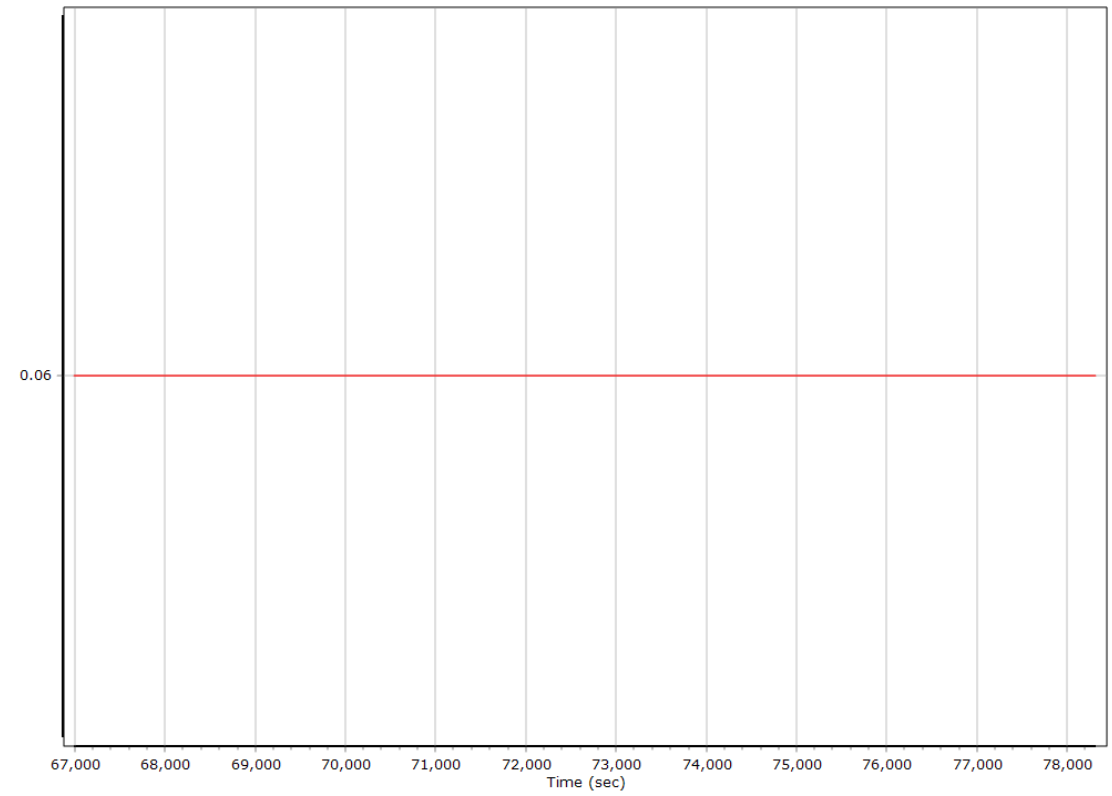
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

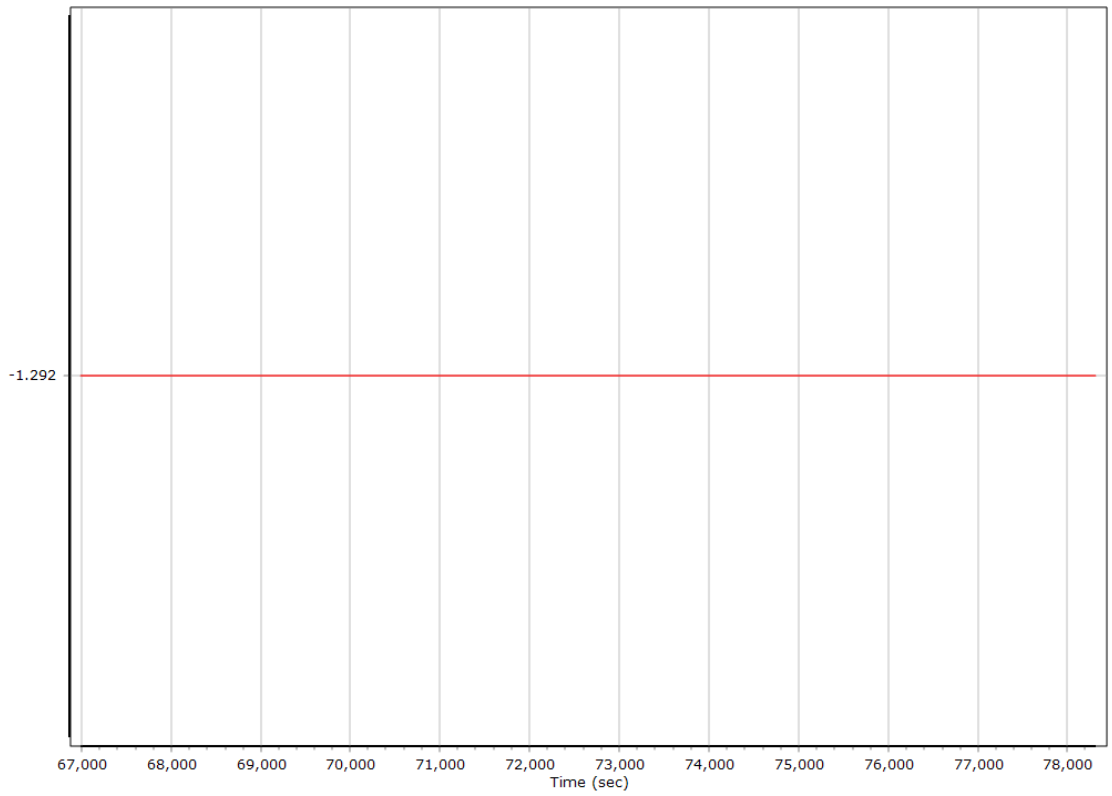
X Reference-Primary GNSS Lever Arm (m)



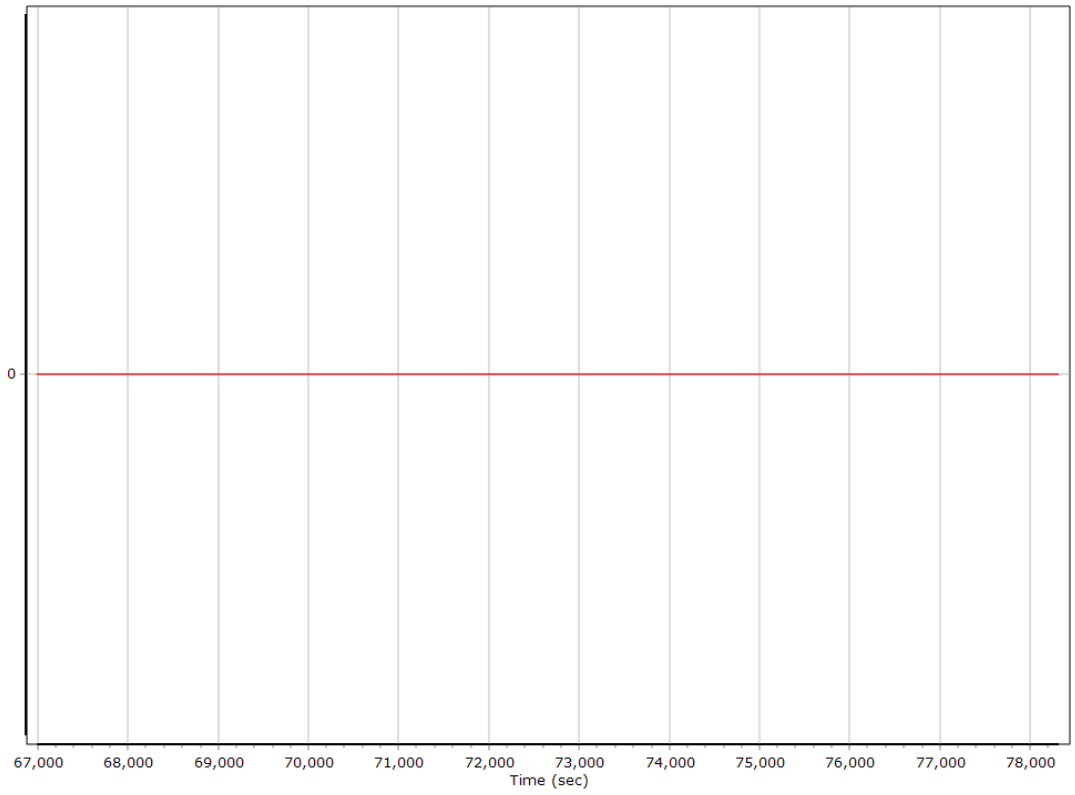
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



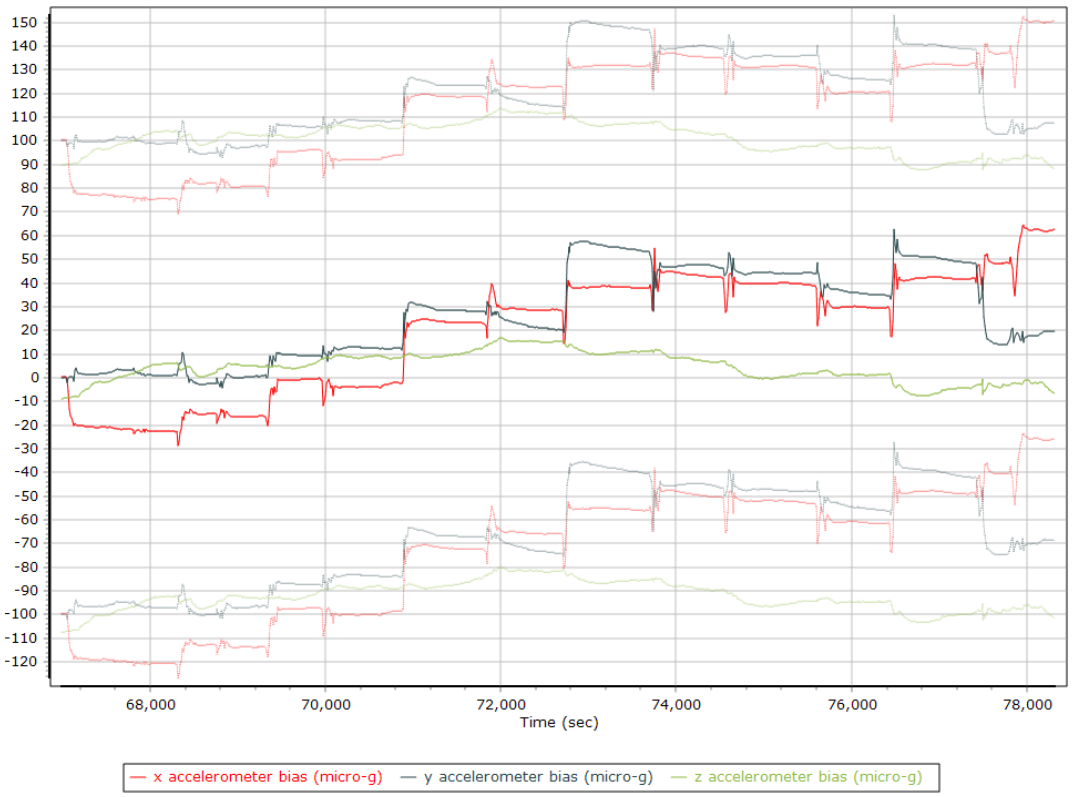
Reference-Primary GNSS Lever Arm Figure of Merit



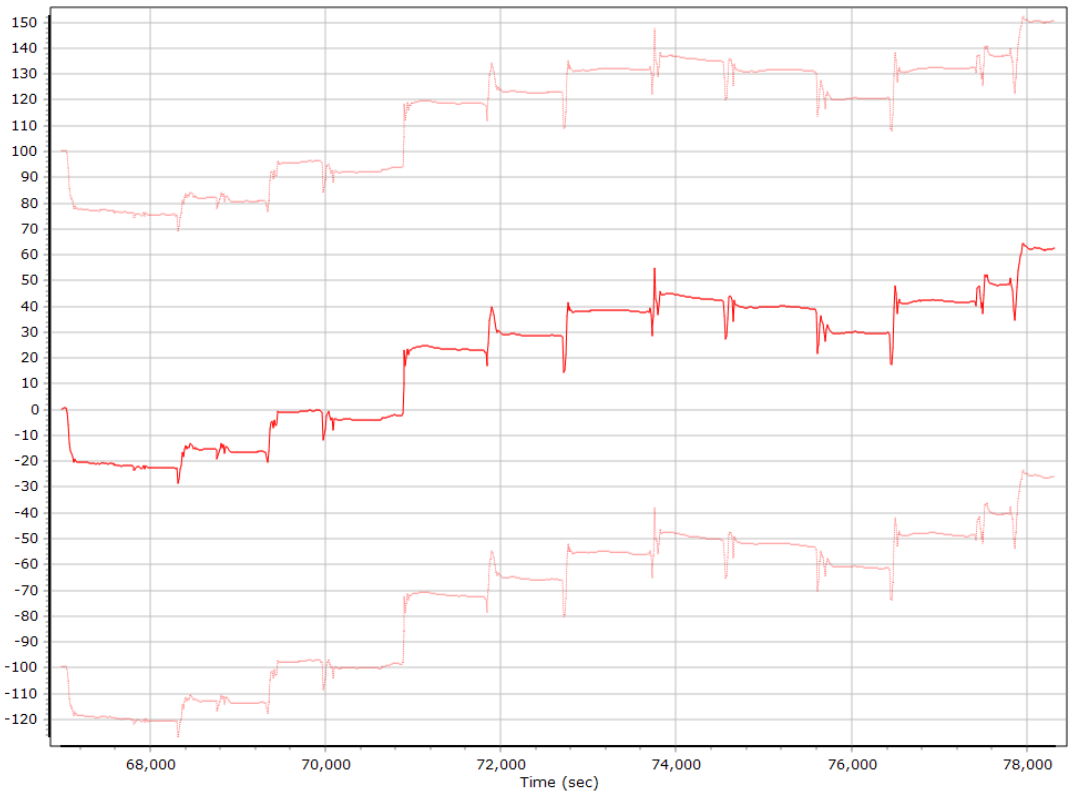
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

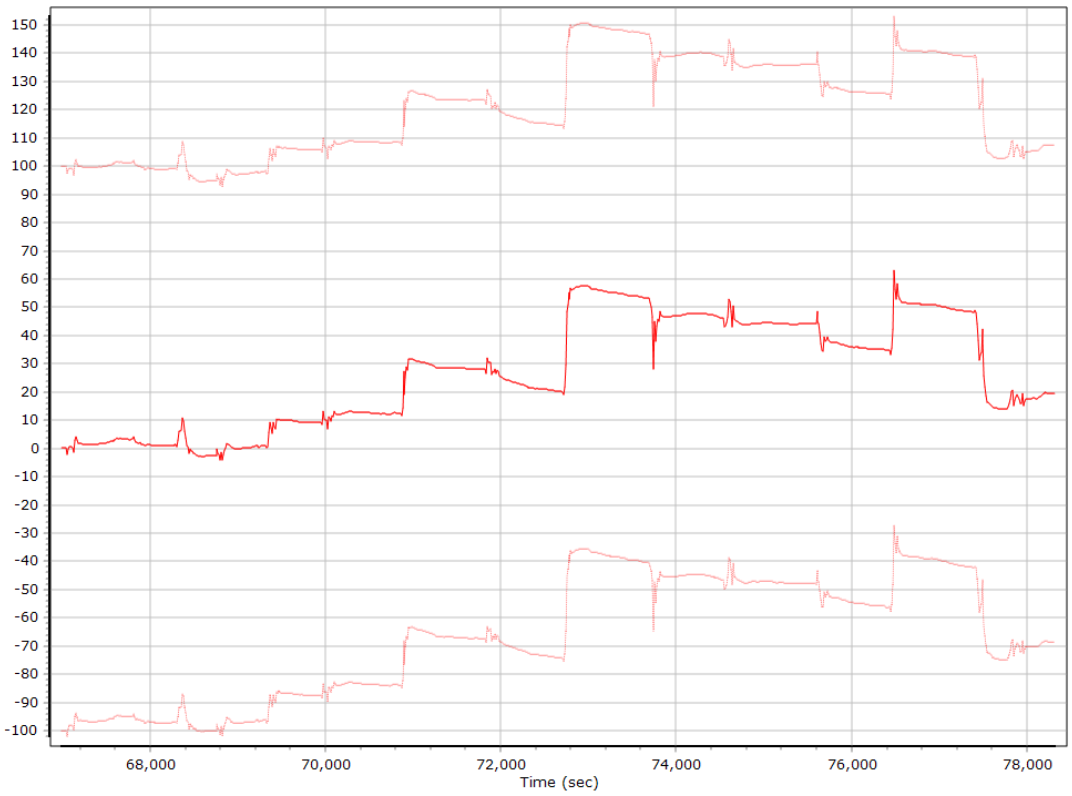
Accelerometer Bias (micro-g)



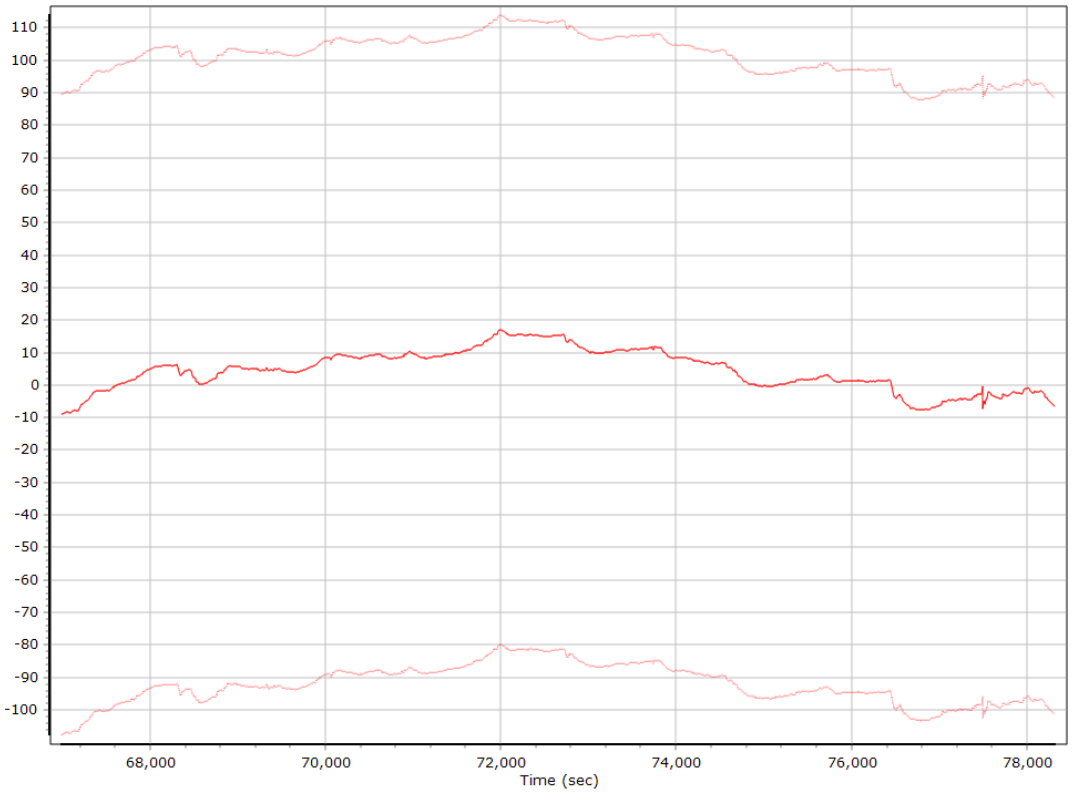
X Accelerometer Bias (micro-g)



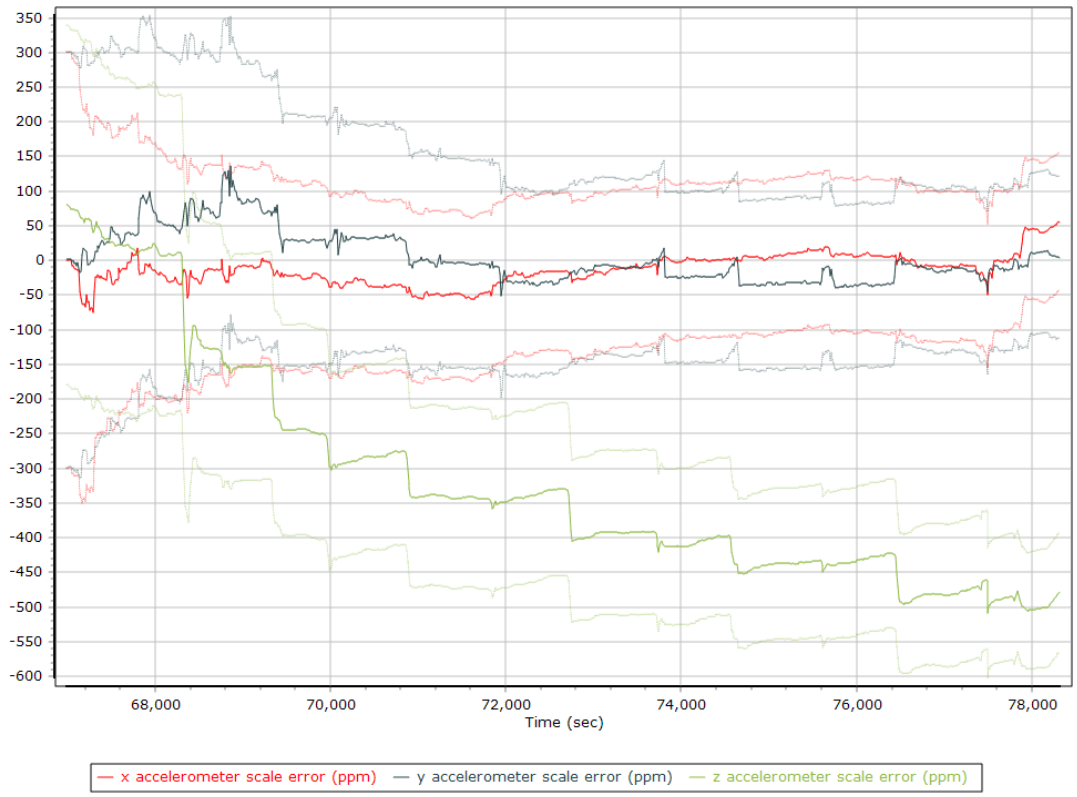
Y Accelerometer Bias (micro-g)



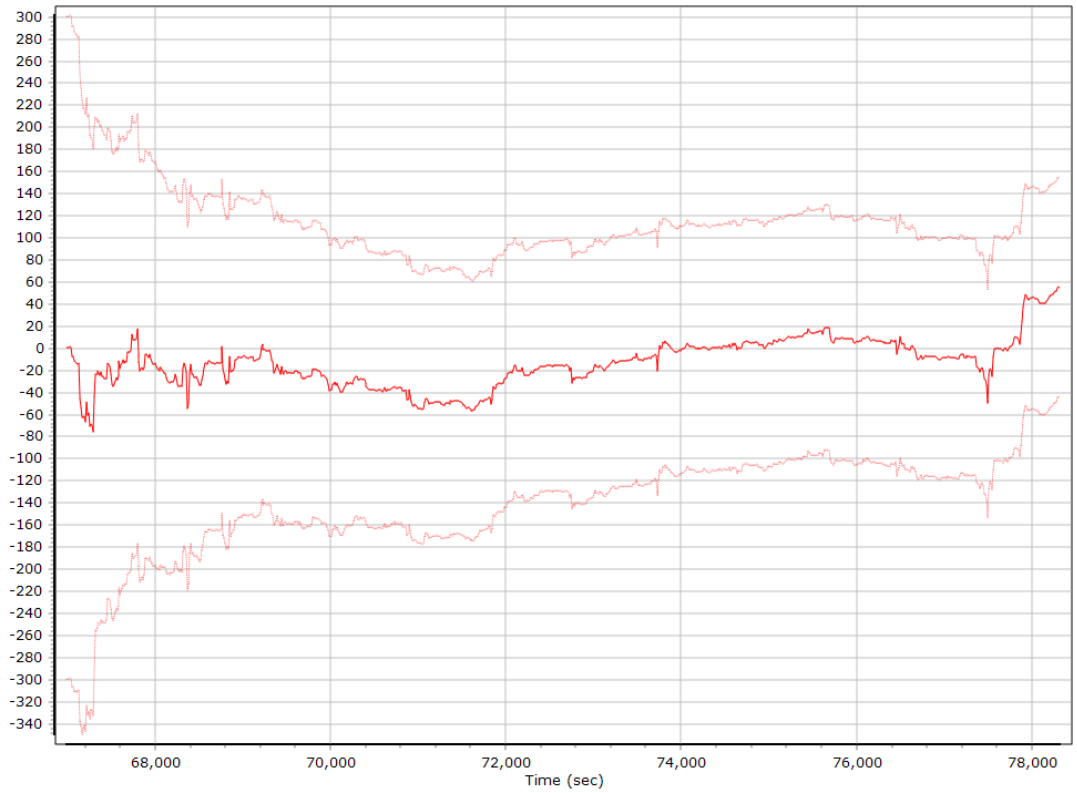
Z Accelerometer Bias (micro-g)



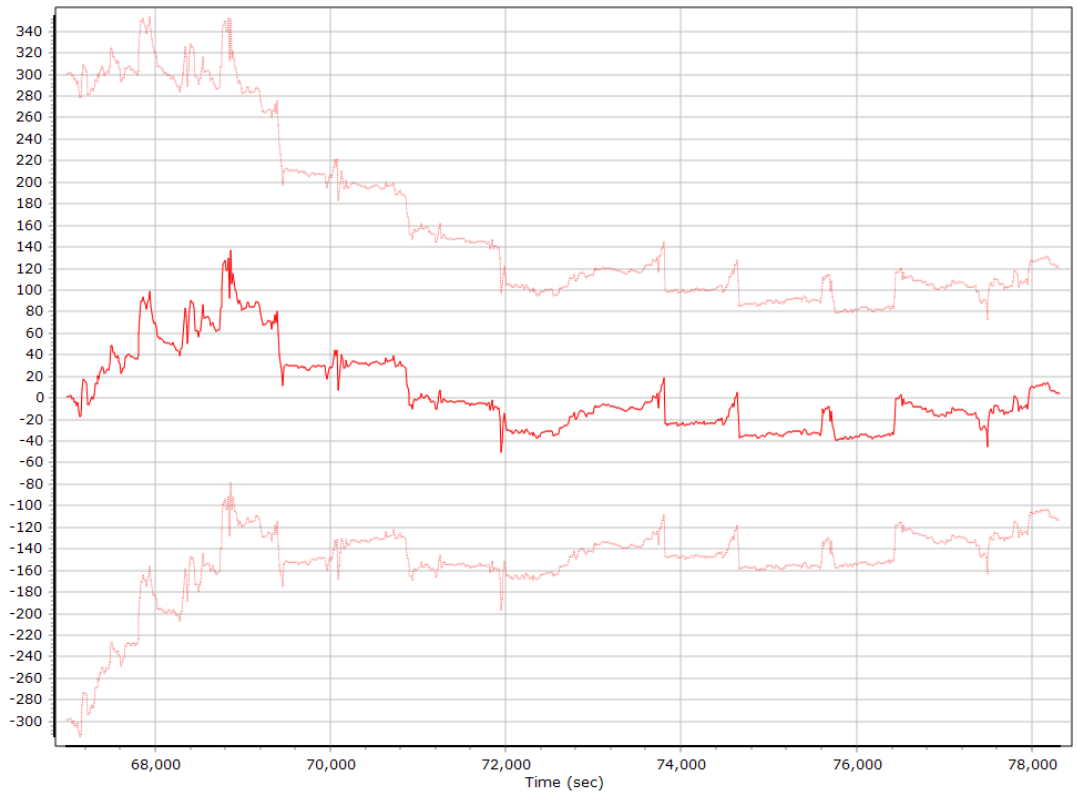
Accelerometer Scale Error (ppm)



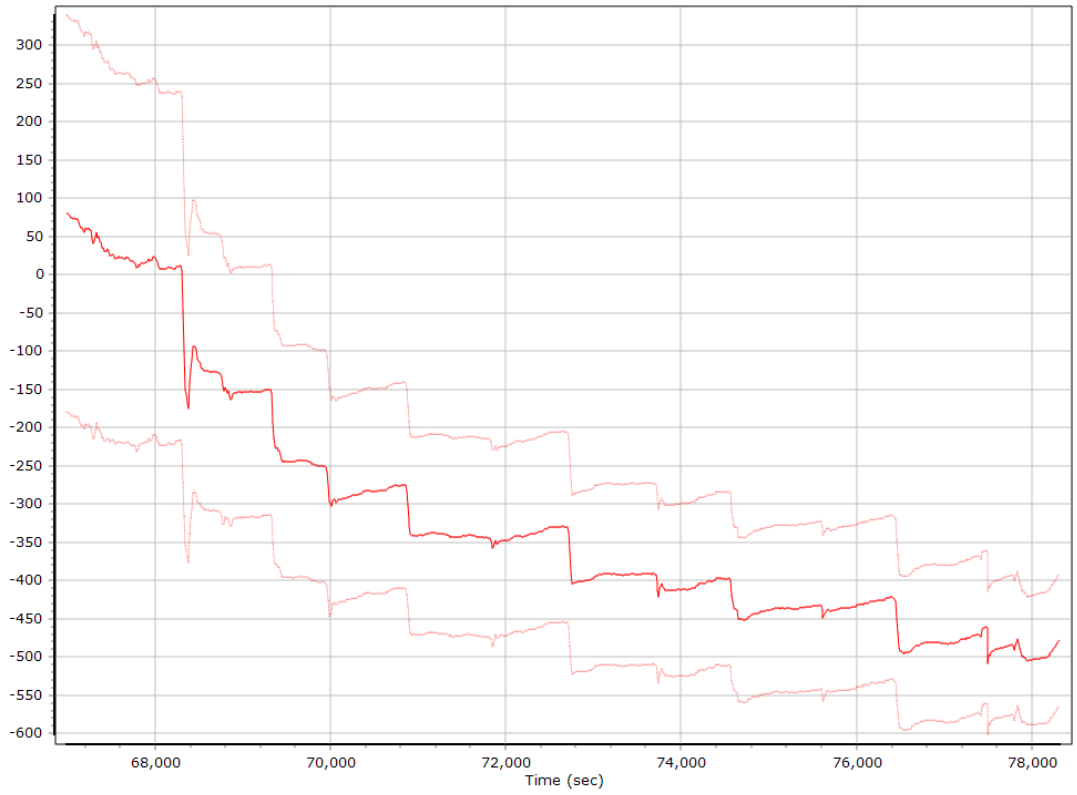
X Accelerometer Scale Error (ppm)



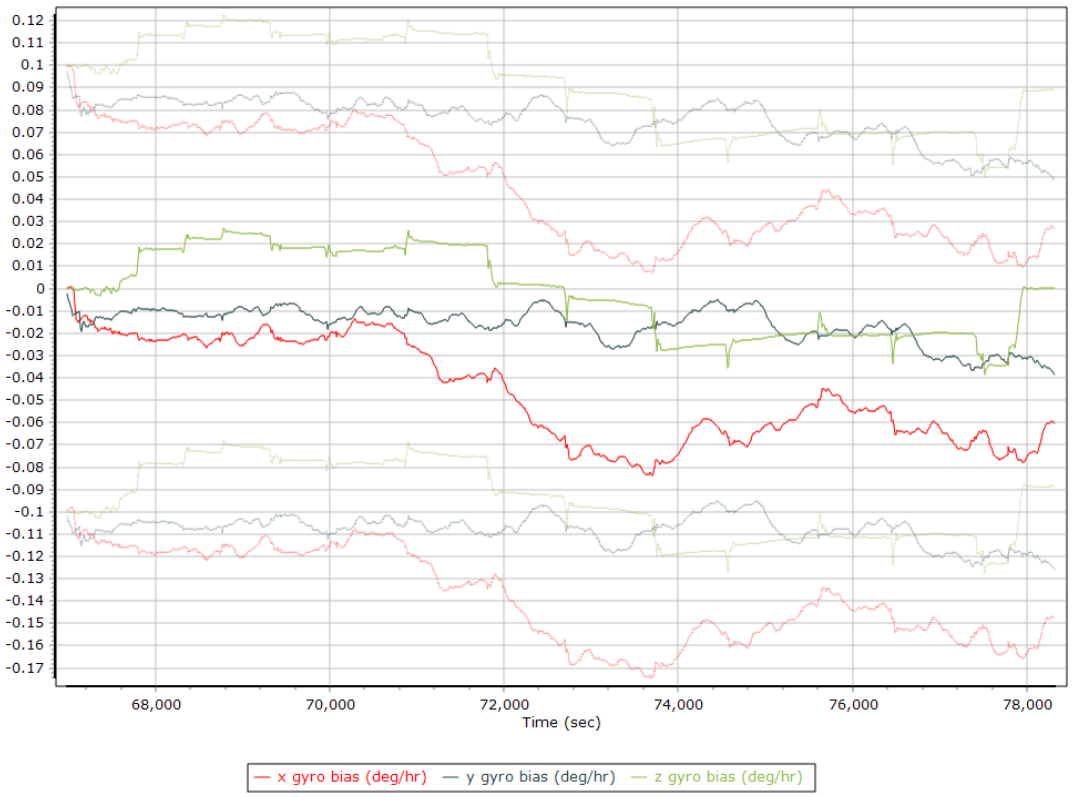
Y Accelerometer Scale Error (ppm)



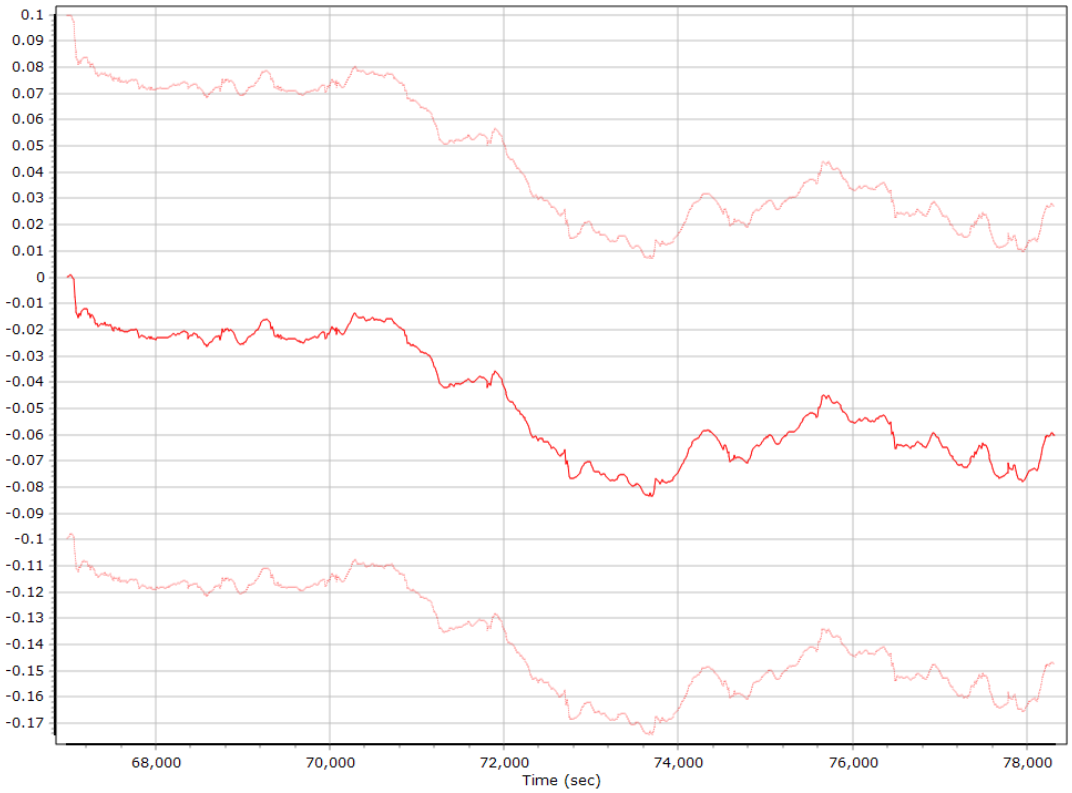
Z Accelerometer Scale Error (ppm)



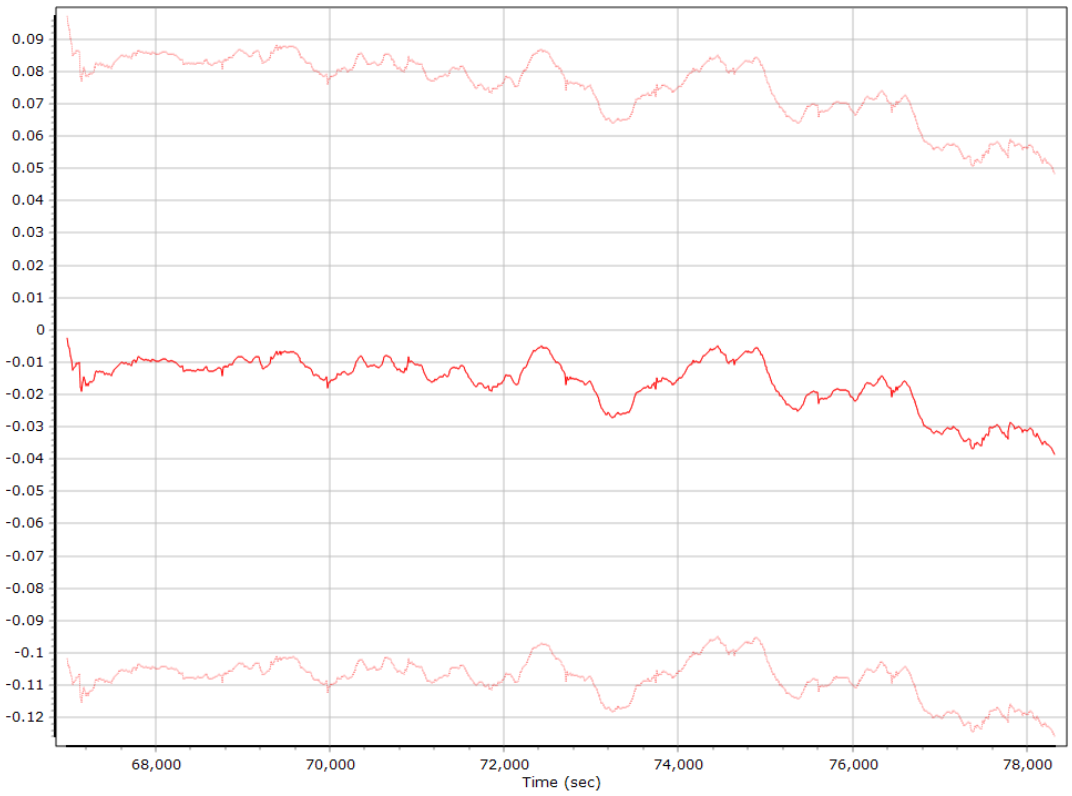
Gyro Bias (deg/h)



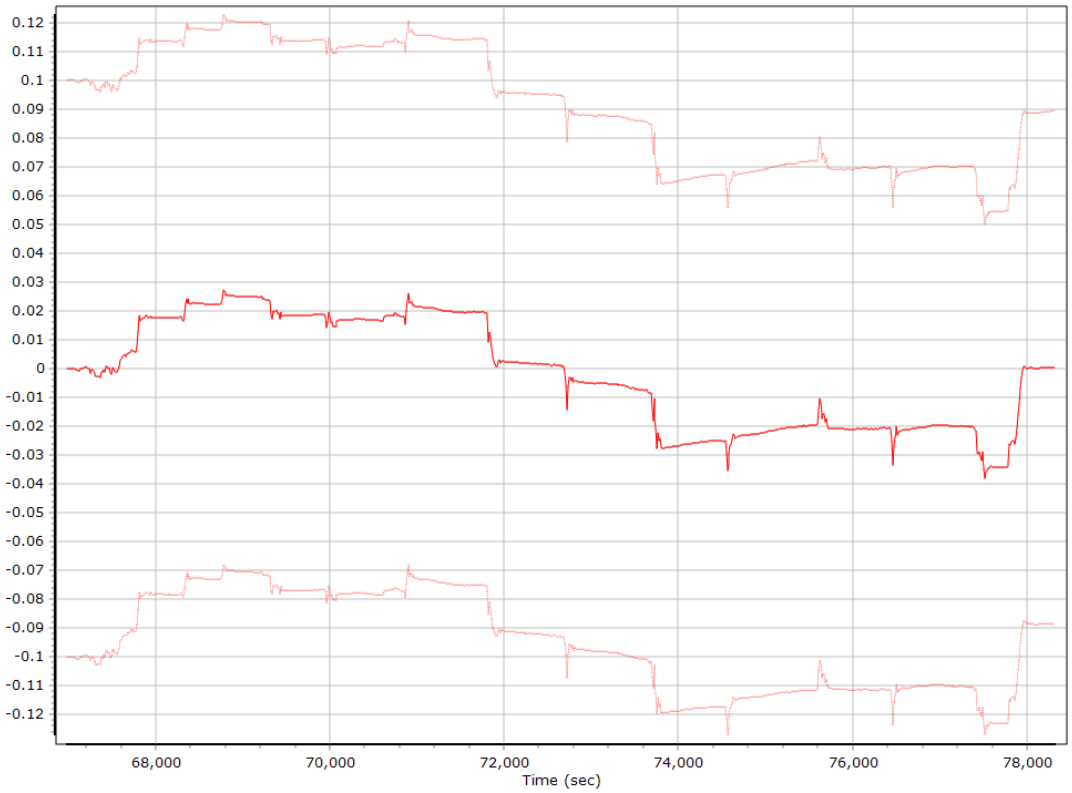
X Gyro Bias (deg/h)



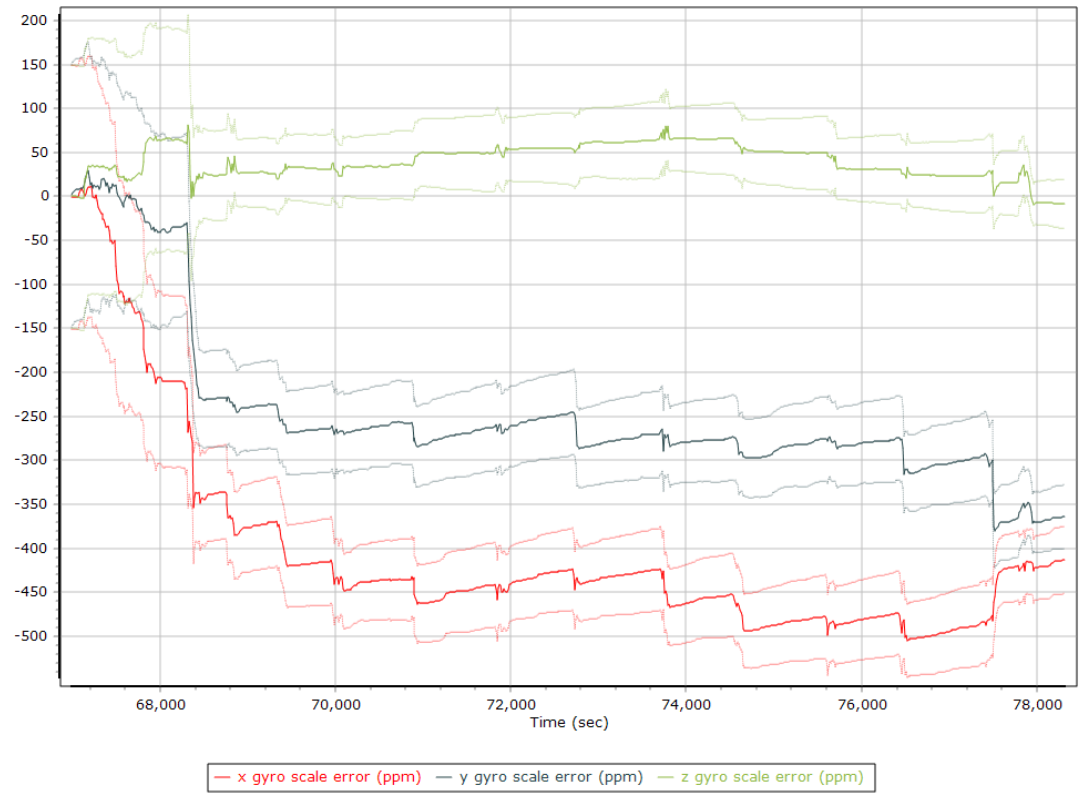
Y Gyro Bias (deg/h)



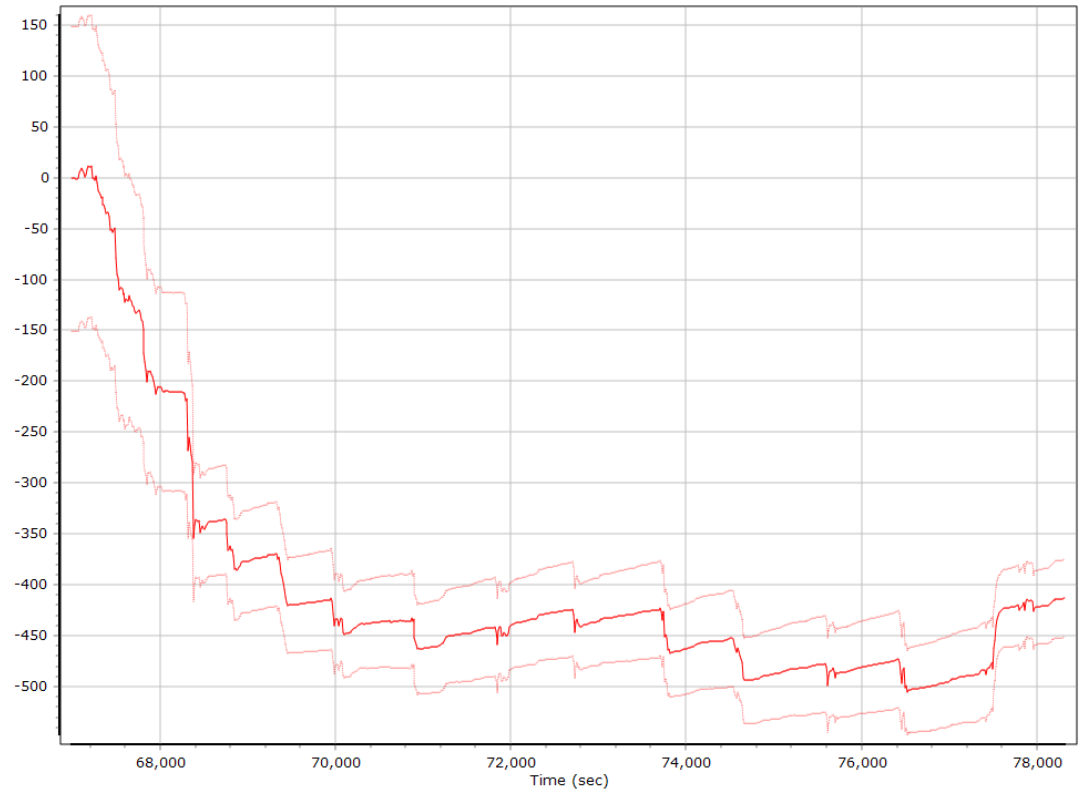
Z Gyro Bias (deg/h)



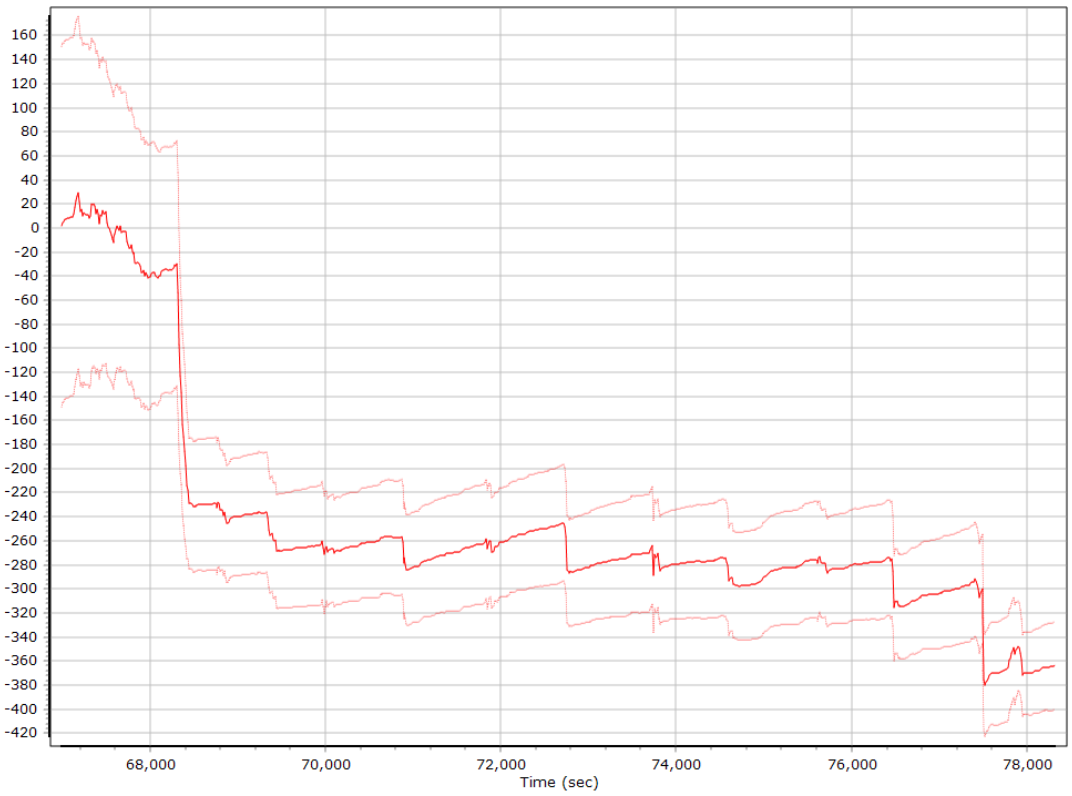
Gyro Scale Error (ppm)



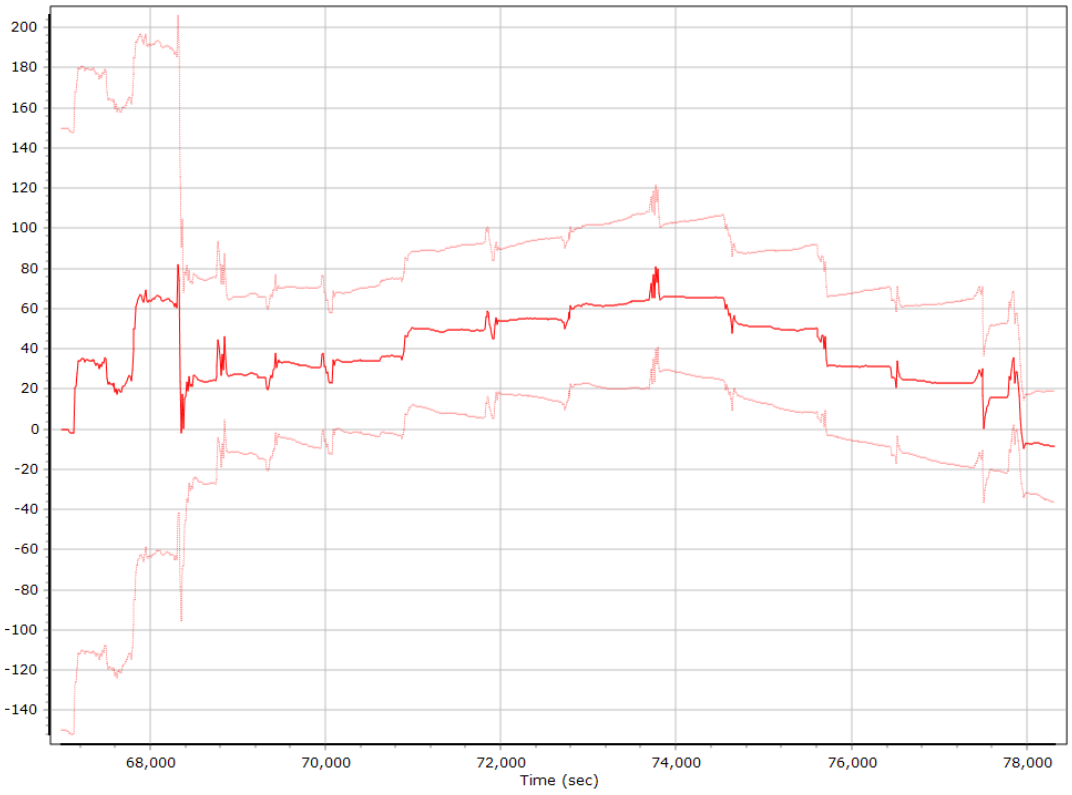
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

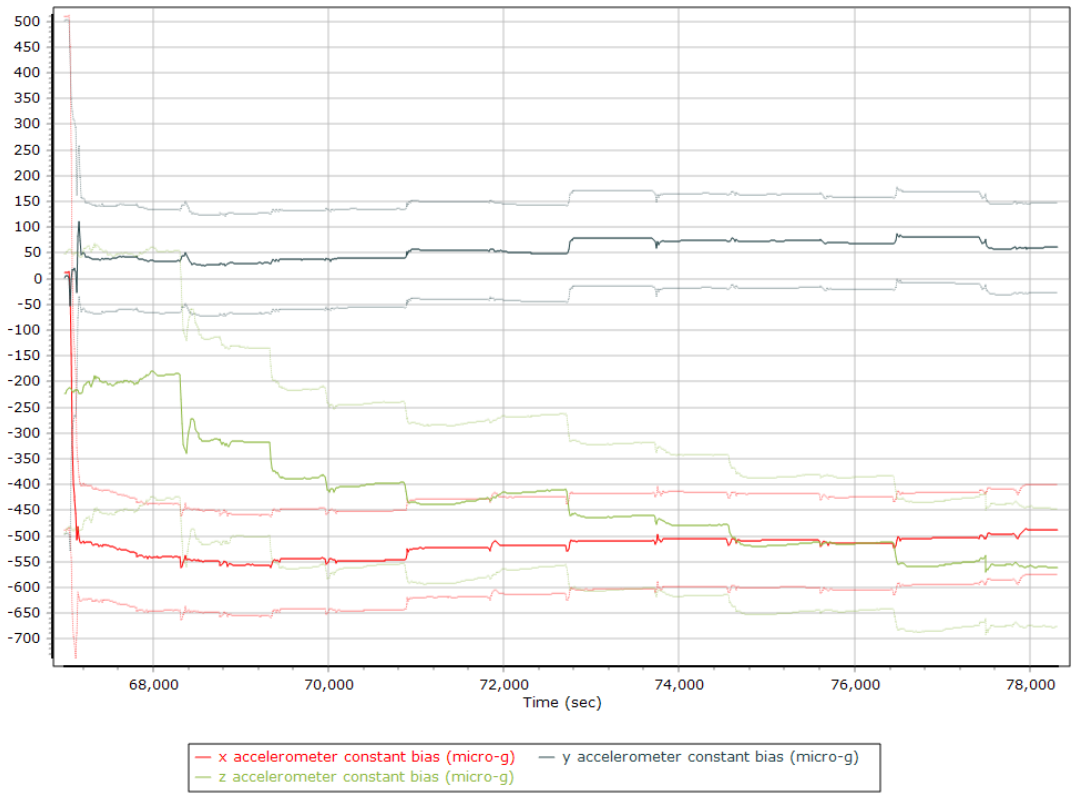


Z Gyro Scale Error (ppm)

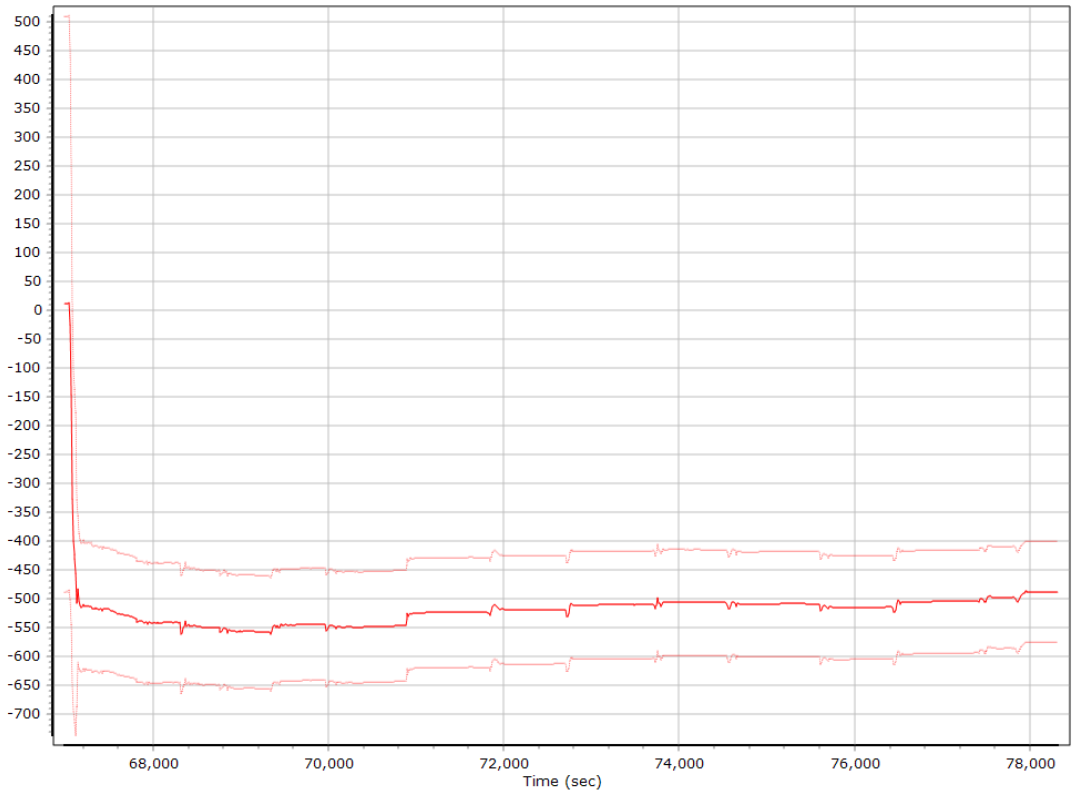


Forward Processed Estimated Constant Errors, Reference Frame

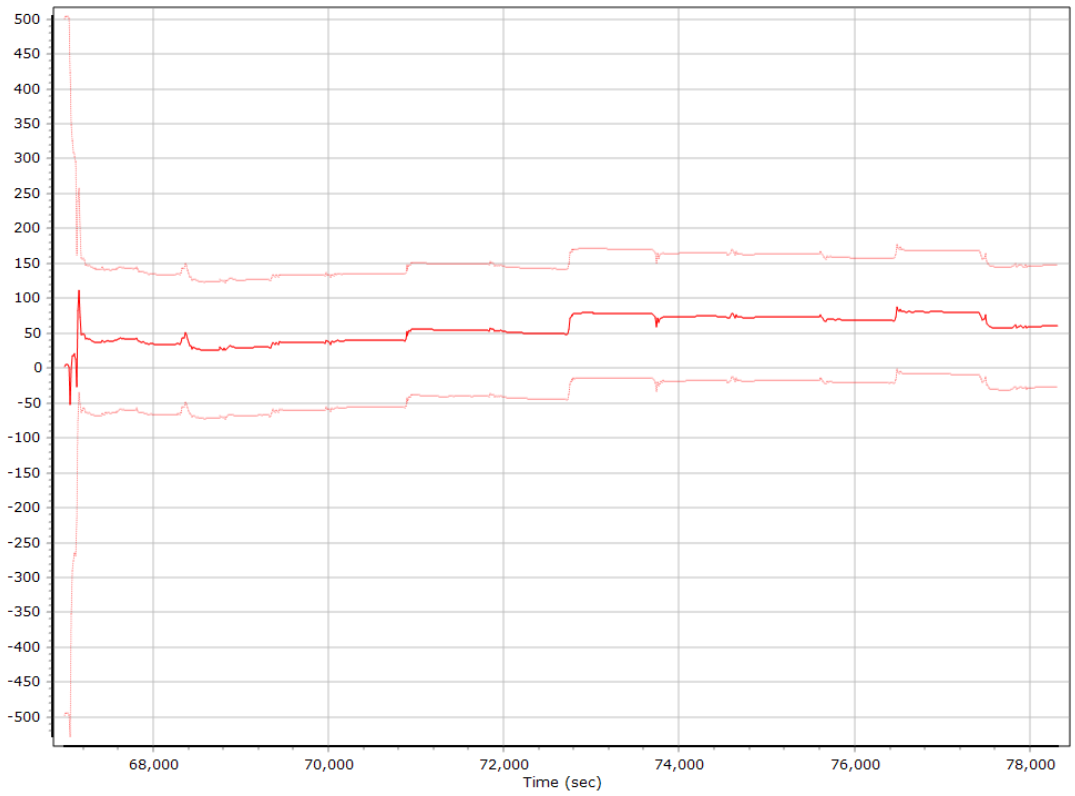
Accelerometer Bias (micro-g)



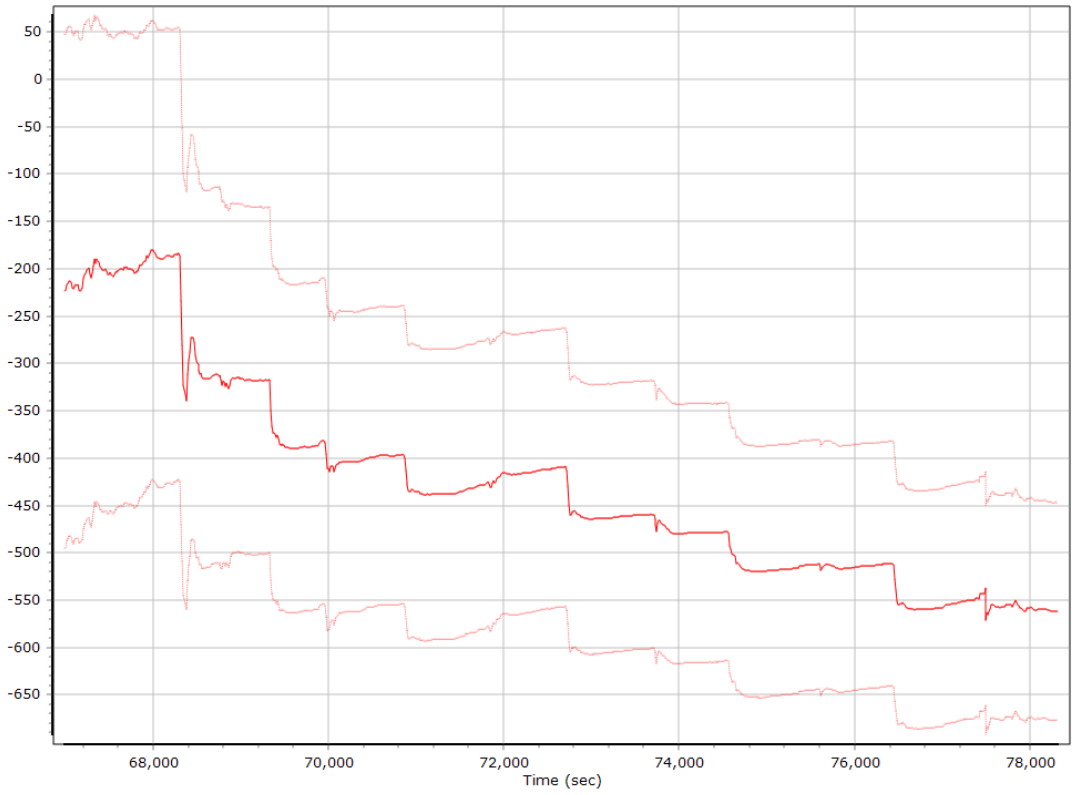
X Accelerometer Bias (micro-g)



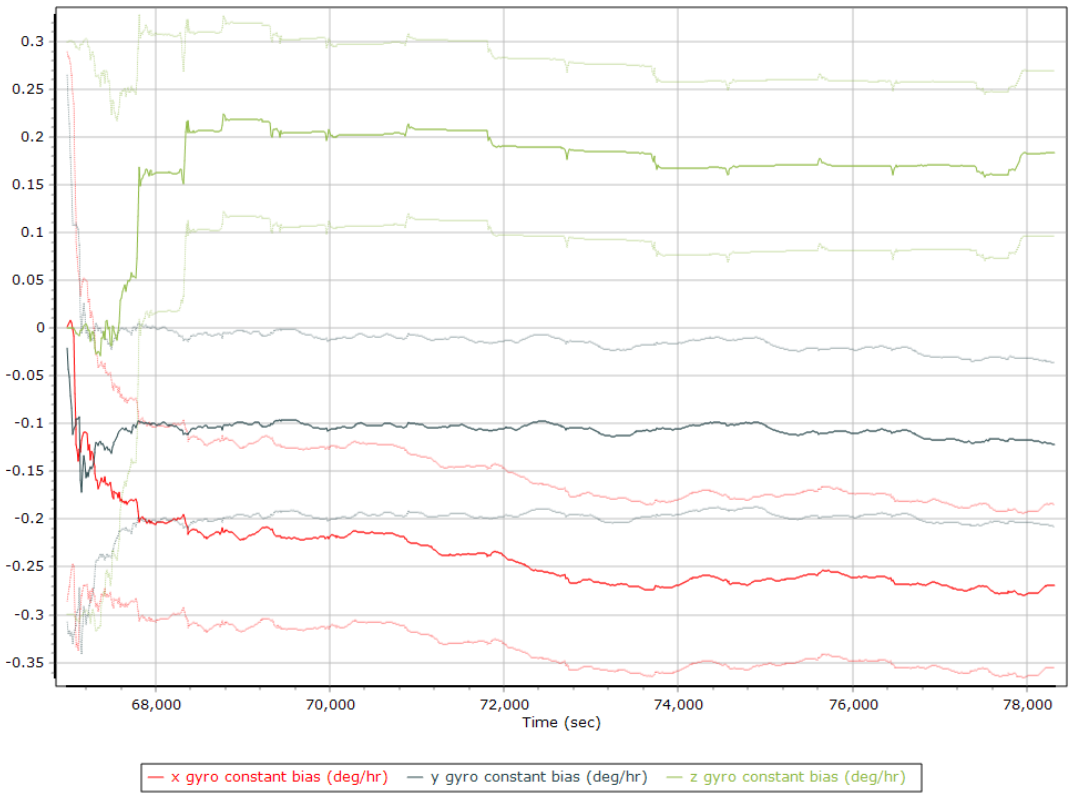
Y Accelerometer Bias (micro-g)



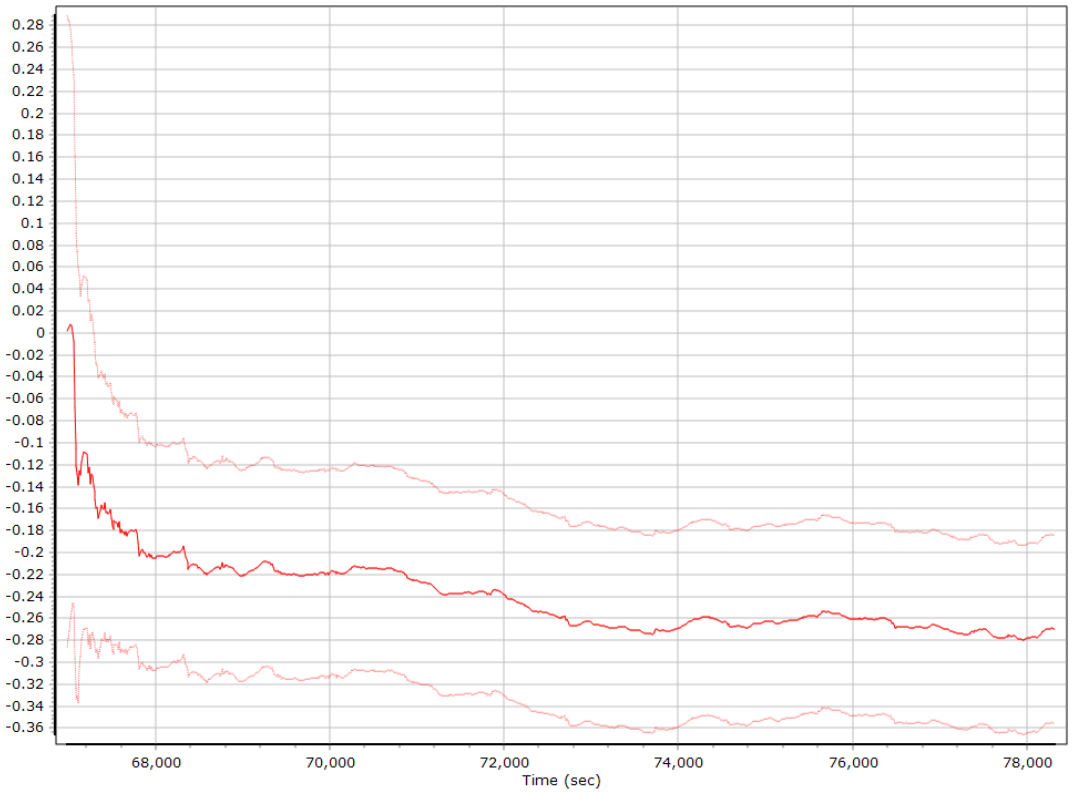
Z Accelerometer Bias (micro-g)



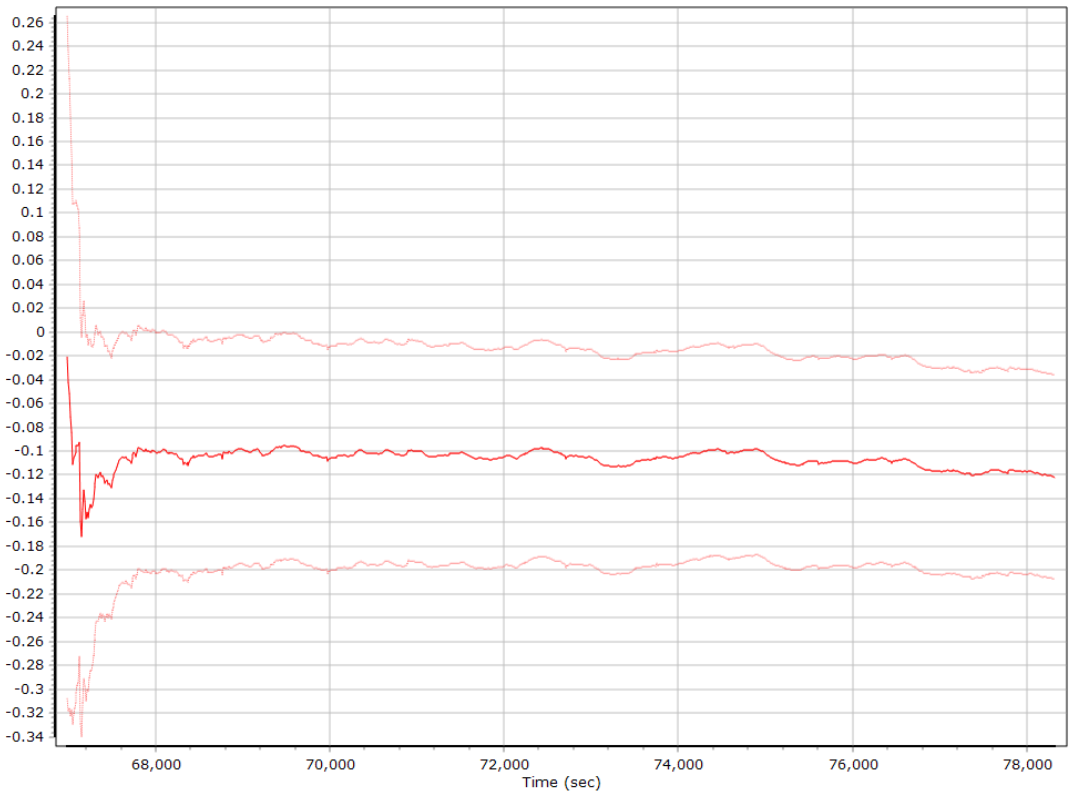
Gyro Bias (deg/h)



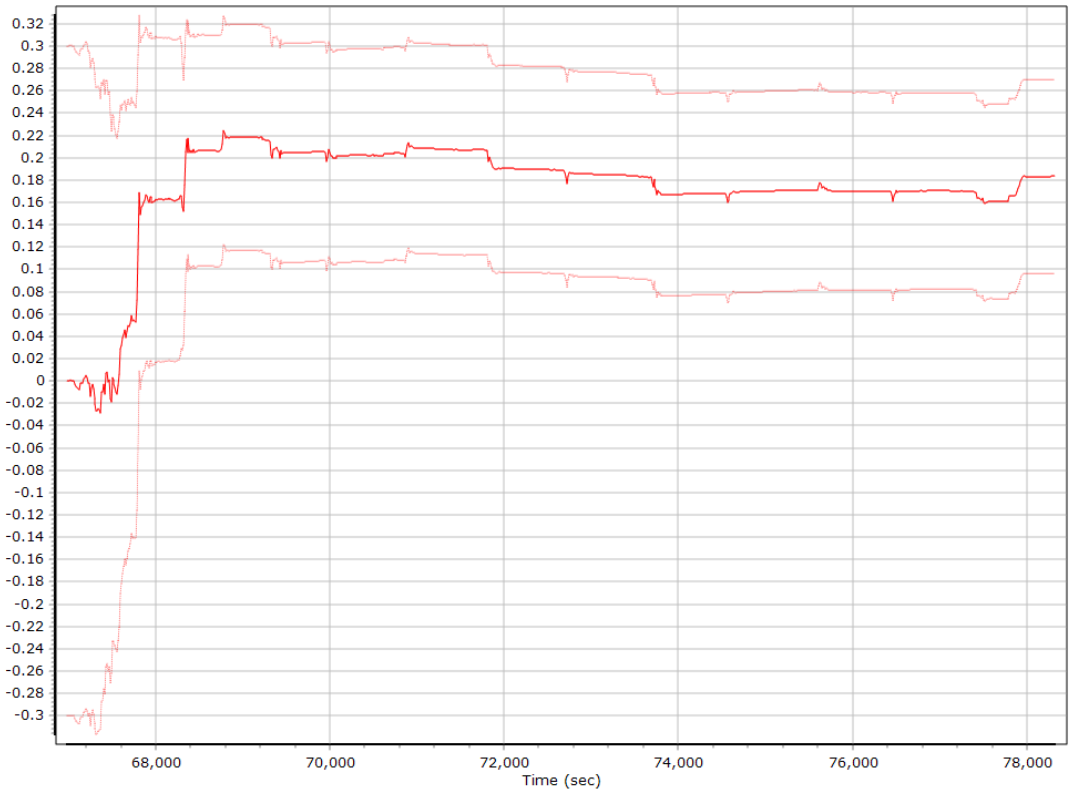
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

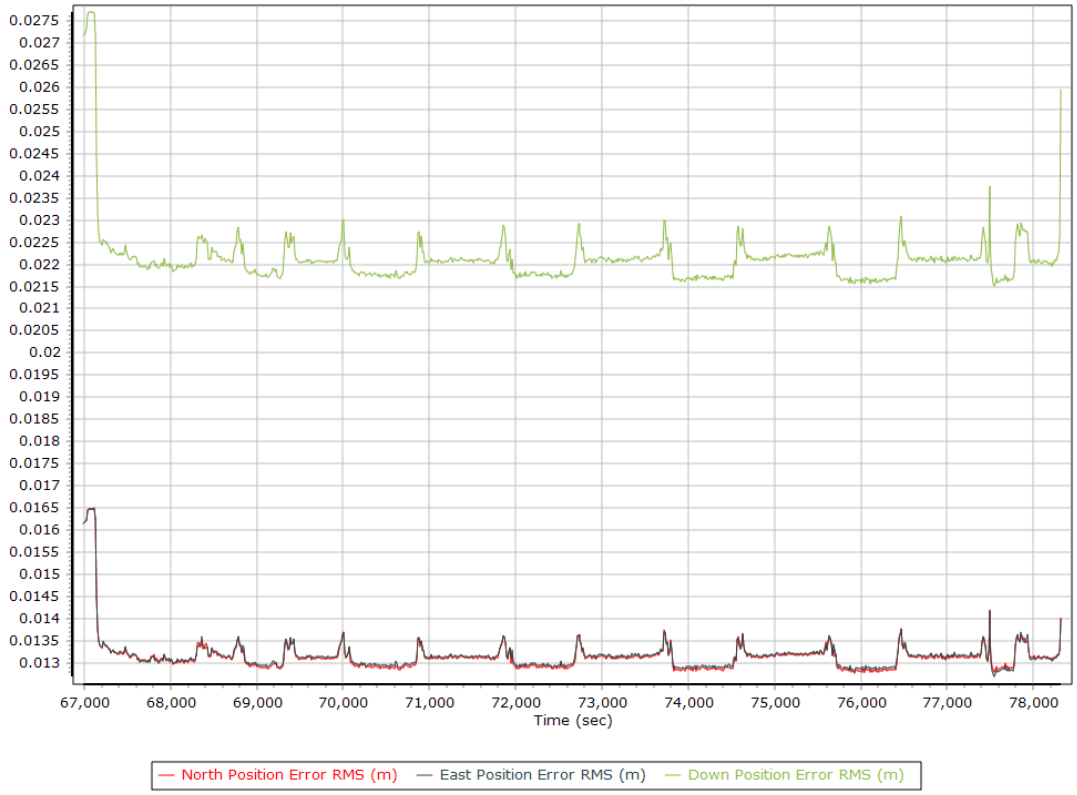


Z Gyro Bias (deg/h)

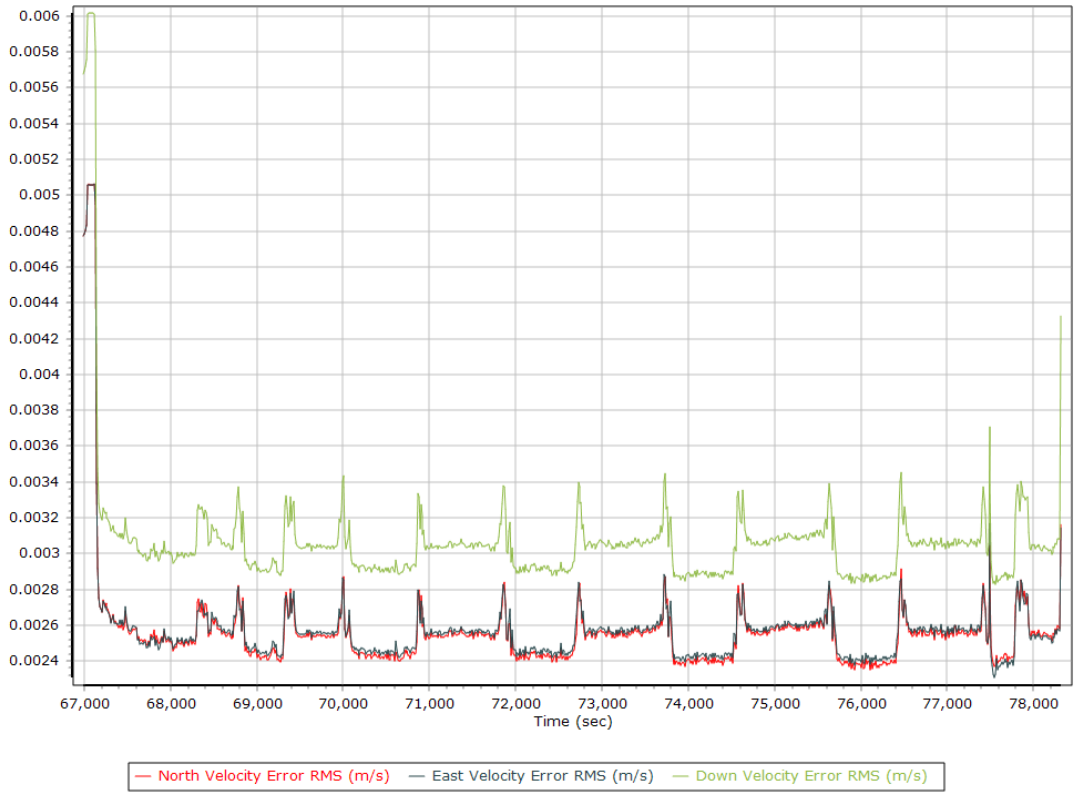


Smoothed Performance Metrics

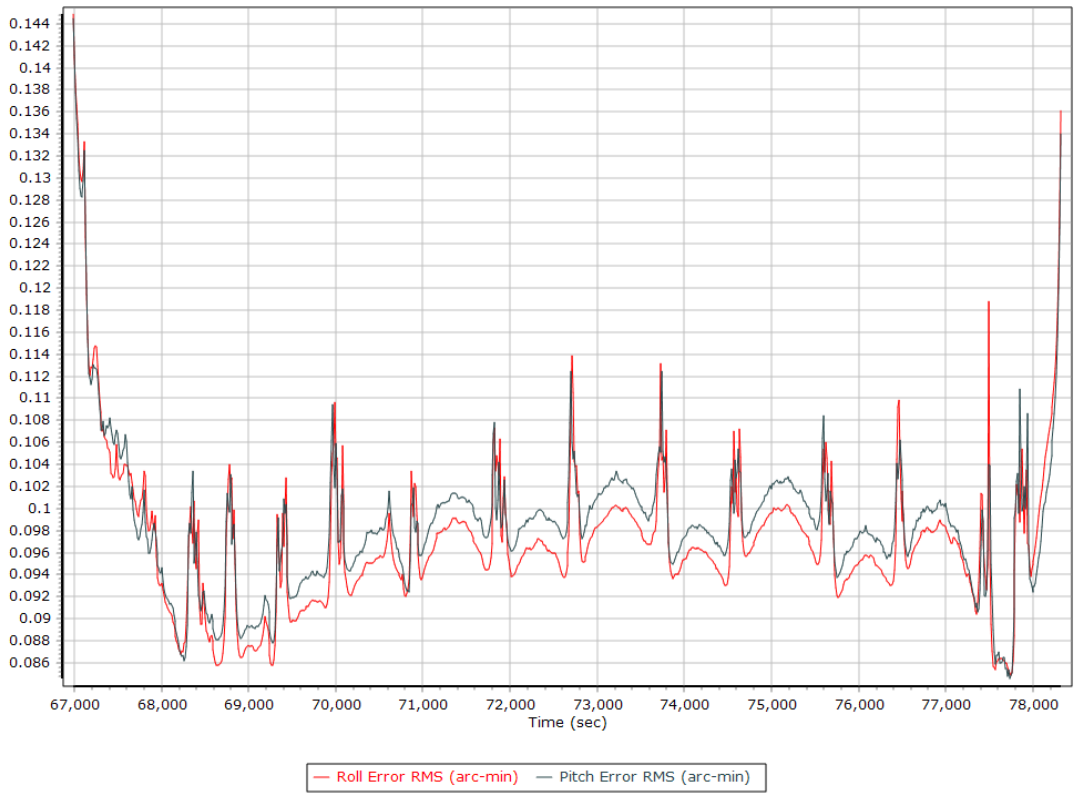
Position Error RMS (m)



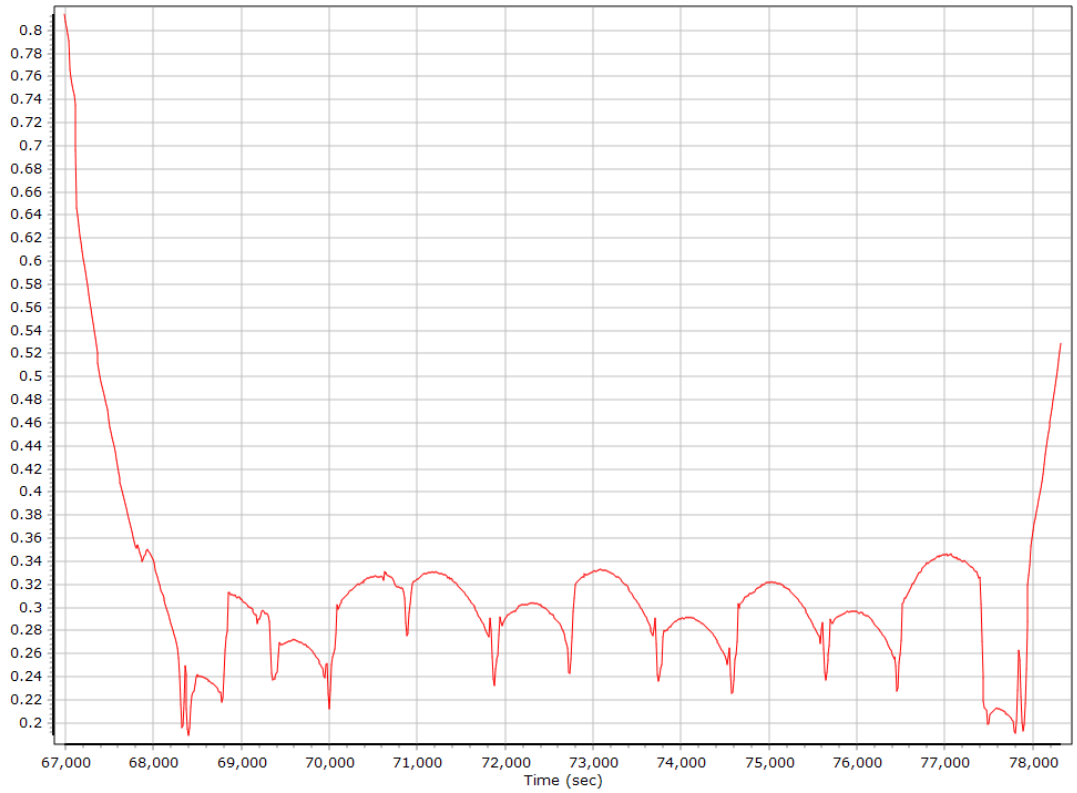
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

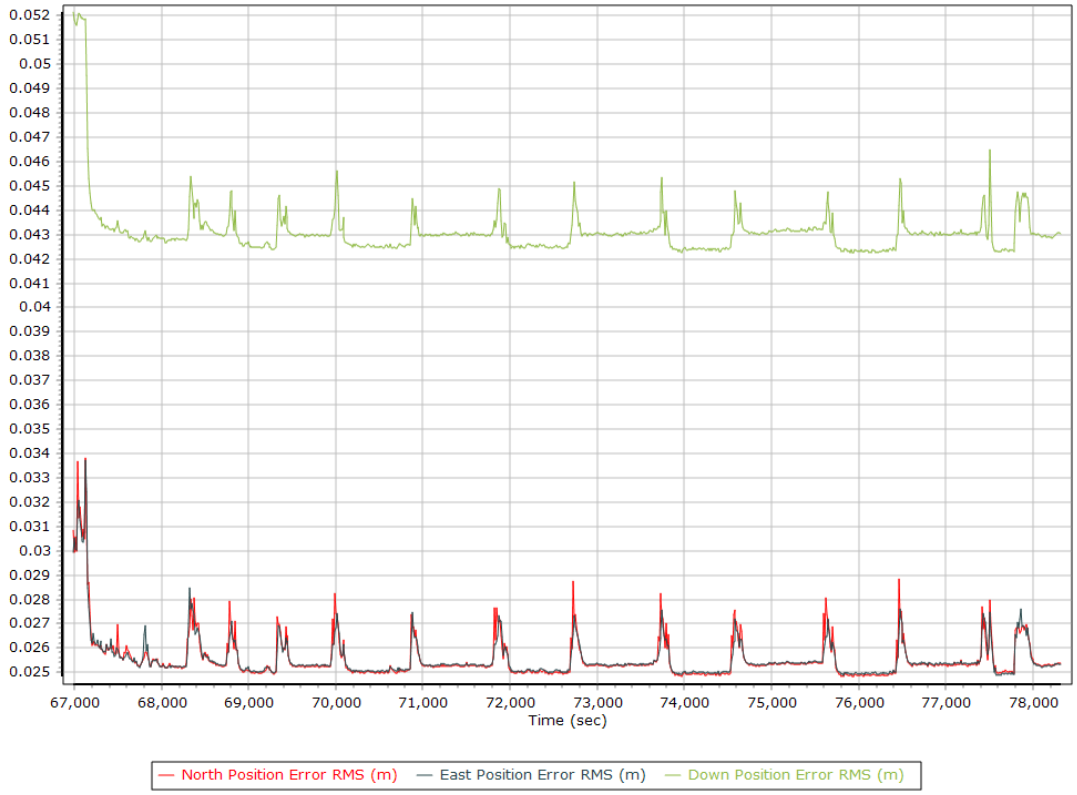


Heading Error RMS (arc-min)

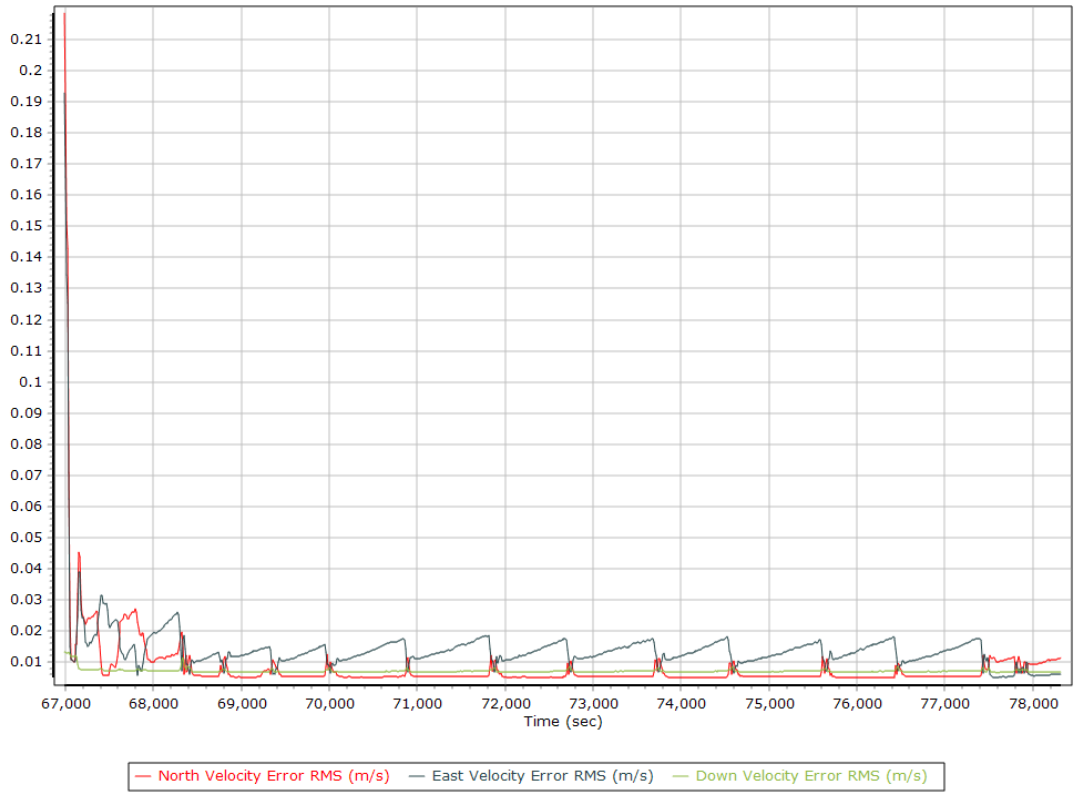


Forward Processed Performance Metrics

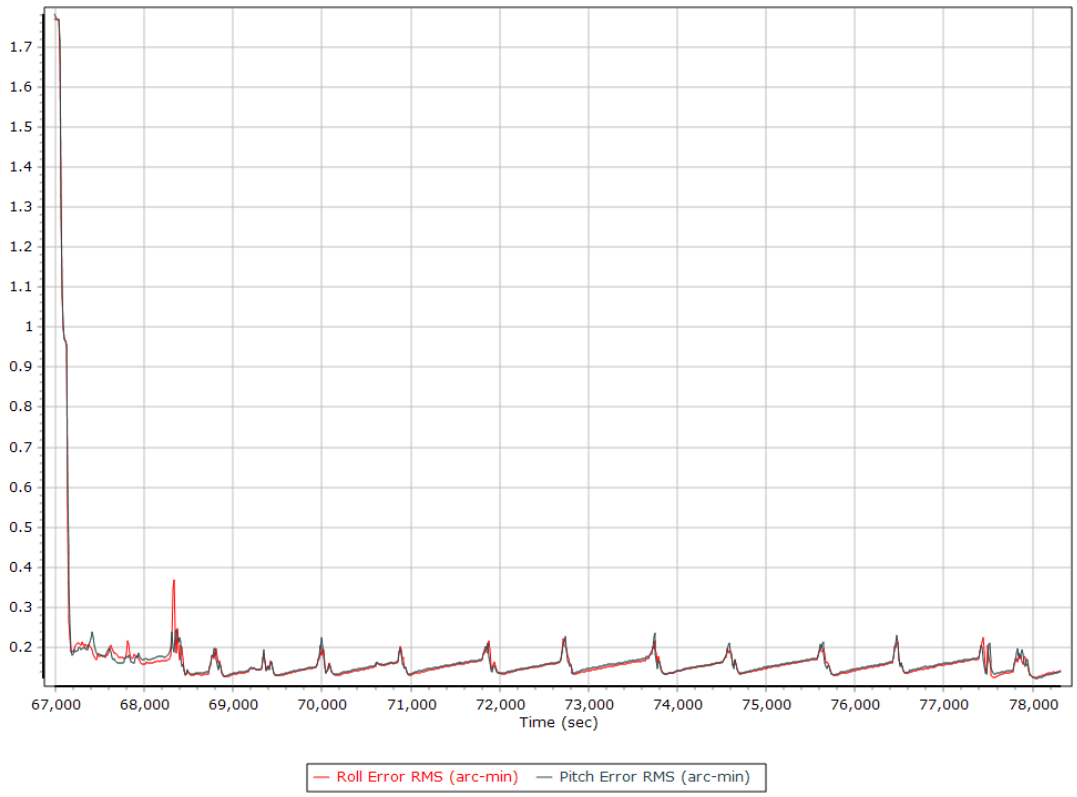
Position Error RMS (m)



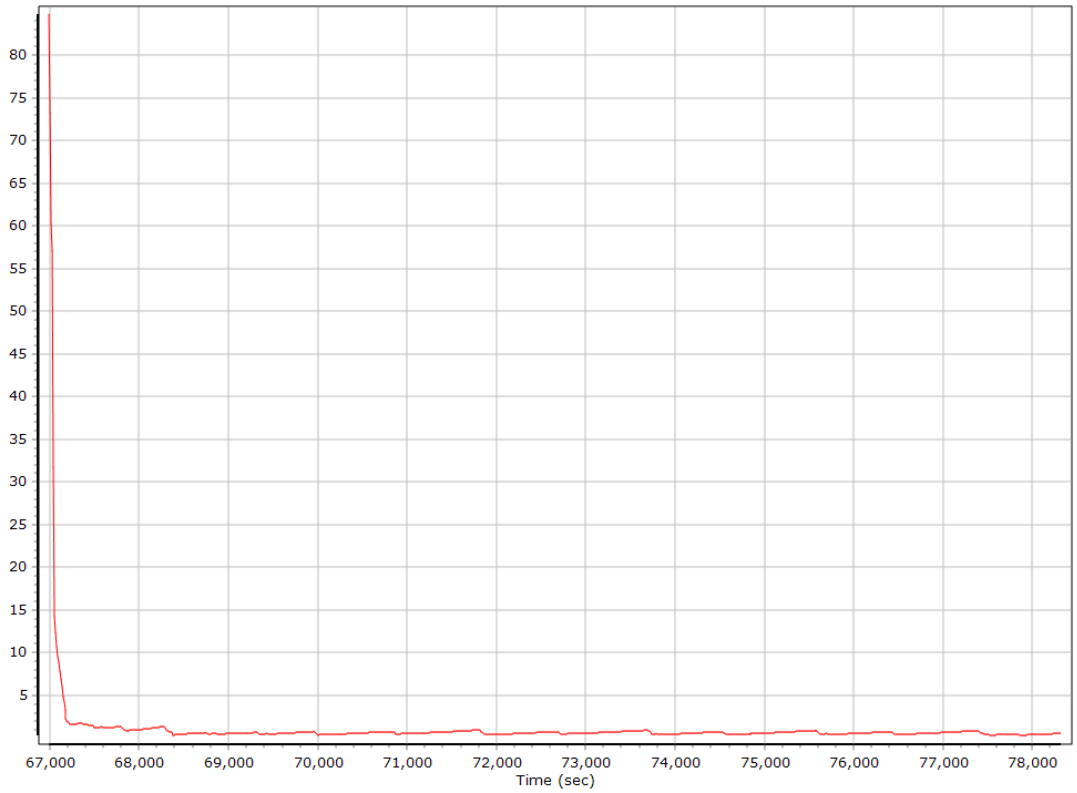
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

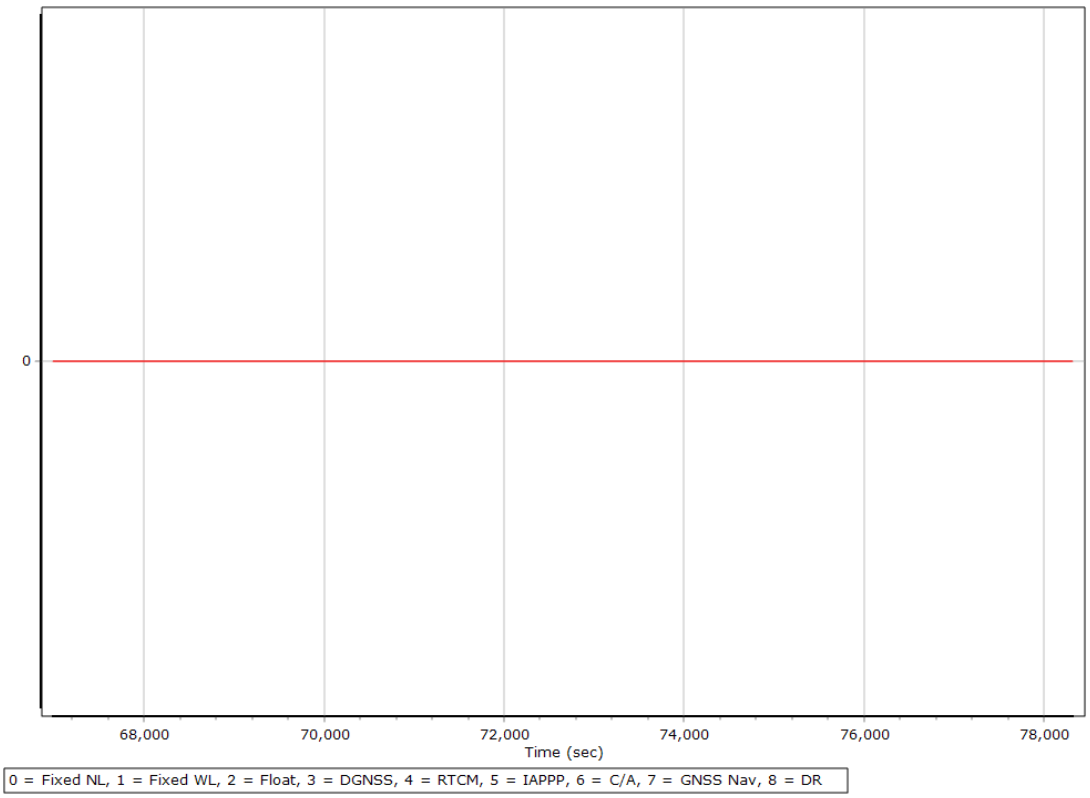


Heading Error RMS (arc-min)

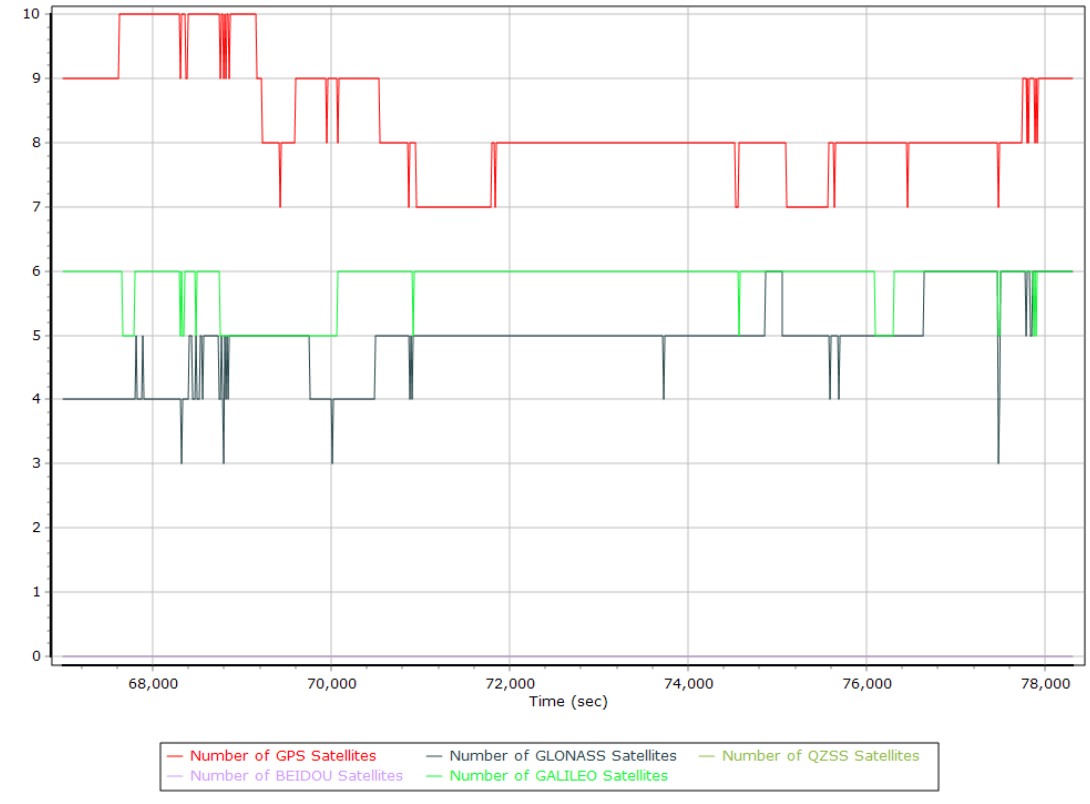


Forward Processed Solution Status

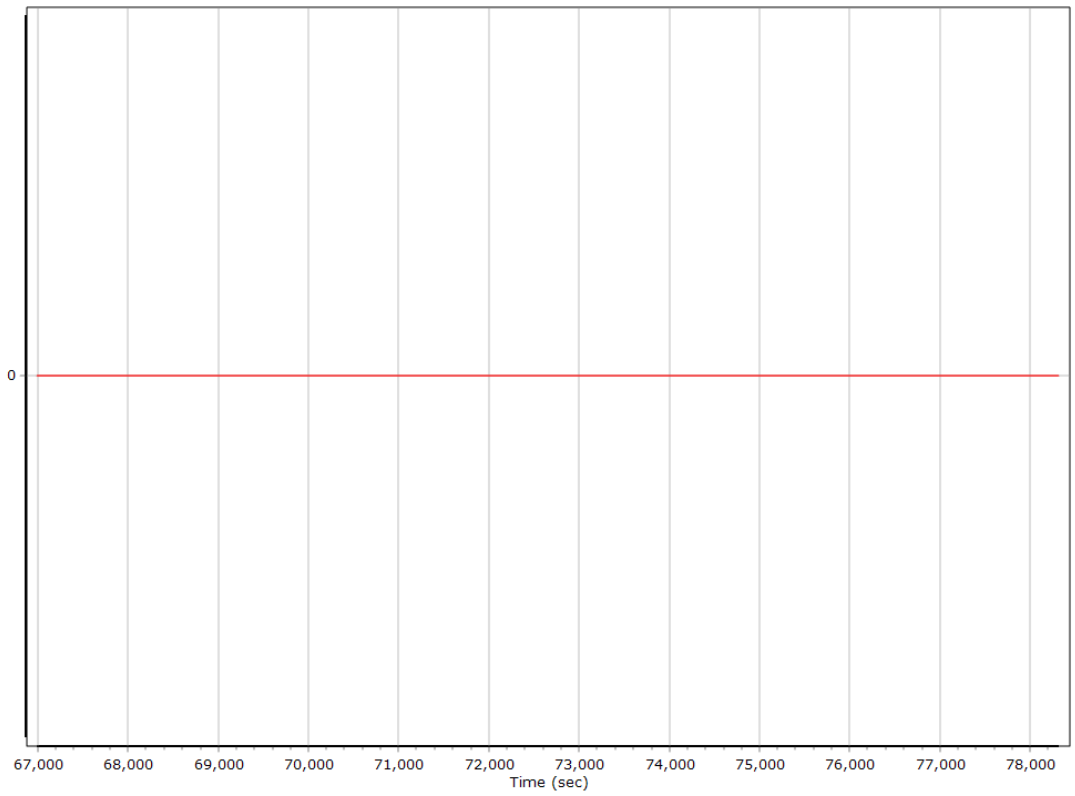
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12182020B_4040
Processing date	2022-01-05 15:08:52
Mission date	2020-12-18 18:33:54
Mission duration	03:25:15.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201218_183336_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3530.20g	GLONASS Broadcast Ephemeris
Ephm3530.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12182020B_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201218_183336_INS-GPS_1.raw		
Last raw data file	201218_183336_INS-GPS_1.raw		
Start GPS week	2136		
Start time	498815.970 (12/18/2020 6:33:35 PM)		
End time	511131.157 (12/18/2020 9:58:51 PM)		
Start of fine alignment	498978.603 (12/18/2020 6:36:18 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

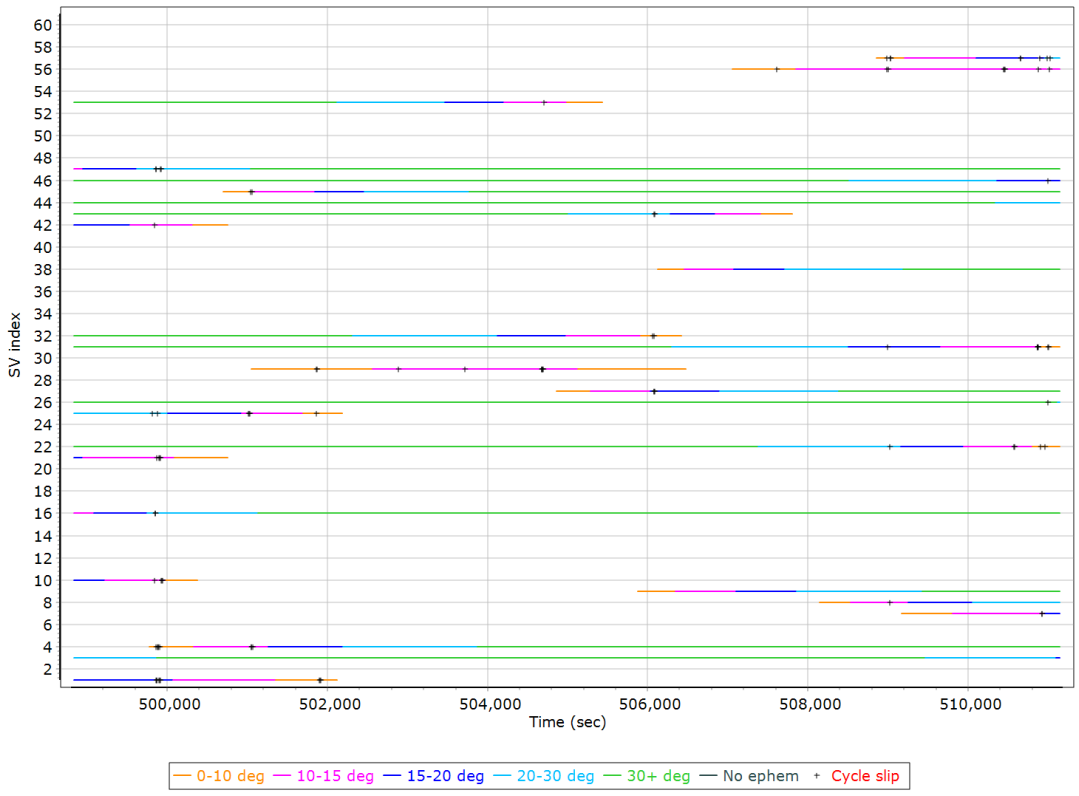
Rover Data QC

Raw IMU Import QC Summary

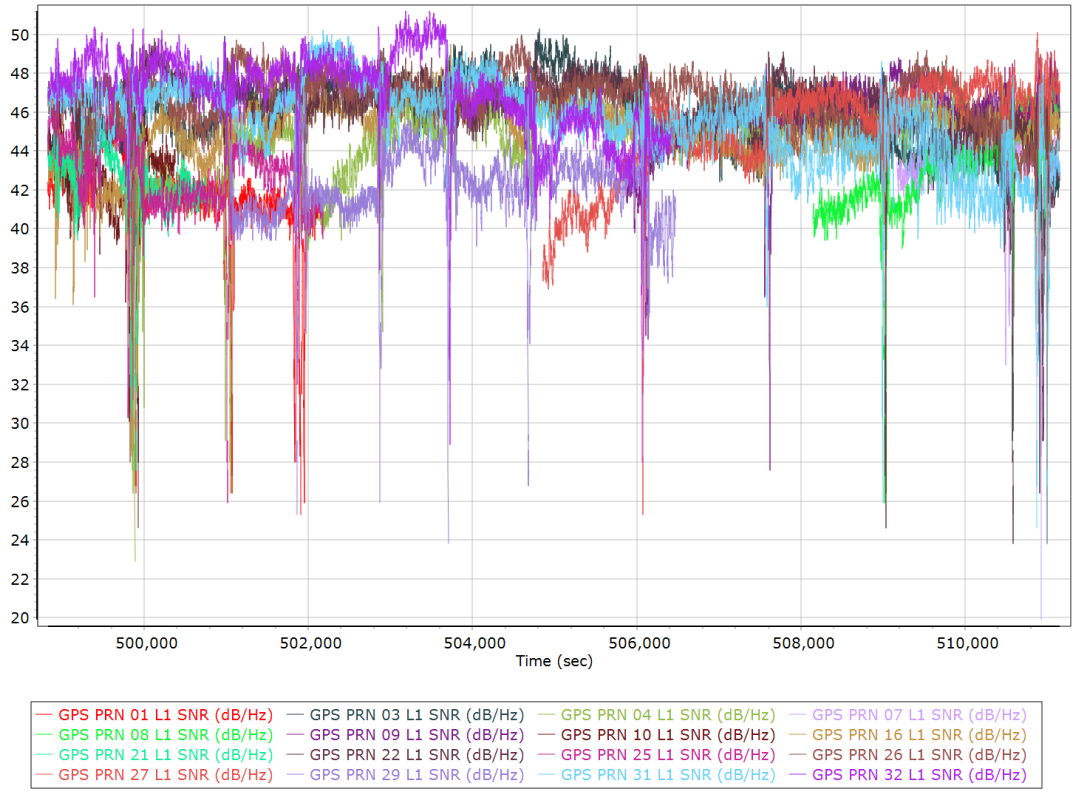
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12182020B_4040.log
IMU Records Processed	2462686
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

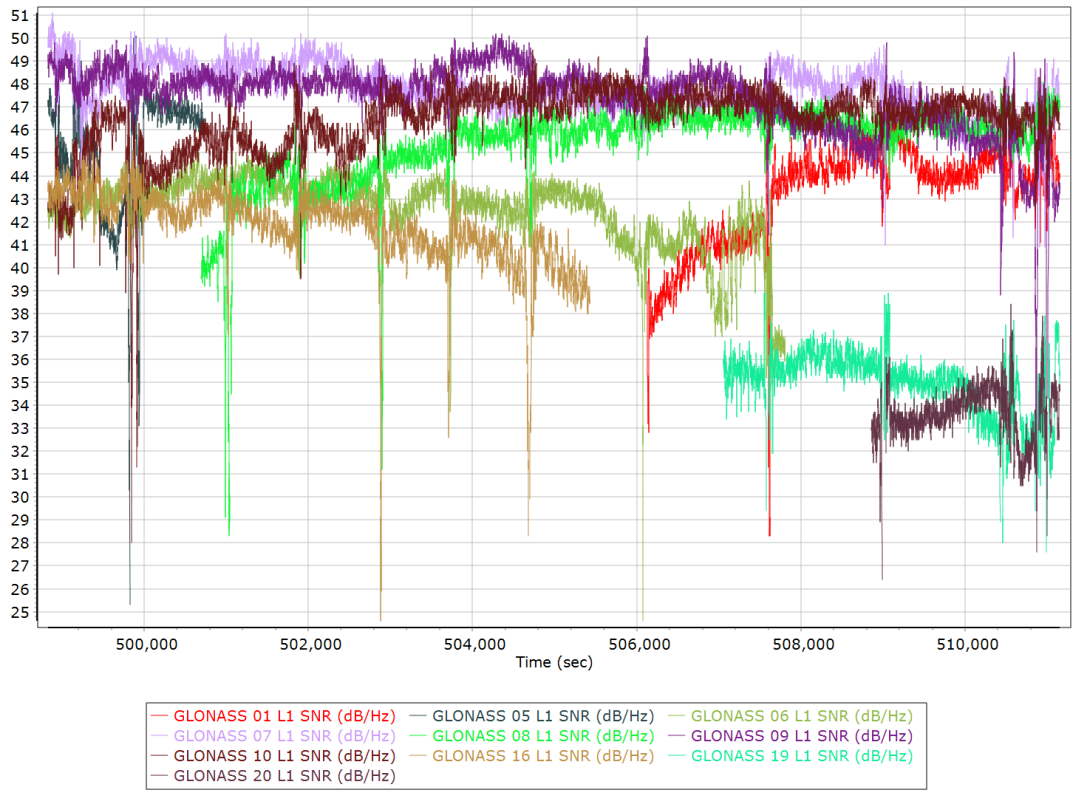
GPS/GLONASS L1 Satellite Lock/Elevation



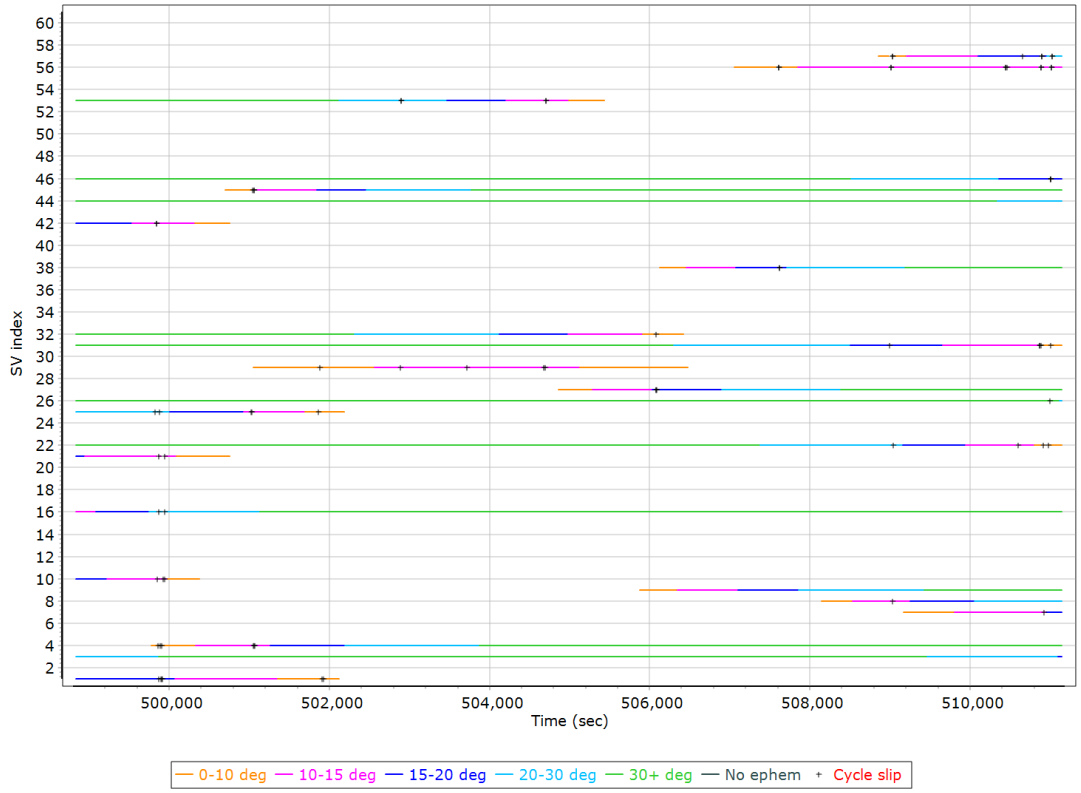
GPS L1 SNR



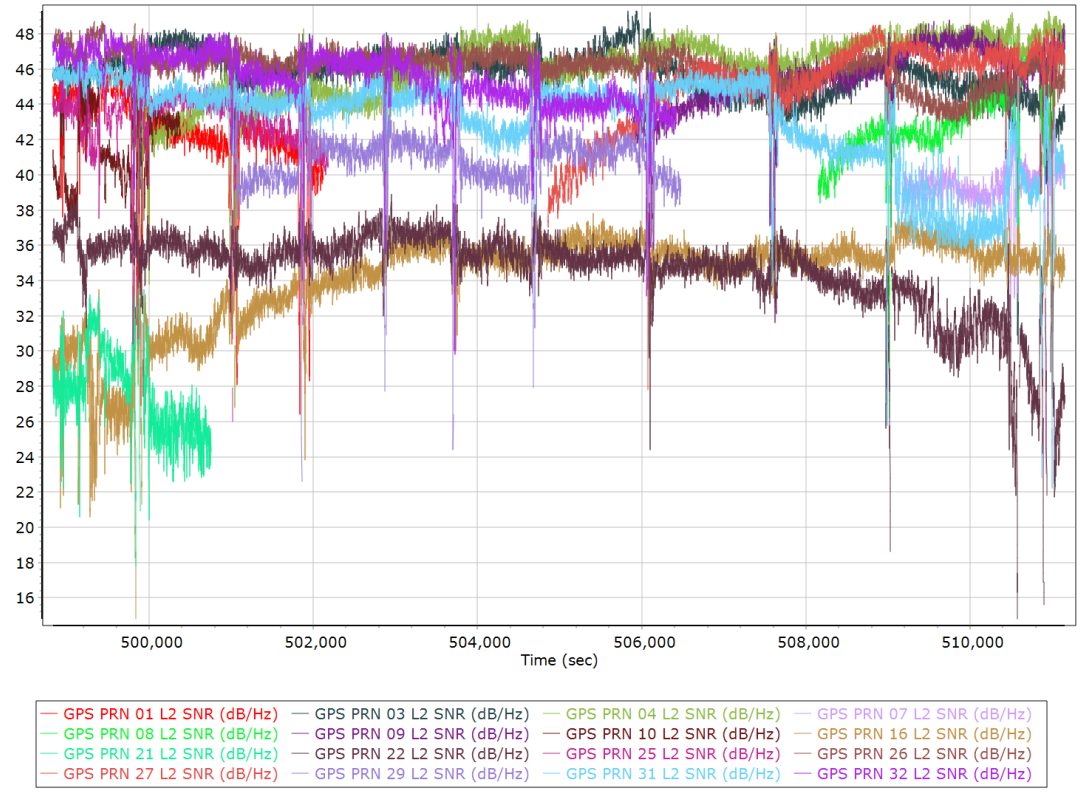
GLONASS L1 SNR



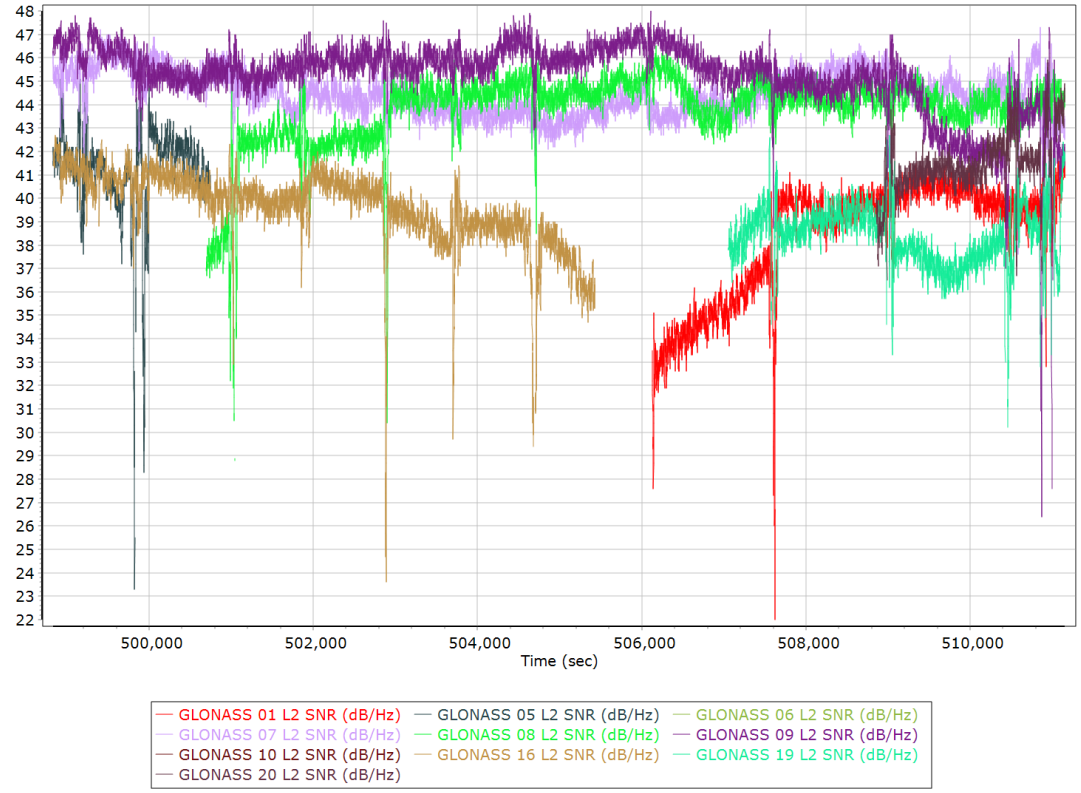
GPS/GLONASS L2 Satellite Lock/Elevation



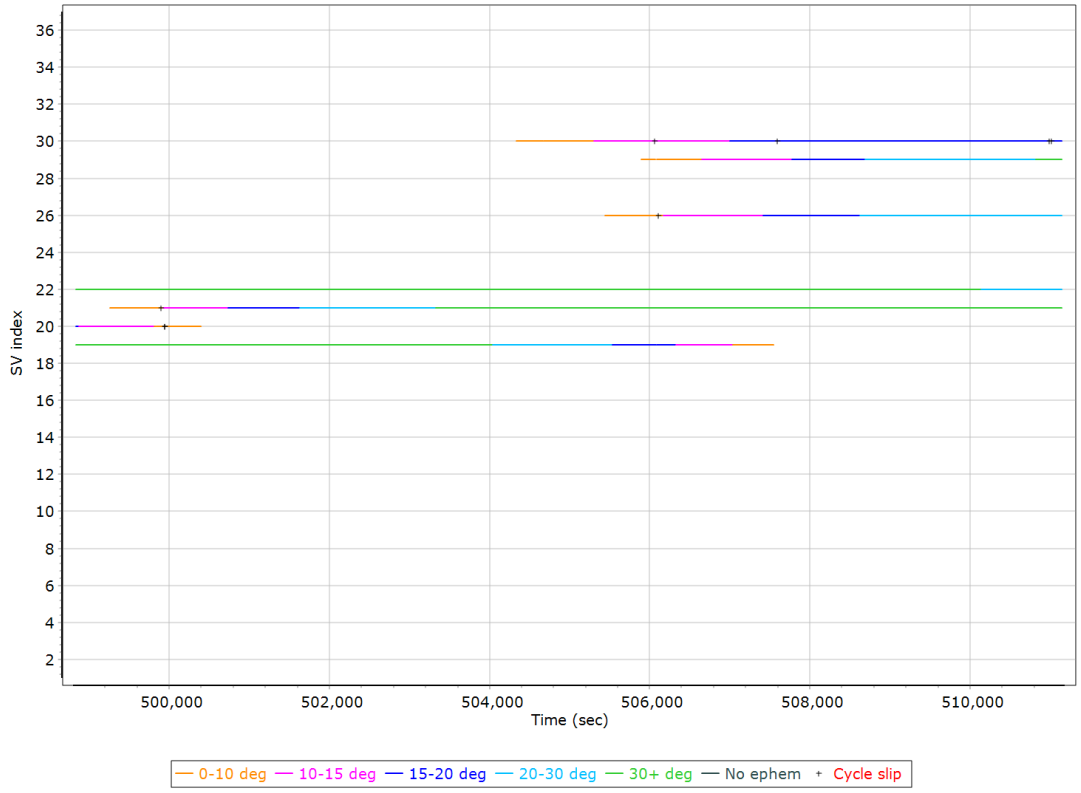
GPS L2 SNR



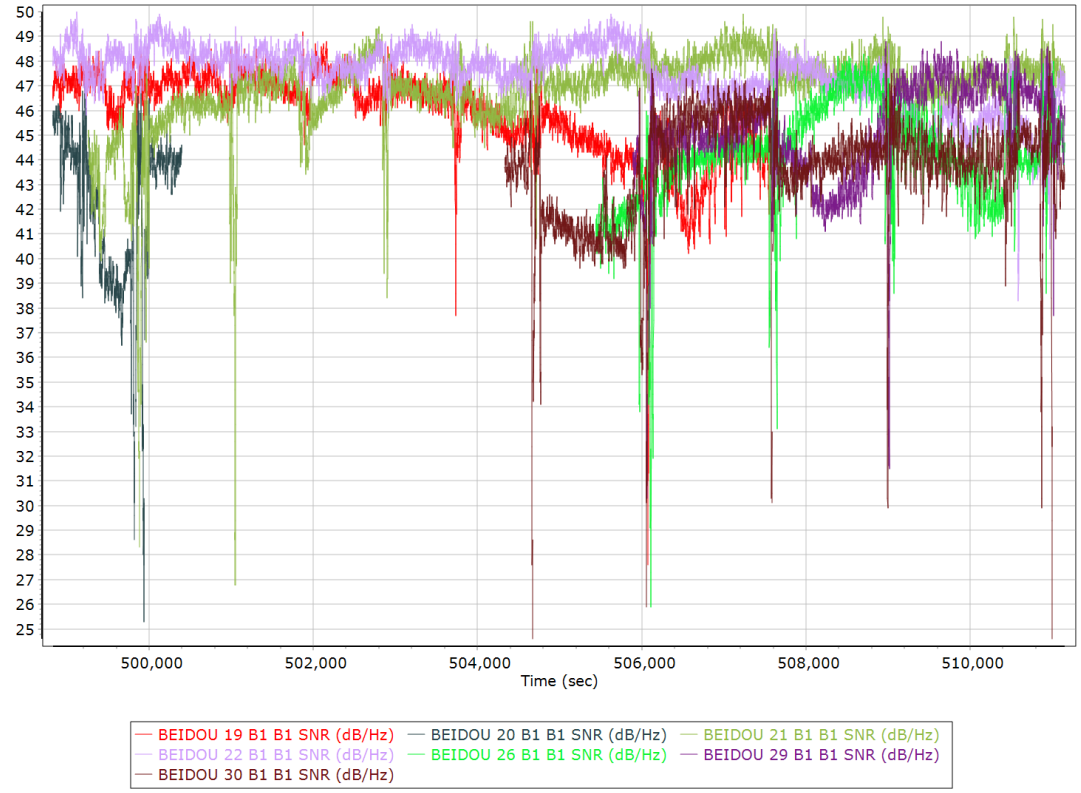
GLONASS L2 SNR



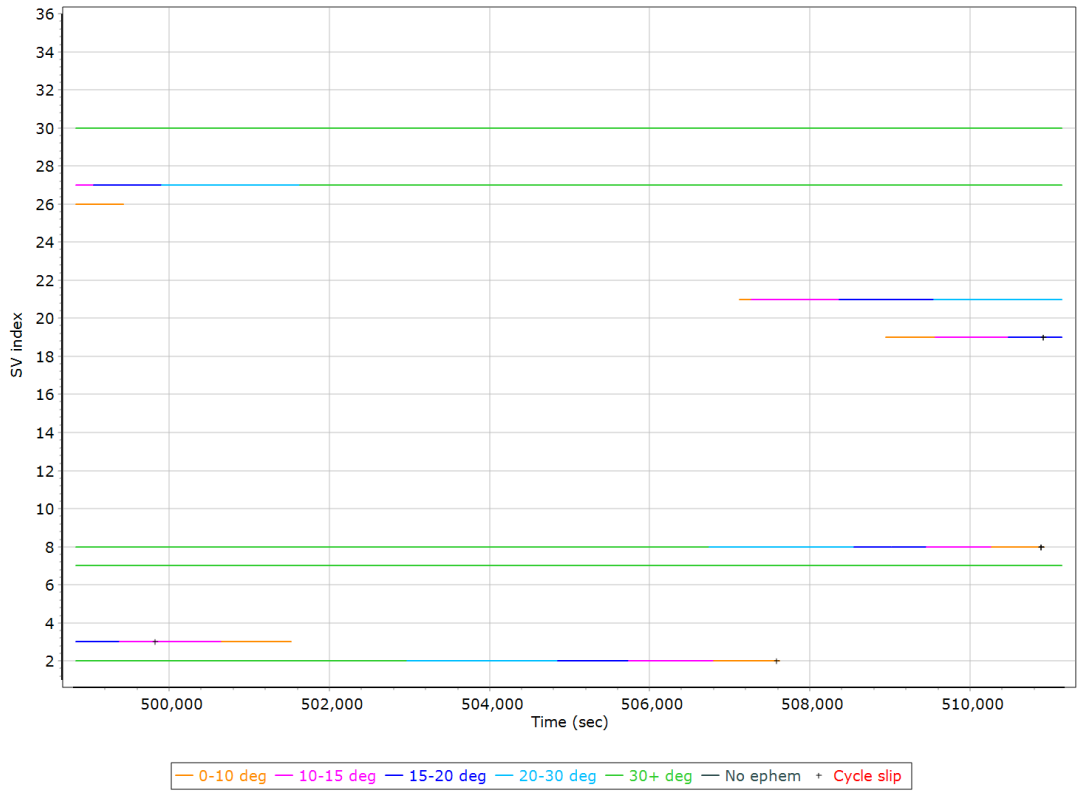
BEIDOU Satellite Lock/Elevation



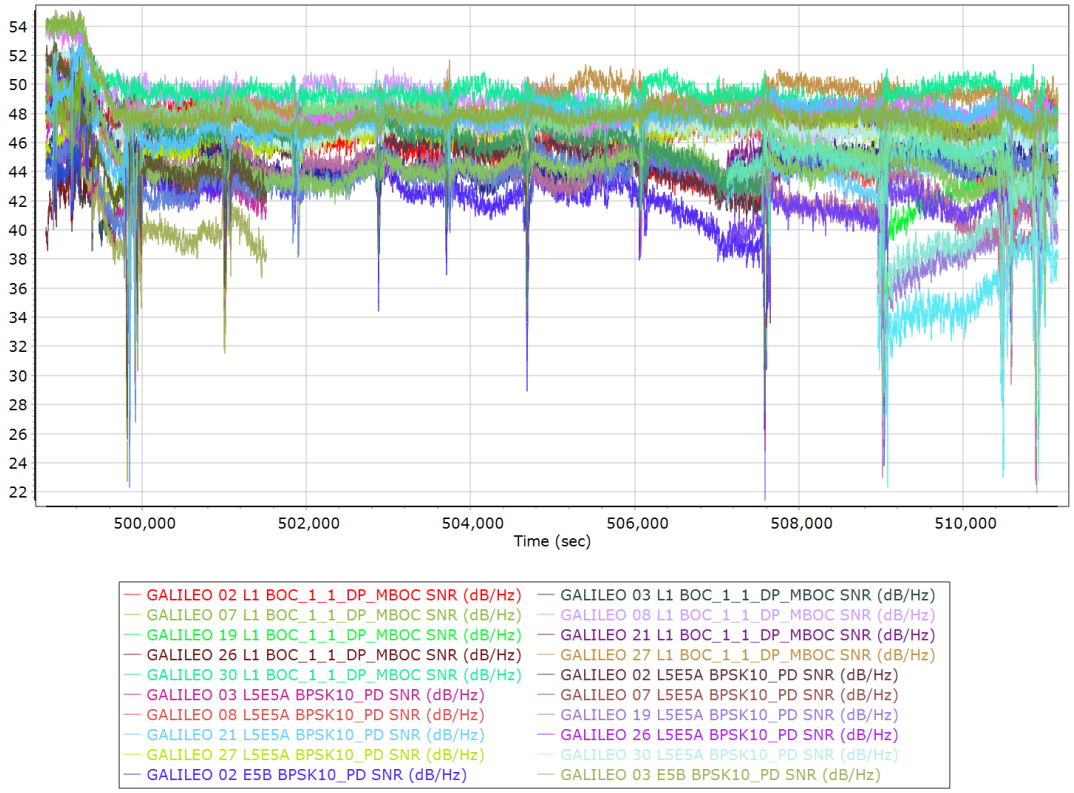
BEIDOU SNR



GALILEO Satellite Lock/Elevation

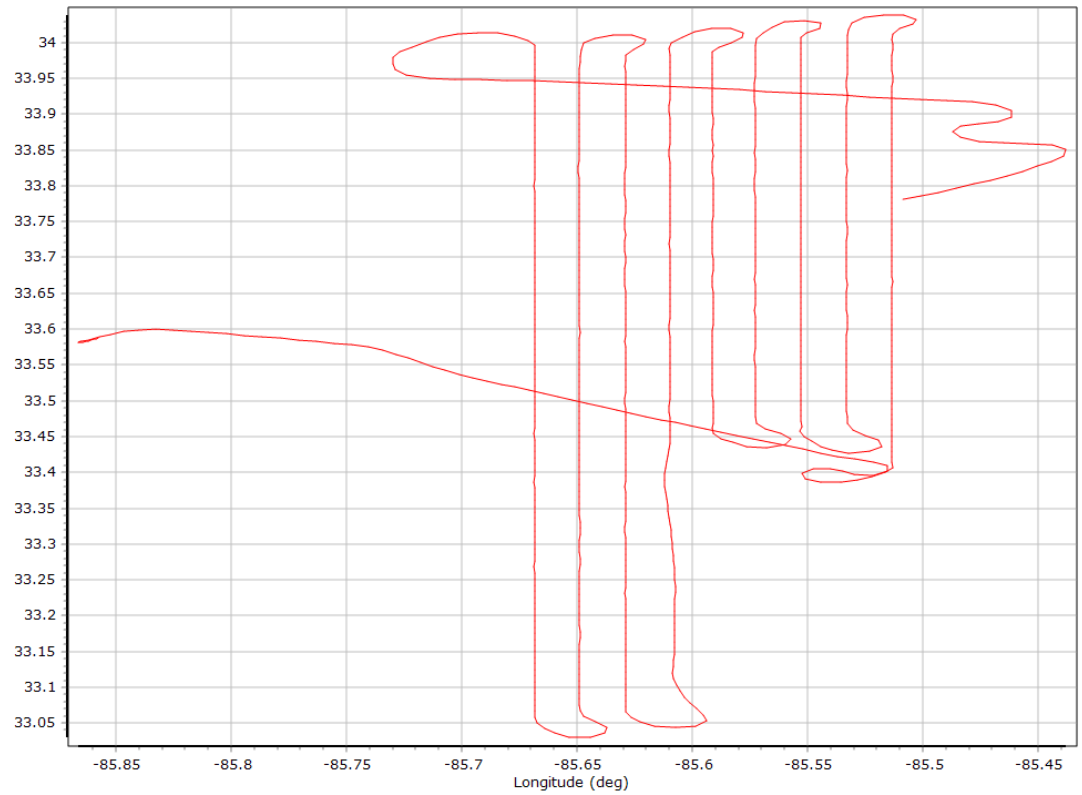


GALILEO SNR

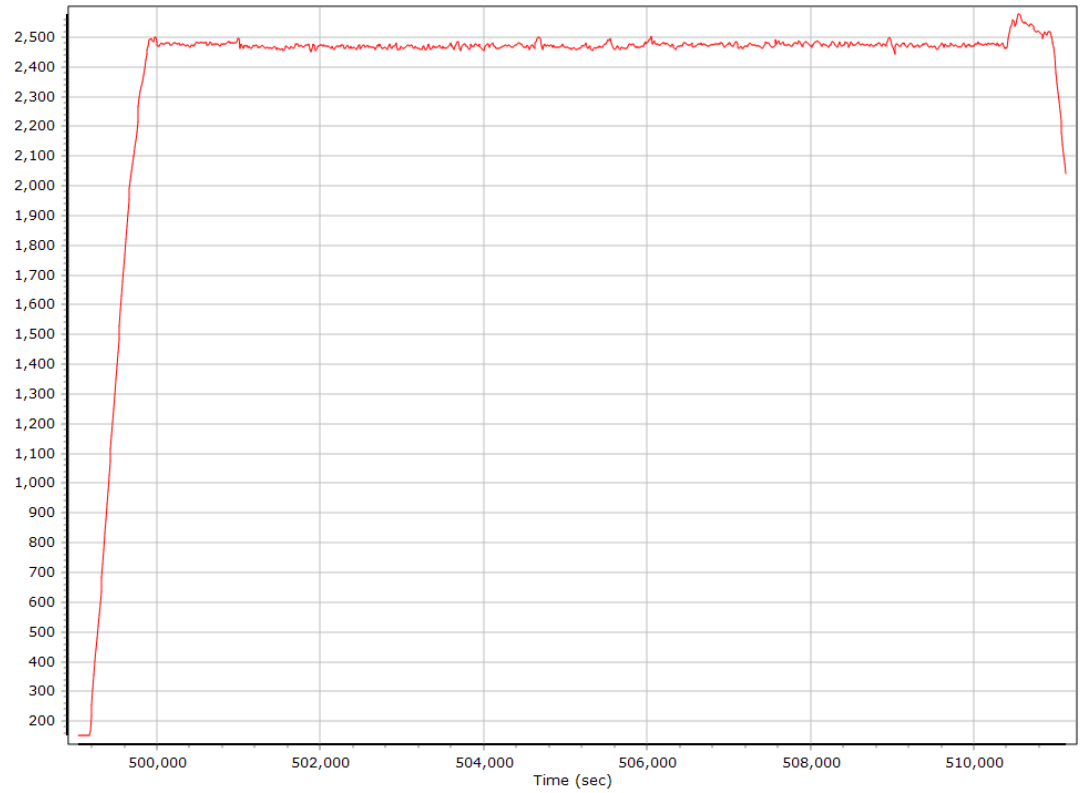

54
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26
24
22
500,000
502,000
504,000
506,000
508,000
510,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 27 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 02 E5B BPSK10_PD SNR (dB/Hz)
GALILEO 03 E5B BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

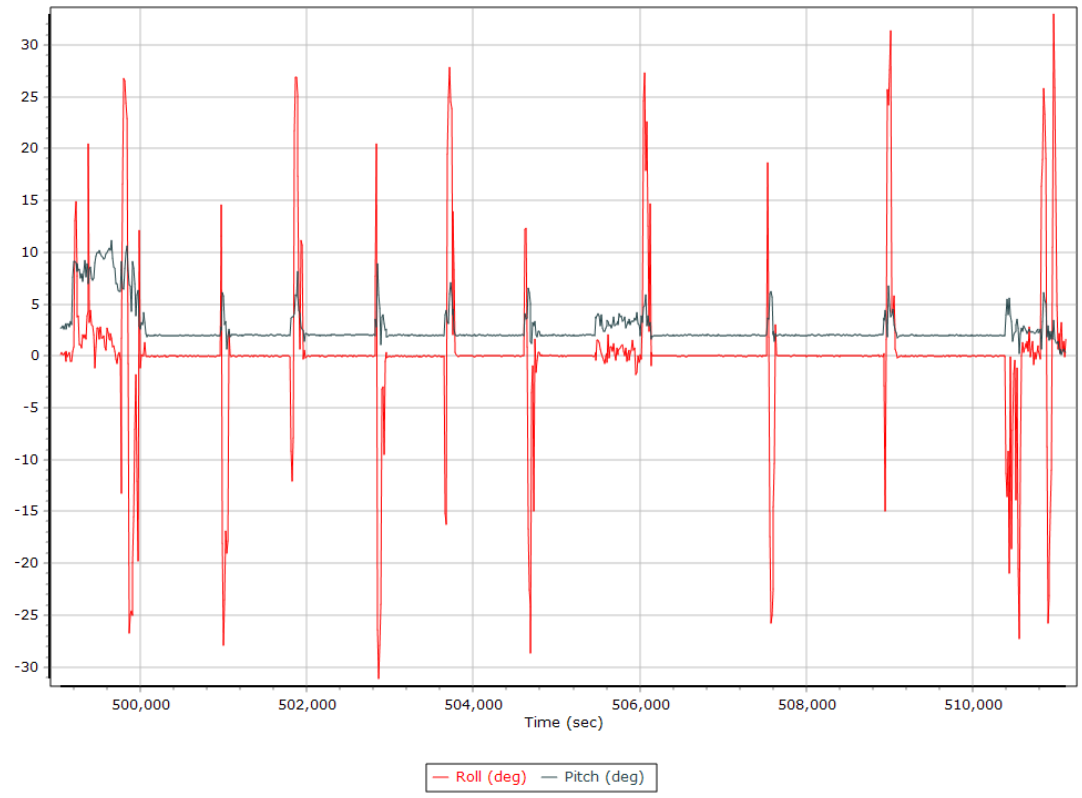
Top View



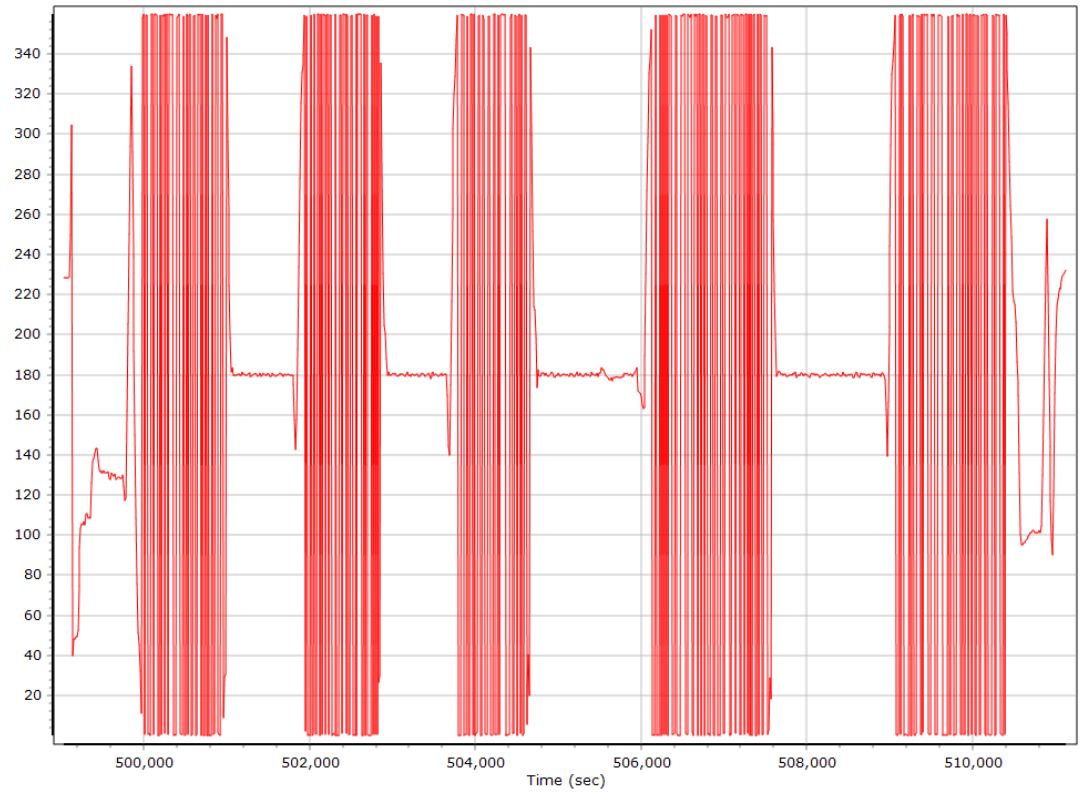
Altitude



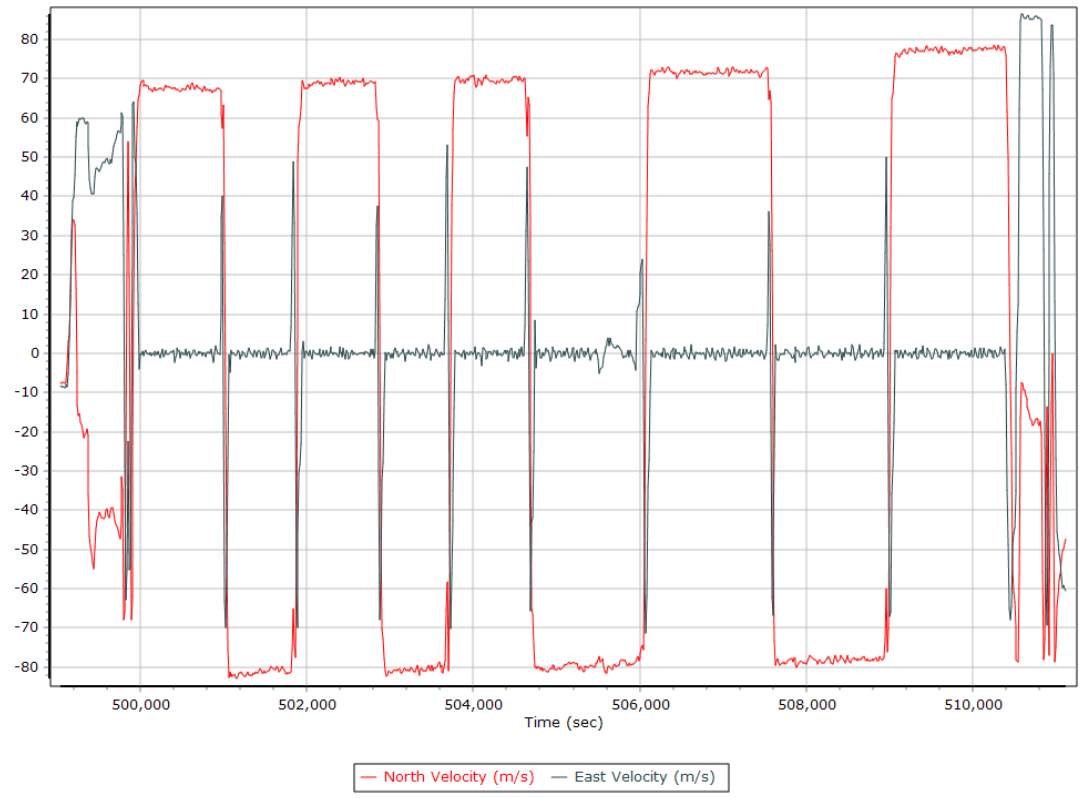
Roll/Pitch



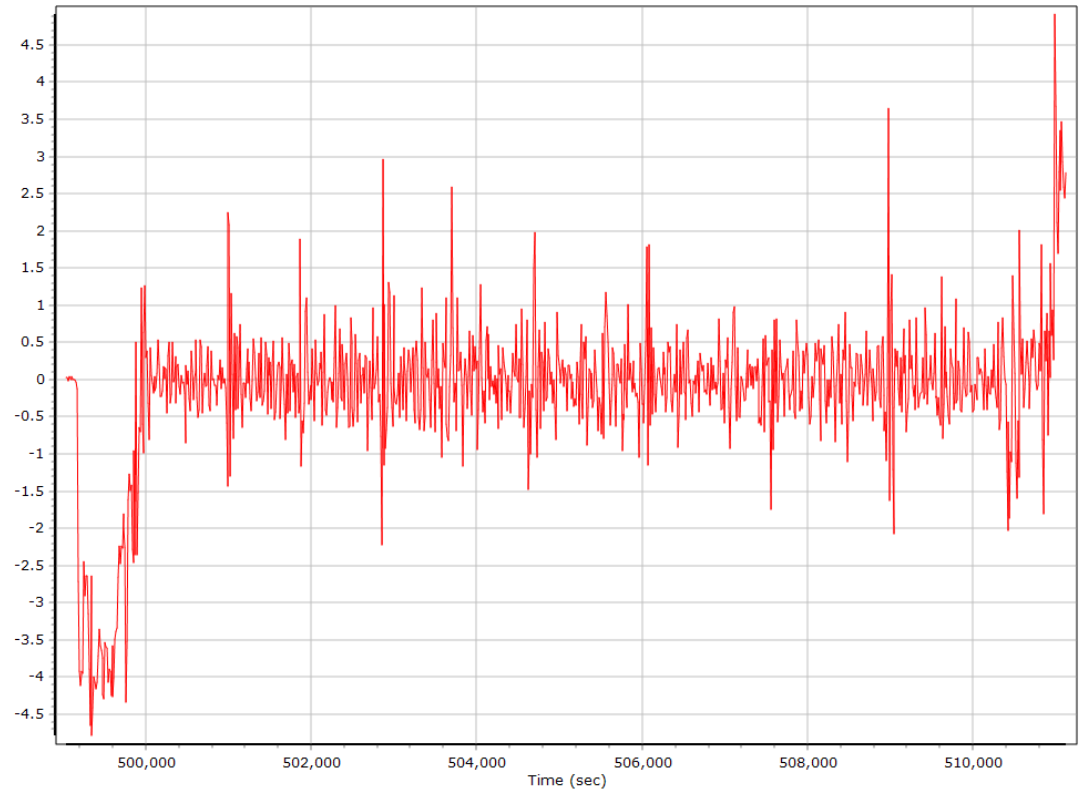
Heading



North/East Velocity



Down Velocity



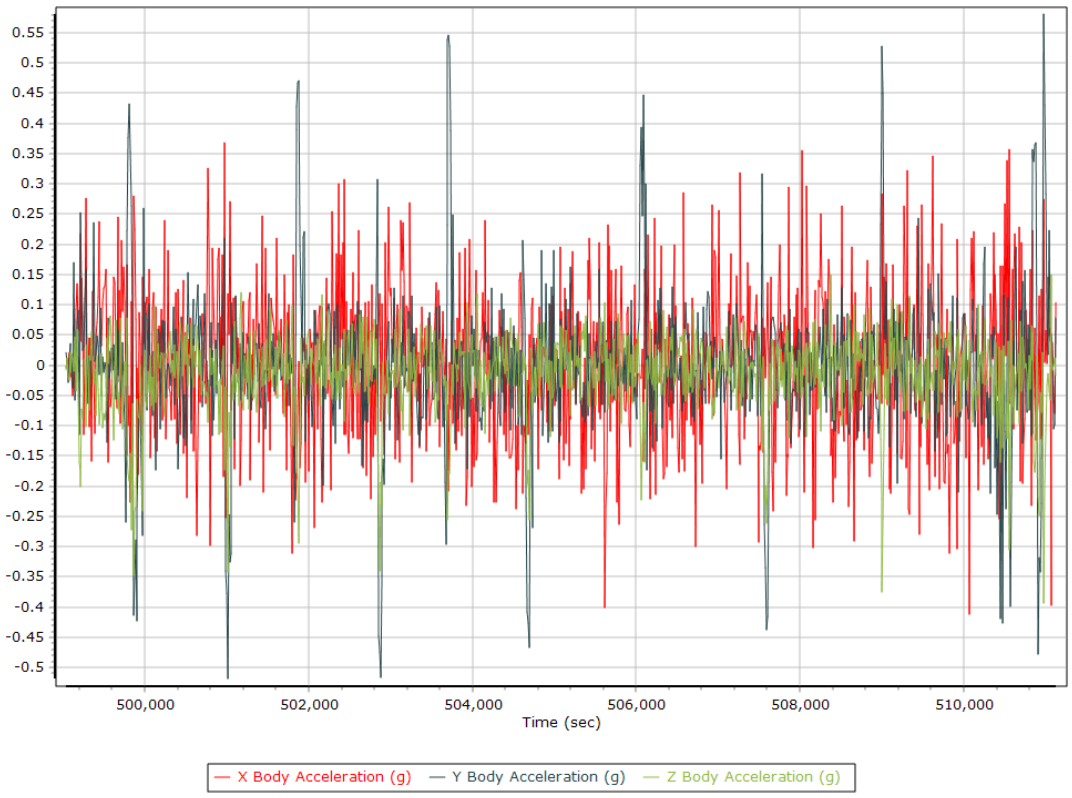
Total Speed



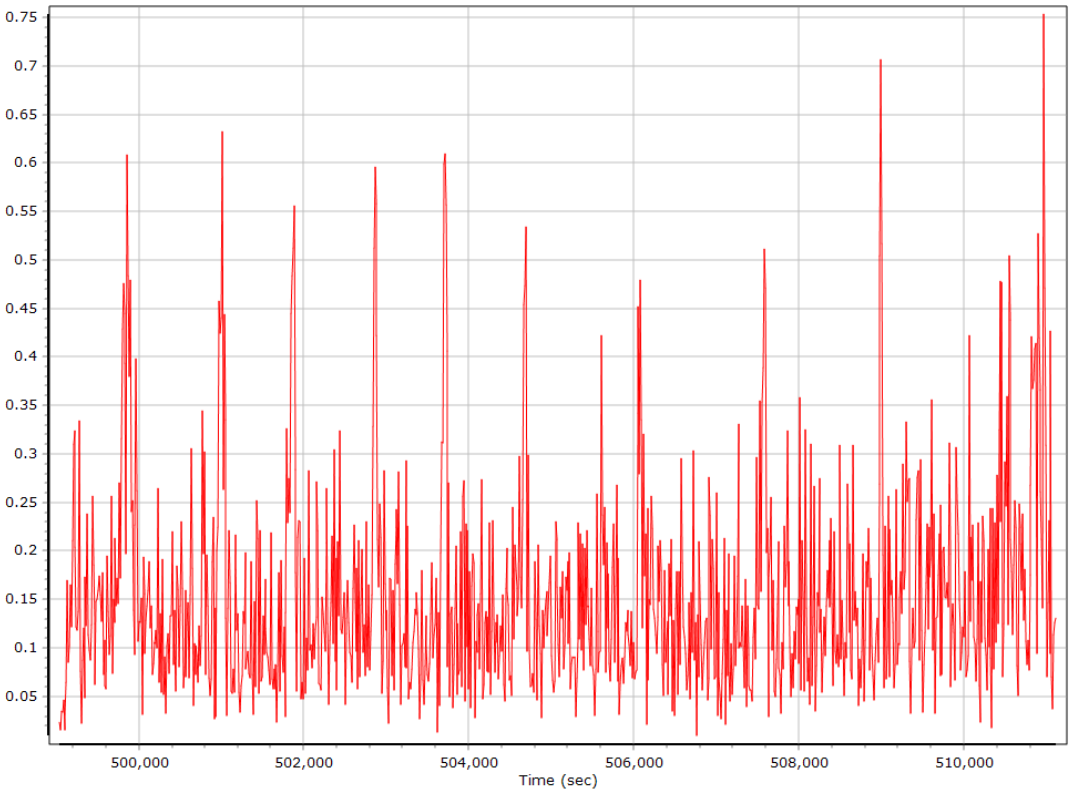
Ground Speed



Body Acceleration



Total Body Acceleration

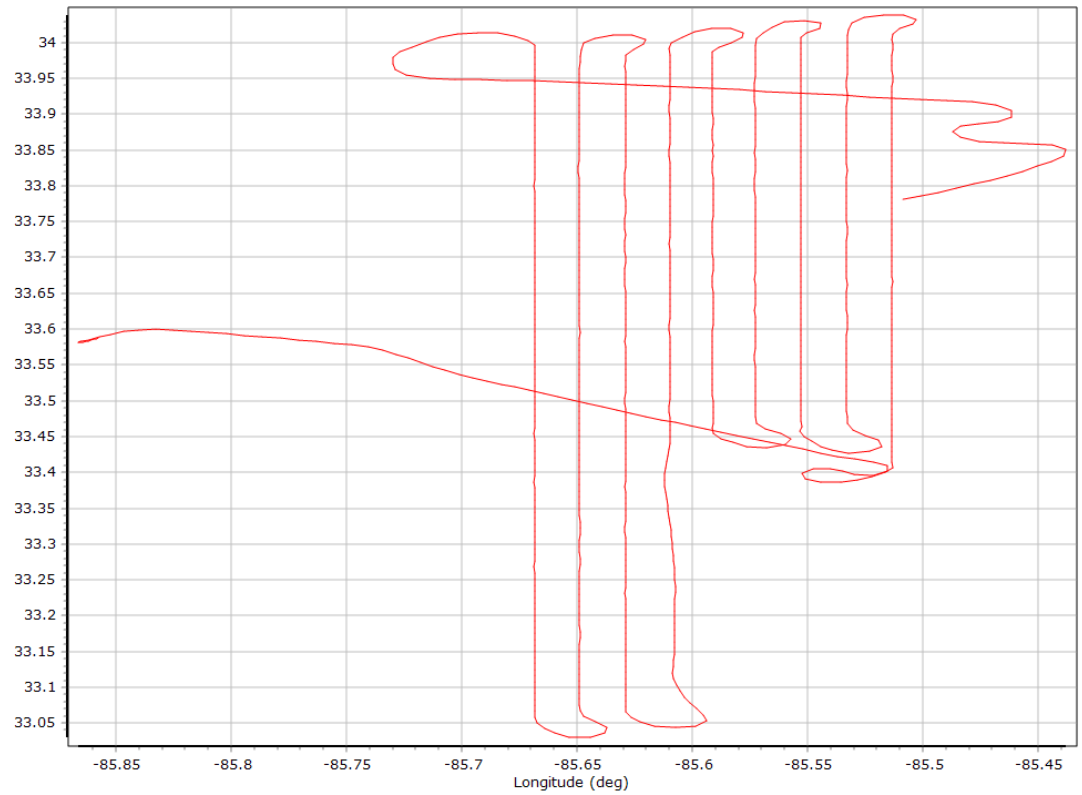


Body Angular Rate

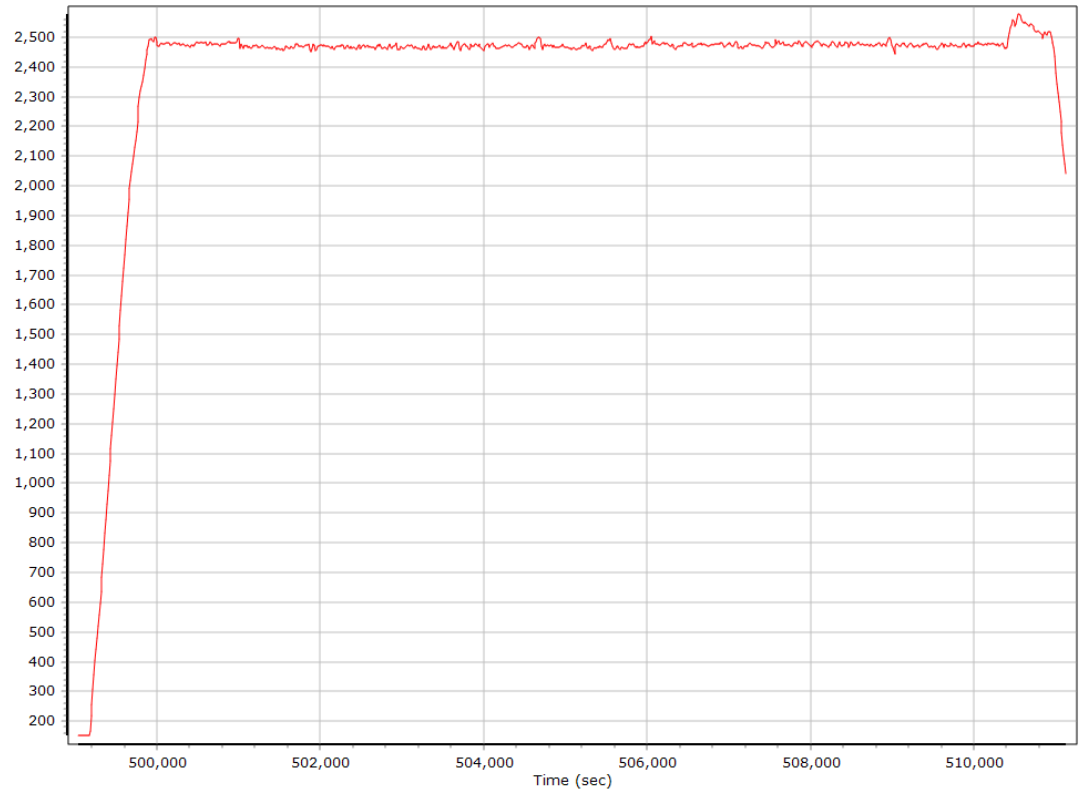


Forward Processed Trajectory Information

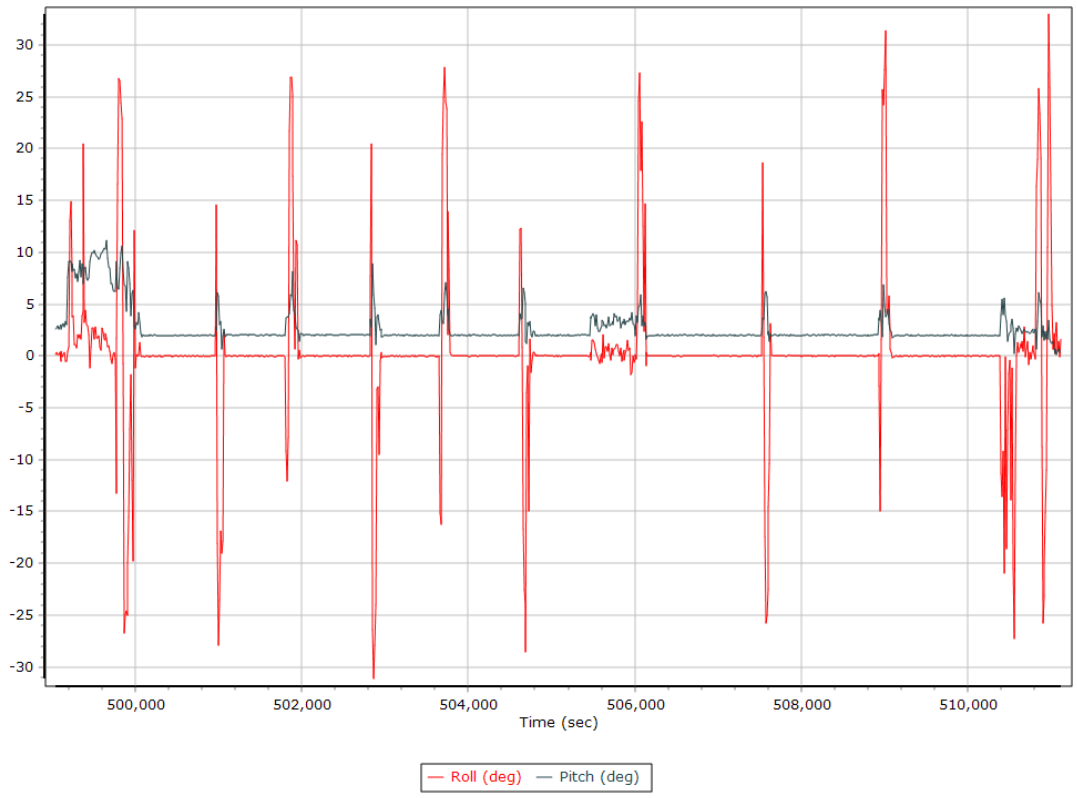
Top View



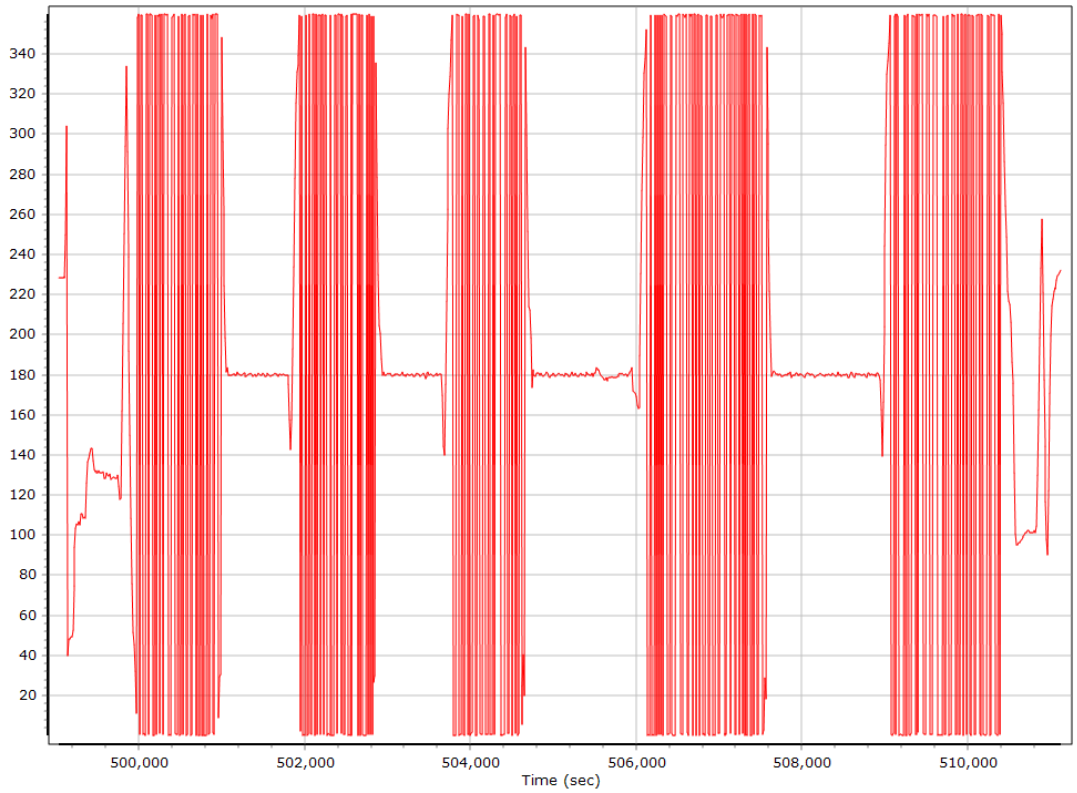
Altitude



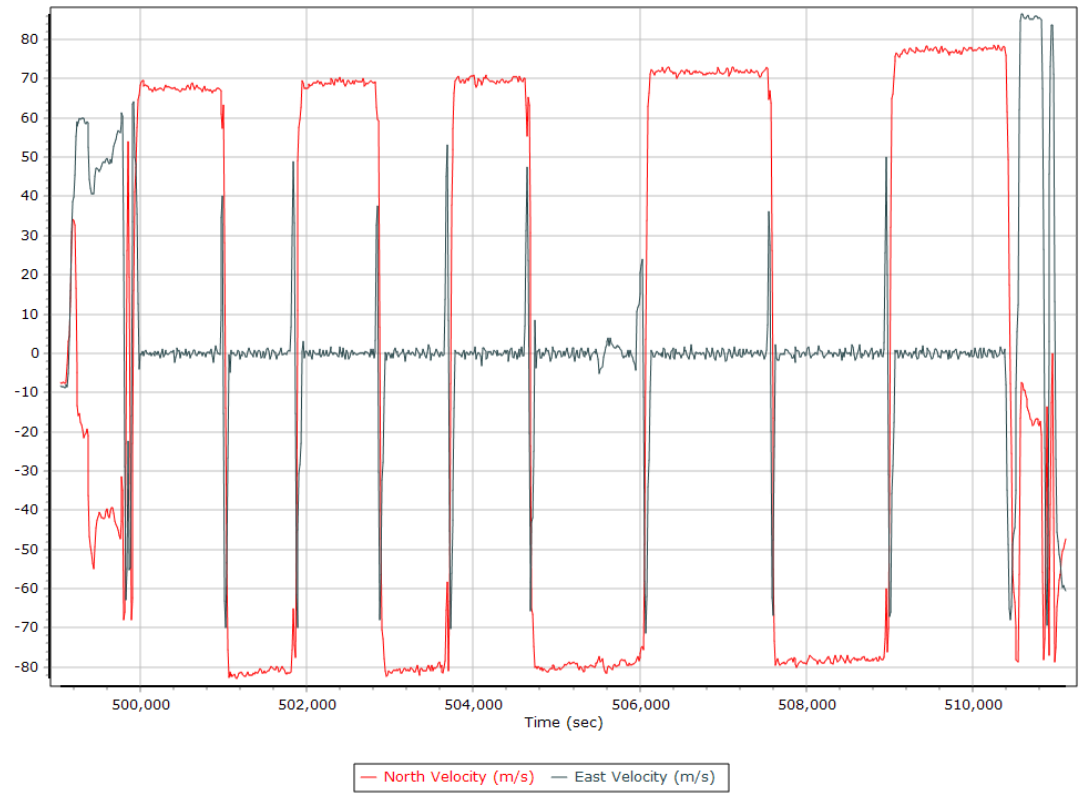
Roll/Pitch



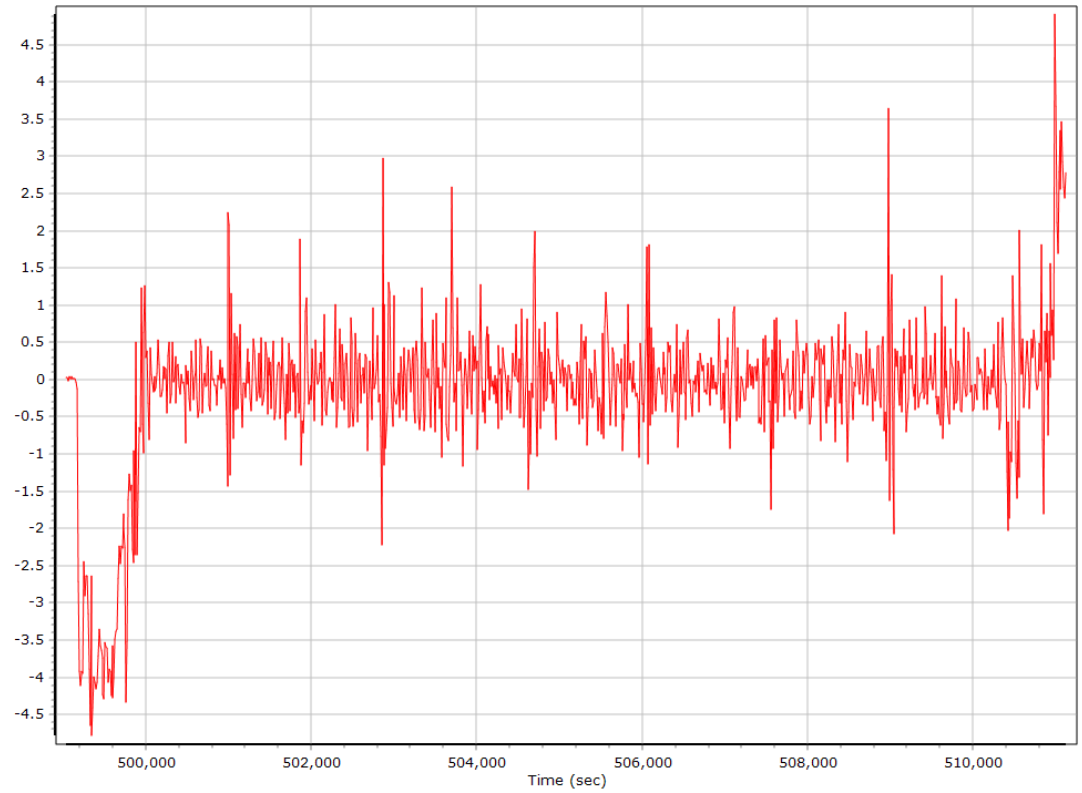
Heading



North/East Velocity



Down Velocity



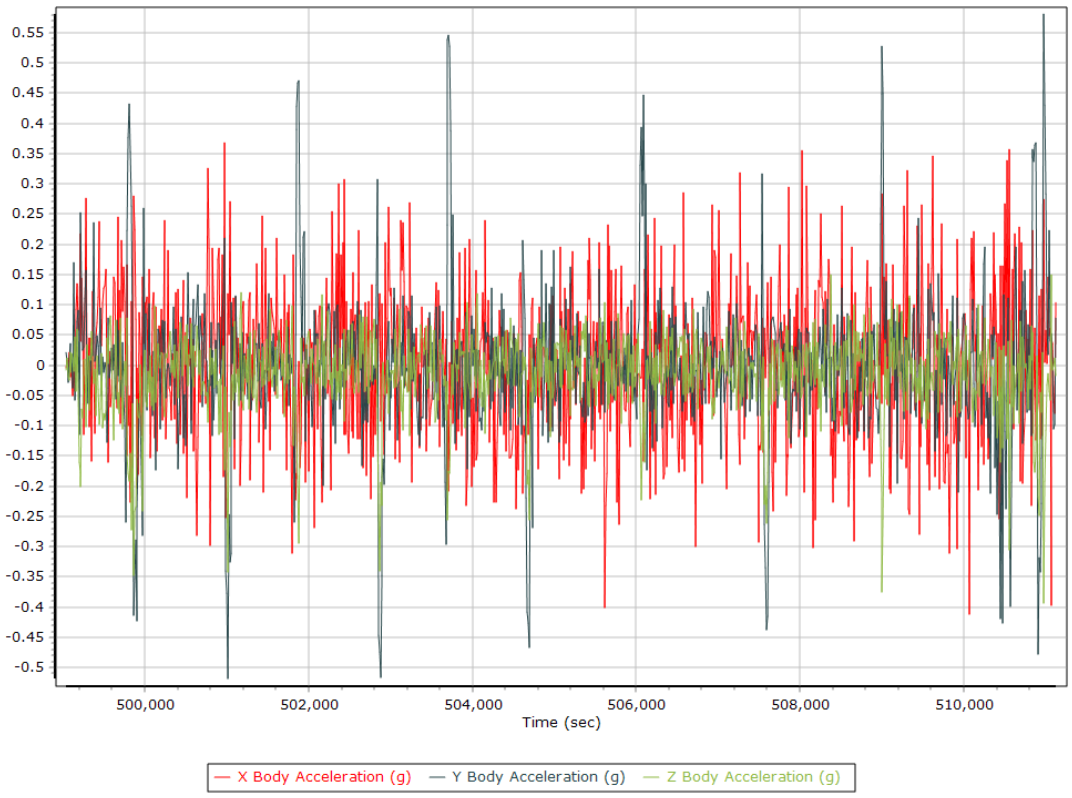
Total Speed



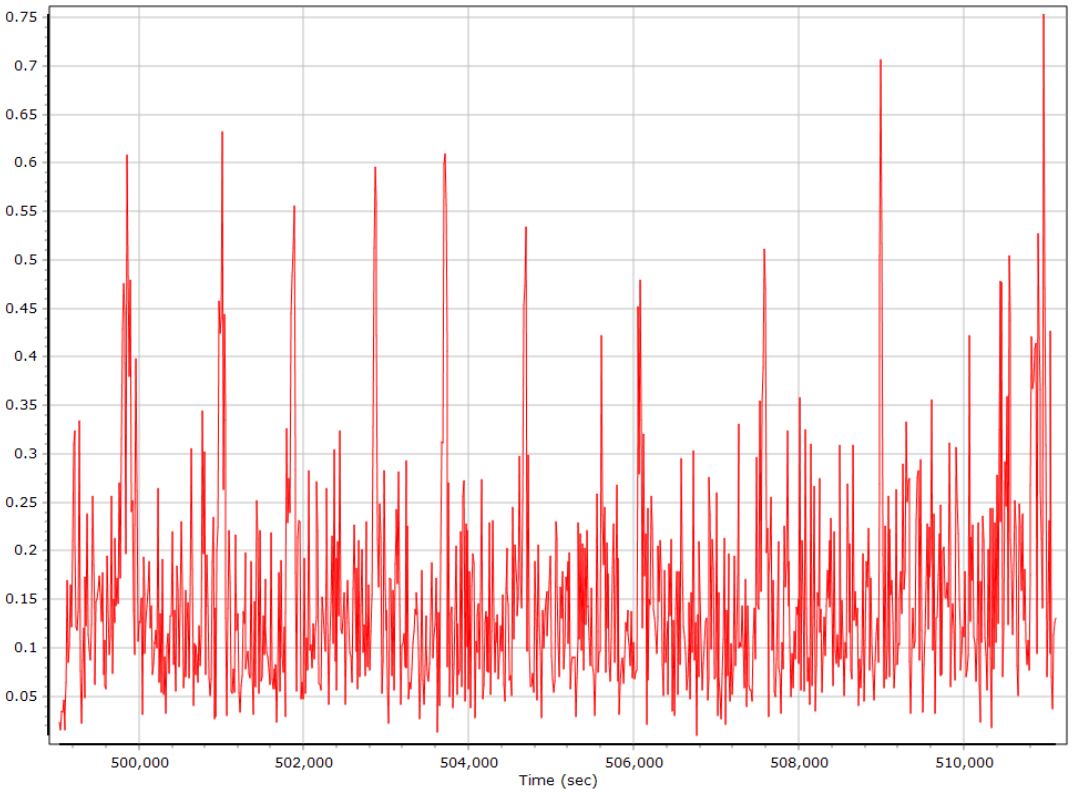
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

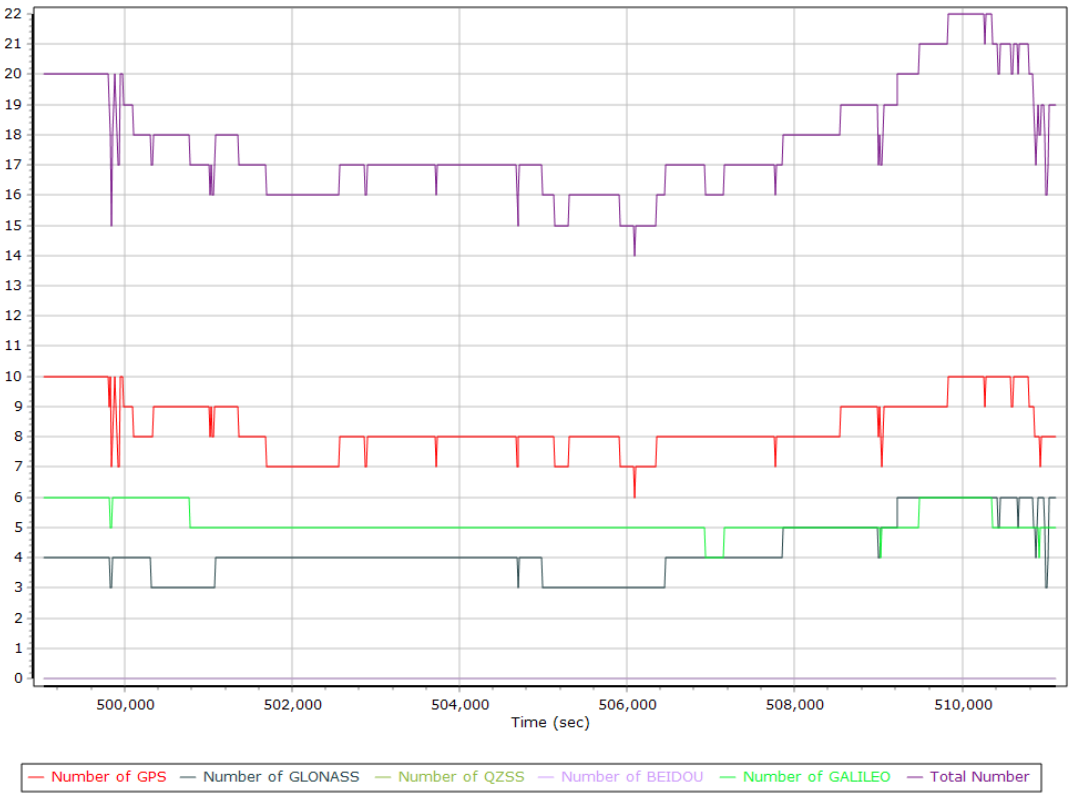


GNSS QC

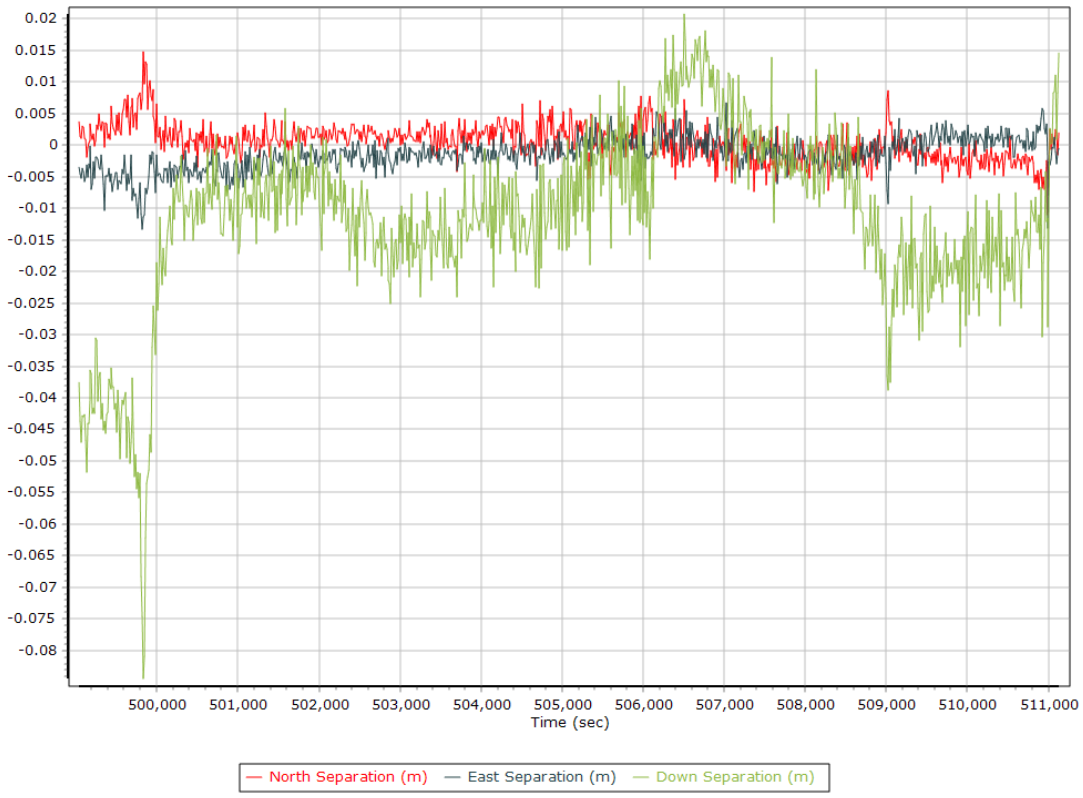
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	10	8
Number of GLONASS SV	3	6	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	4	6	5
Total number of SV	14	22	18
PDOP	0.97	1.78	1.29
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	12283.00	0.00	0.00
Percentage	100.00	0.00	0.00

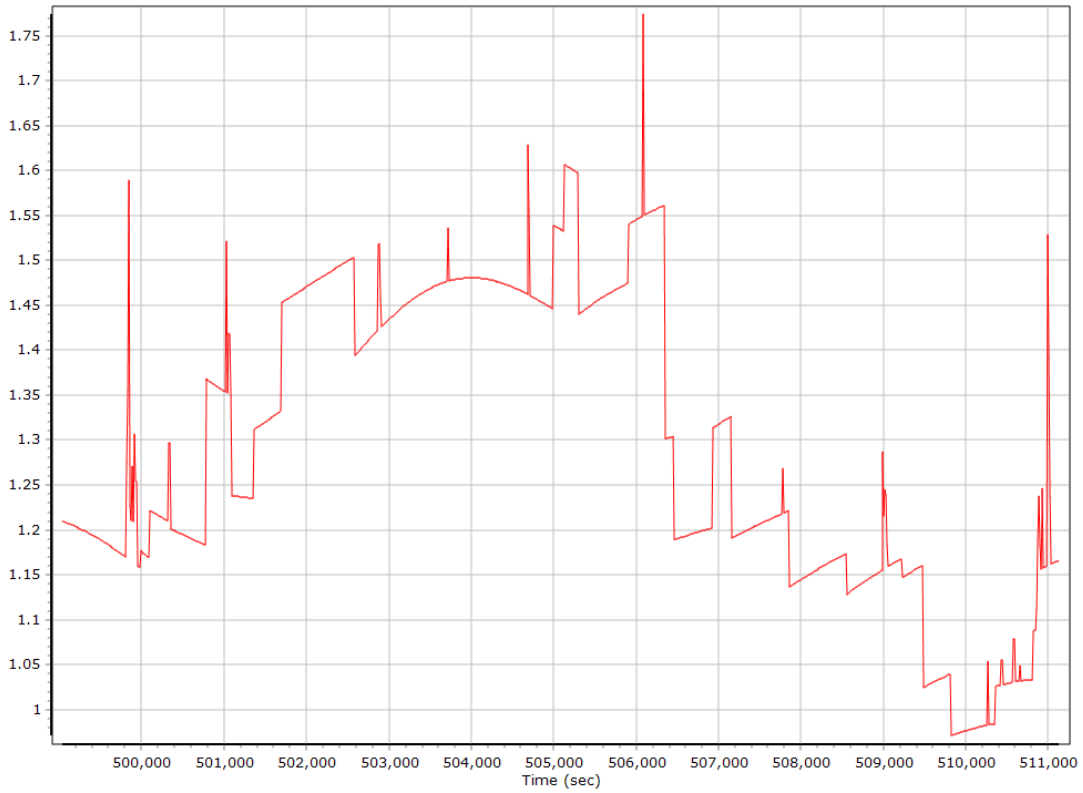
Num SVs in solution



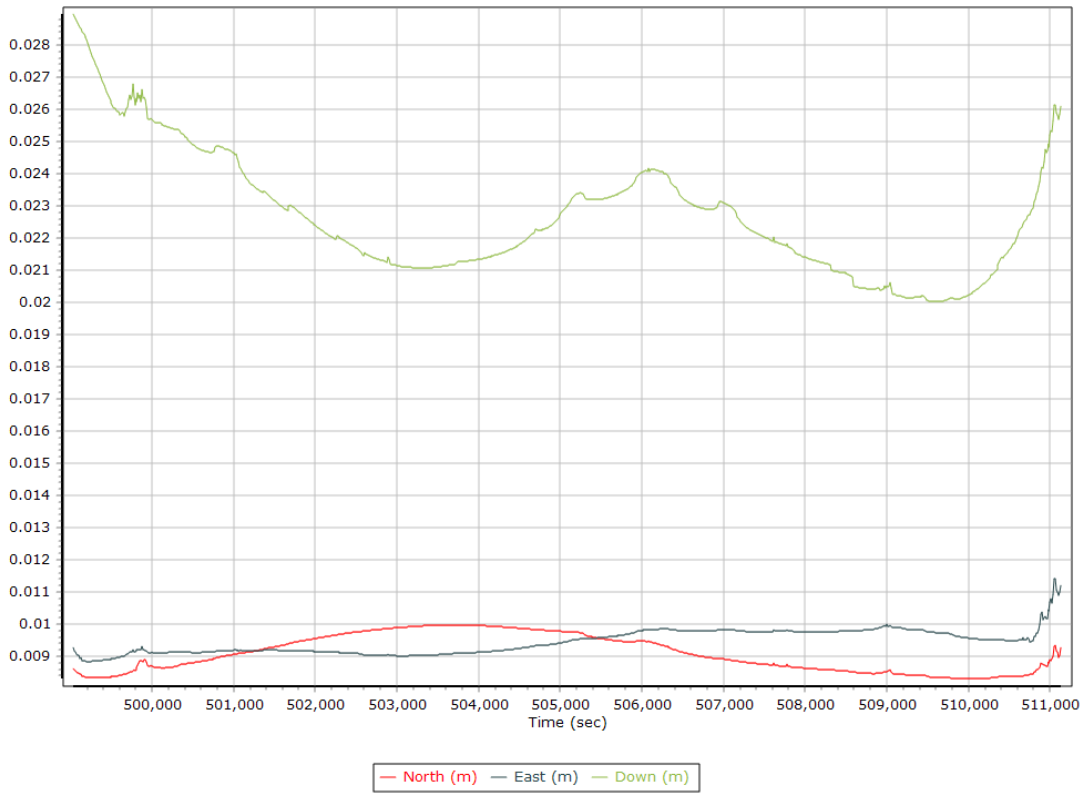
Forward/Reverse Separation



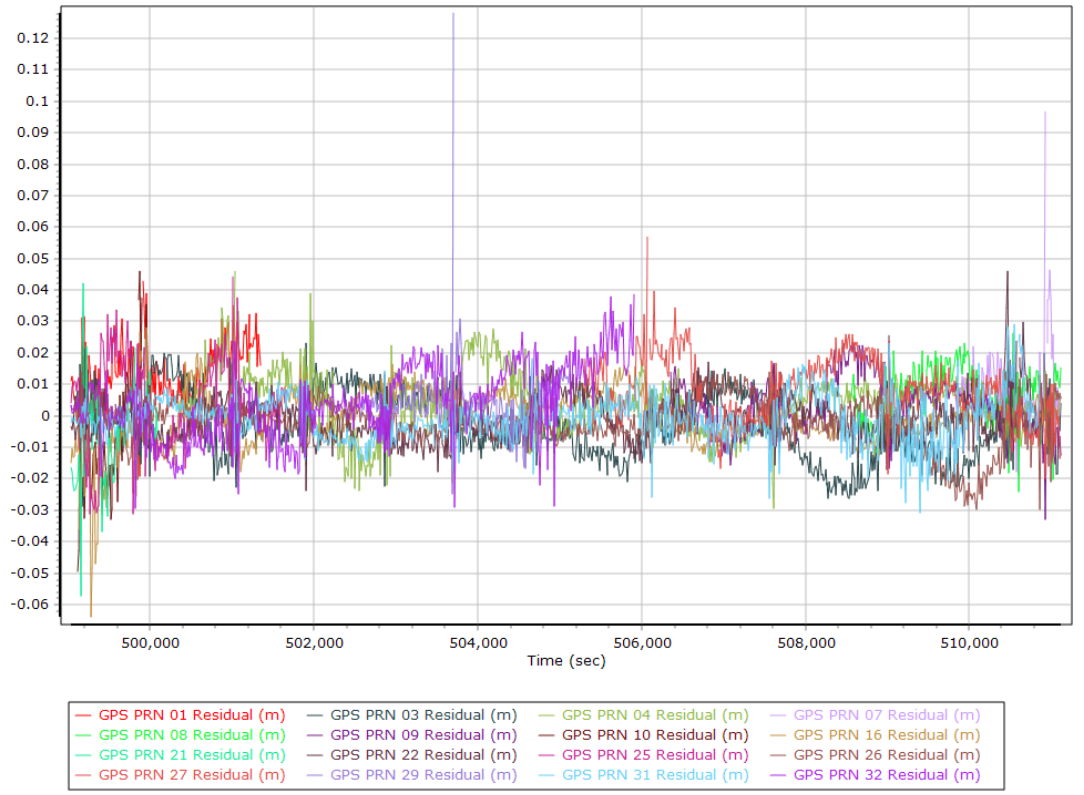
PDOP



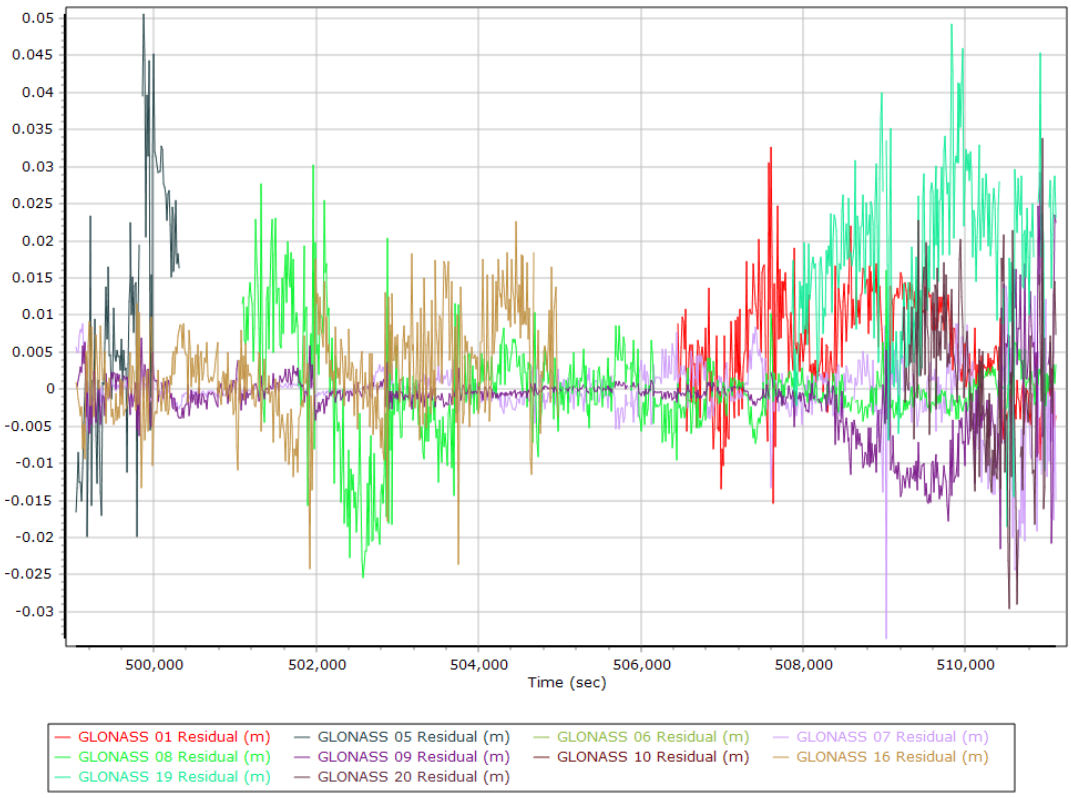
Estimated Position Accuracy



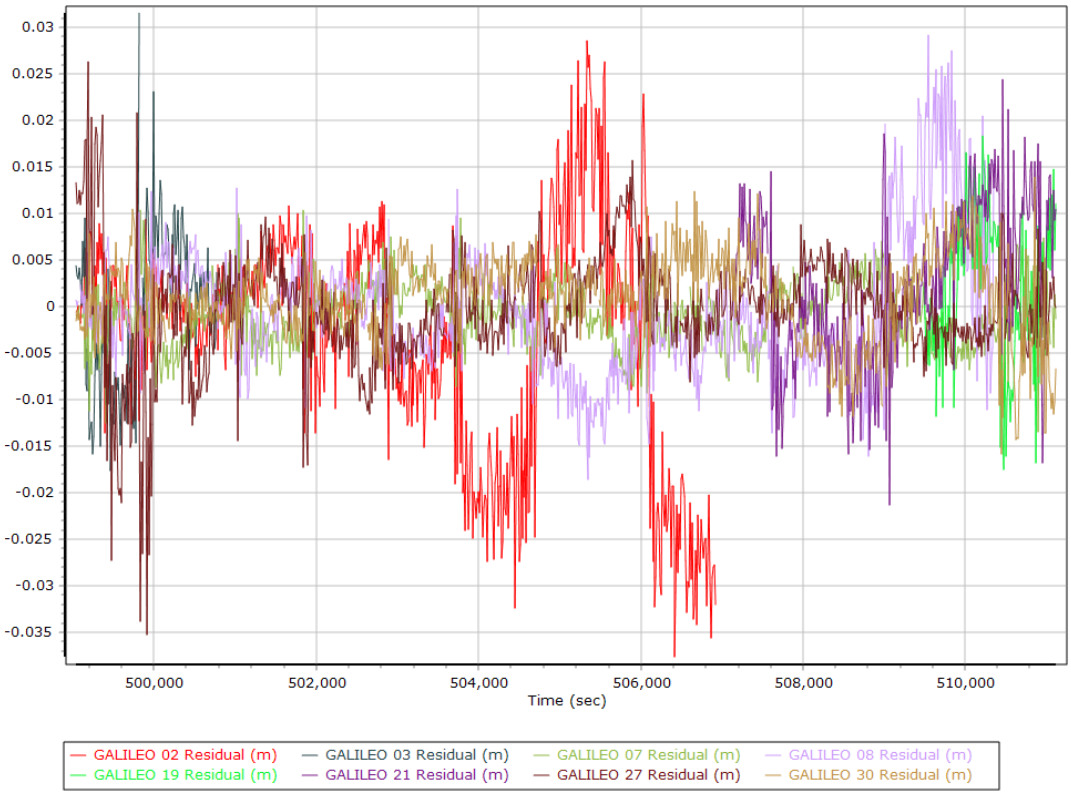
GPS Residuals



GLONASS Residuals



GALILEO Residuals



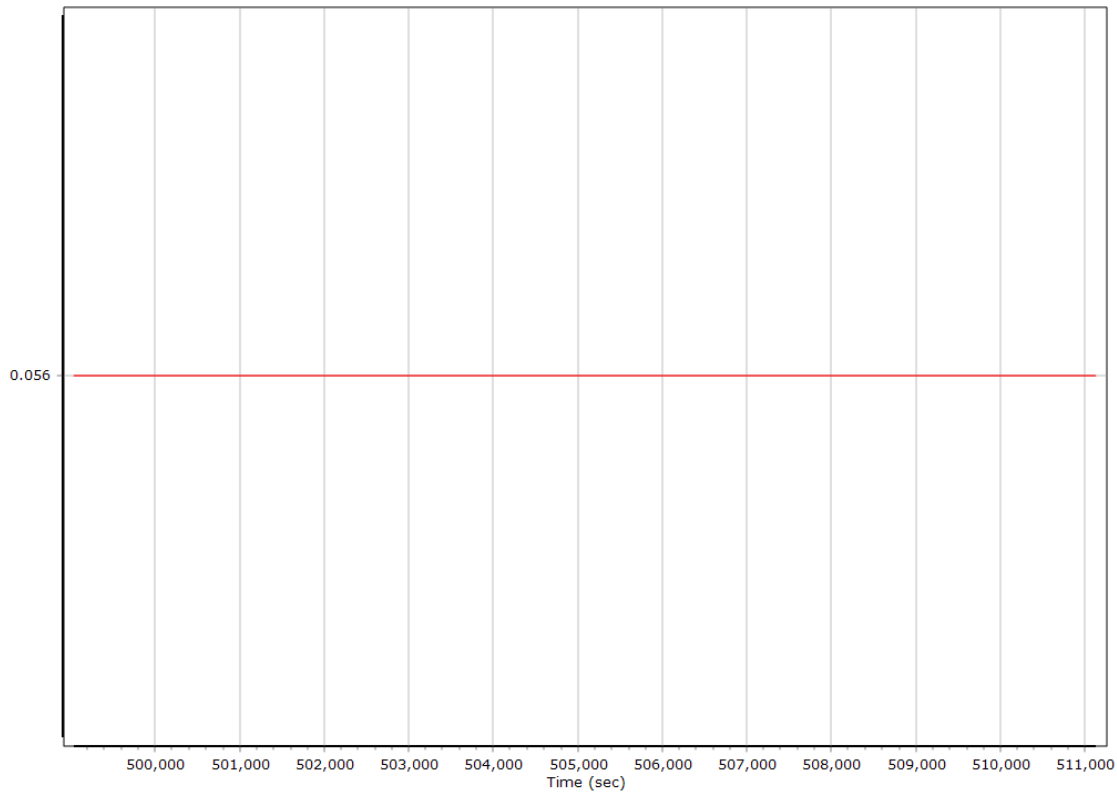
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	498816.000 (12/18/2020 6:33:36 PM)		
Processing end time	511131.000 (12/18/2020 9:58:51 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

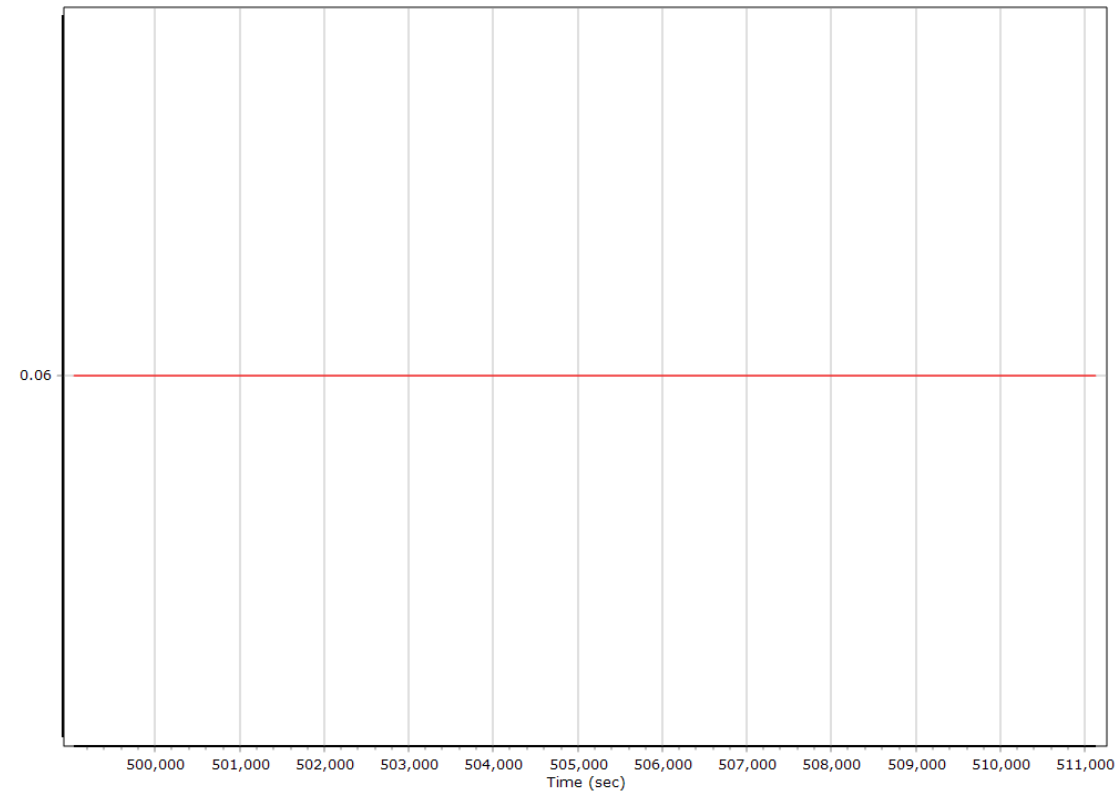
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

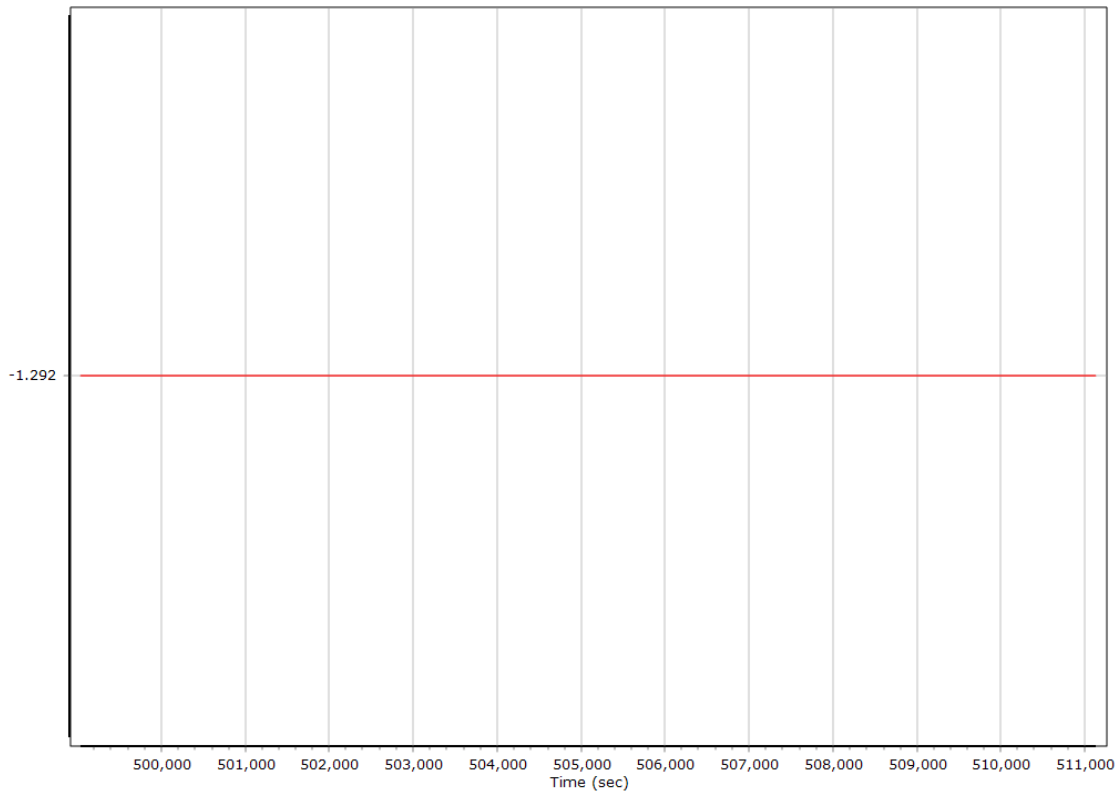
X Reference-Primary GNSS Lever Arm (m)



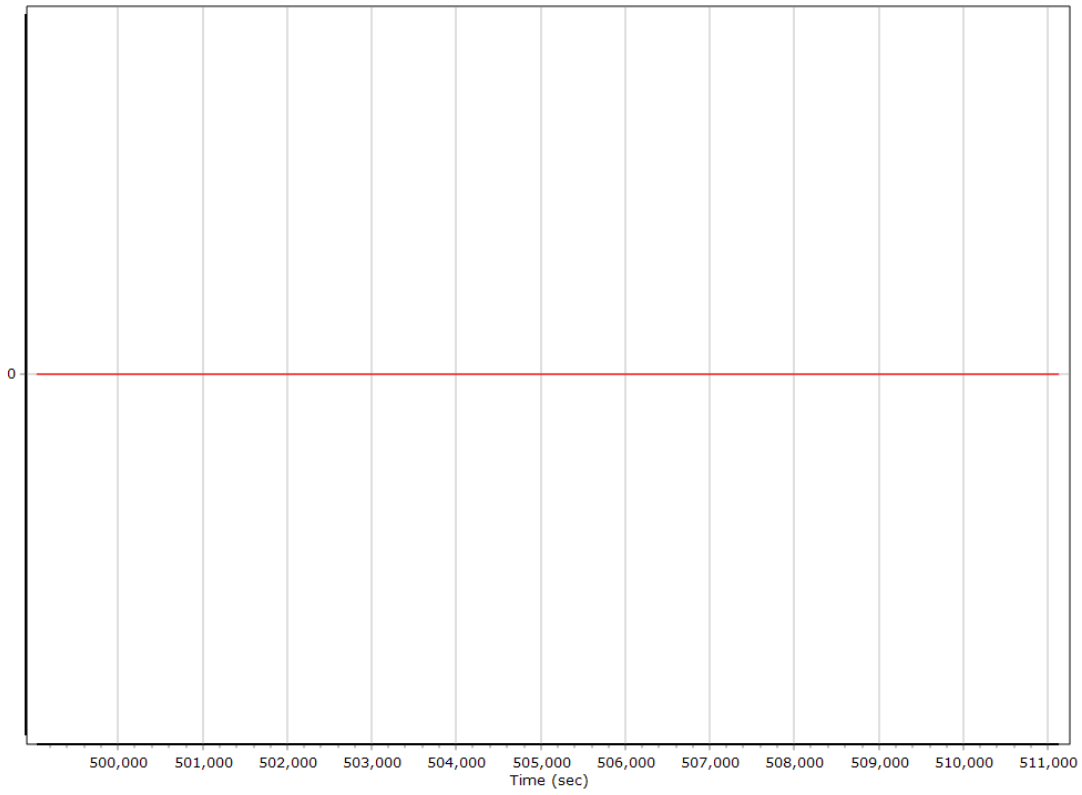
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



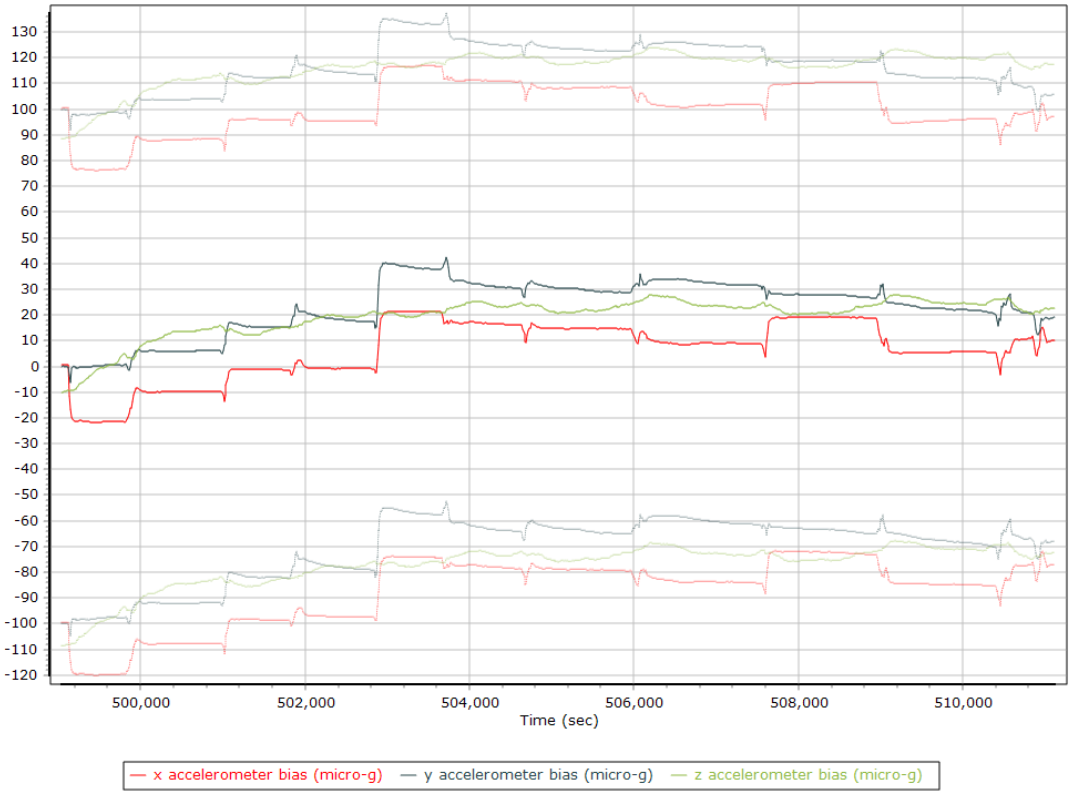
Reference-Primary GNSS Lever Arm Figure of Merit



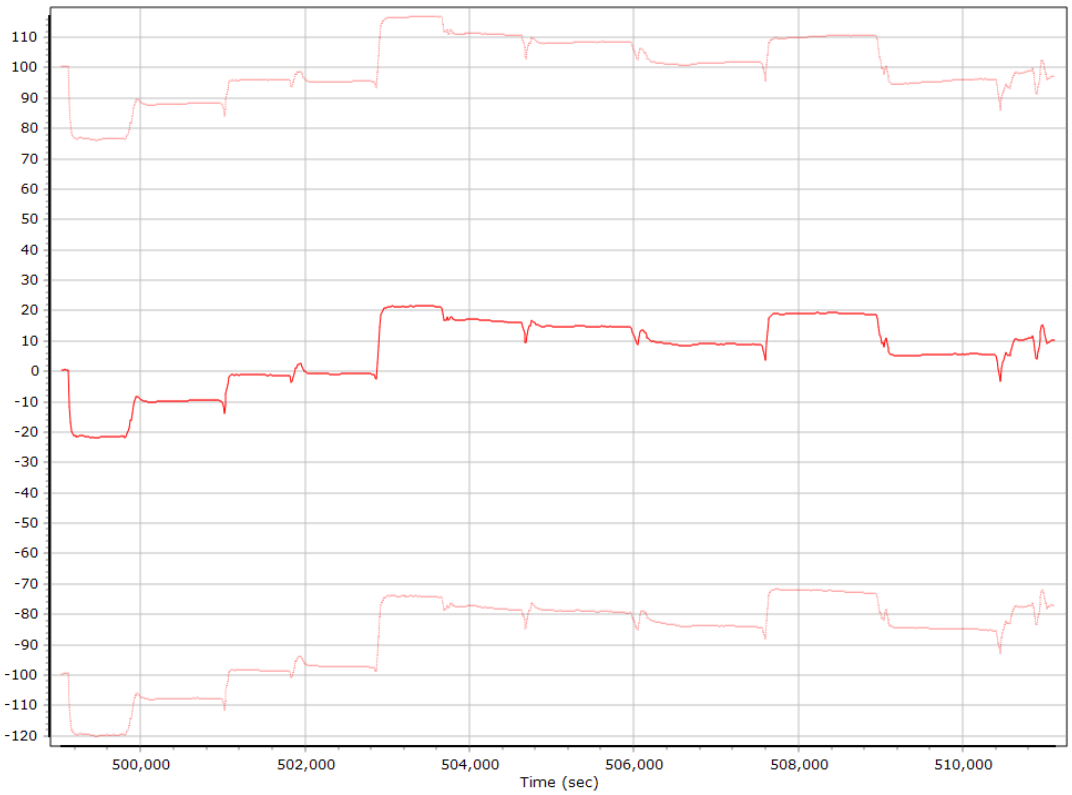
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

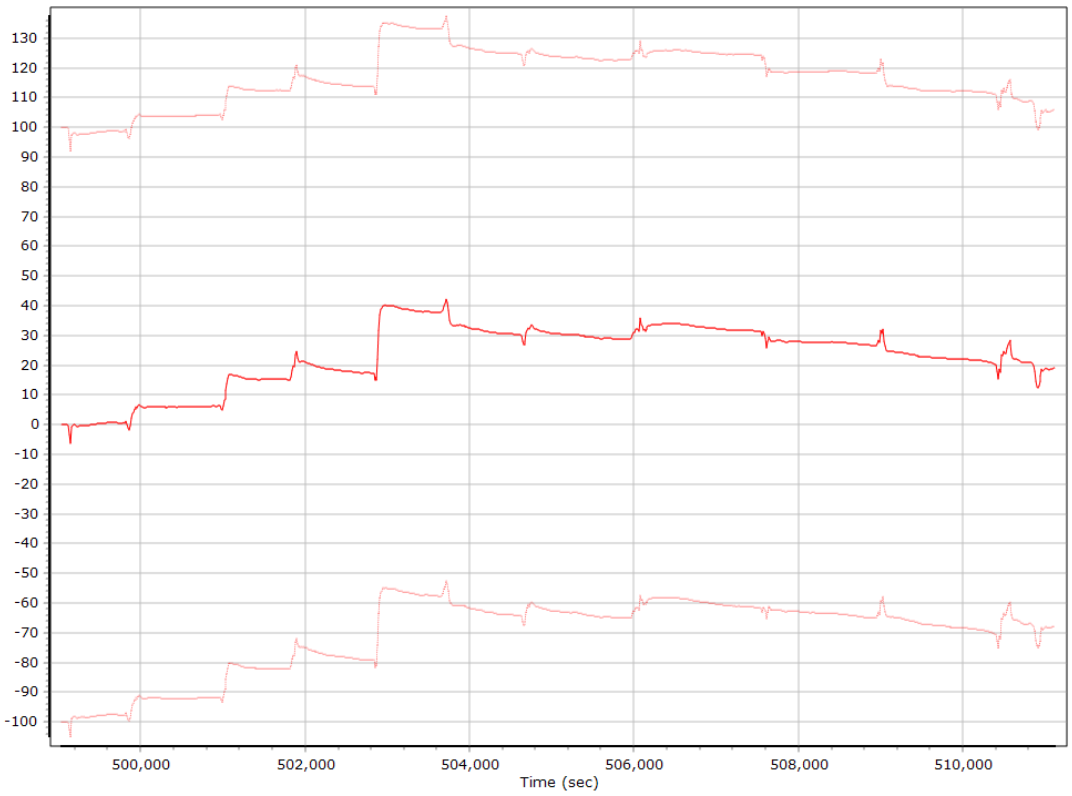
Accelerometer Bias (micro-g)



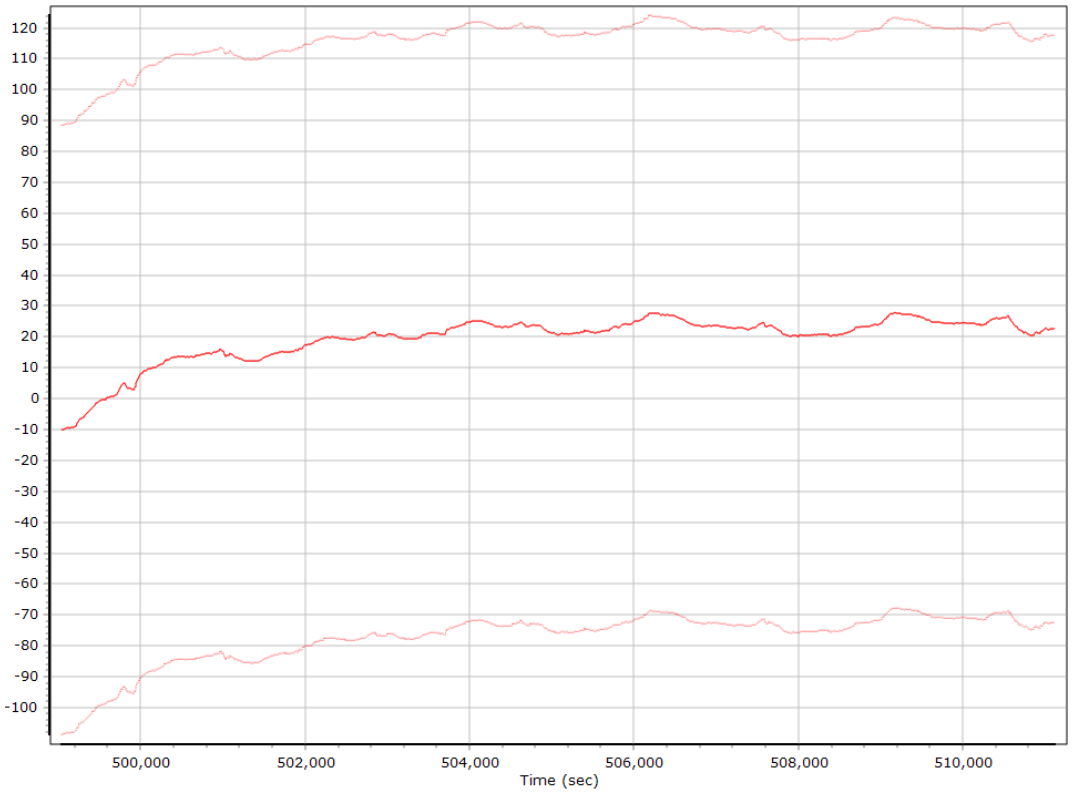
X Accelerometer Bias (micro-g)



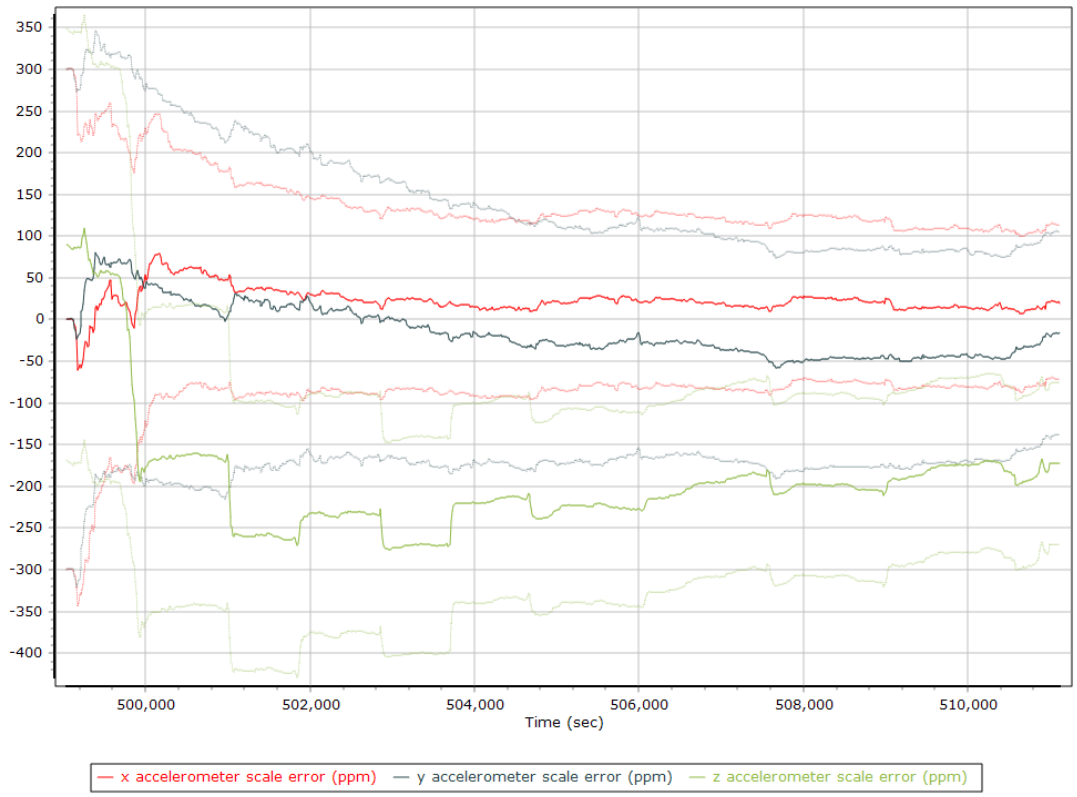
Y Accelerometer Bias (micro-g)



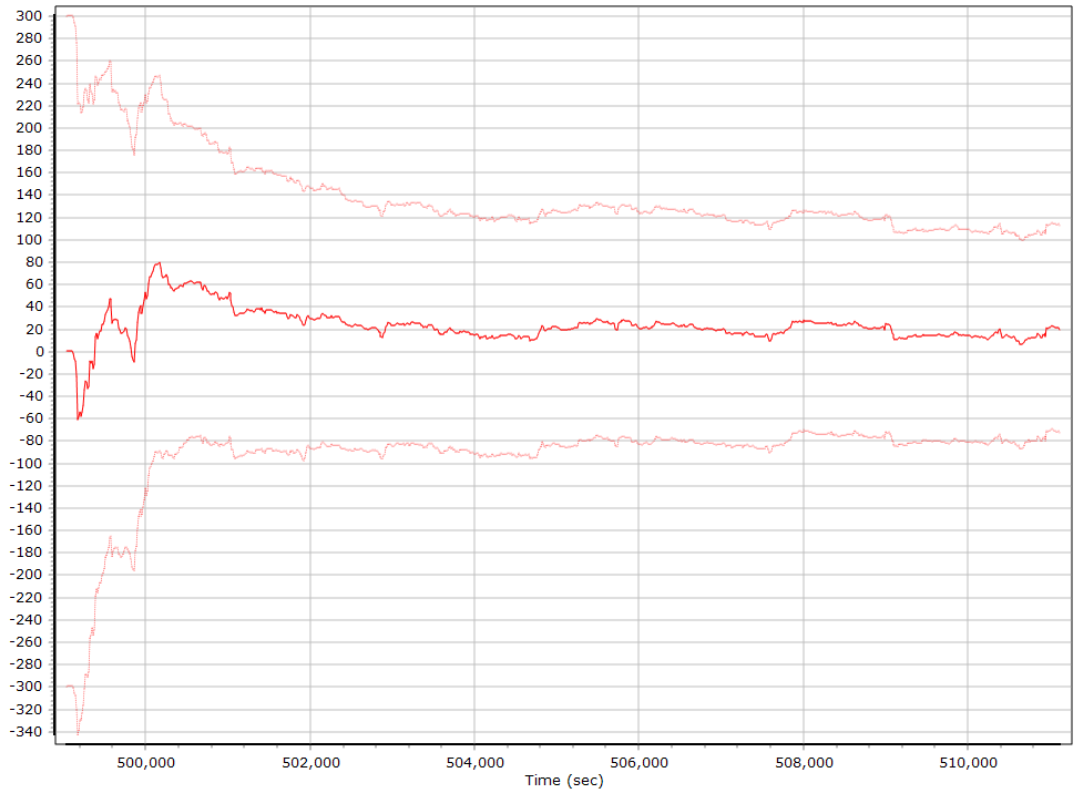
Z Accelerometer Bias (micro-g)



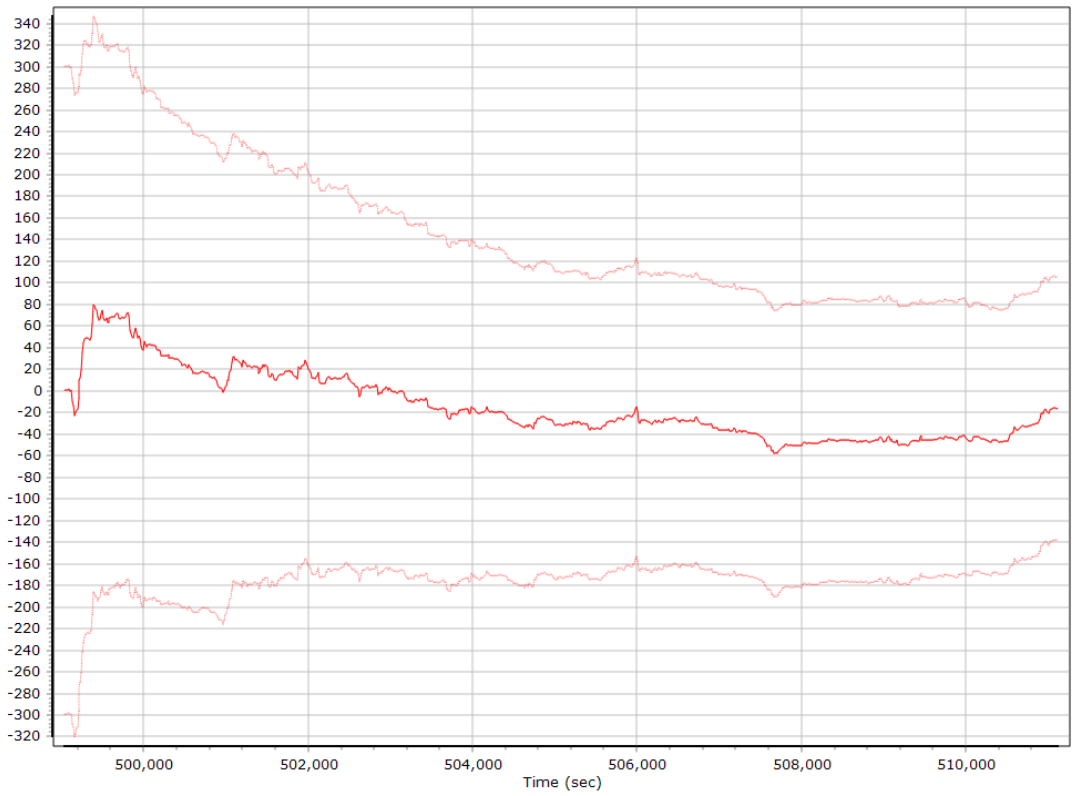
Accelerometer Scale Error (ppm)



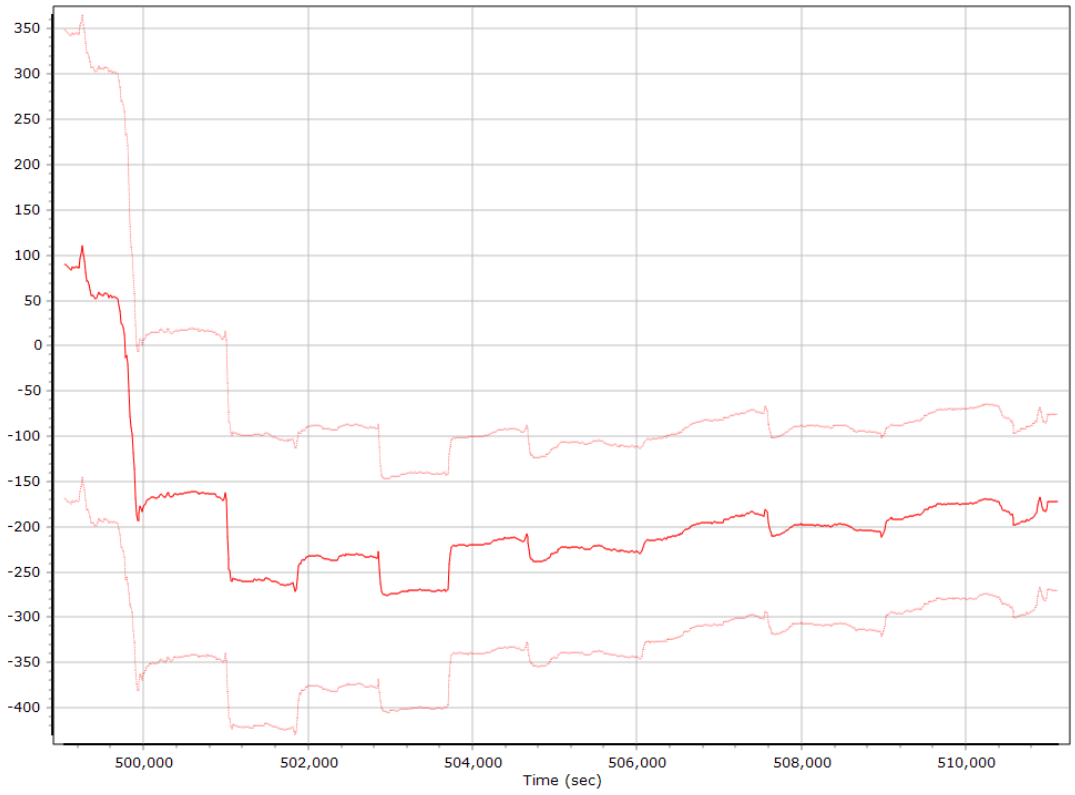
X Accelerometer Scale Error (ppm)



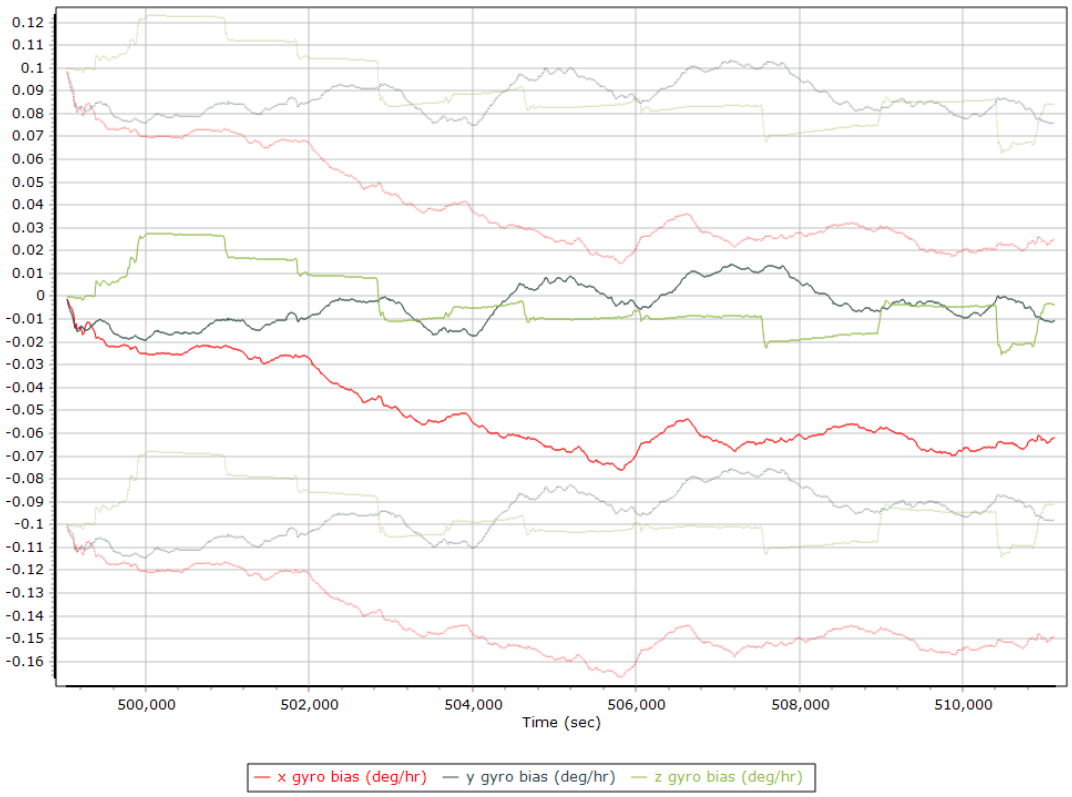
Y Accelerometer Scale Error (ppm)



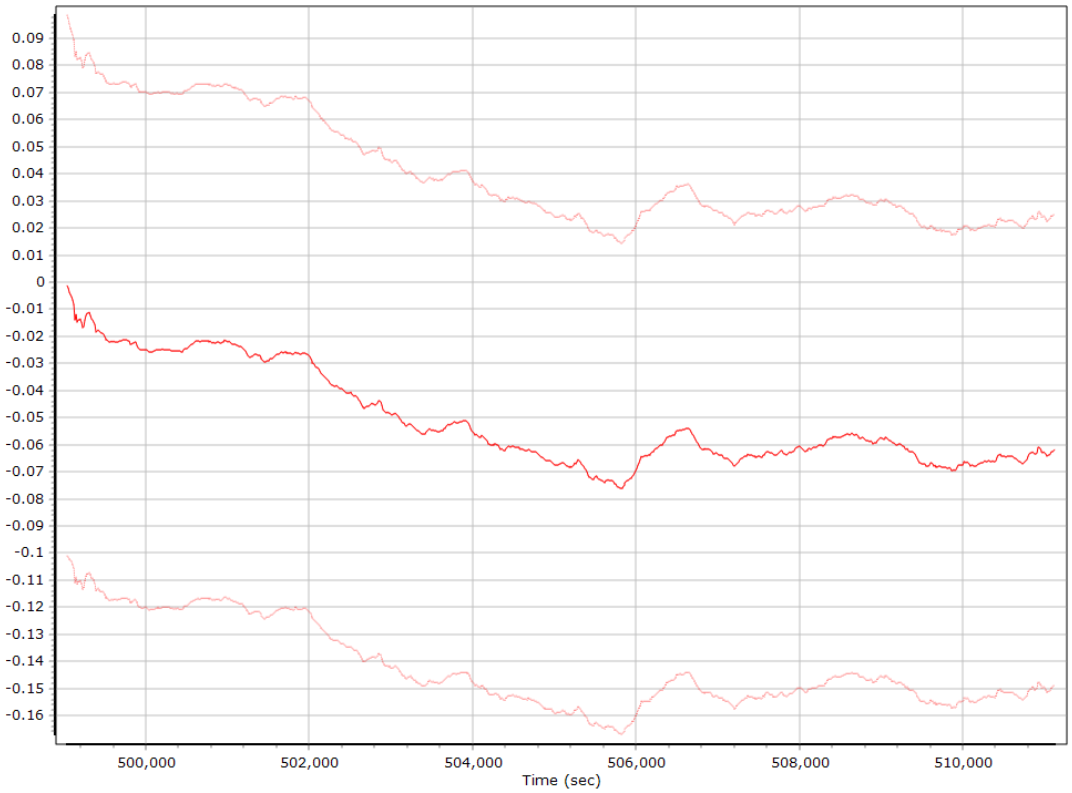
Z Accelerometer Scale Error (ppm)



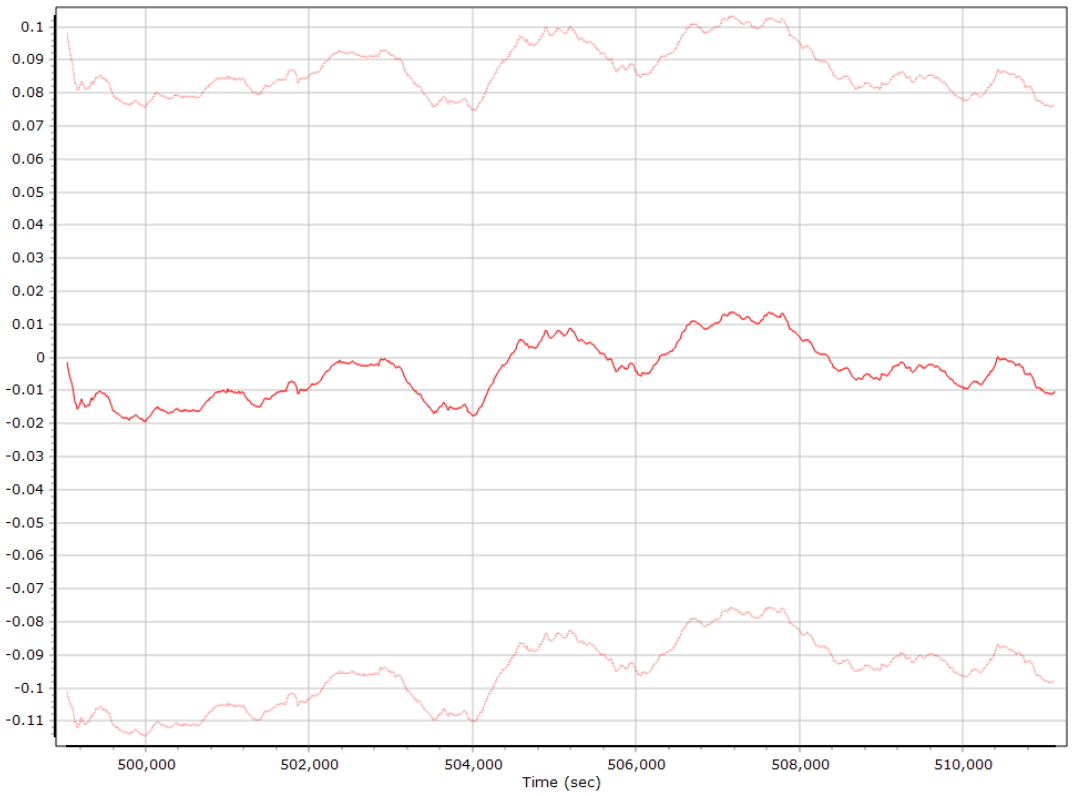
Gyro Bias (deg/h)



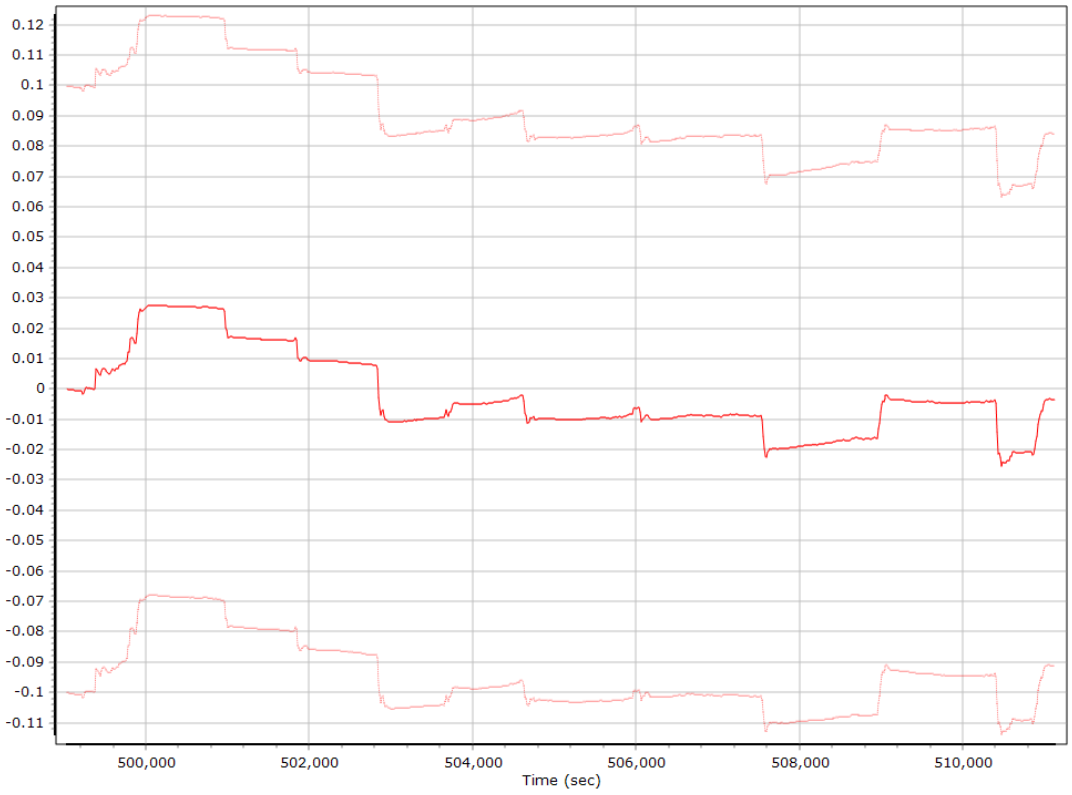
X Gyro Bias (deg/h)



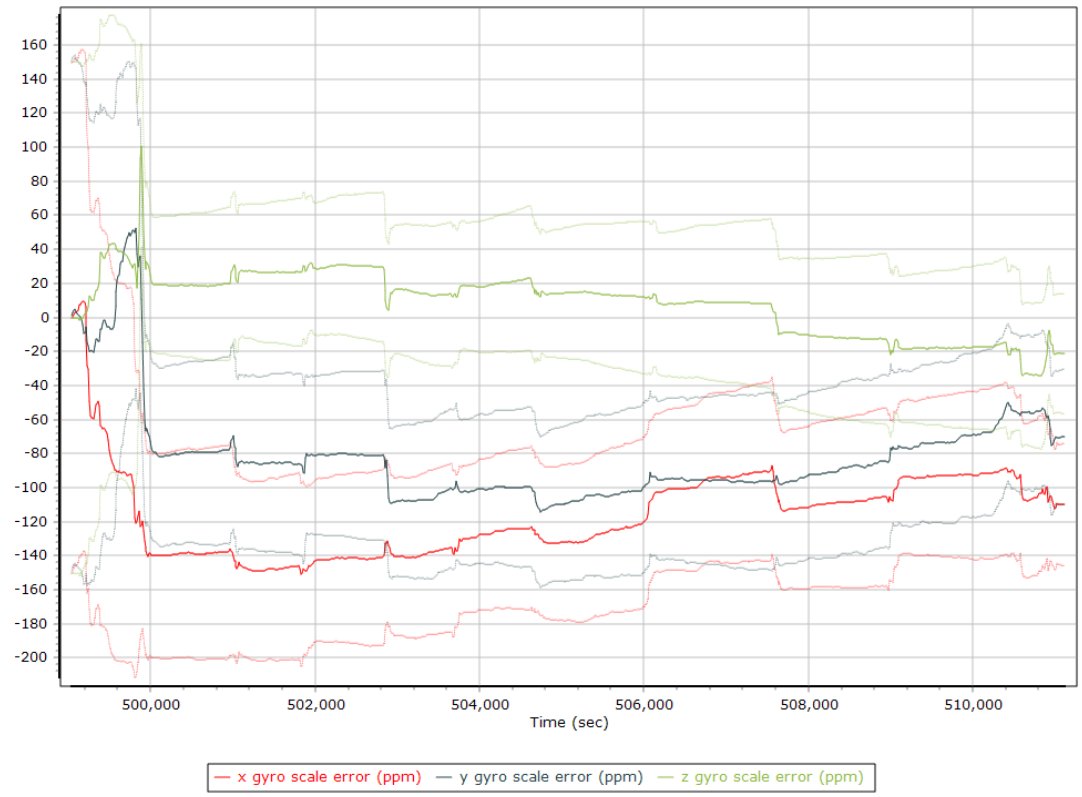
Y Gyro Bias (deg/h)



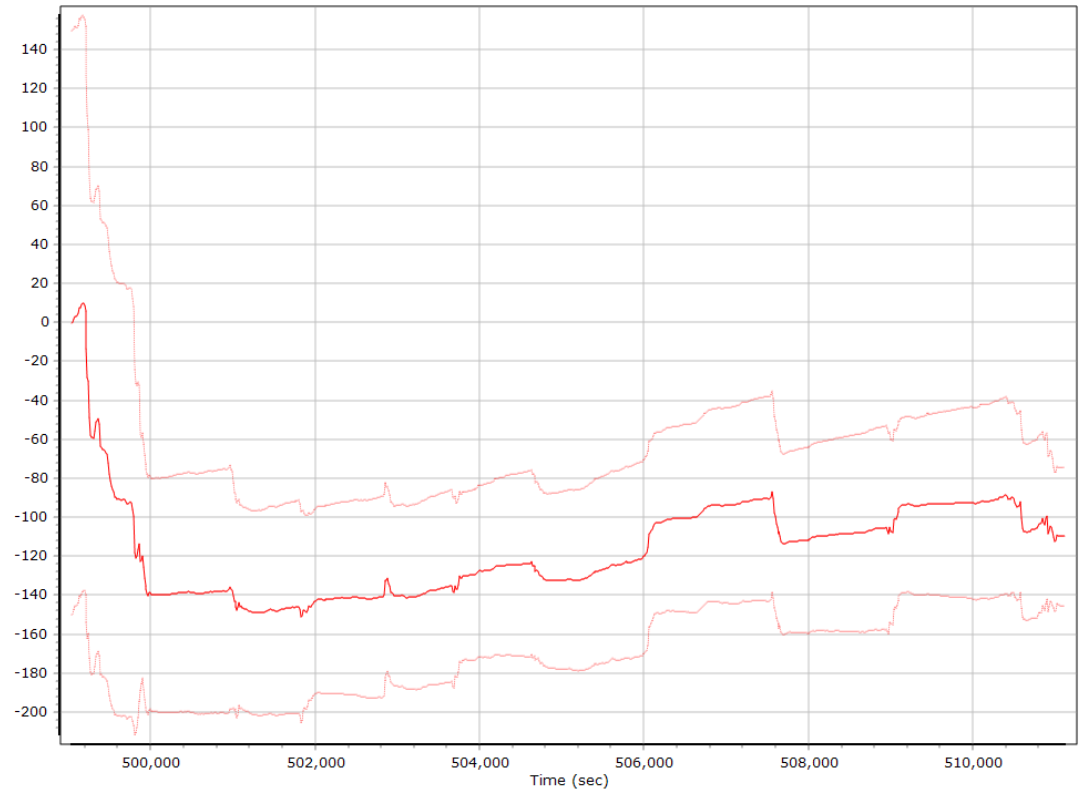
Z Gyro Bias (deg/h)



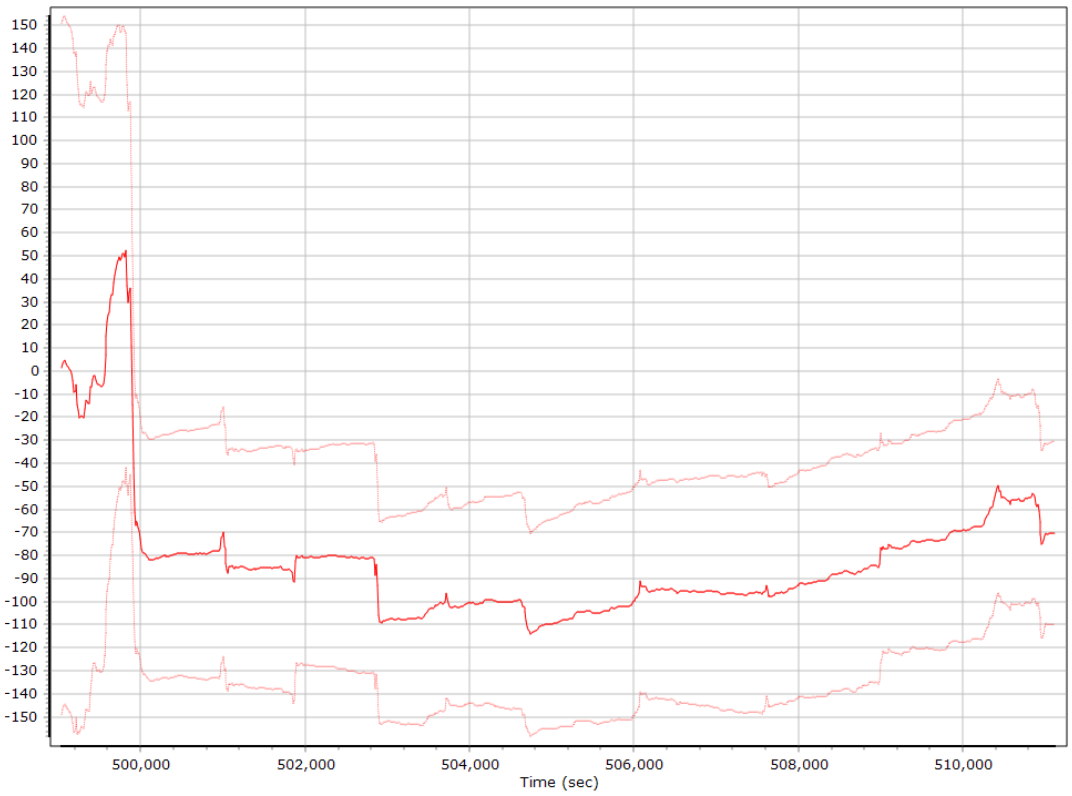
Gyro Scale Error (ppm)



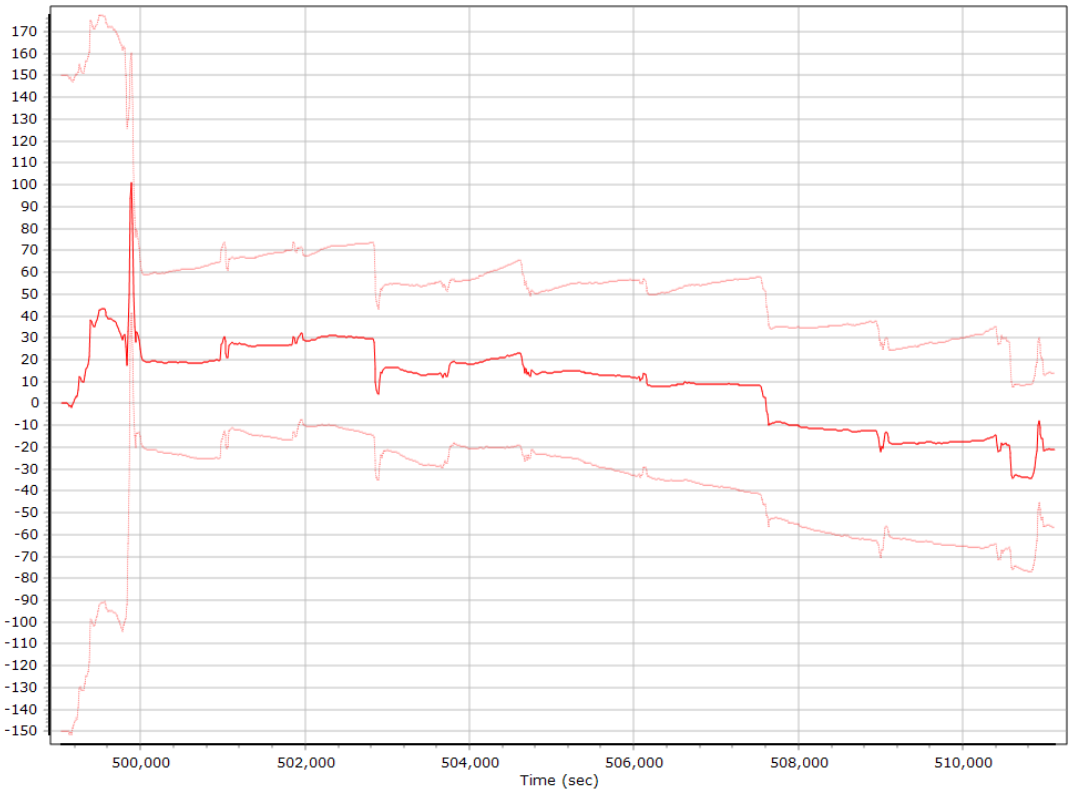
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

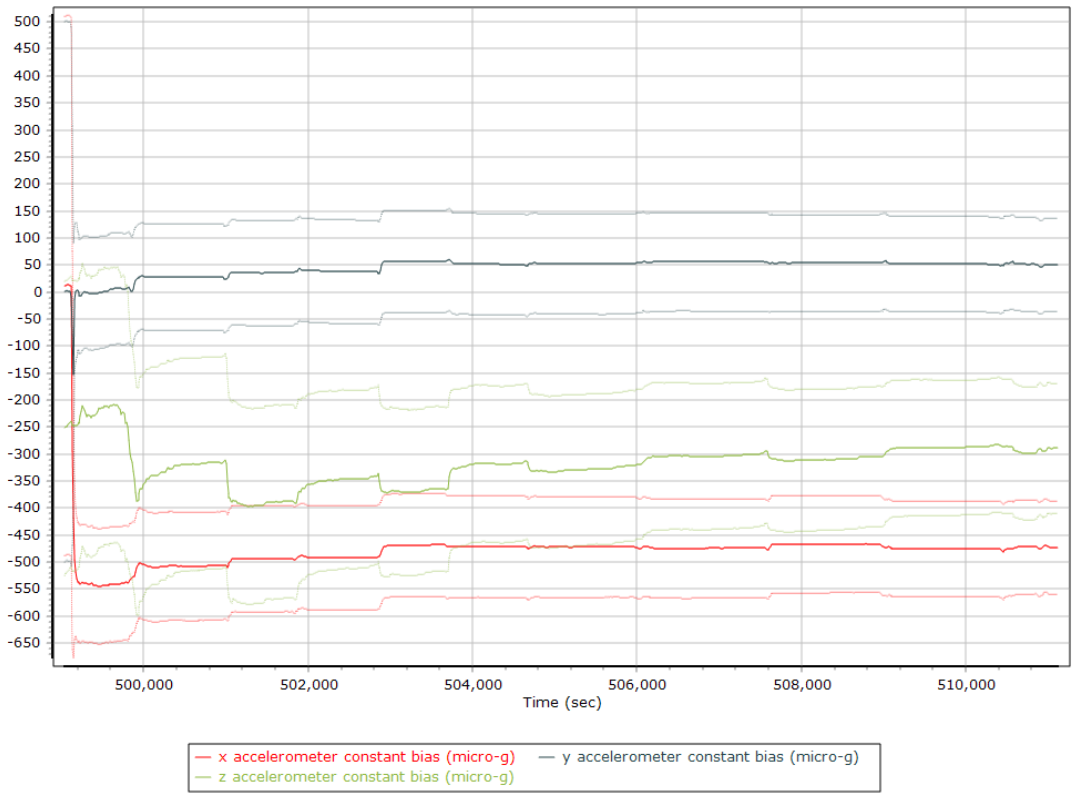


Z Gyro Scale Error (ppm)

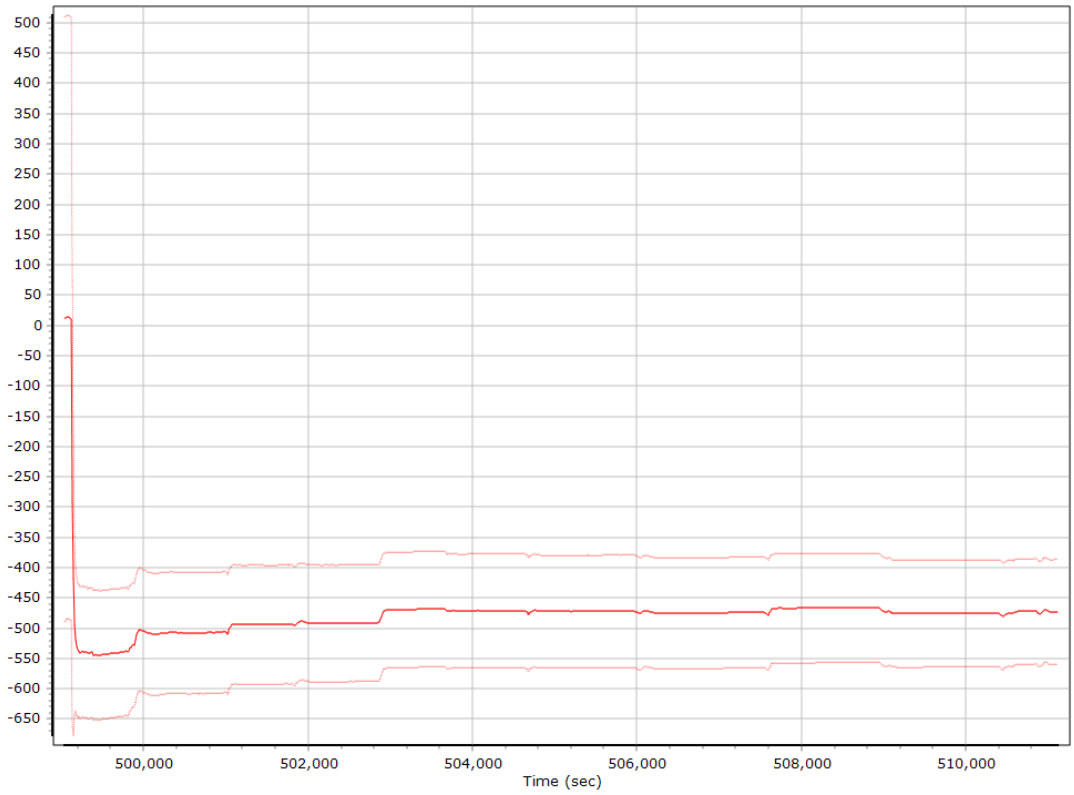


Forward Processed Estimated Constant Errors, Reference Frame

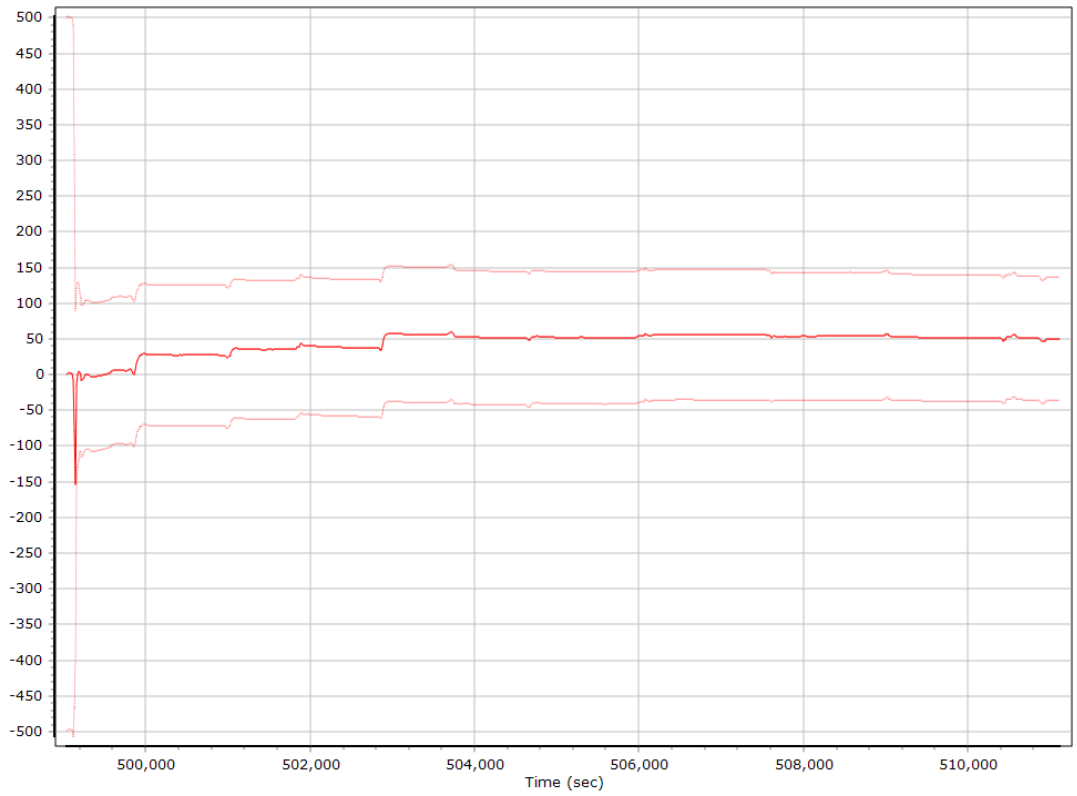
Accelerometer Bias (micro-g)



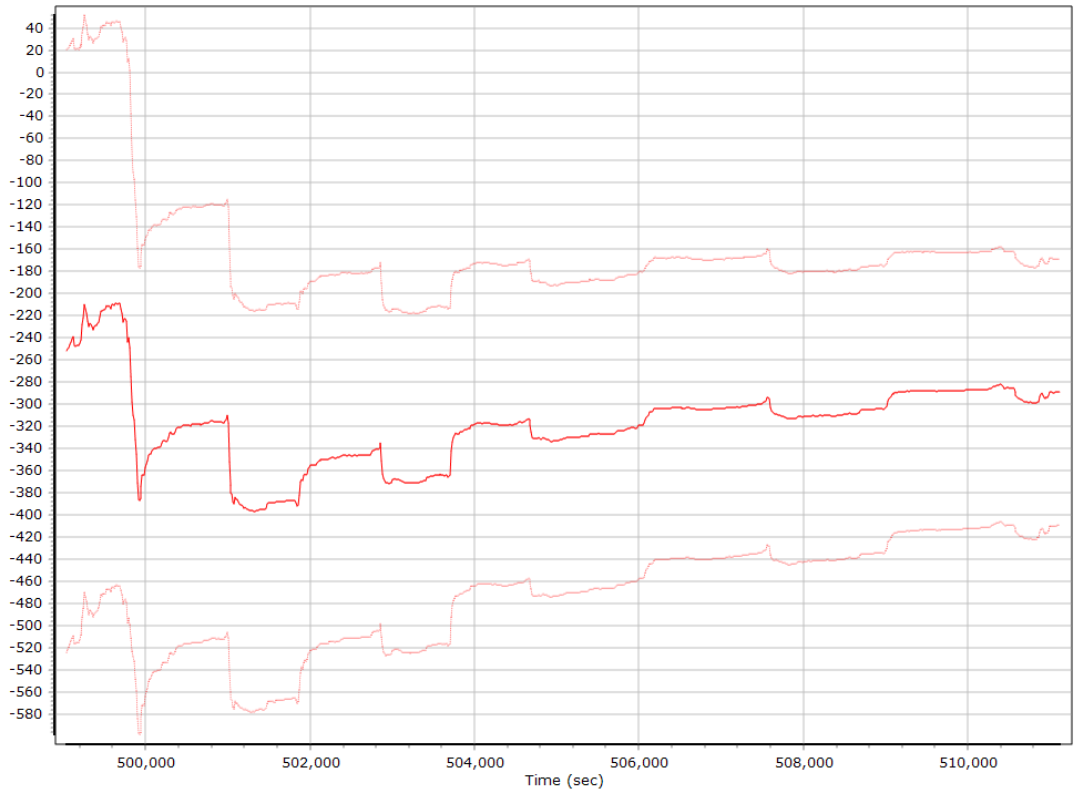
X Accelerometer Bias (micro-g)



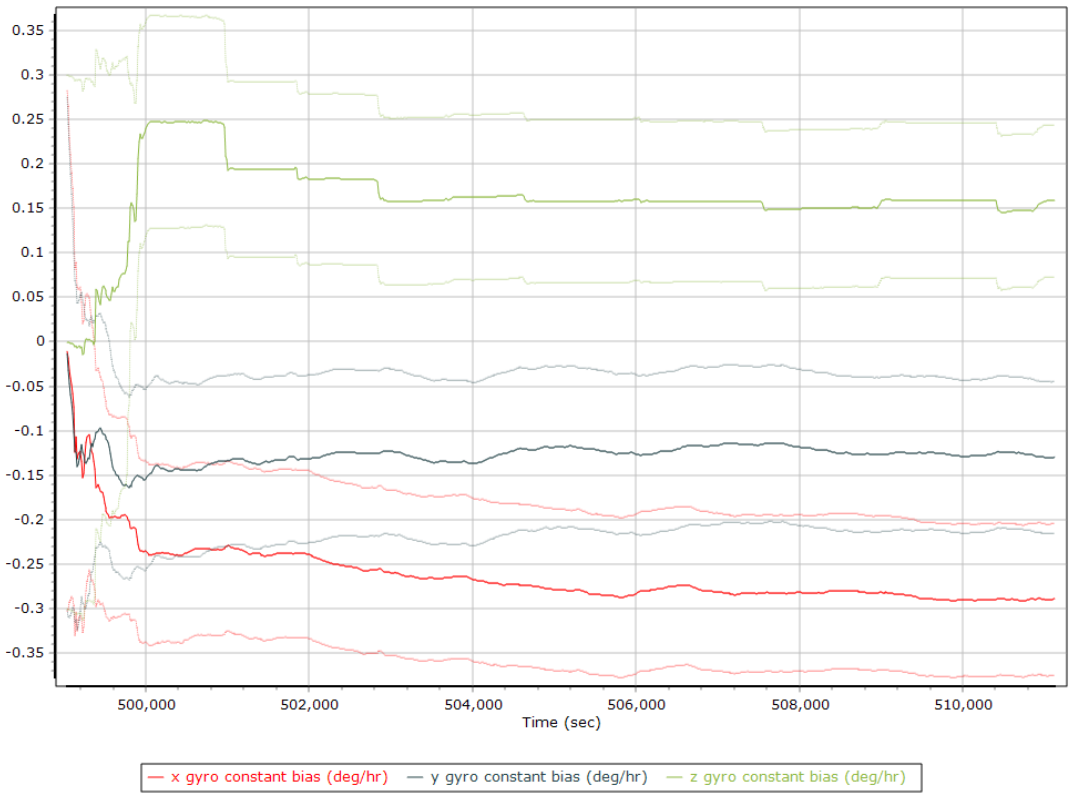
Y Accelerometer Bias (micro-g)



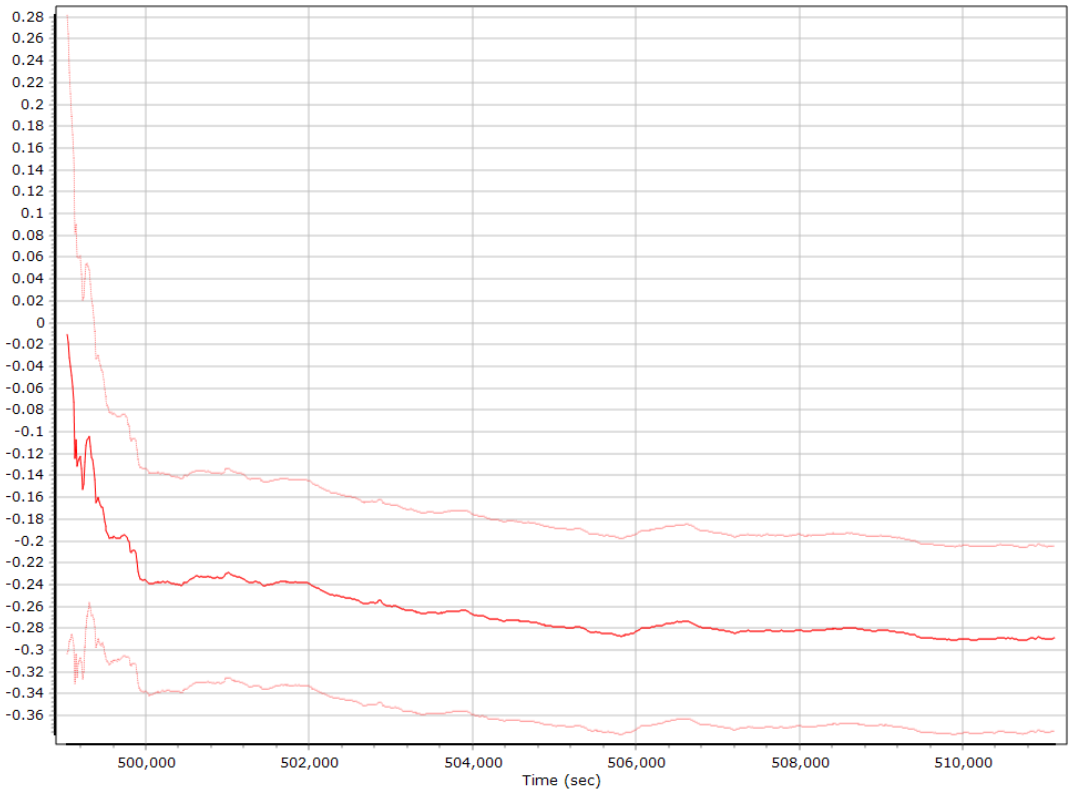
Z Accelerometer Bias (micro-g)



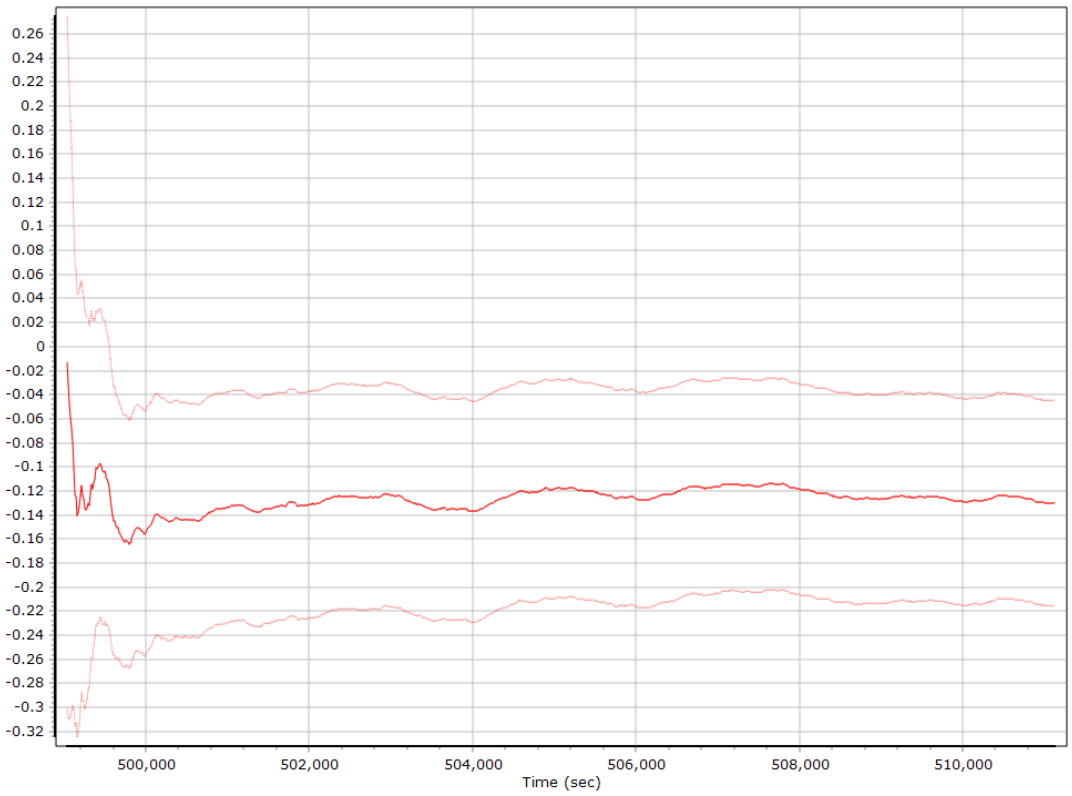
Gyro Bias (deg/h)



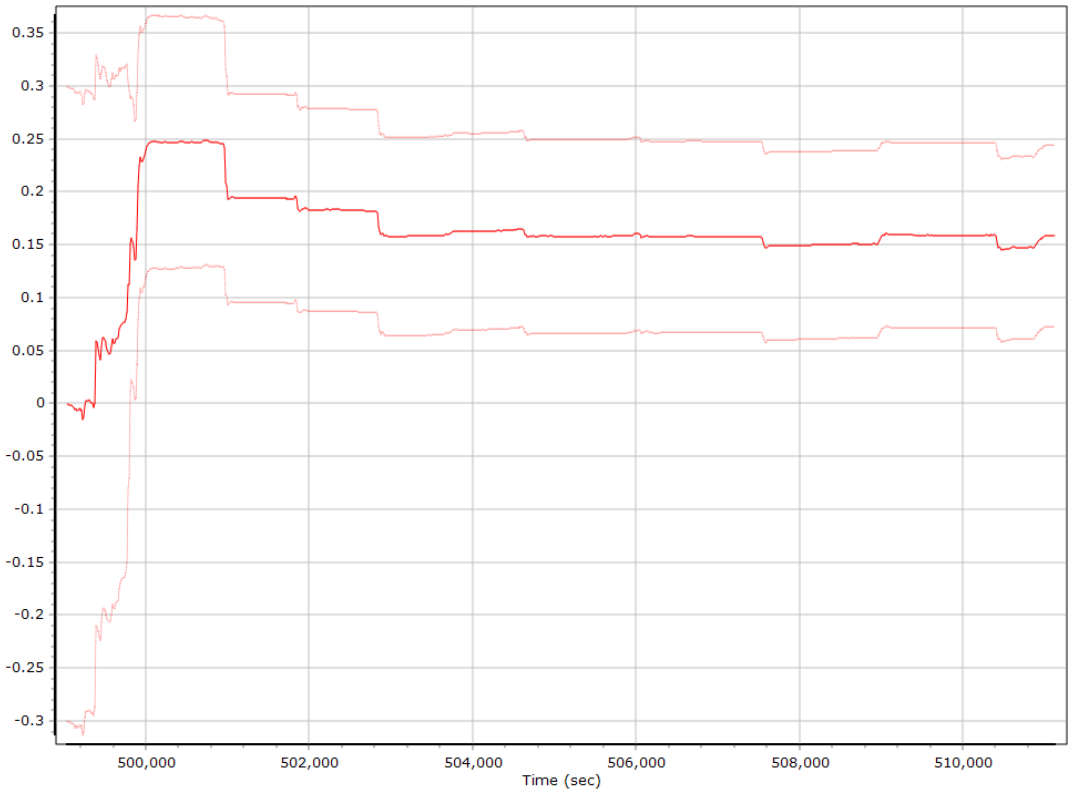
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

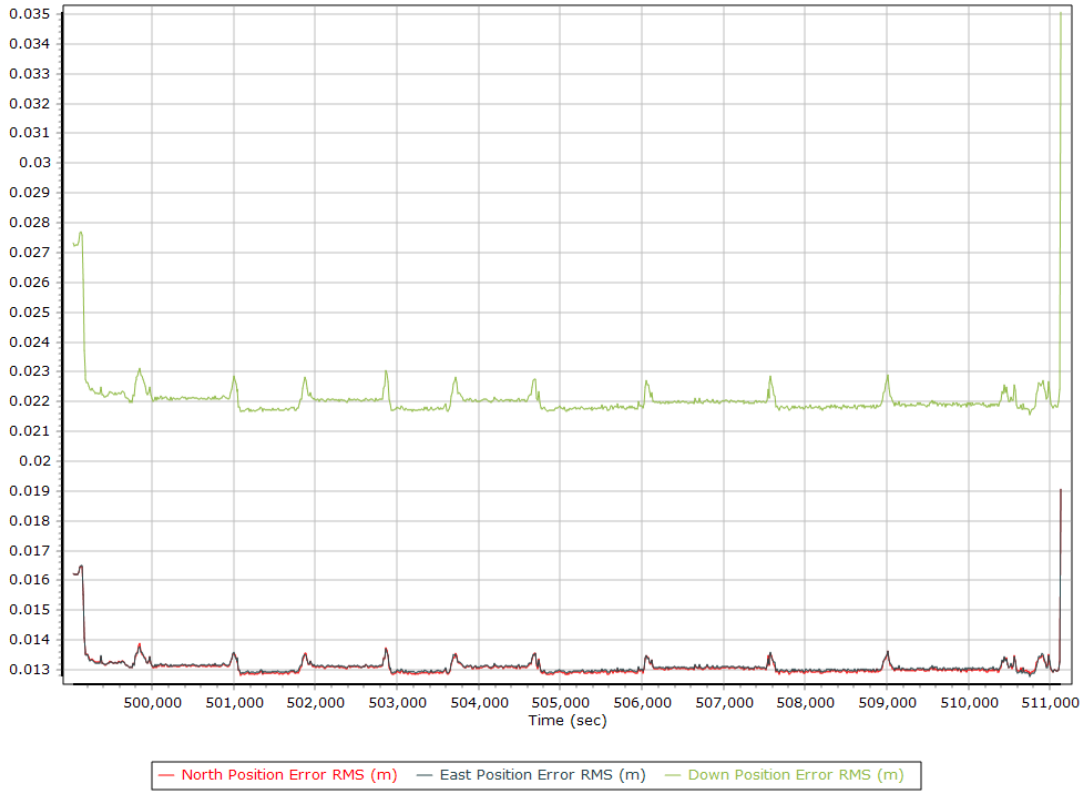


Z Gyro Bias (deg/h)

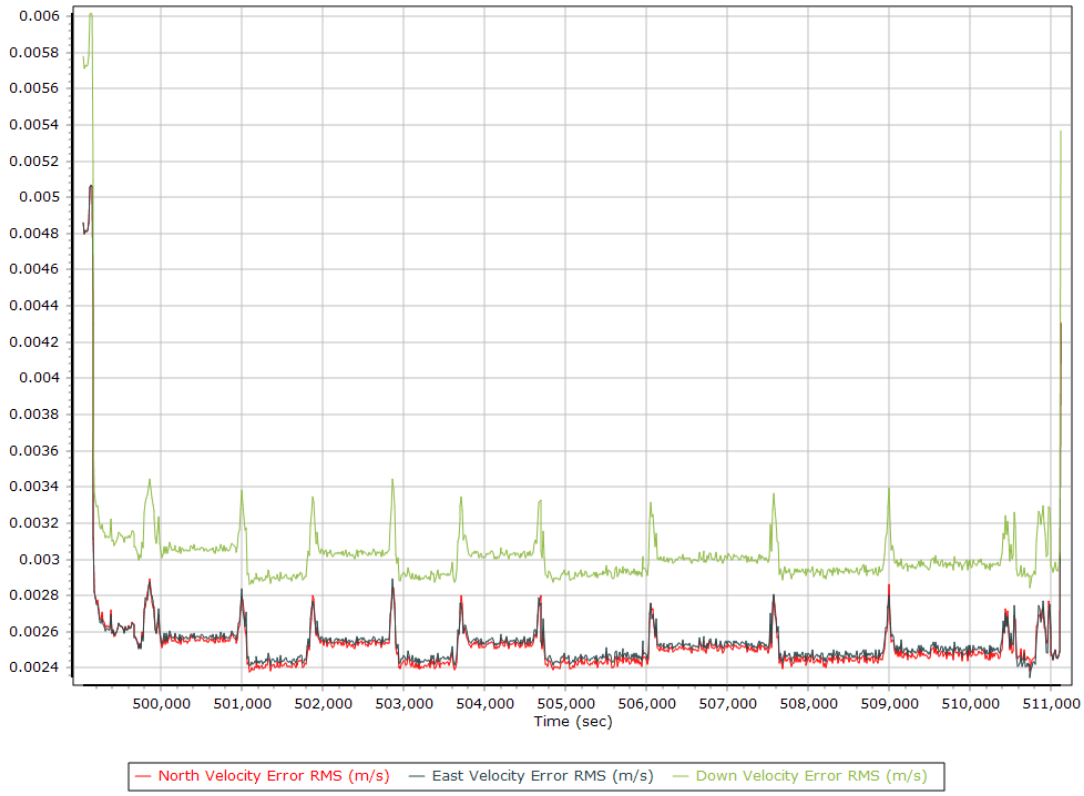


Smoothed Performance Metrics

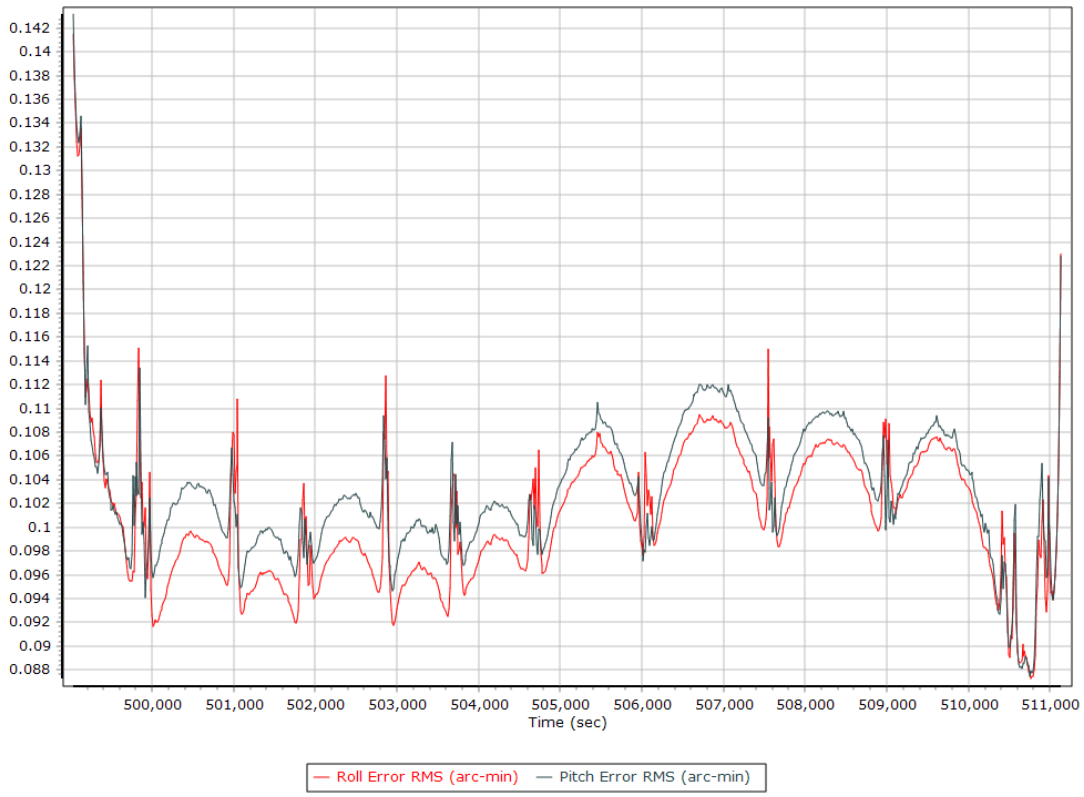
Position Error RMS (m)



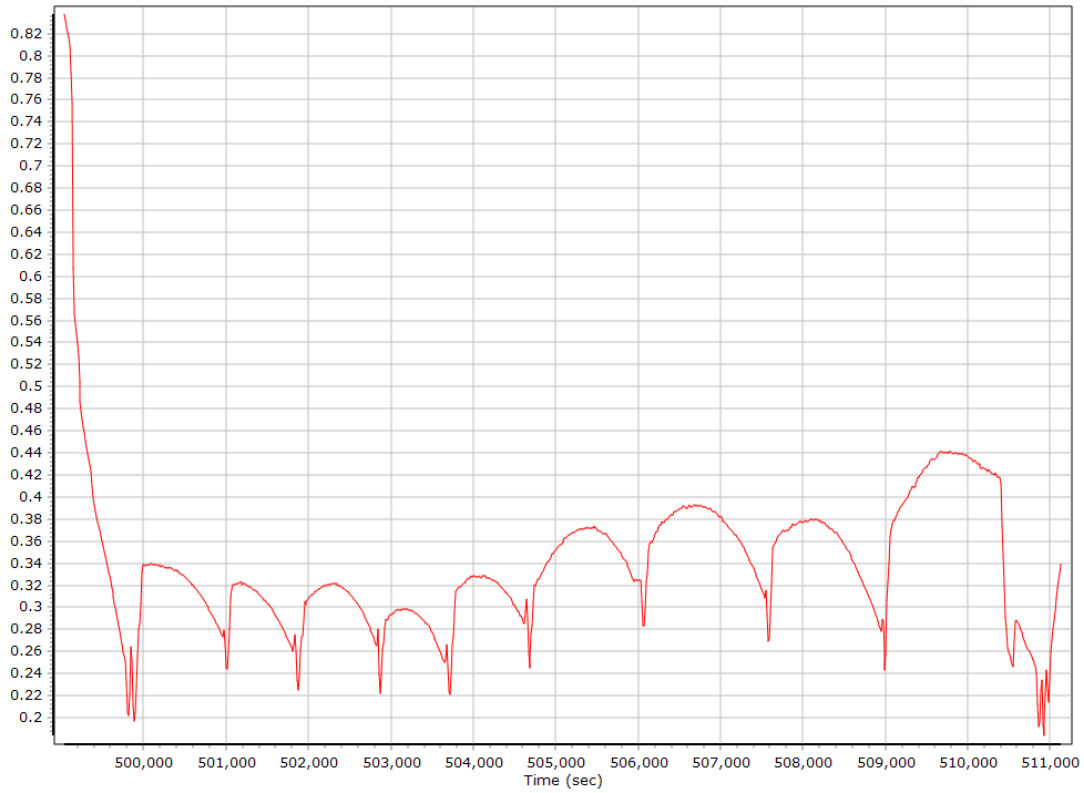
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

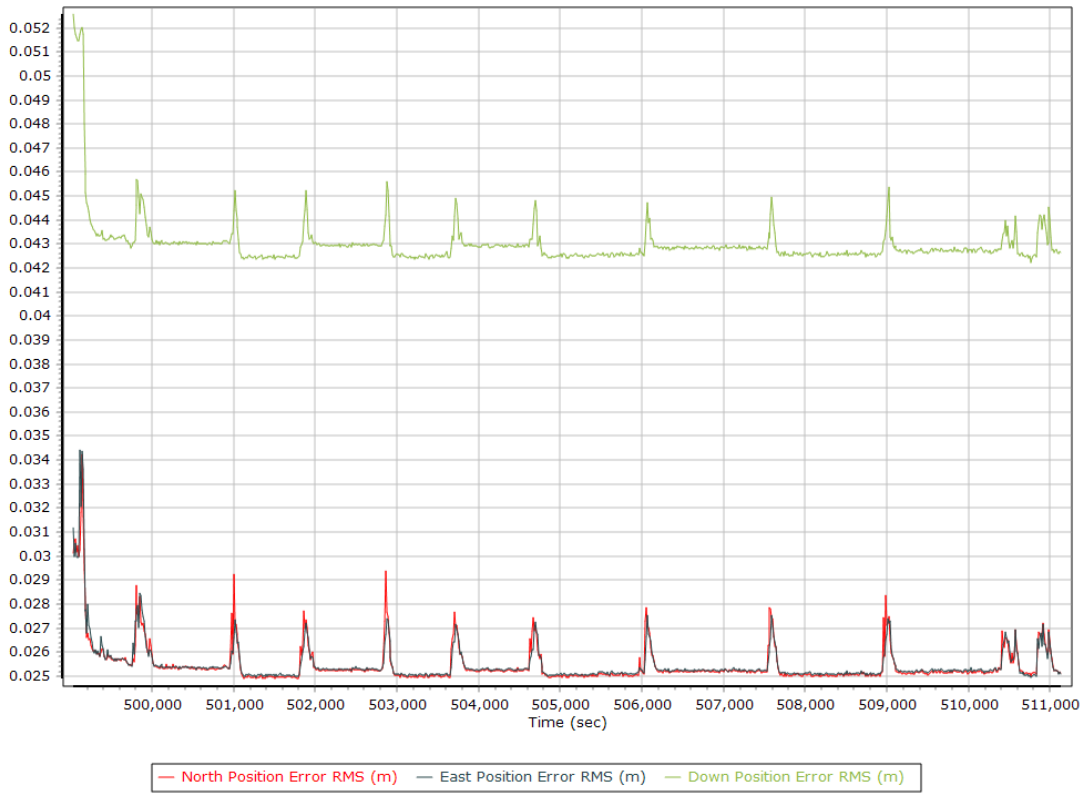


Heading Error RMS (arc-min)

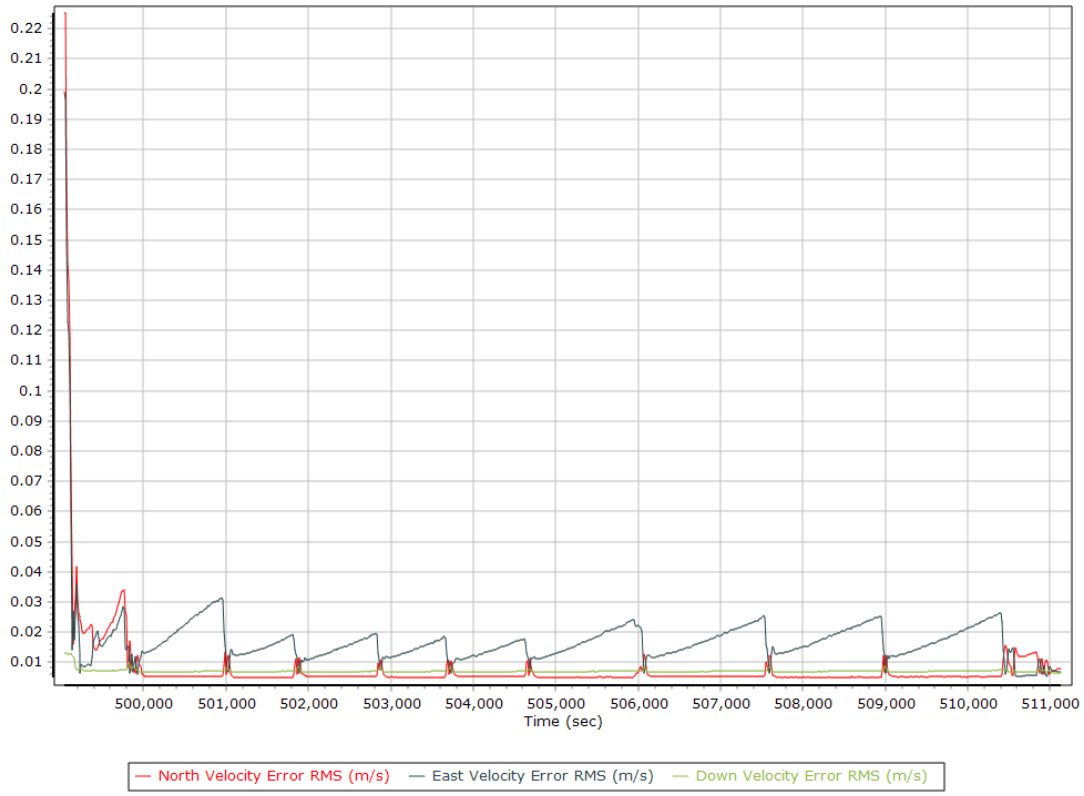


Forward Processed Performance Metrics

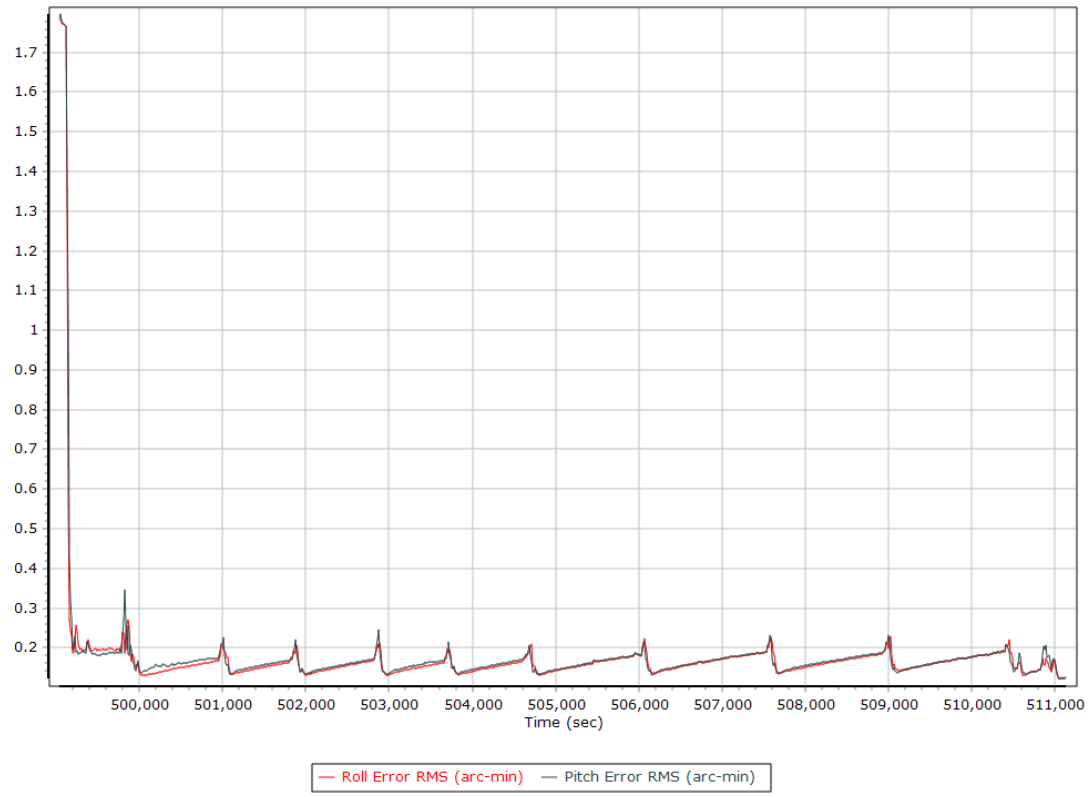
Position Error RMS (m)



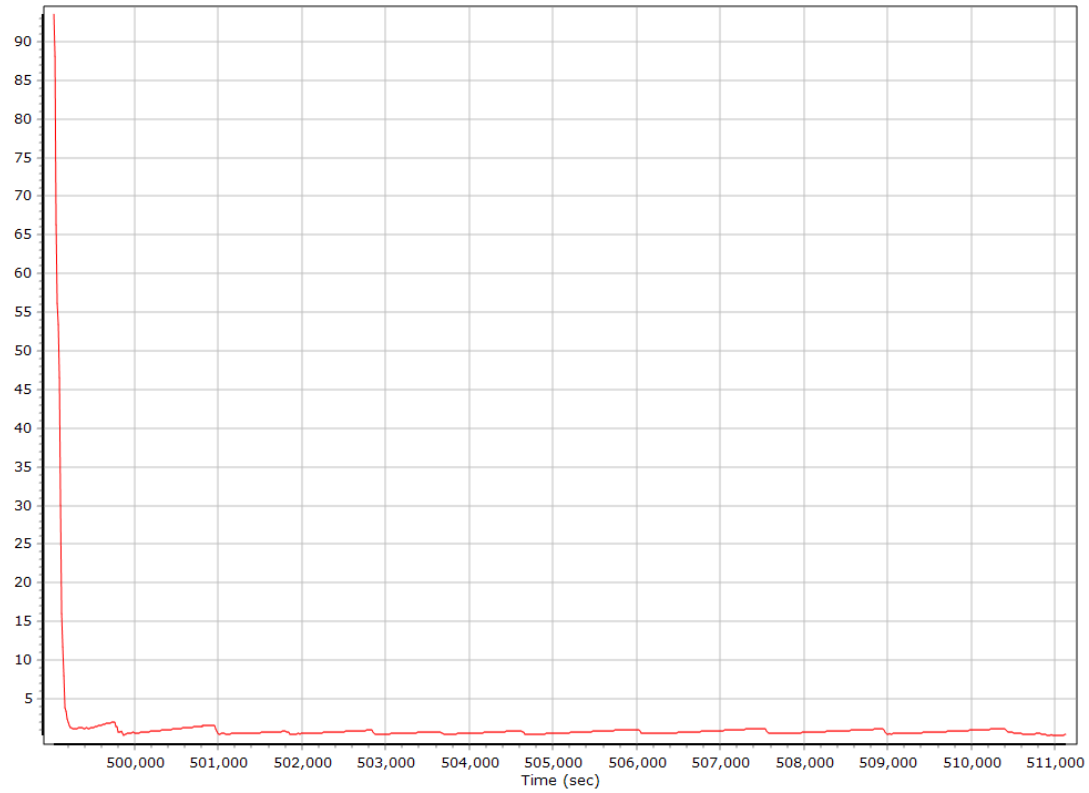
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

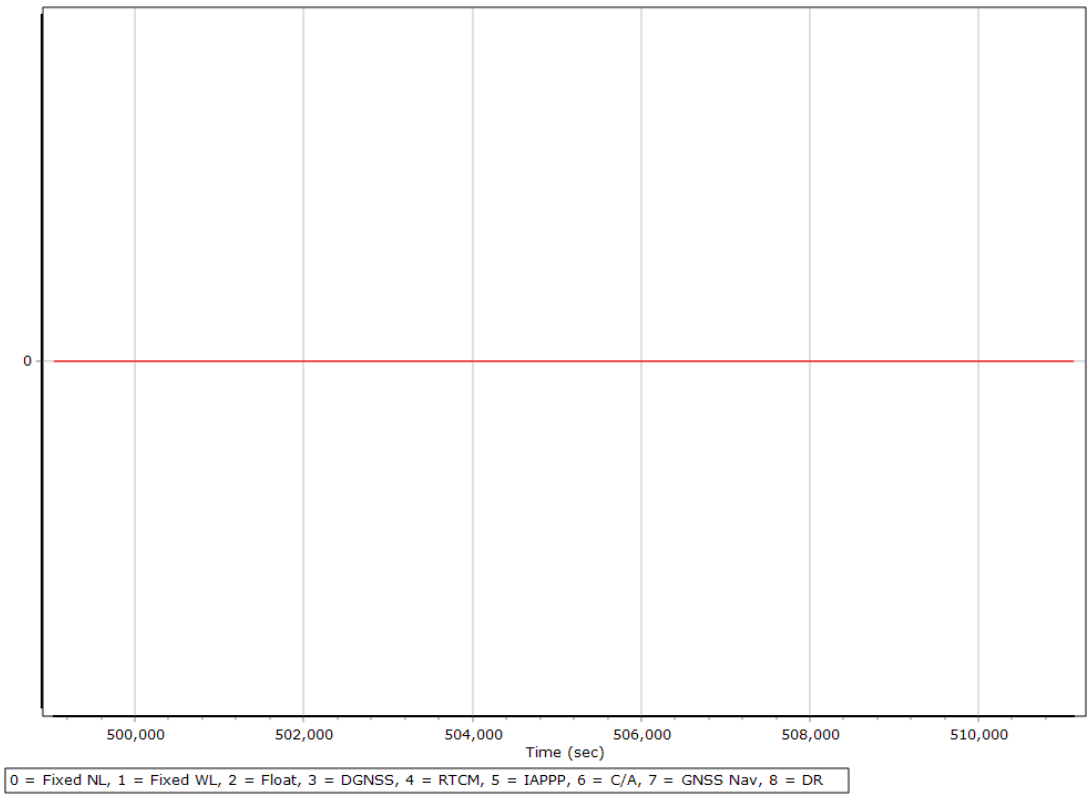


Heading Error RMS (arc-min)

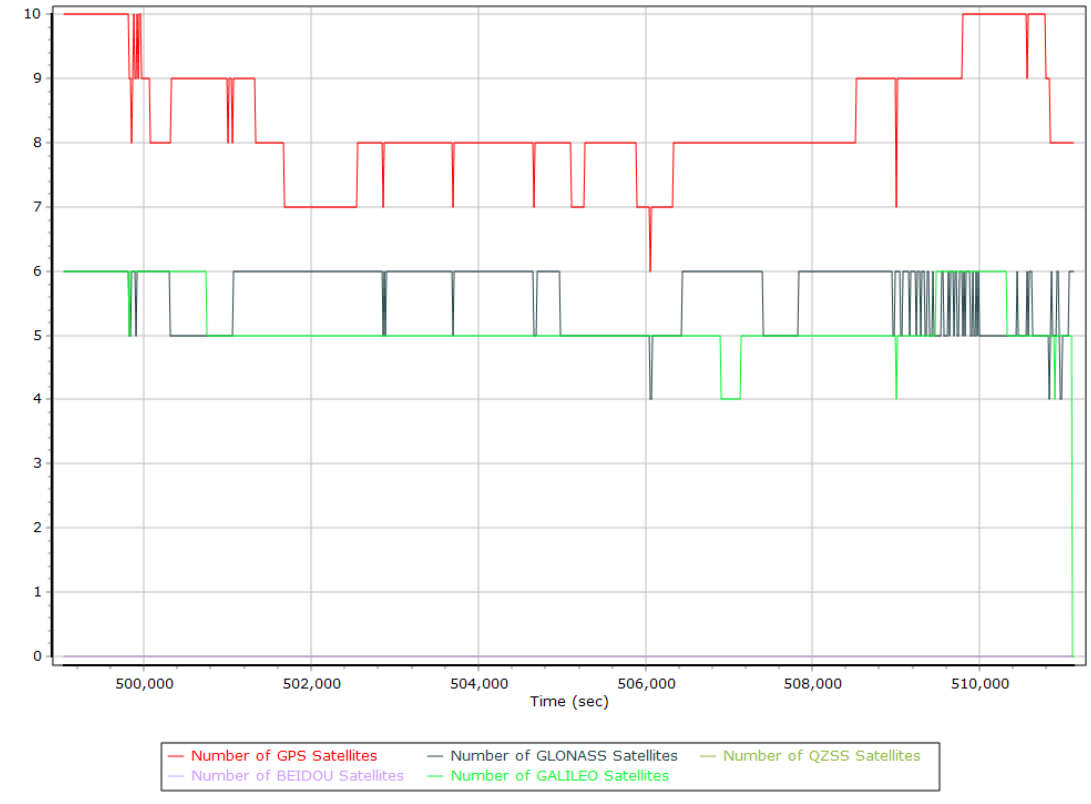


Forward Processed Solution Status

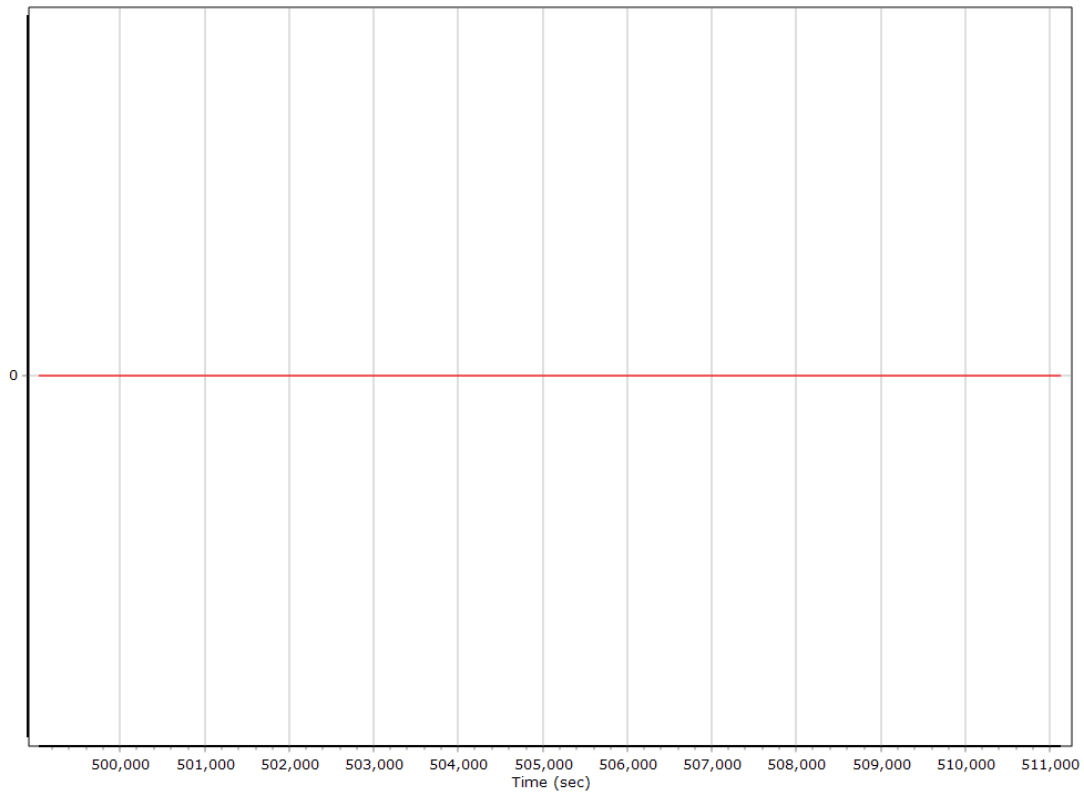
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12192020A_4040
Processing date	2022-01-05 15:10:30
Mission date	2020-12-19 15:24:07
Mission duration	04:22:05.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201219_152348_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3540.20g	GLONASS Broadcast Ephemeris
Ephm3540.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12192020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201219_152348_INS-GPS_1.raw		
Last raw data file	201219_152348_INS-GPS_1.raw		
Start GPS week	2136		
Start time	573828.866 (12/19/2020 3:23:48 PM)		
End time	589554.638 (12/19/2020 7:45:54 PM)		
Start of fine alignment	573852.880 (12/19/2020 3:24:12 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

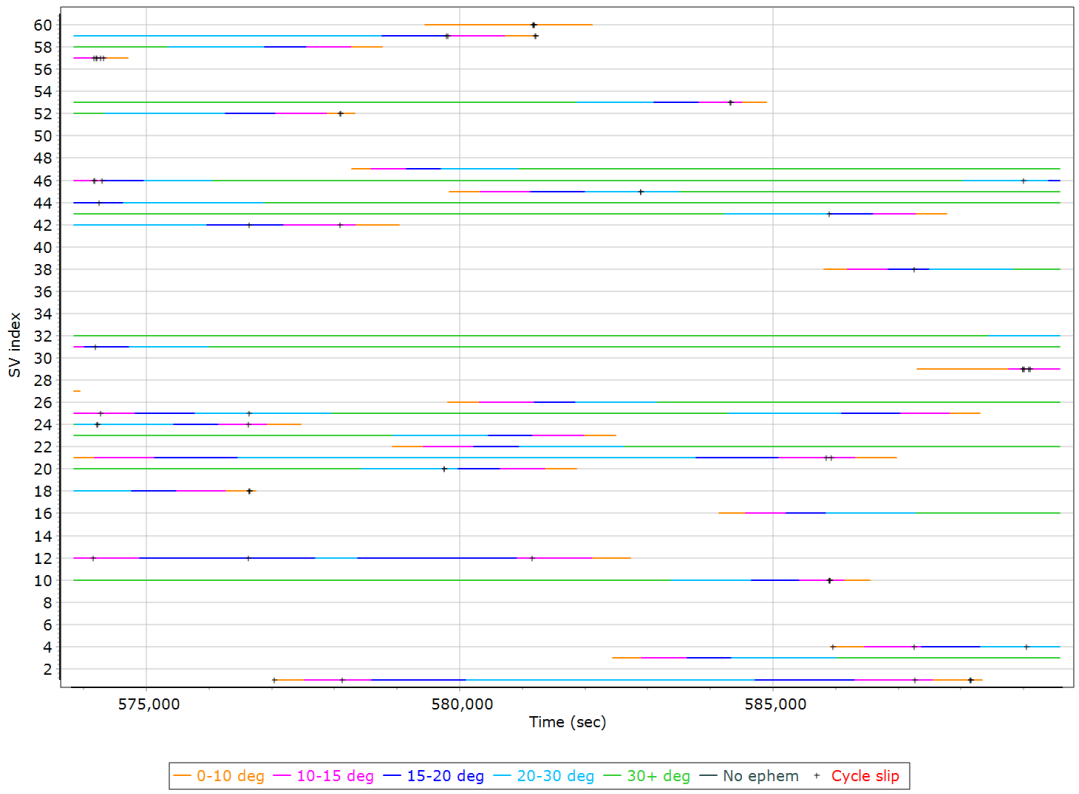
Rover Data QC

Raw IMU Import QC Summary

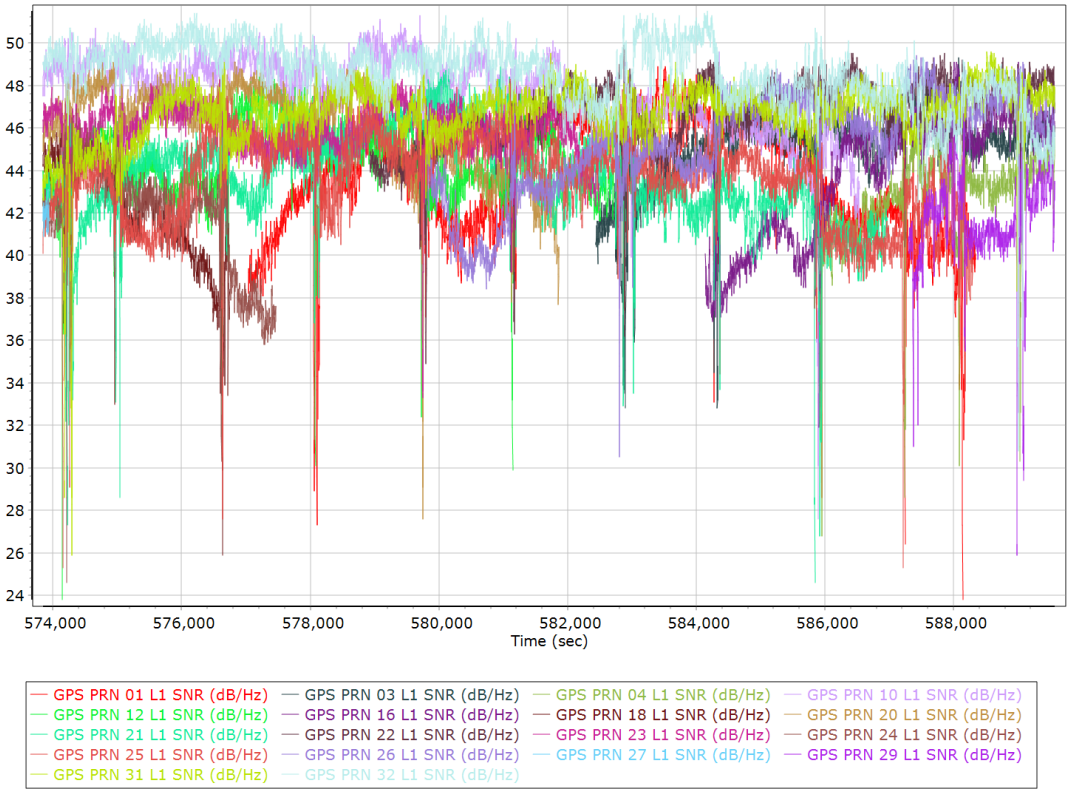
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12192020A_4040.log
IMU Records Processed	3144672
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

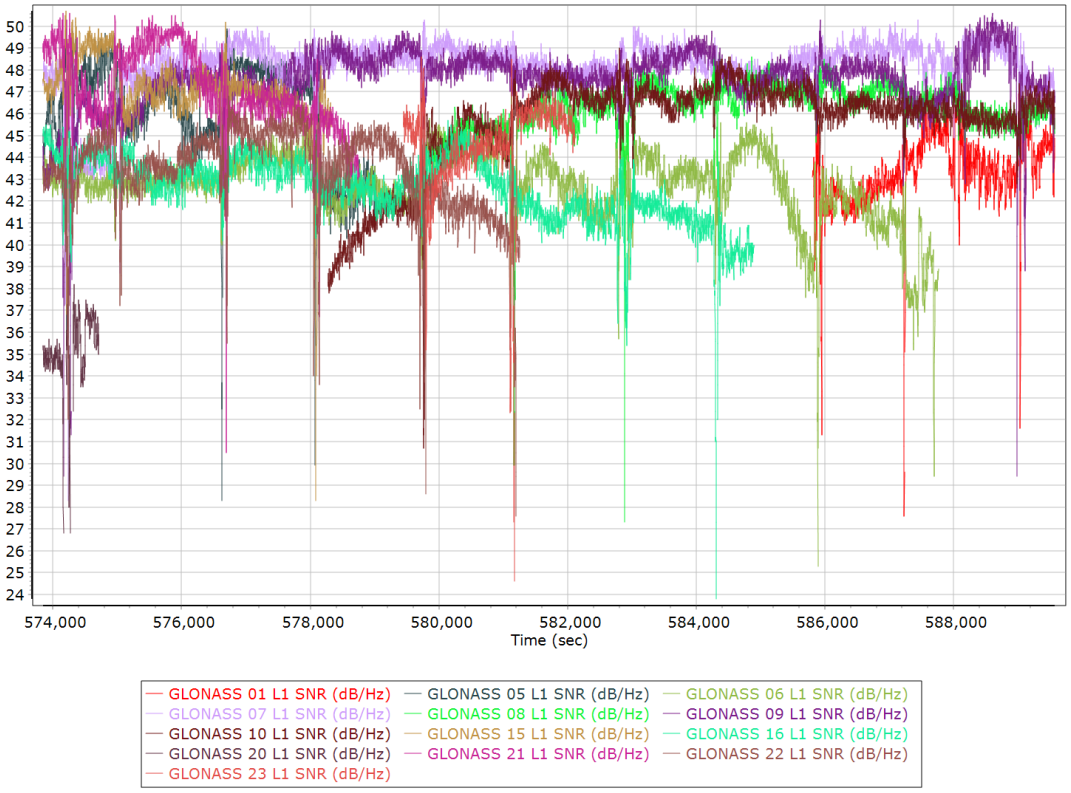
GPS/GLONASS L1 Satellite Lock/Elevation



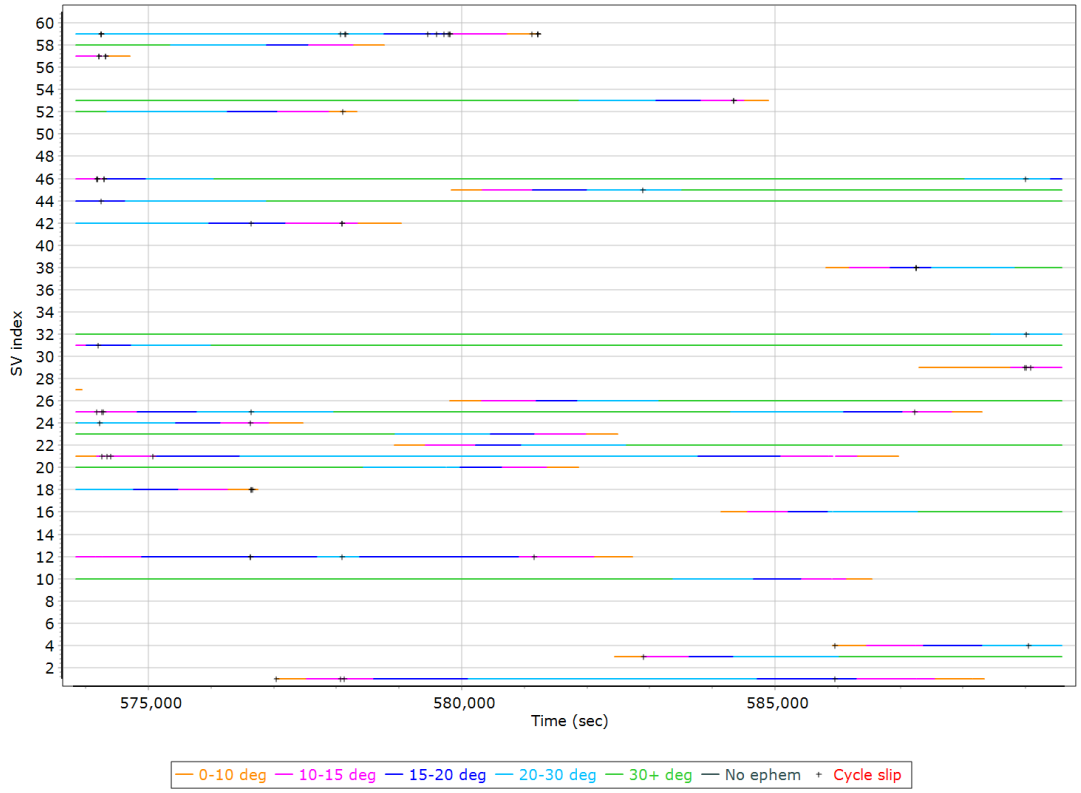
GPS L1 SNR



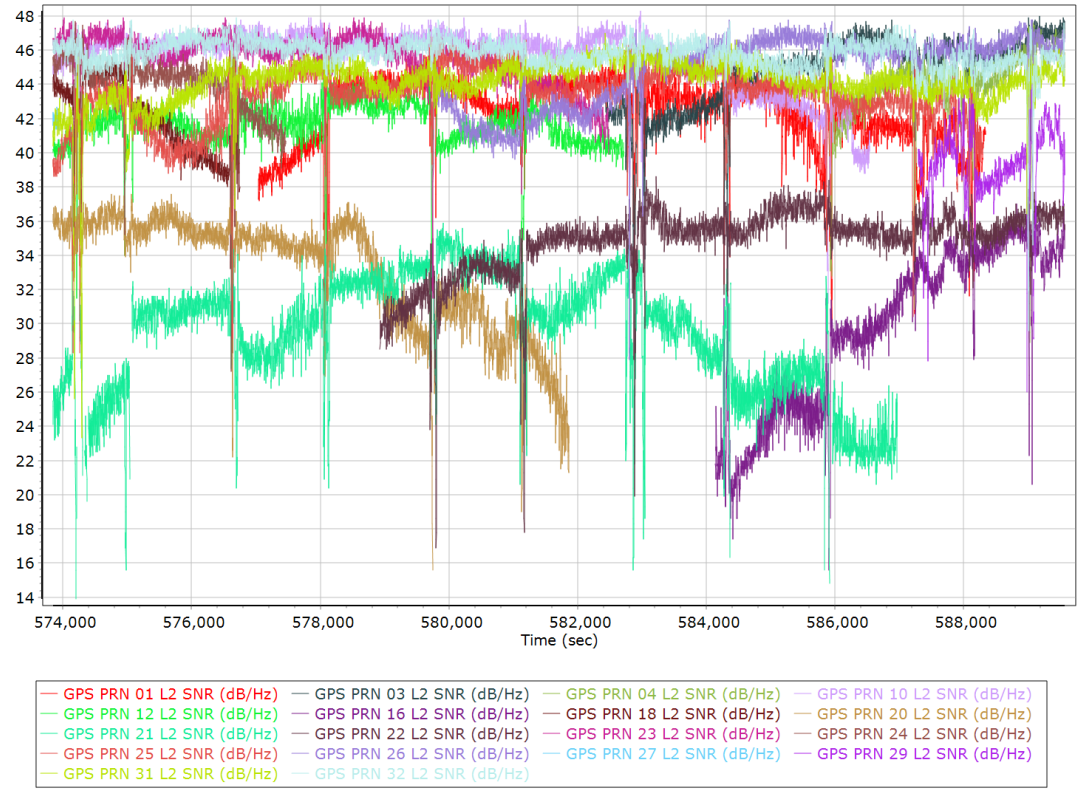
GLONASS L1 SNR



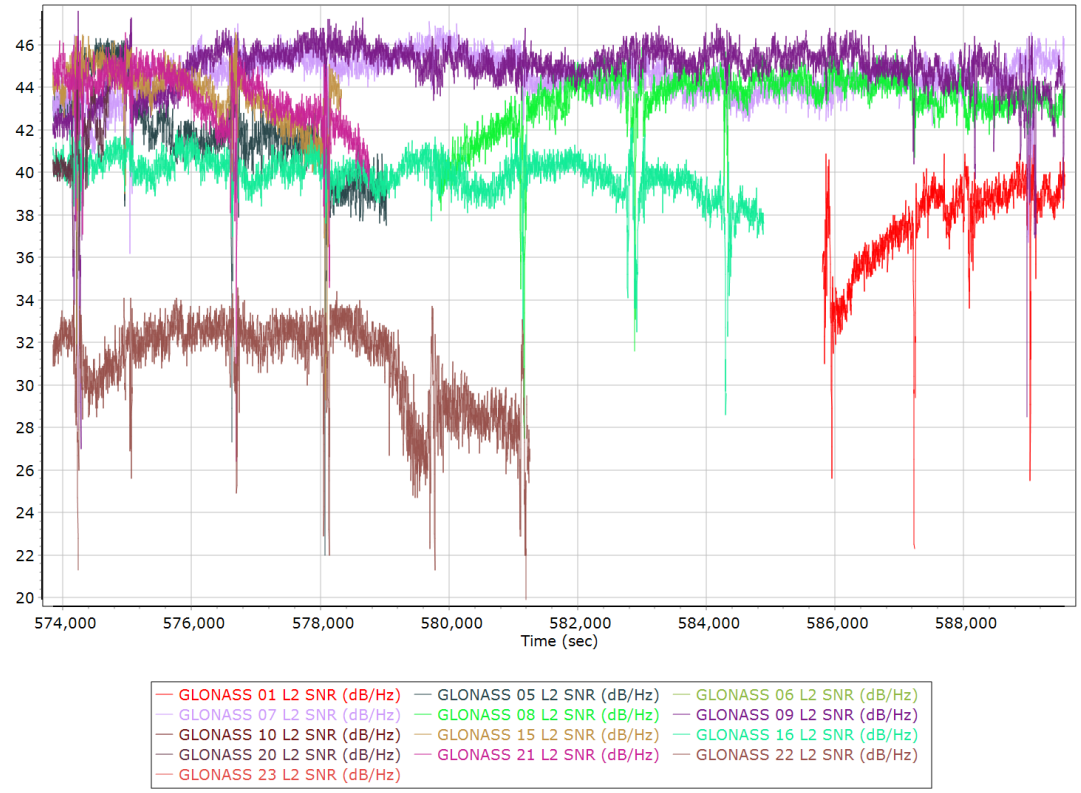
GPS/GLONASS L2 Satellite Lock/Elevation



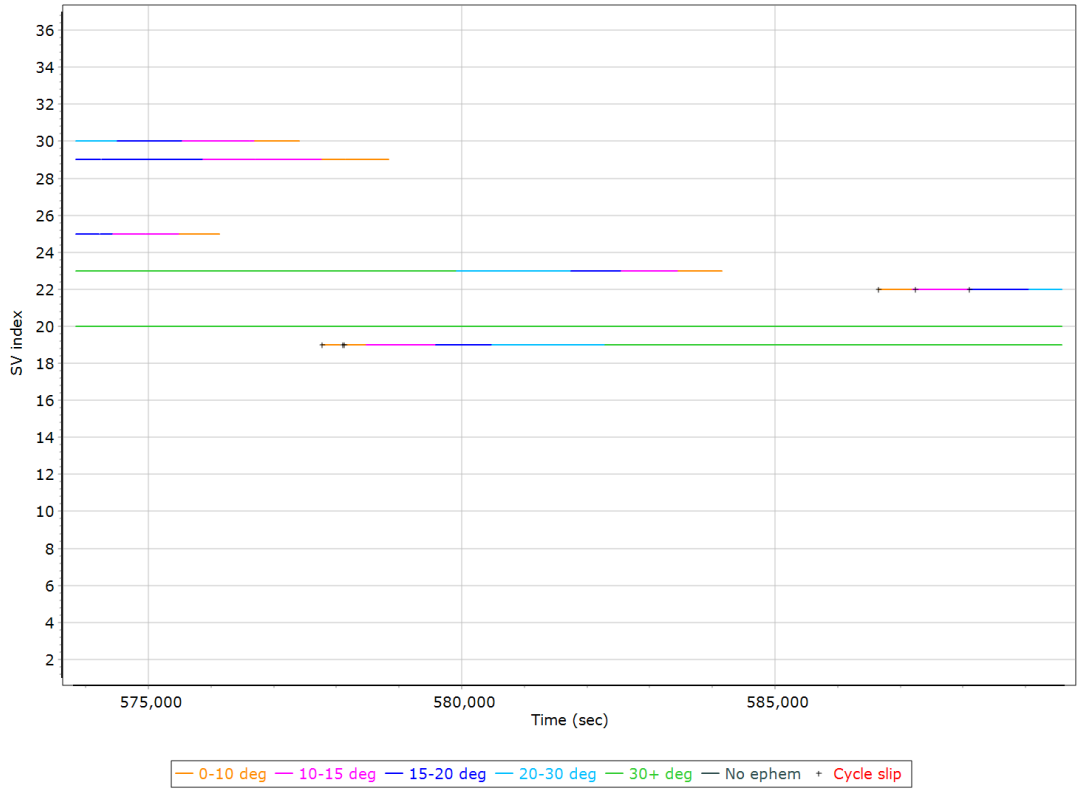
GPS L2 SNR



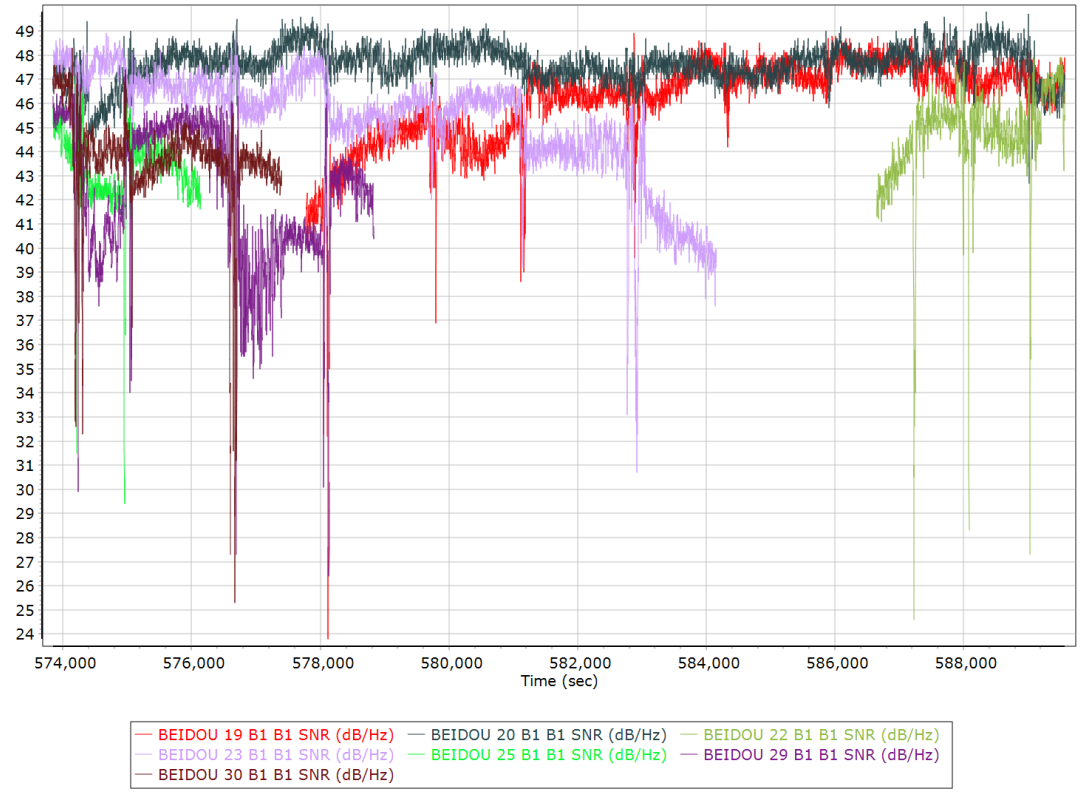
GLONASS L2 SNR



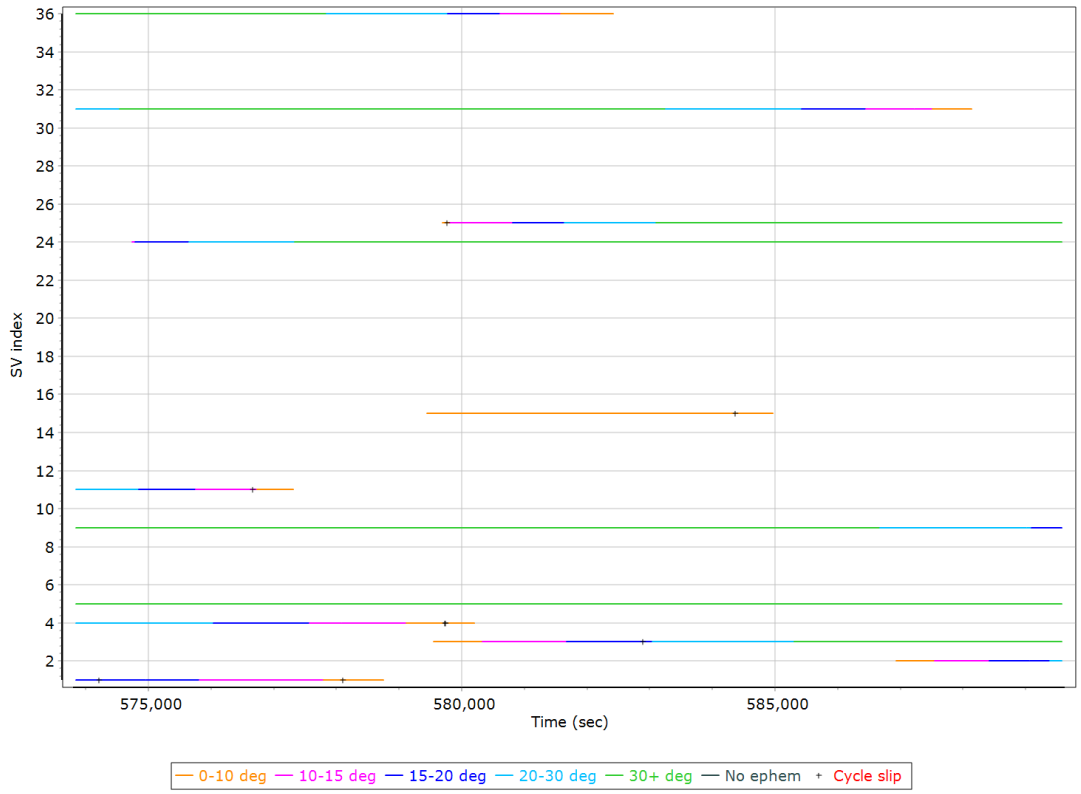
BEIDOU Satellite Lock/Elevation



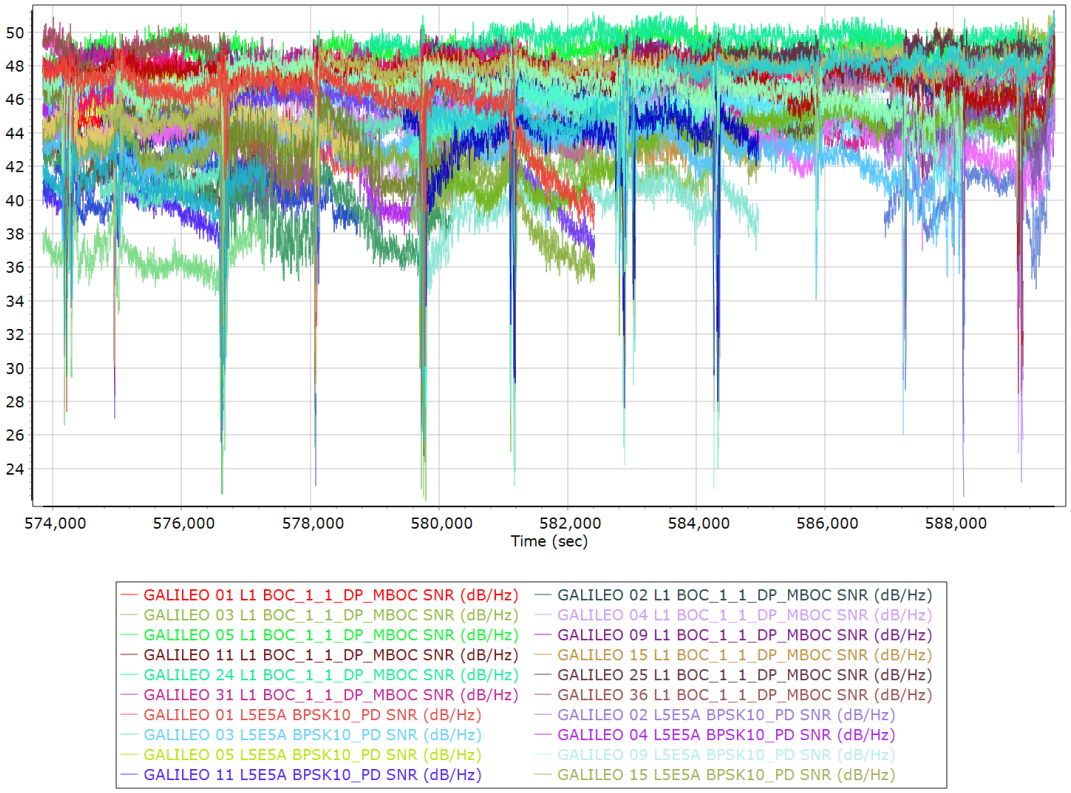
BEIDOU SNR



GALILEO Satellite Lock/Elevation

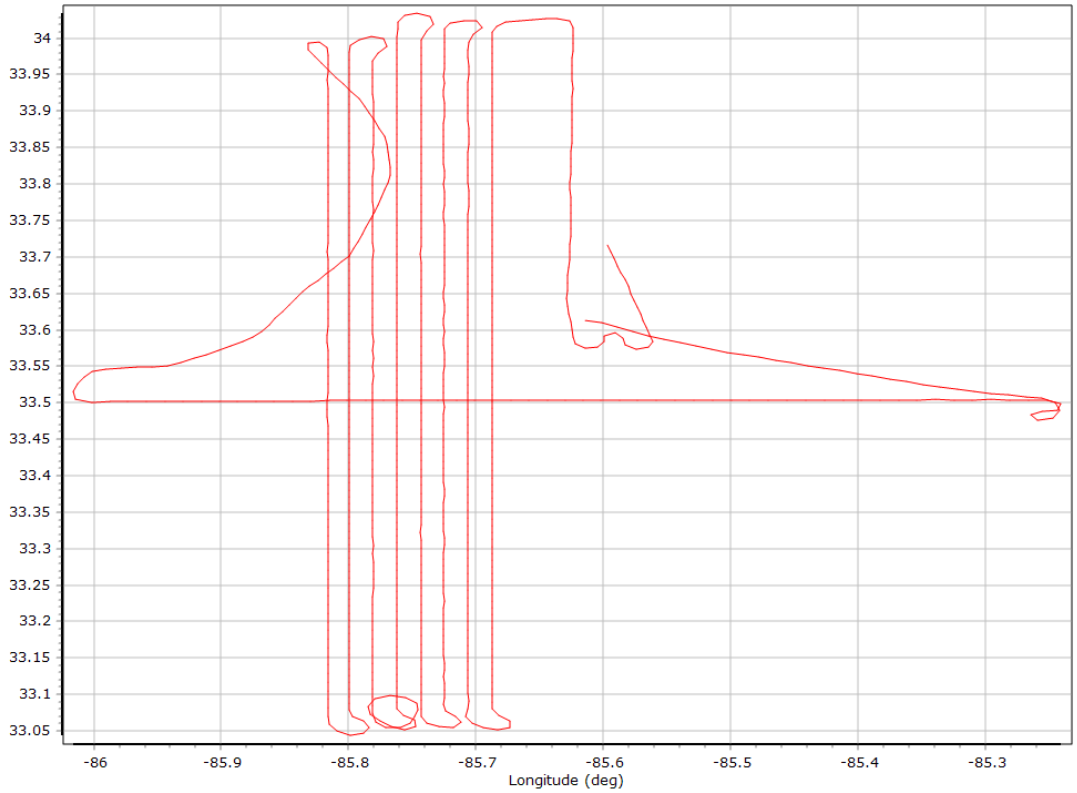


GALILEO SNR

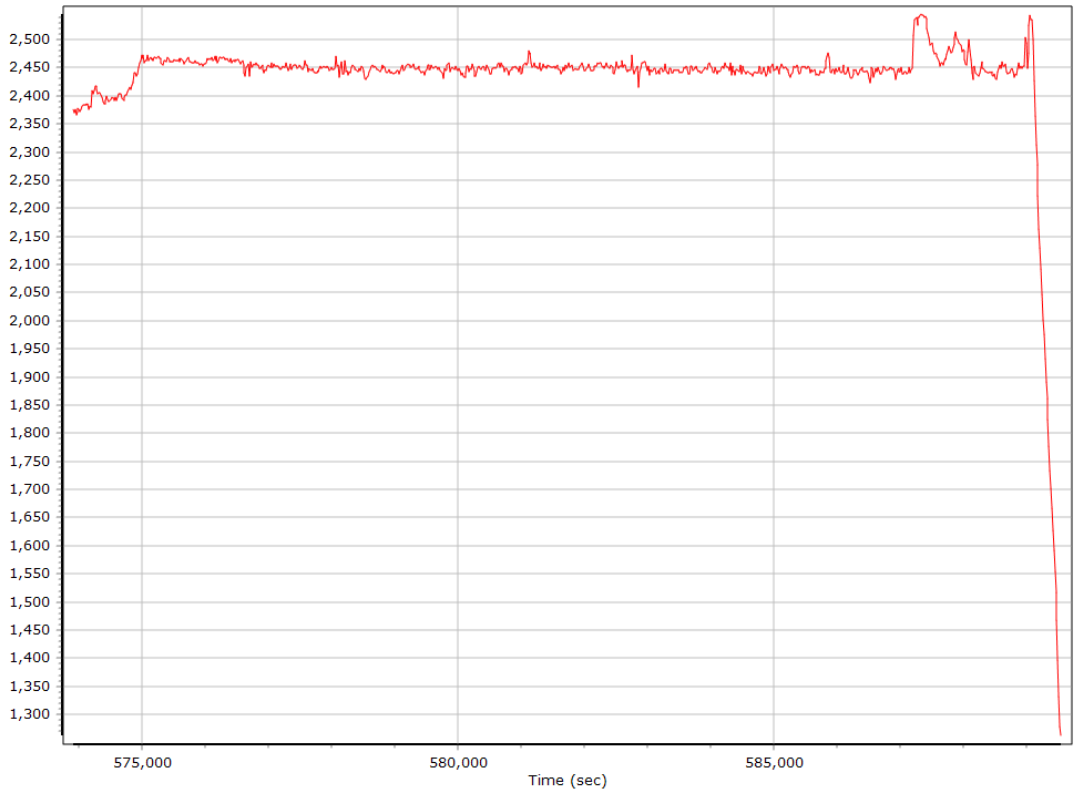

50
48
46
44
42
40
38
36
34
32
30
28
26
24
574,000
576,000
578,000
580,000
582,000
584,000
586,000
588,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 11 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 36 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 11 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

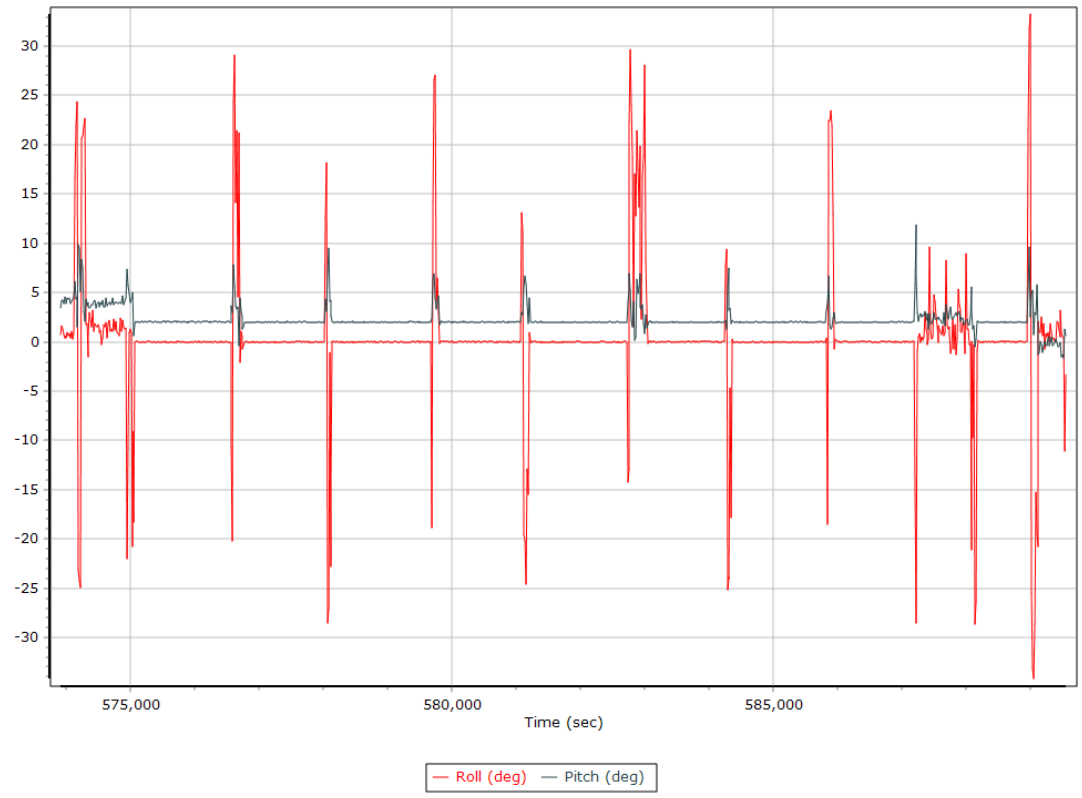
Top View



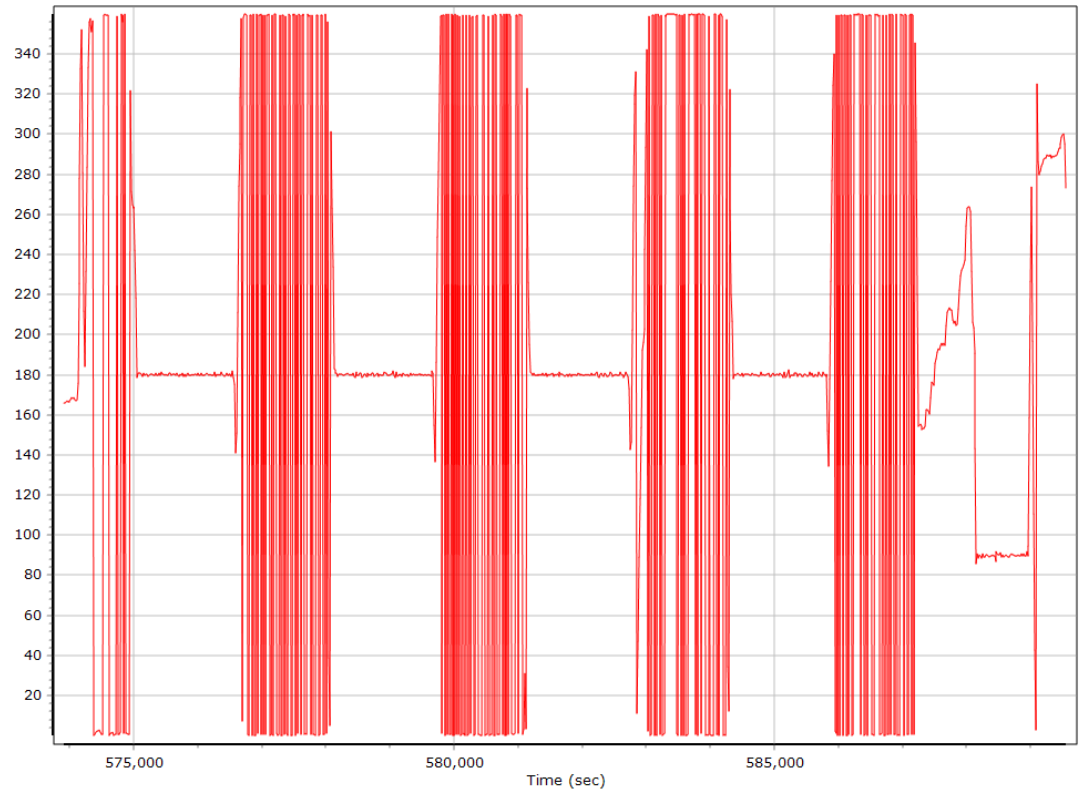
Altitude



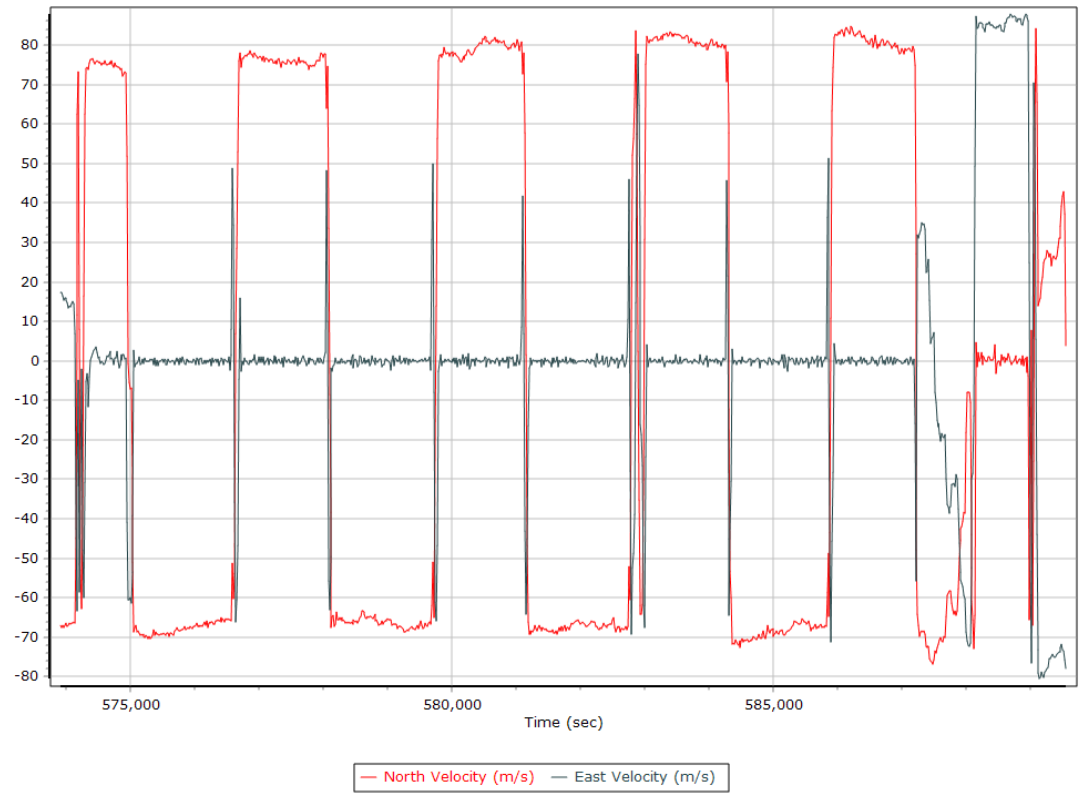
Roll/Pitch



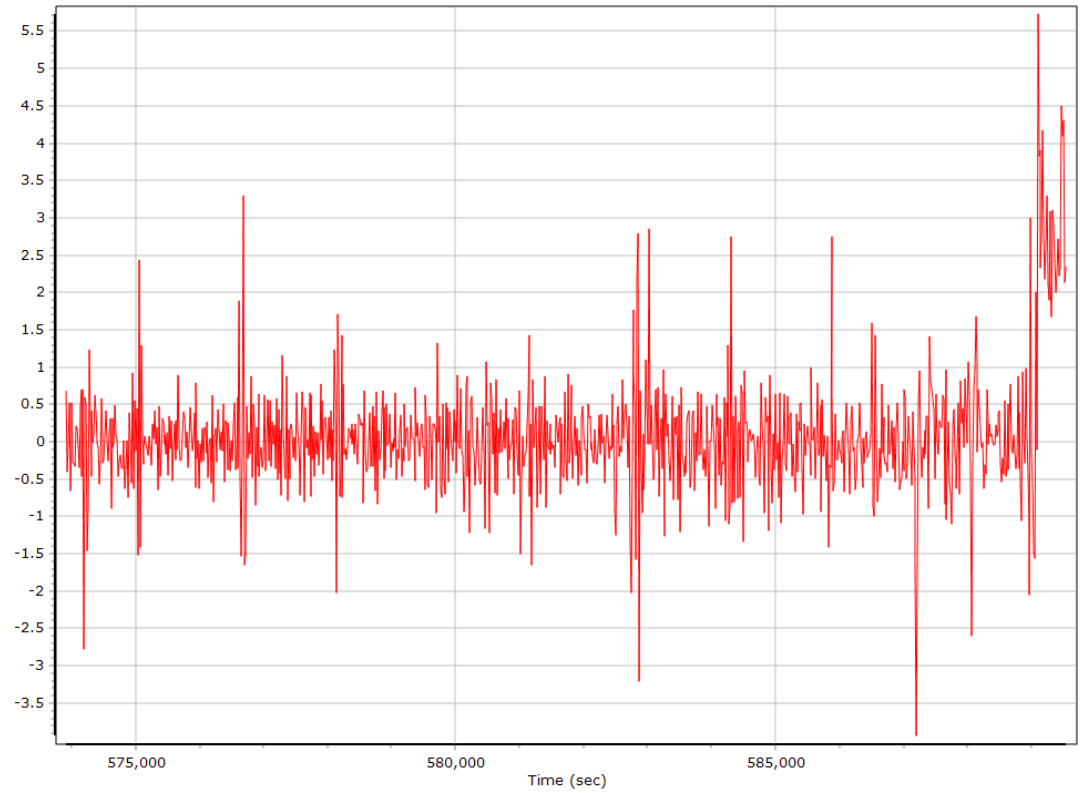
Heading



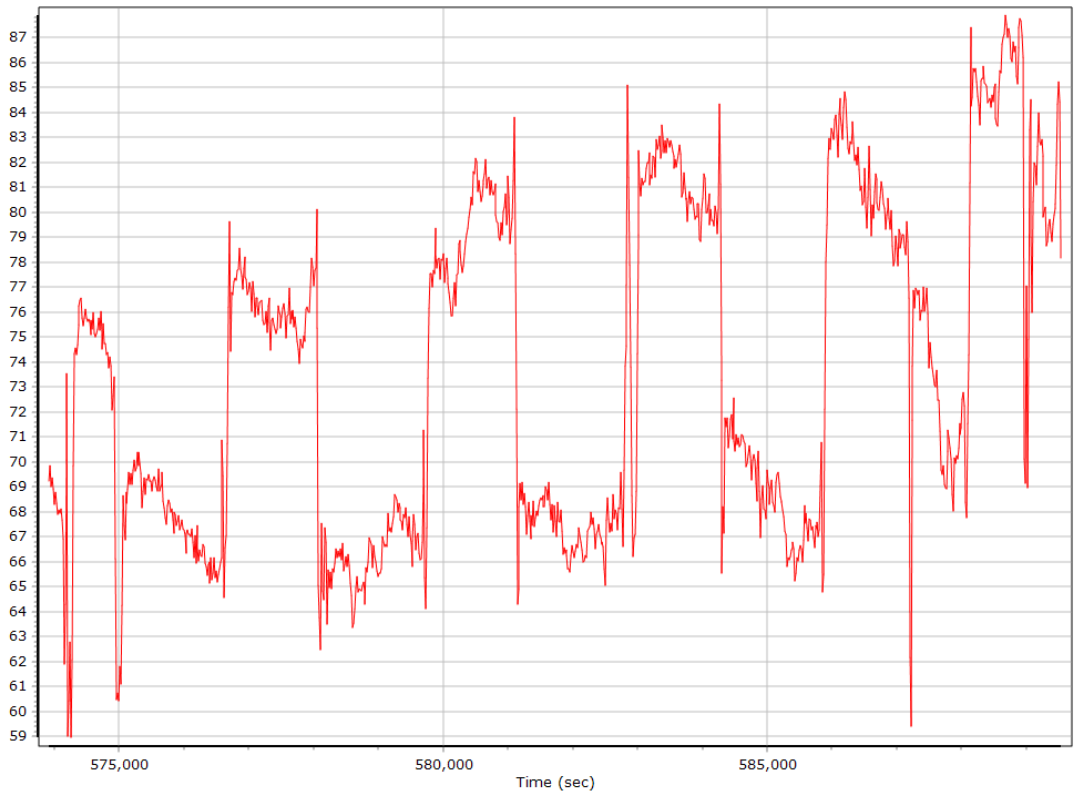
North/East Velocity



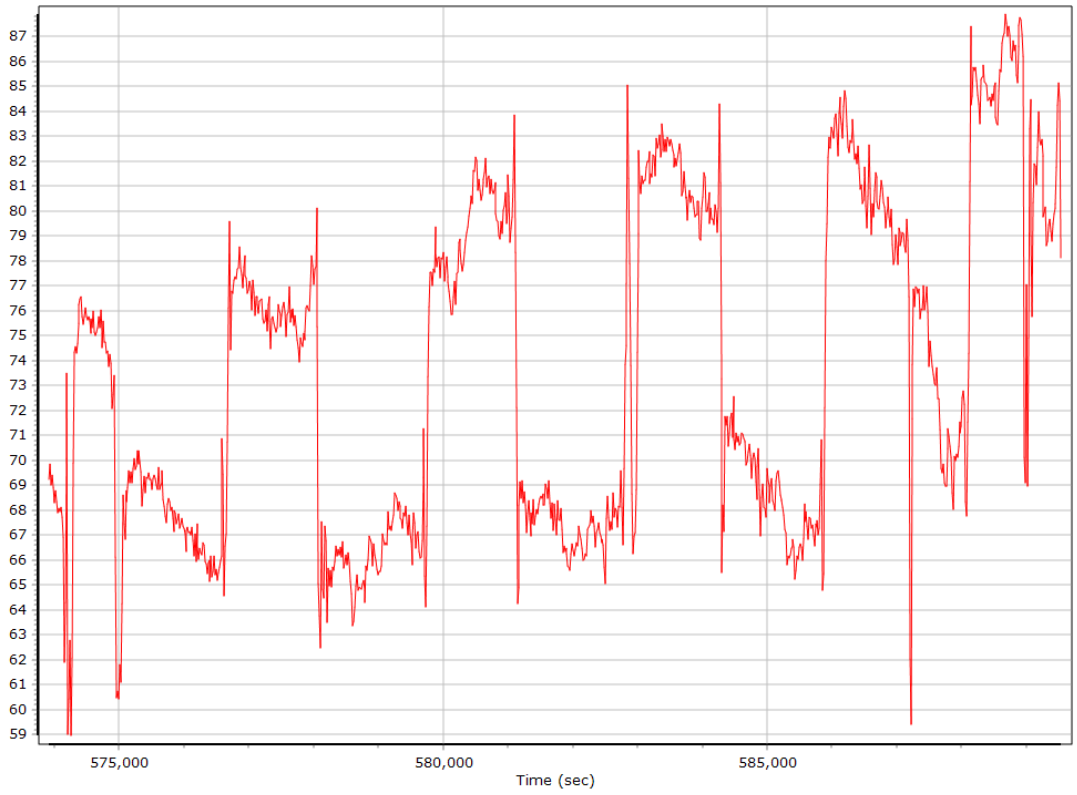
Down Velocity



Total Speed



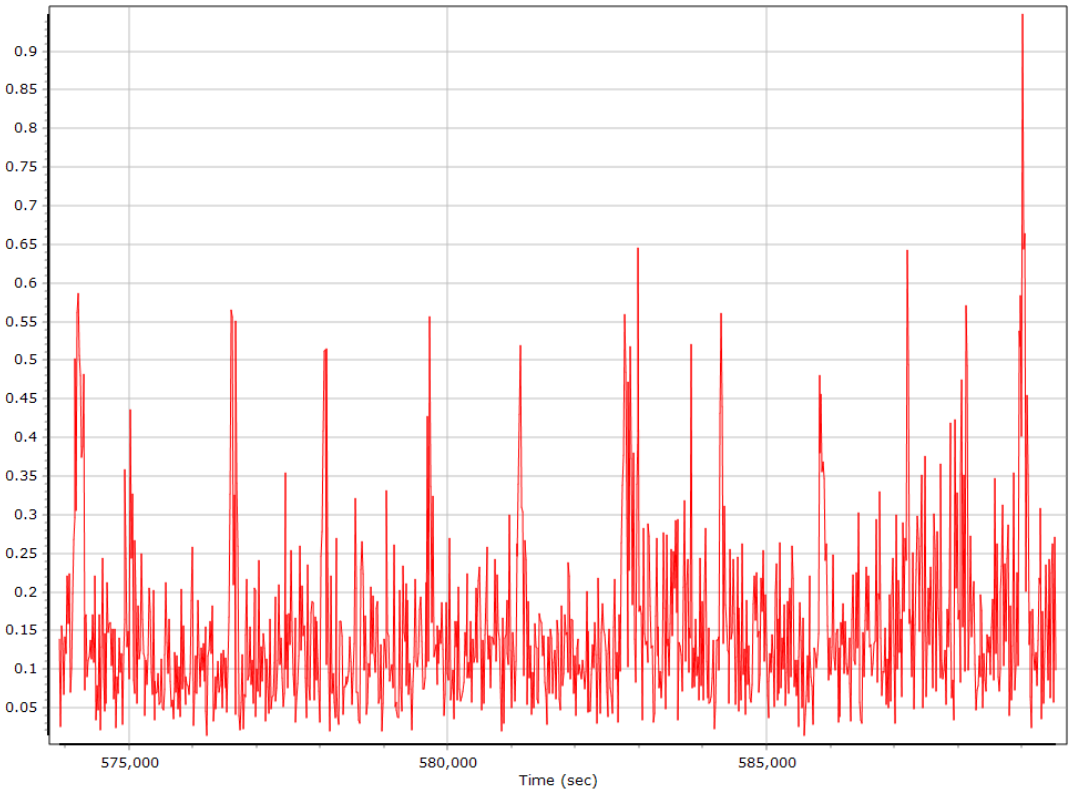
Ground Speed



Body Acceleration



Total Body Acceleration

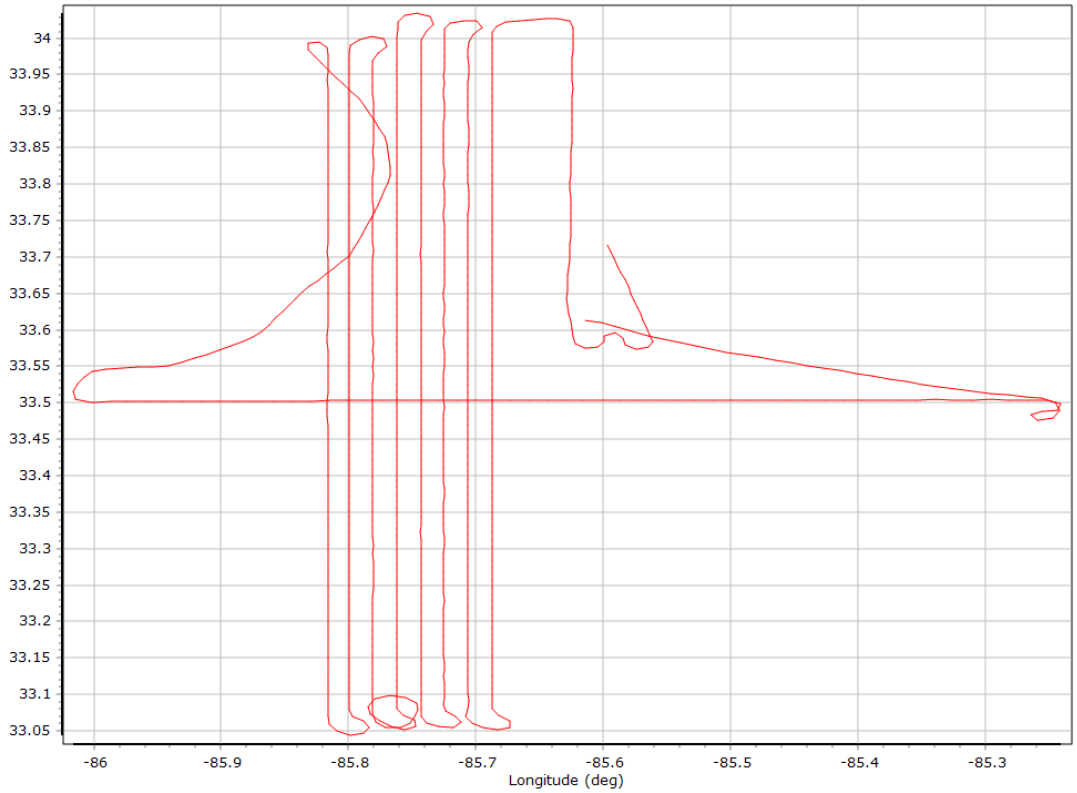


Body Angular Rate

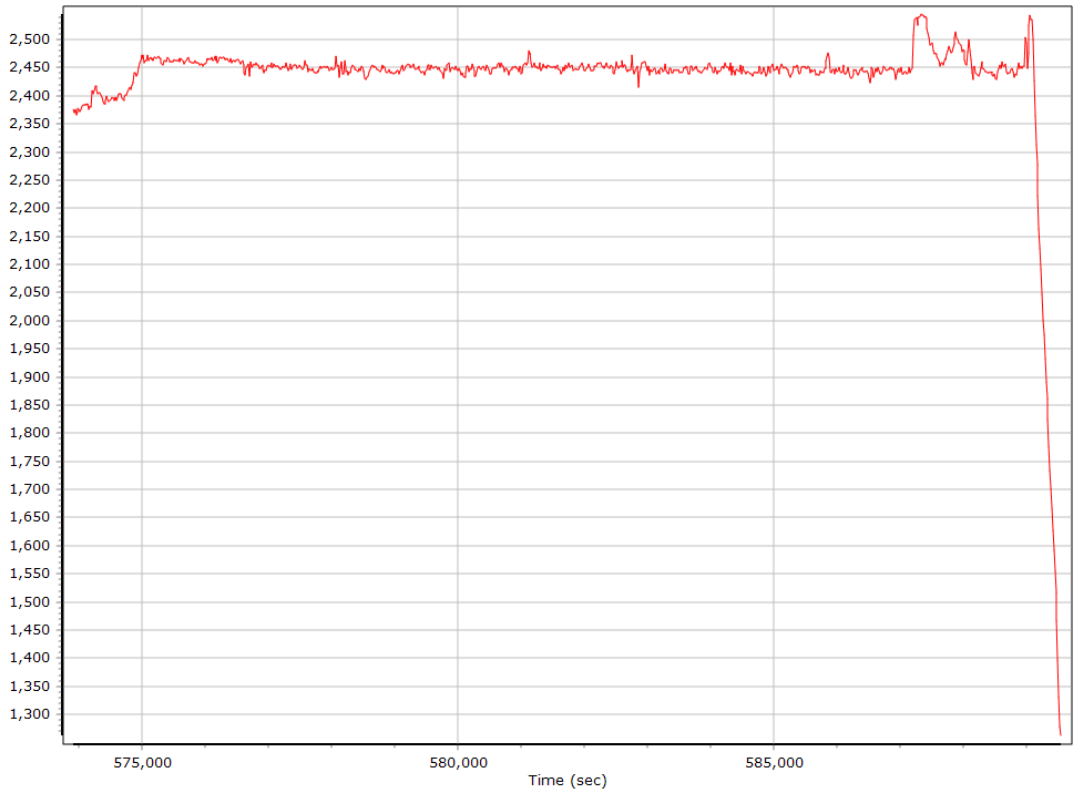


Forward Processed Trajectory Information

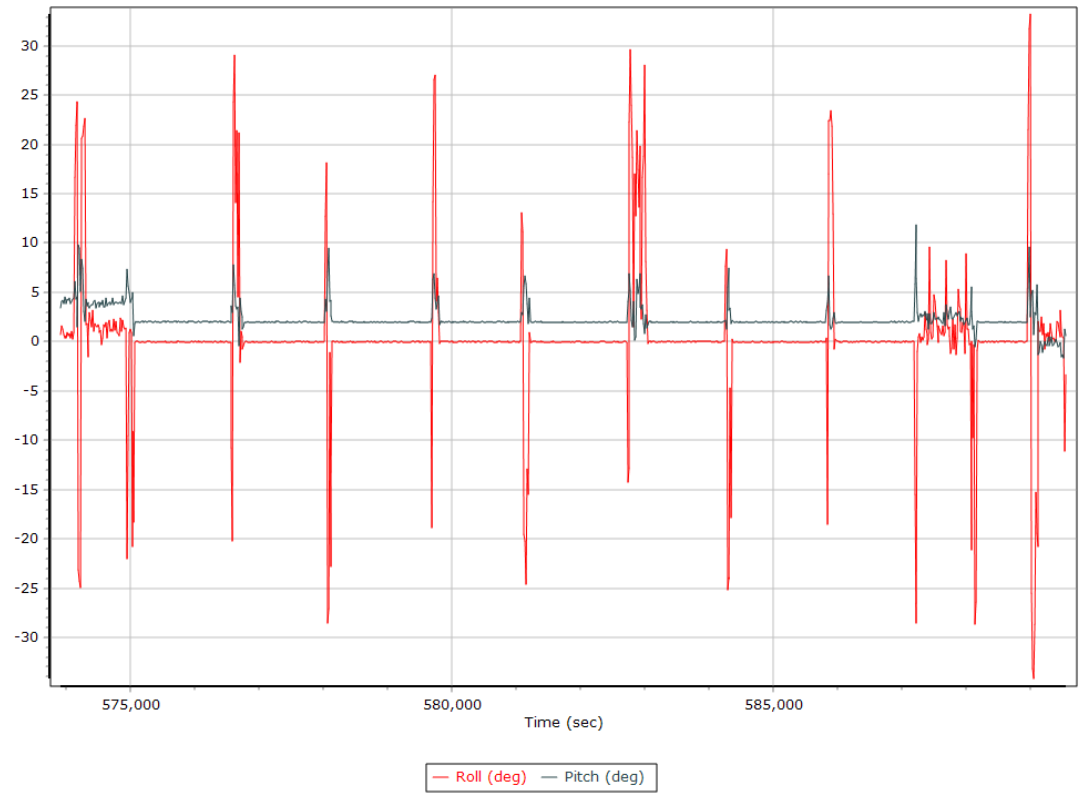
Top View



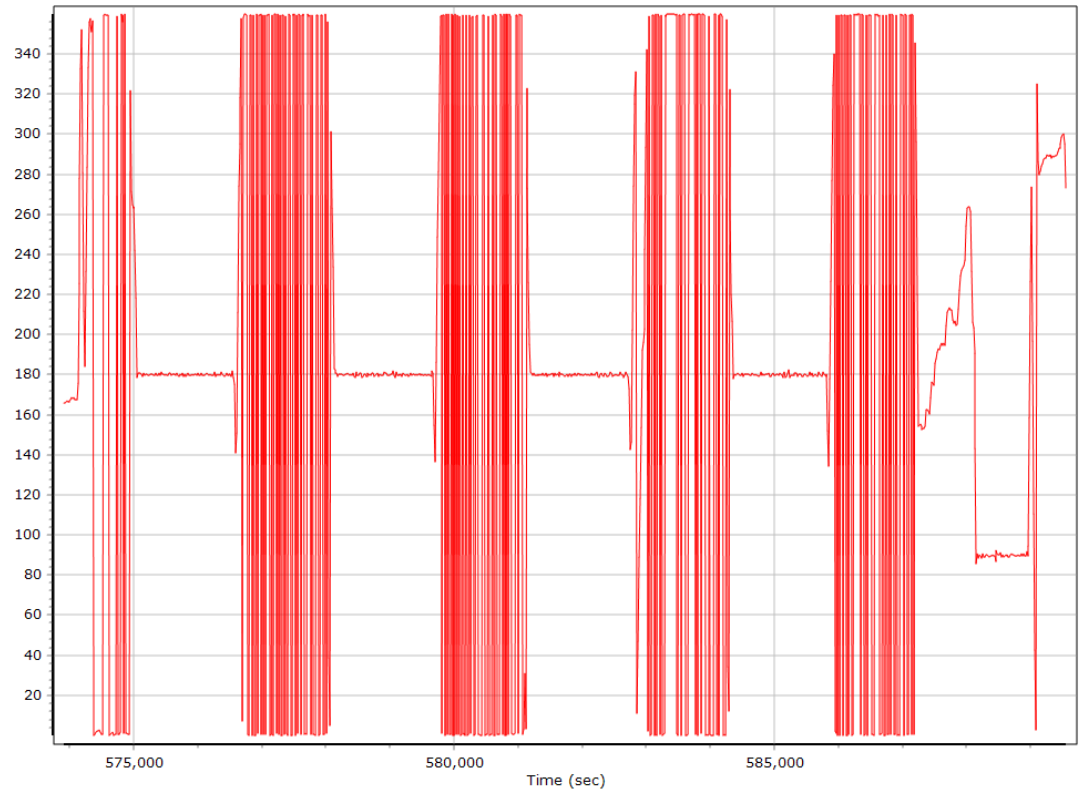
Altitude



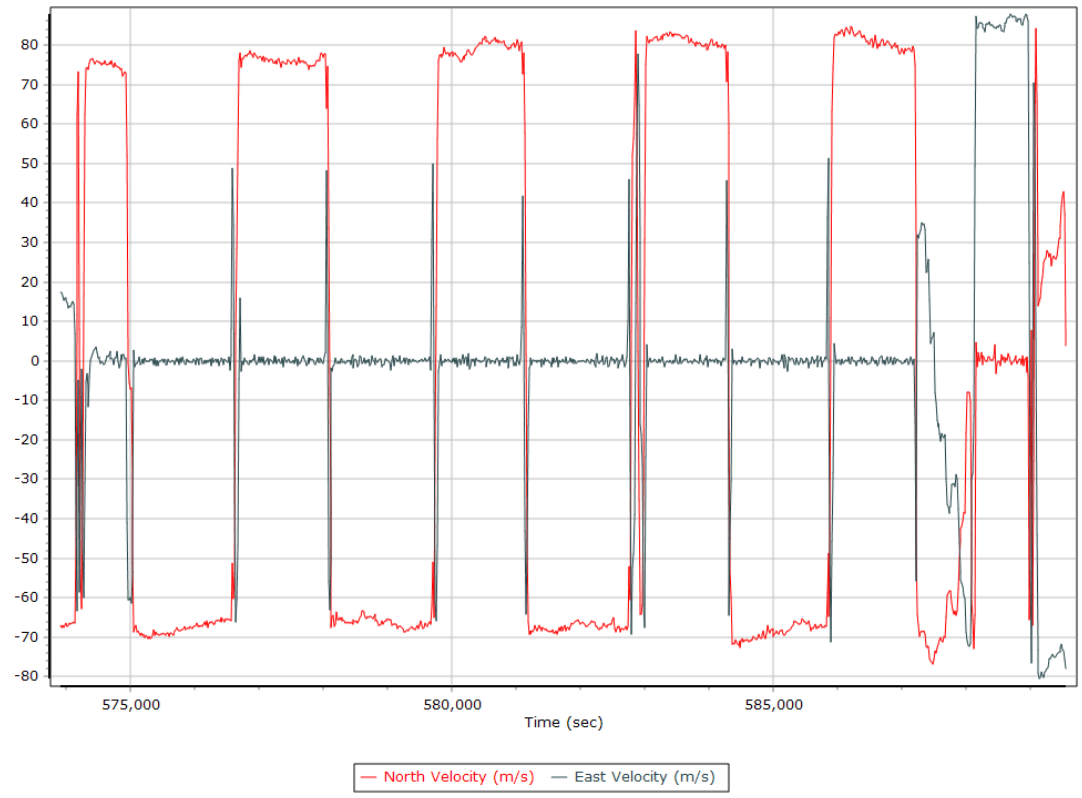
Roll/Pitch



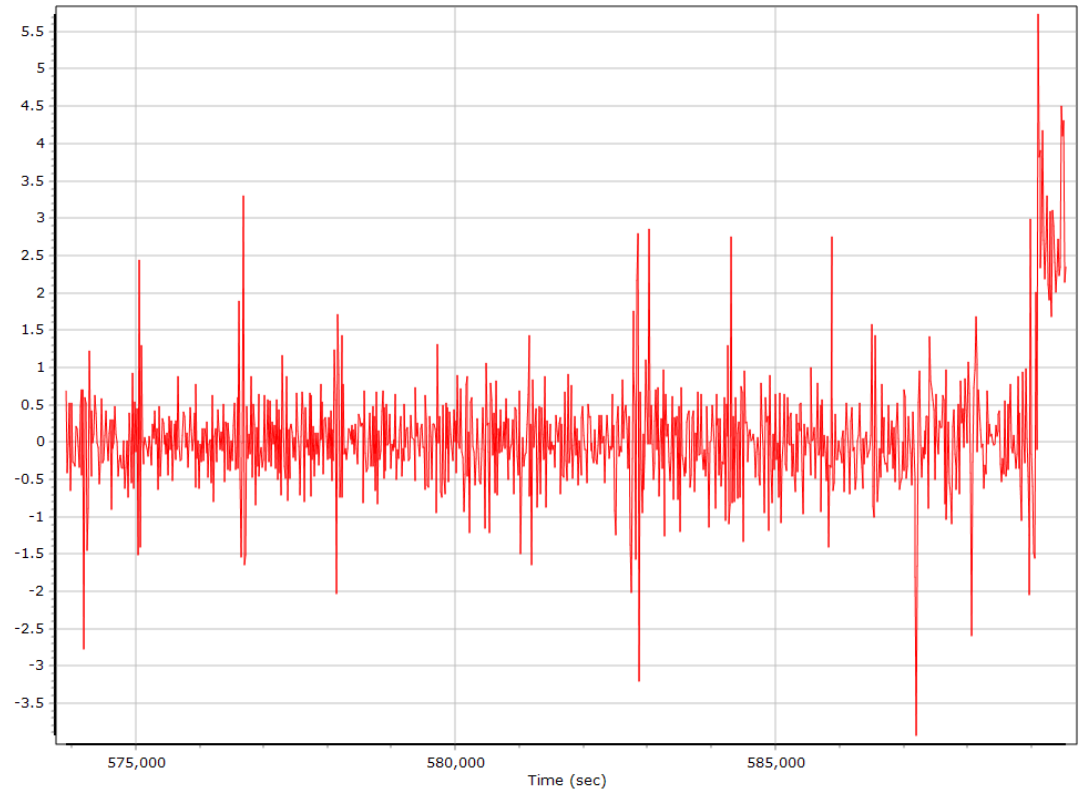
Heading



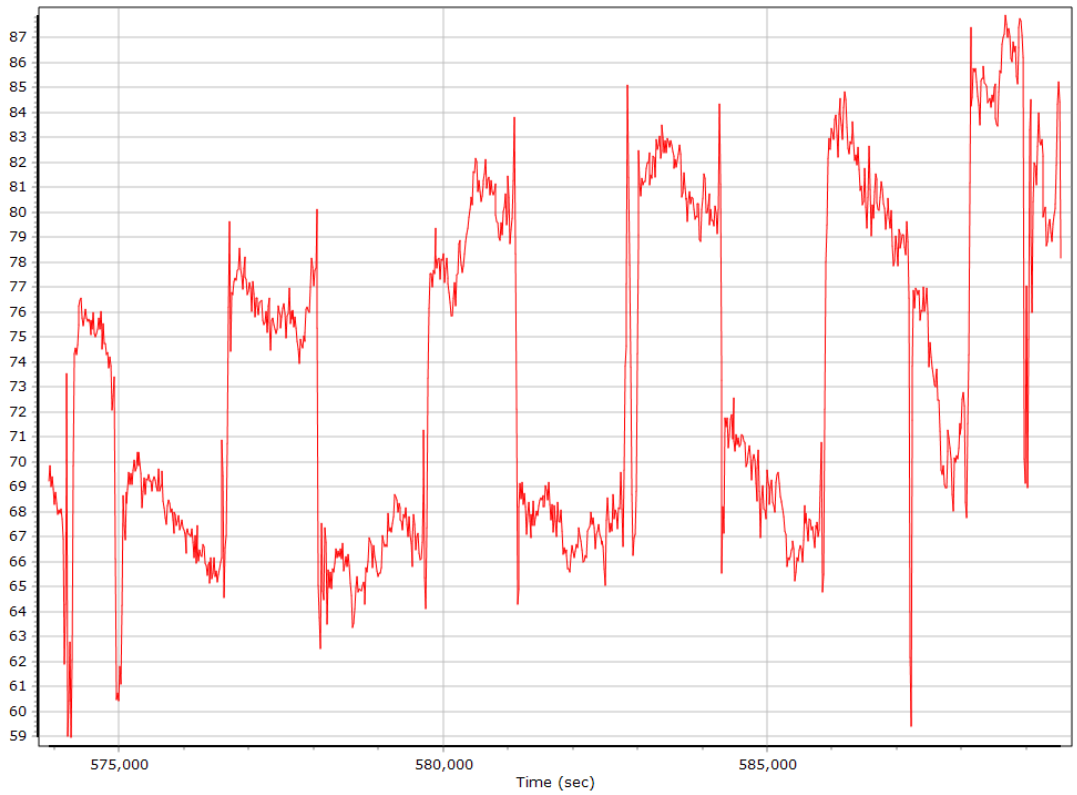
North/East Velocity



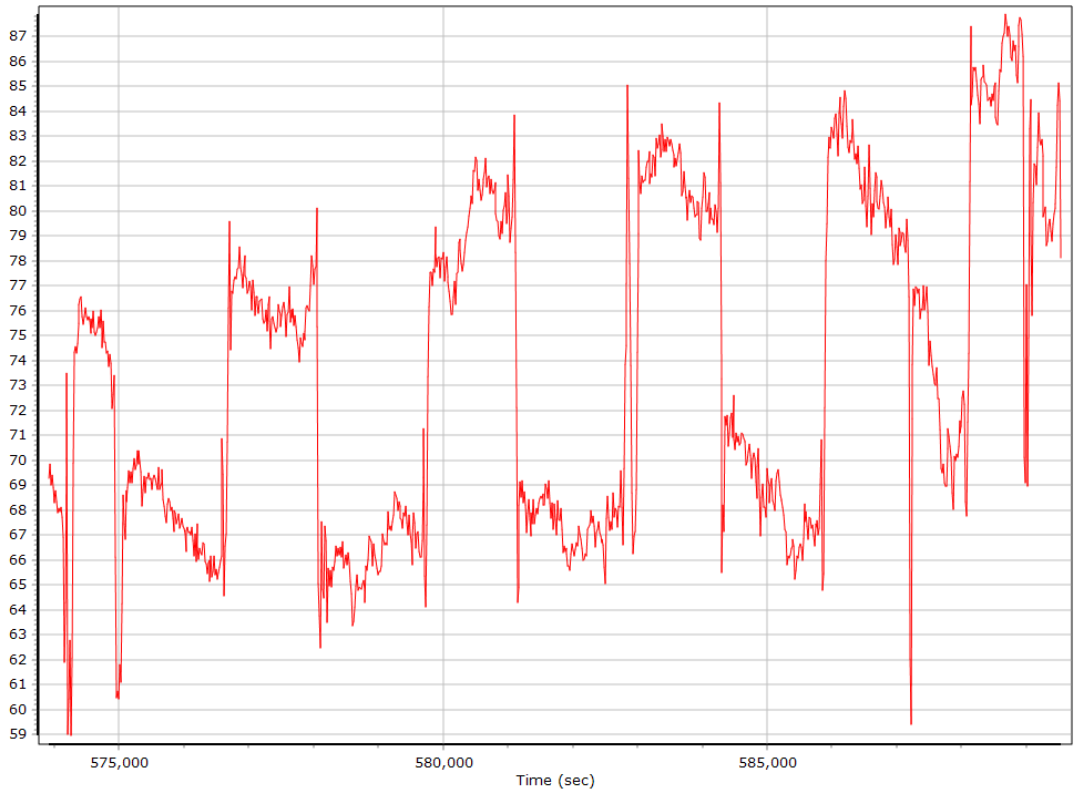
Down Velocity



Total Speed



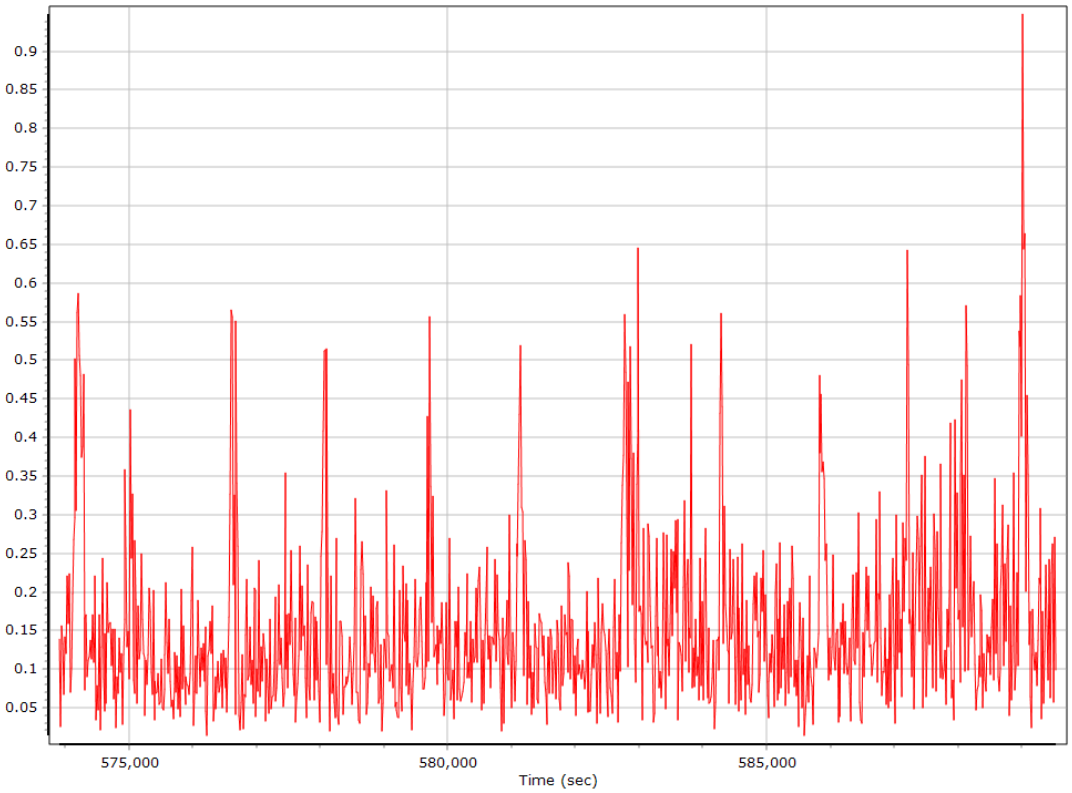
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

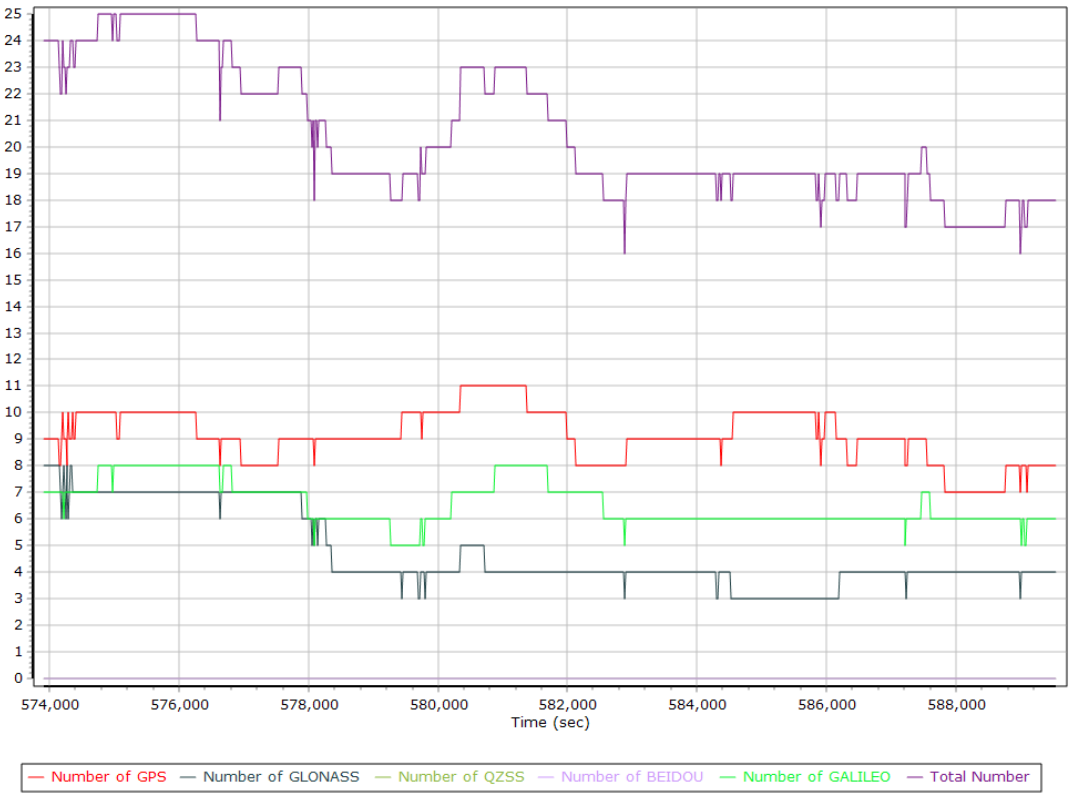


GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	11	9
Number of GLONASS SV	3	8	5
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	5	8	7
Total number of SV	16	25	20
PDOP	1.02	1.63	1.20
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	15696.00	0.00	0.00
Percentage	100.00	0.00	0.00

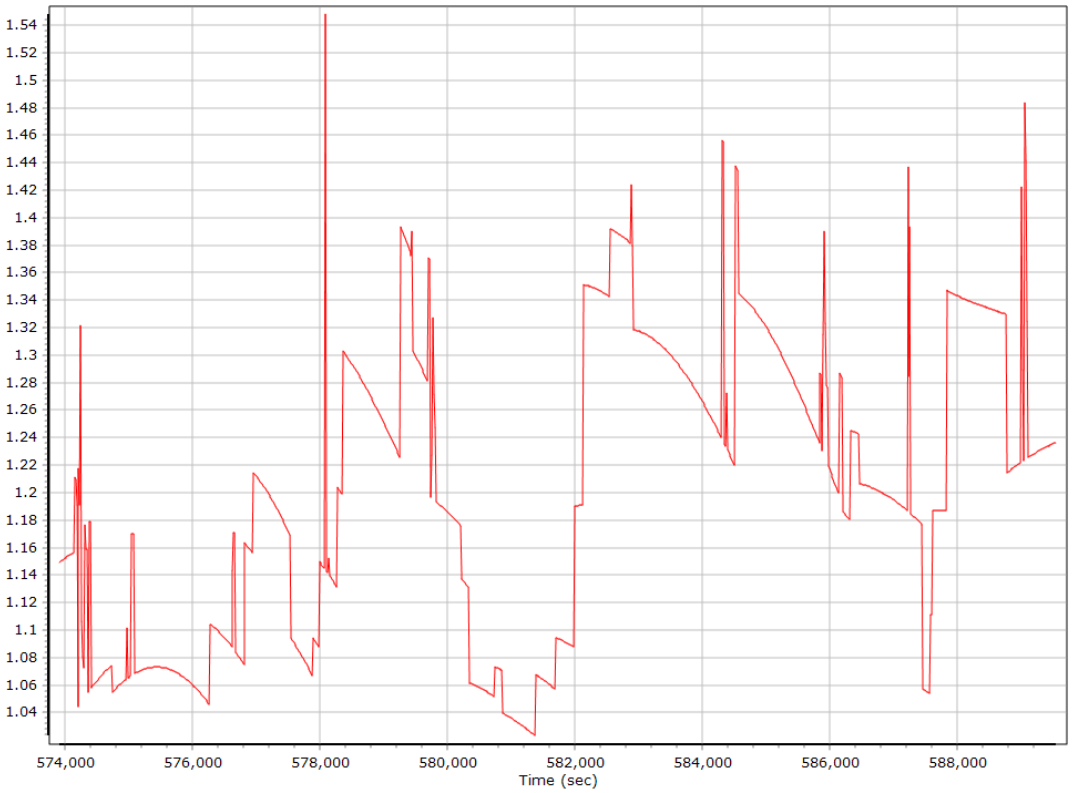
Num SVs in solution



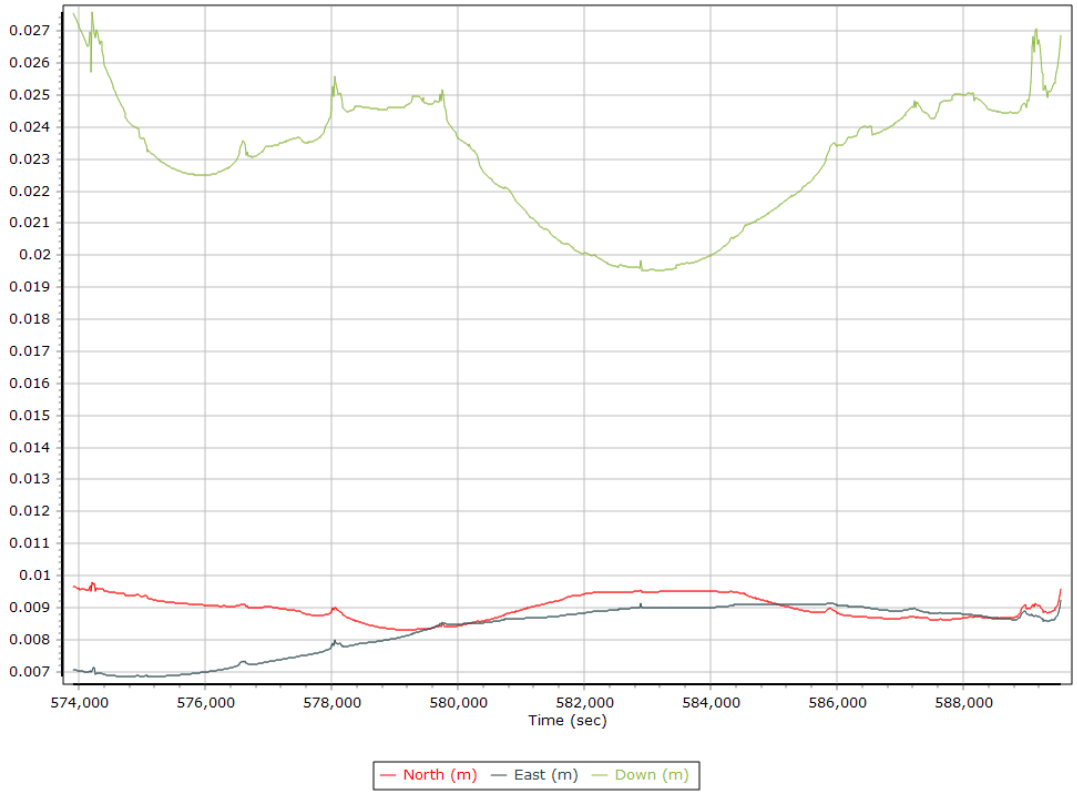
Forward/Reverse Separation



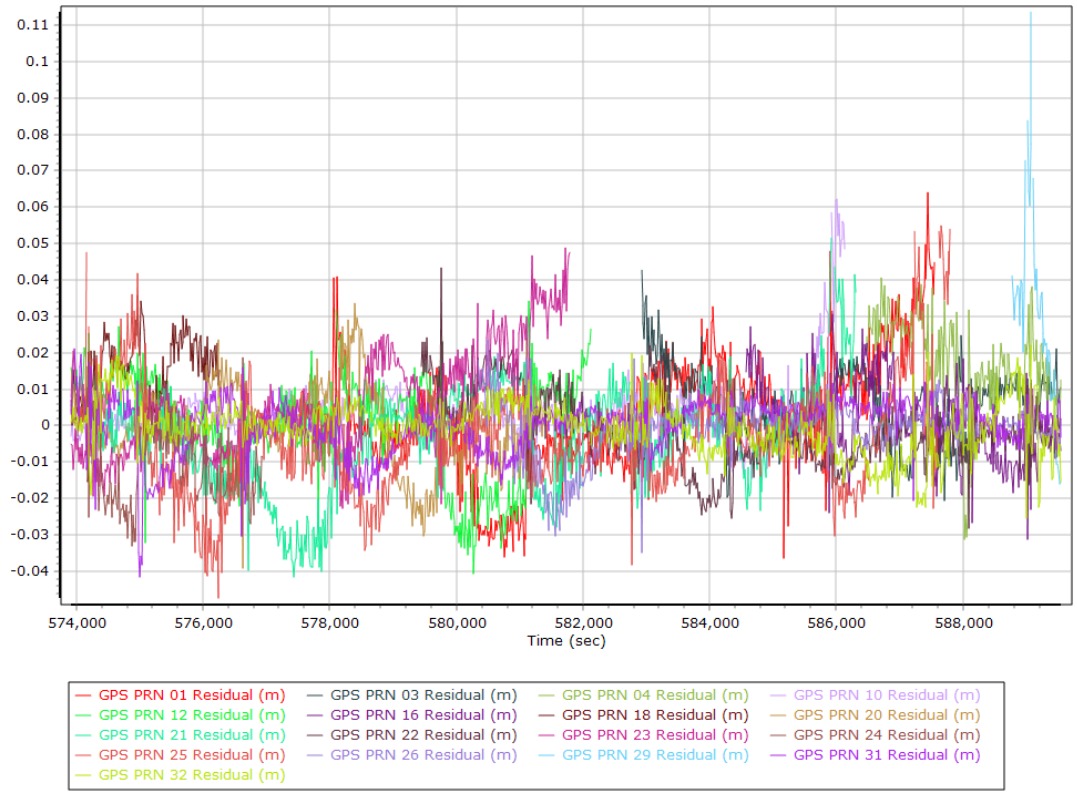
PDOP



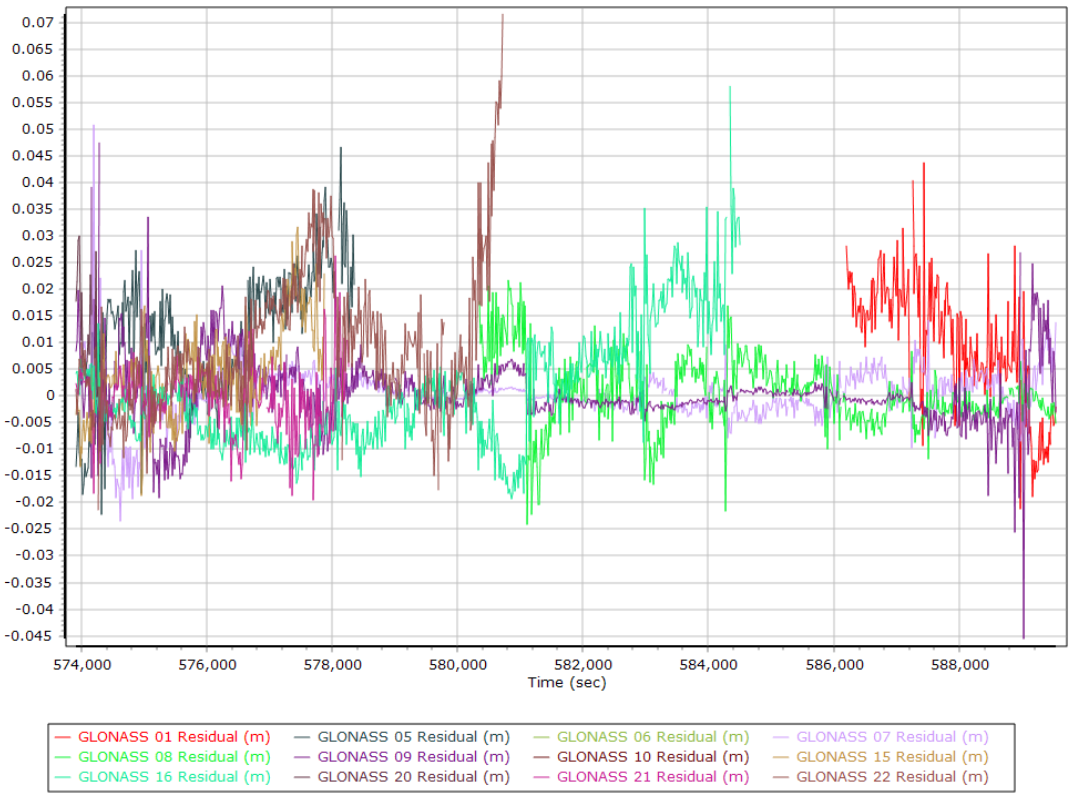
Estimated Position Accuracy



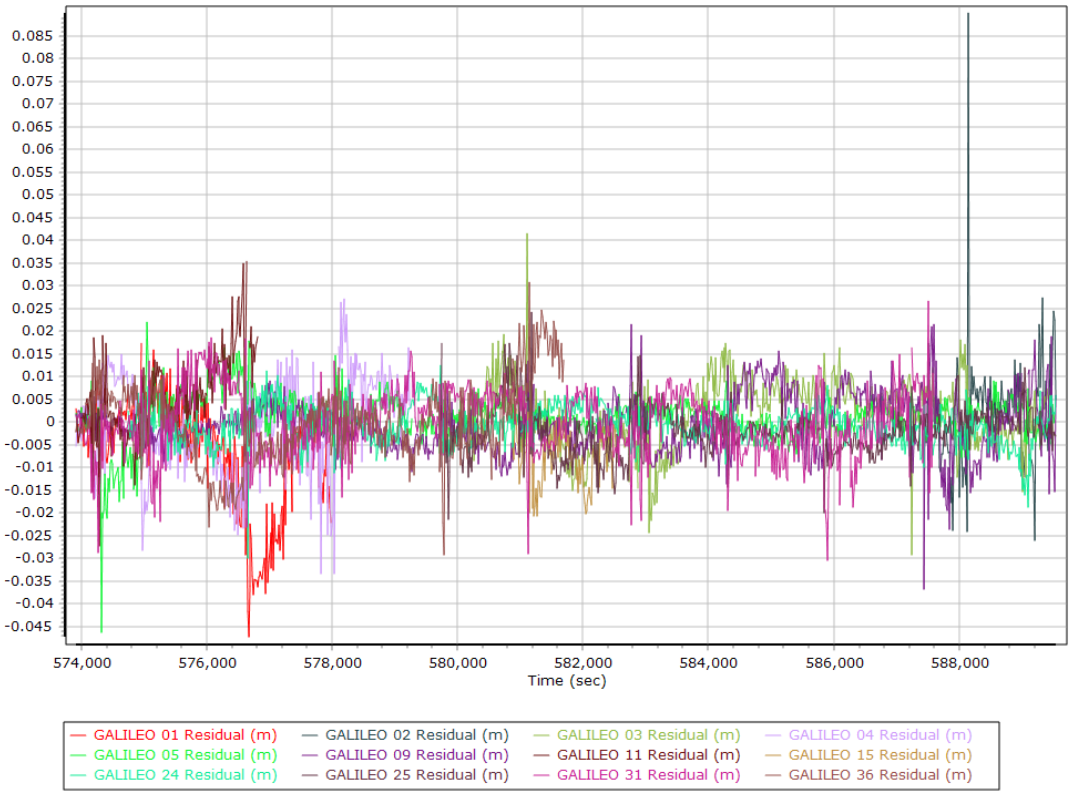
GPS Residuals



GLONASS Residuals



GALILEO Residuals



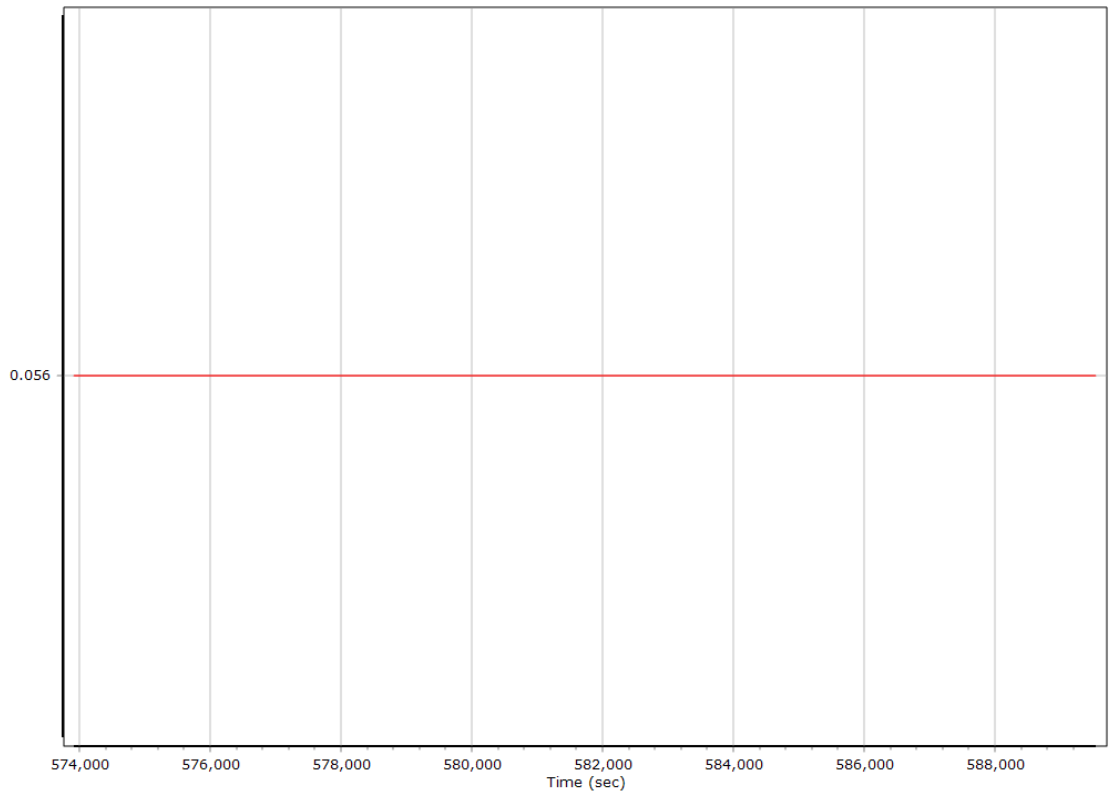
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	573829.000 (12/19/2020 3:23:49 PM)		
Processing end time	589554.000 (12/19/2020 7:45:54 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

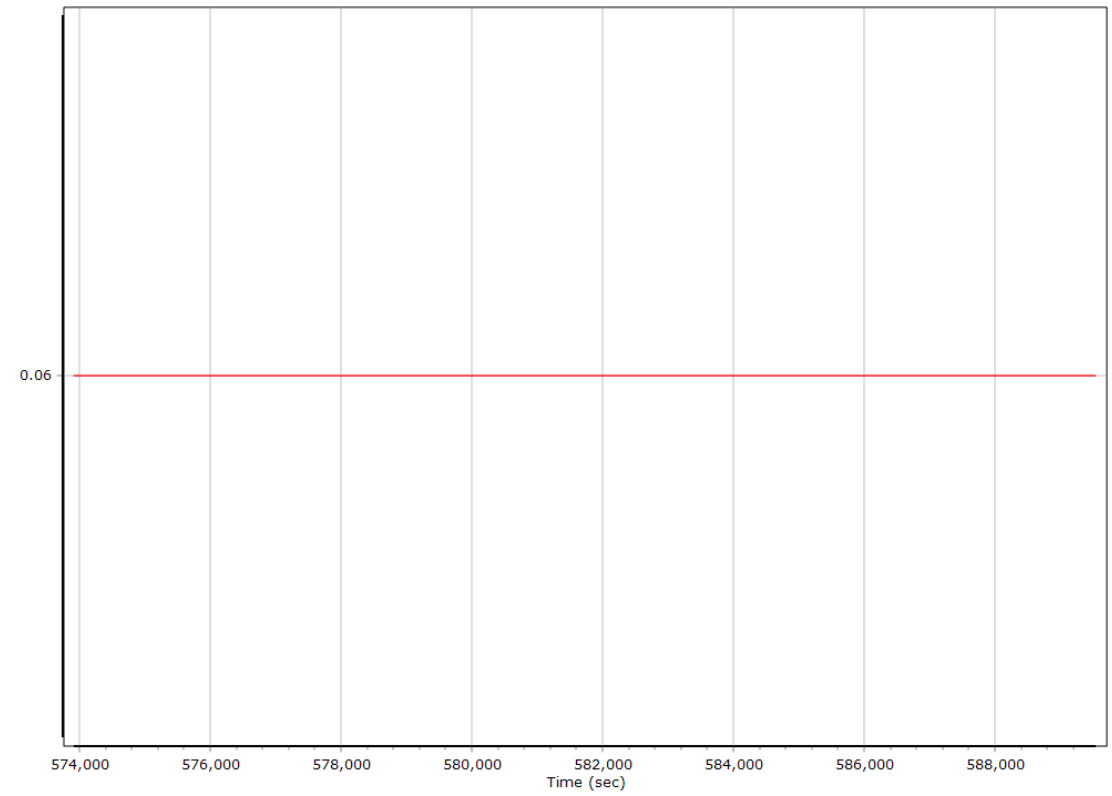
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

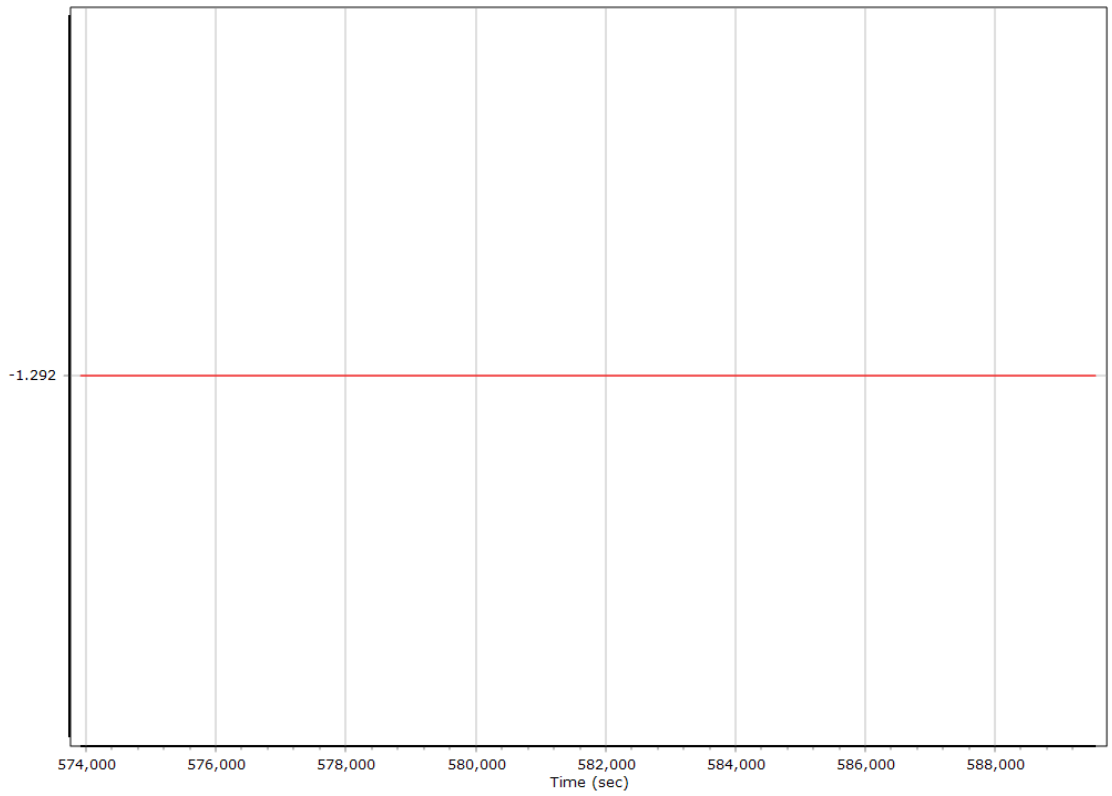
X Reference-Primary GNSS Lever Arm (m)



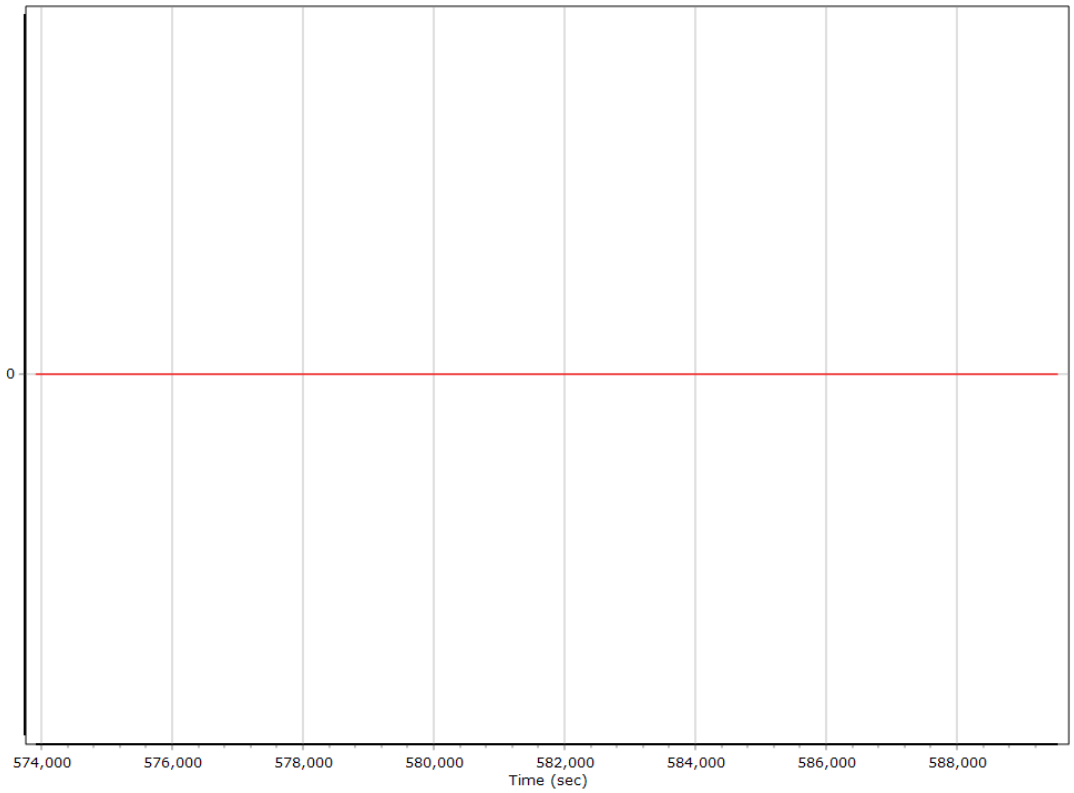
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



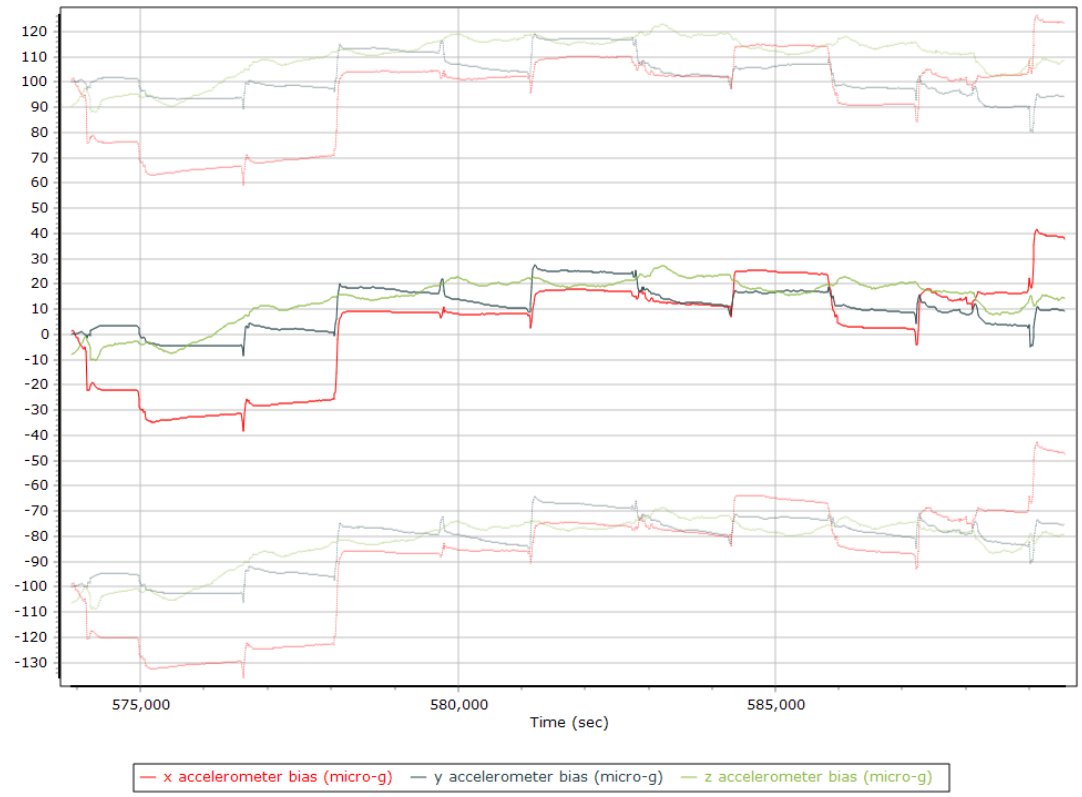
Reference-Primary GNSS Lever Arm Figure of Merit



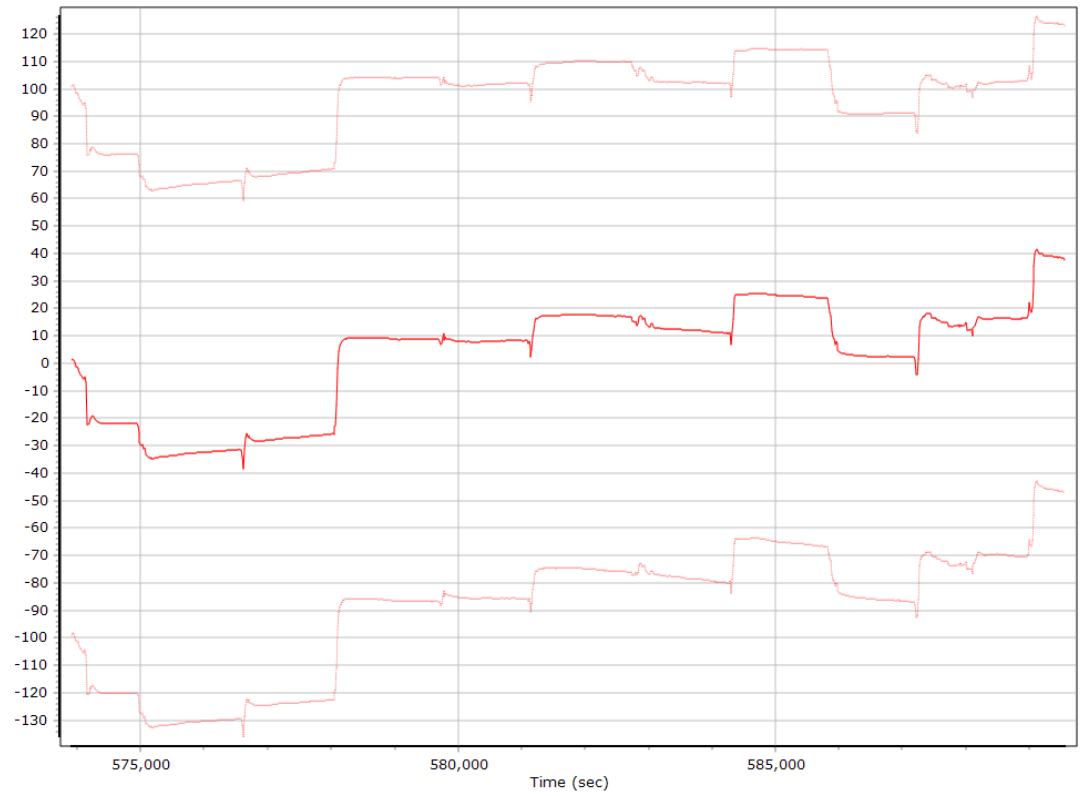
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

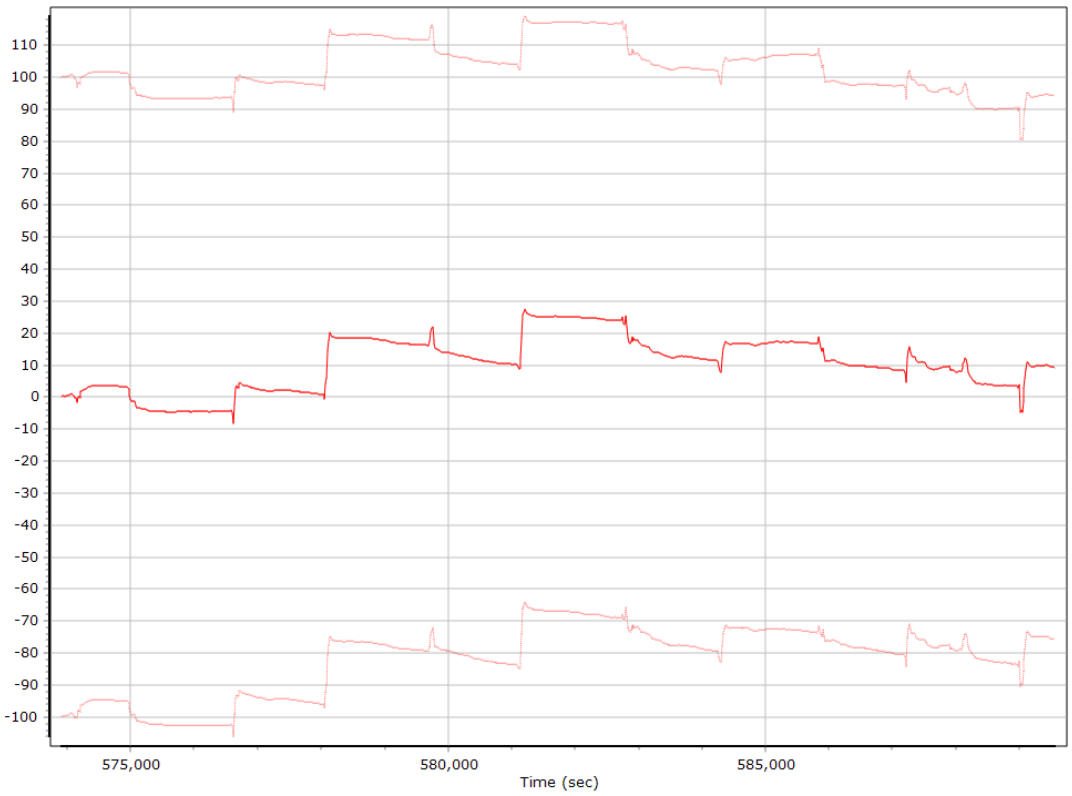
Accelerometer Bias (micro-g)



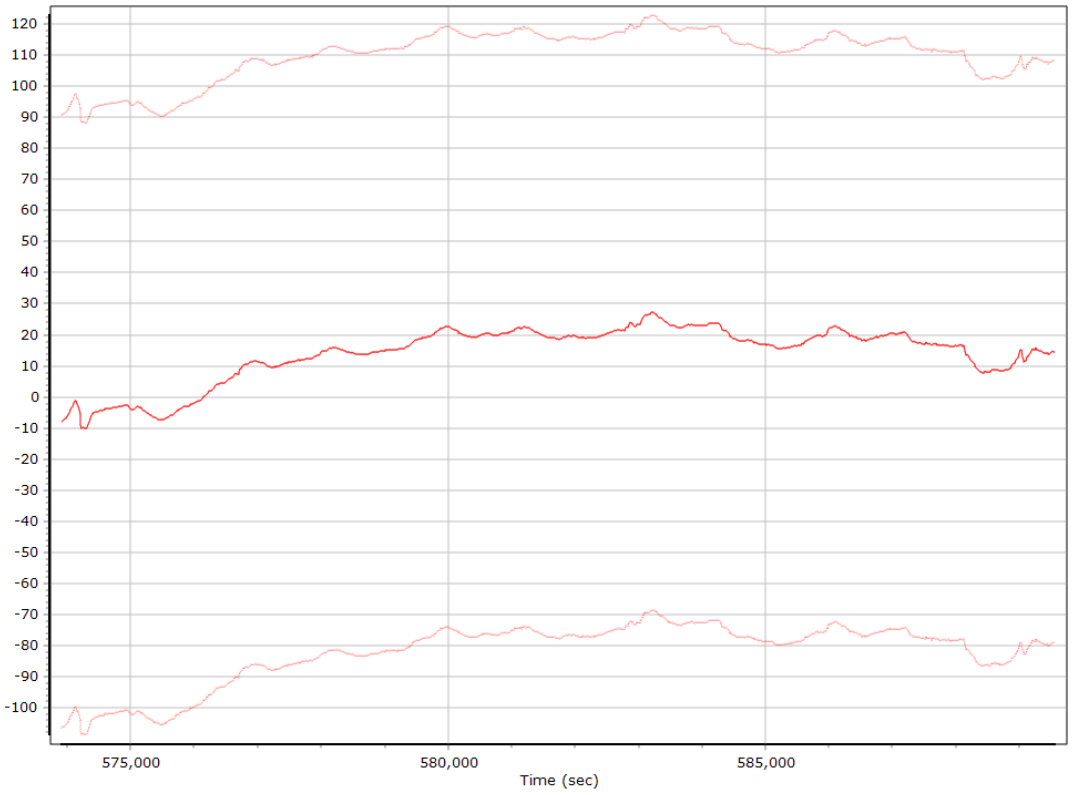
X Accelerometer Bias (micro-g)



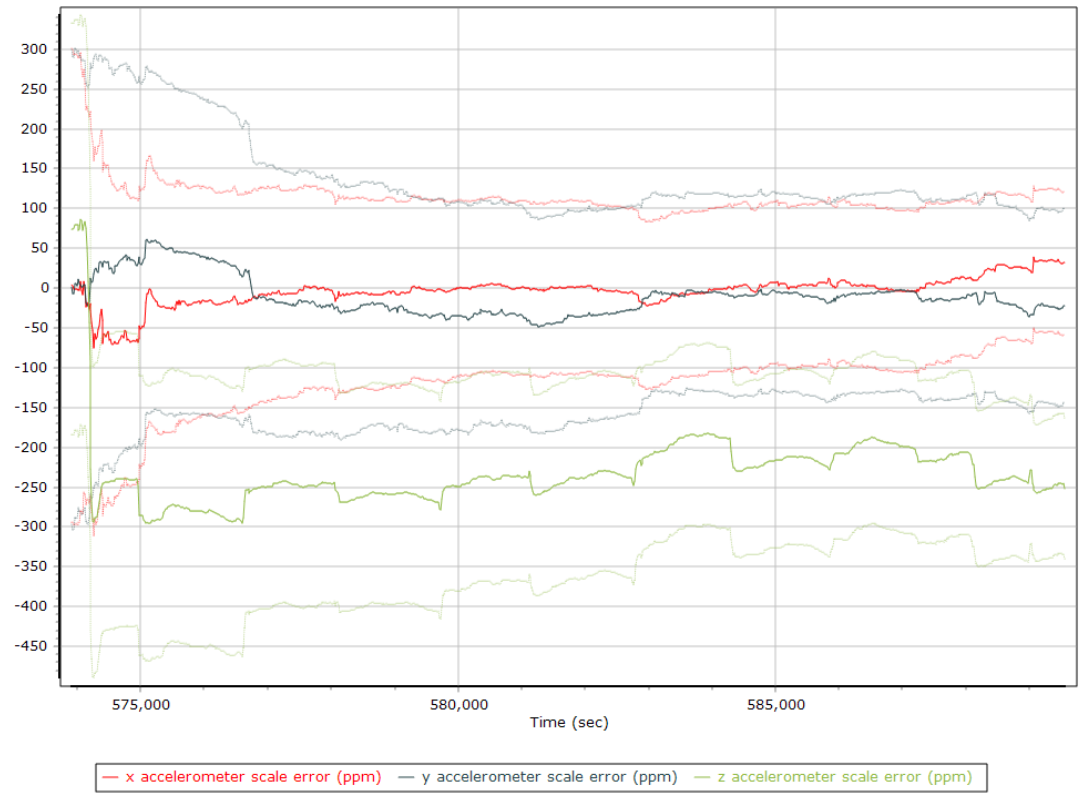
Y Accelerometer Bias (micro-g)



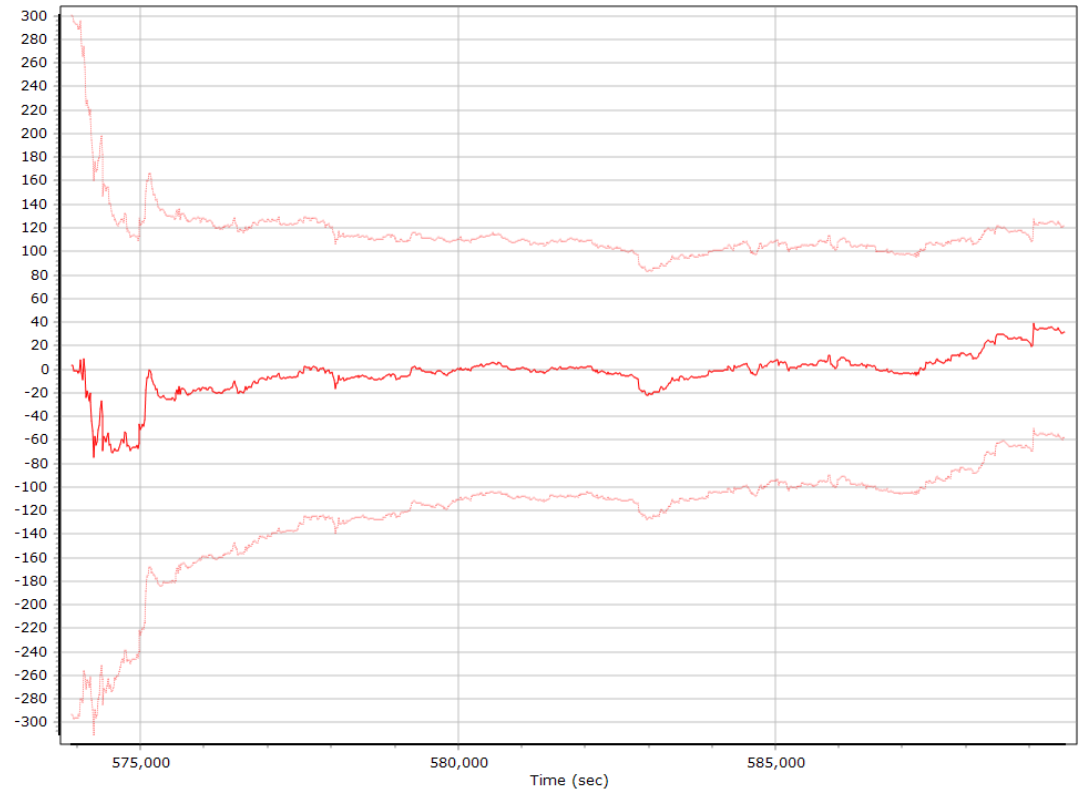
Z Accelerometer Bias (micro-g)



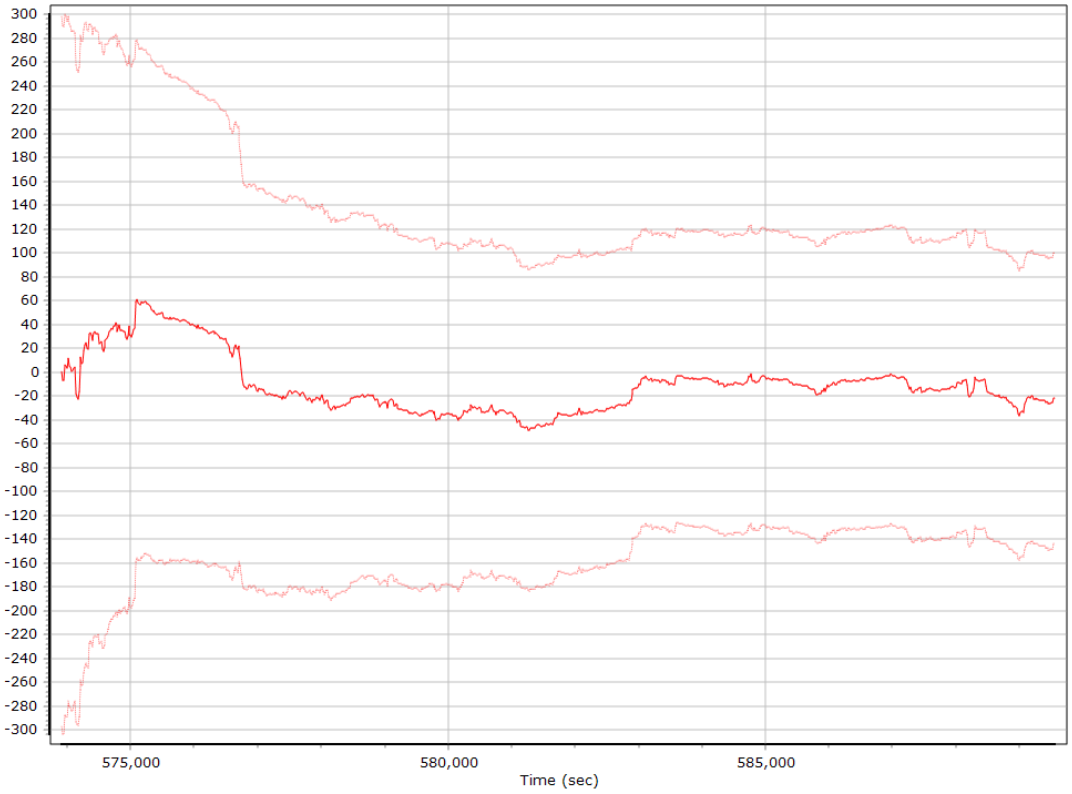
Accelerometer Scale Error (ppm)



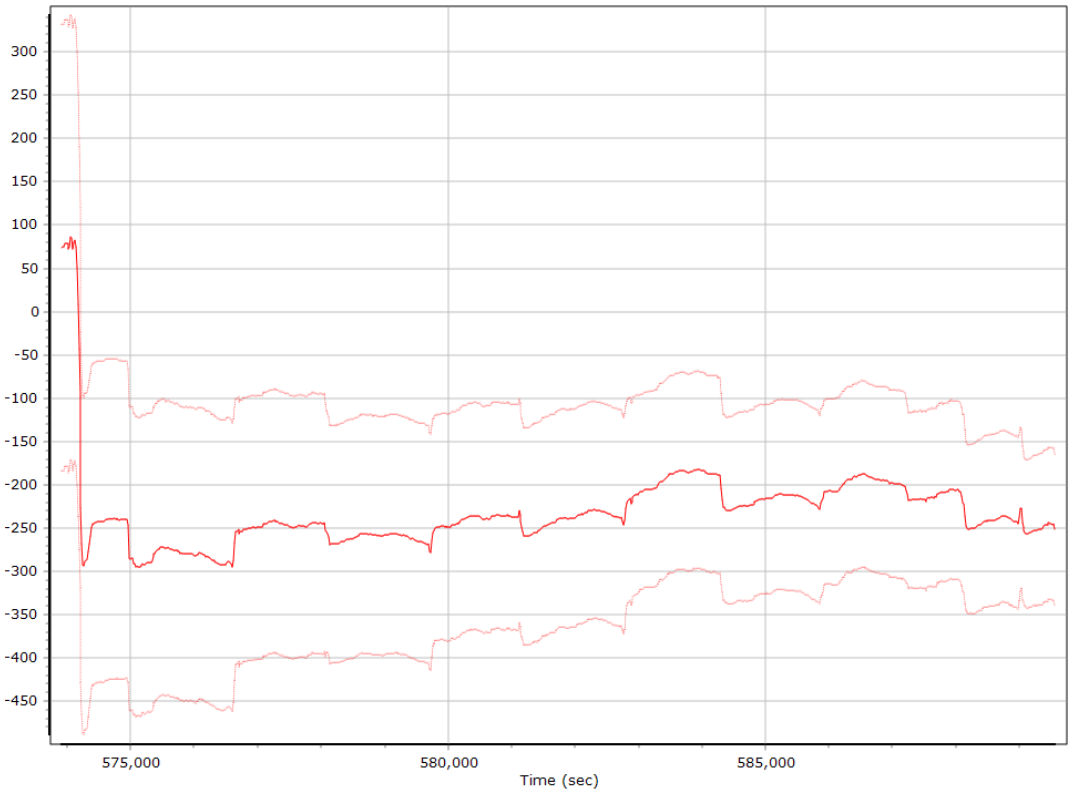
X Accelerometer Scale Error (ppm)



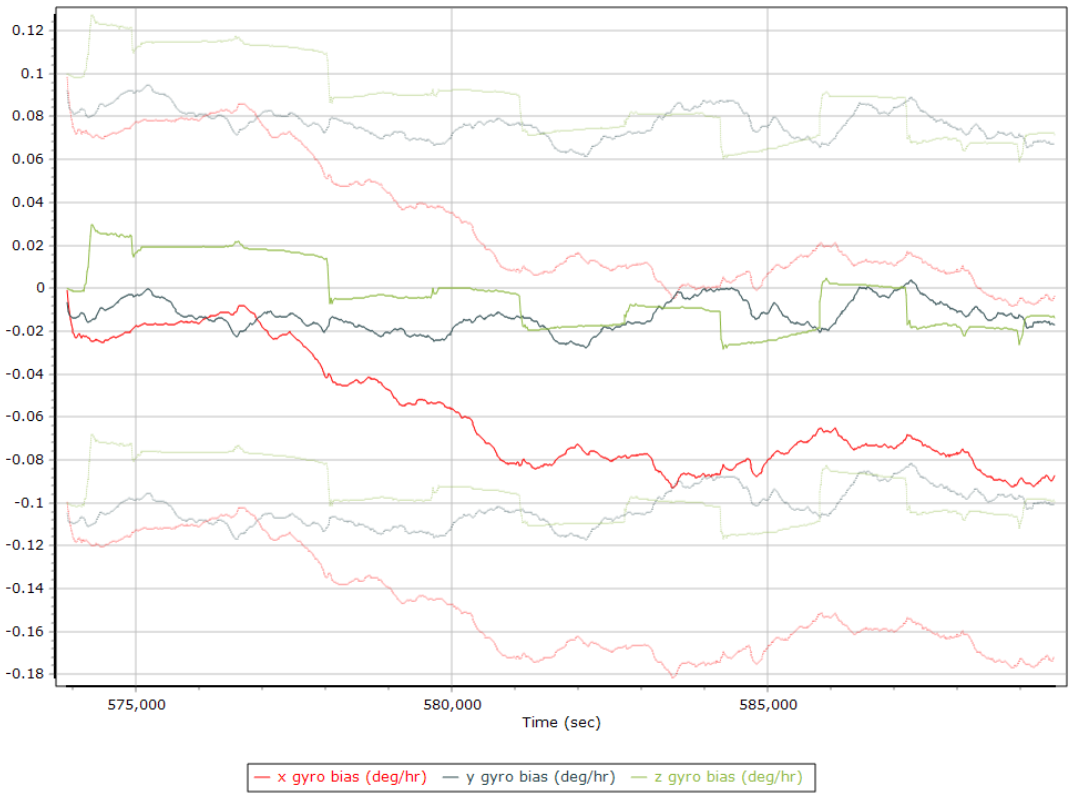
Y Accelerometer Scale Error (ppm)



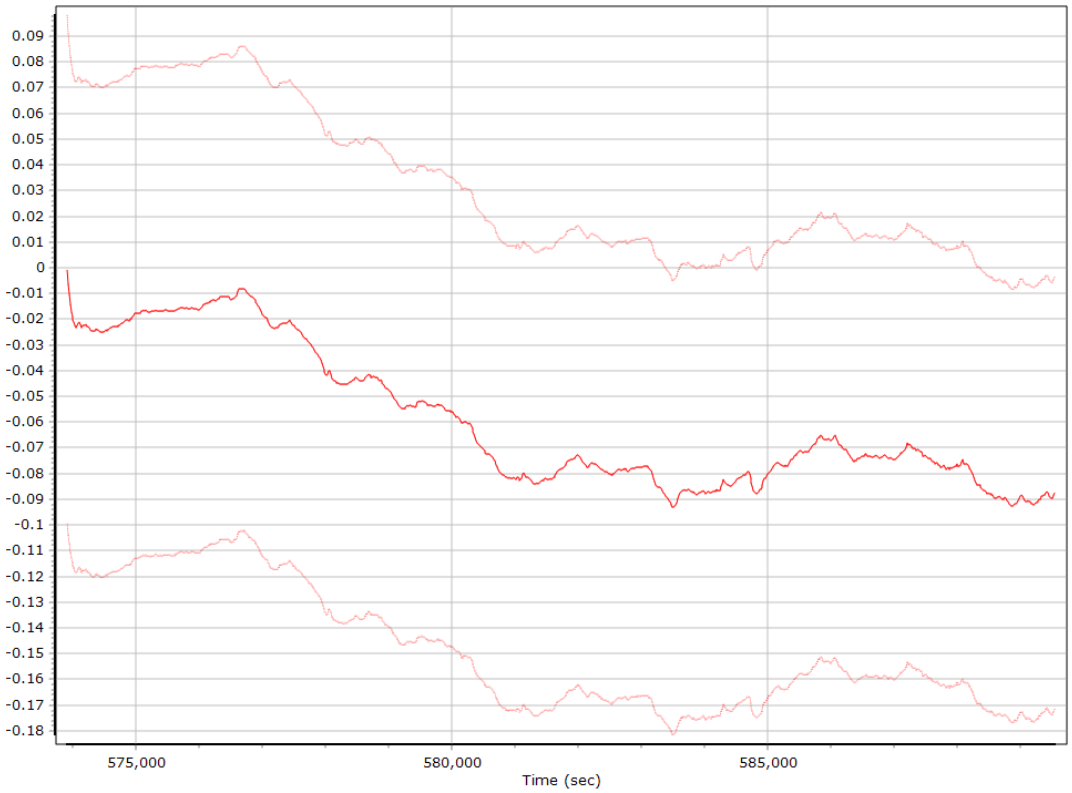
Z Accelerometer Scale Error (ppm)



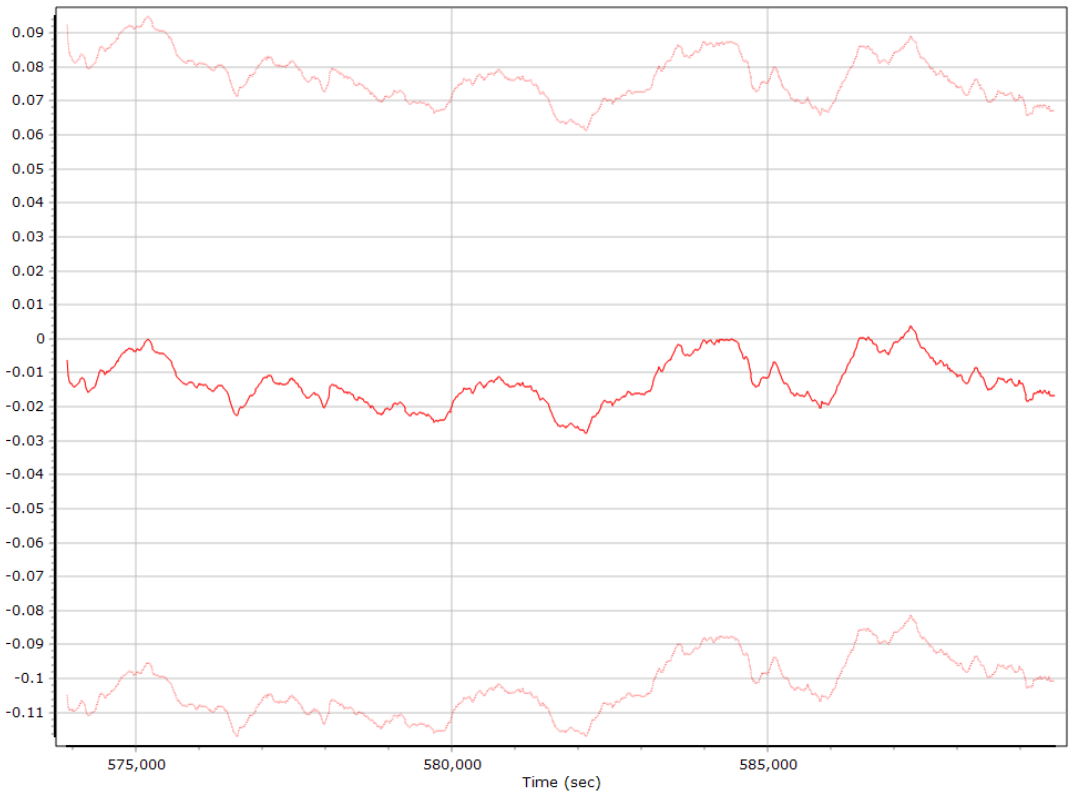
Gyro Bias (deg/h)



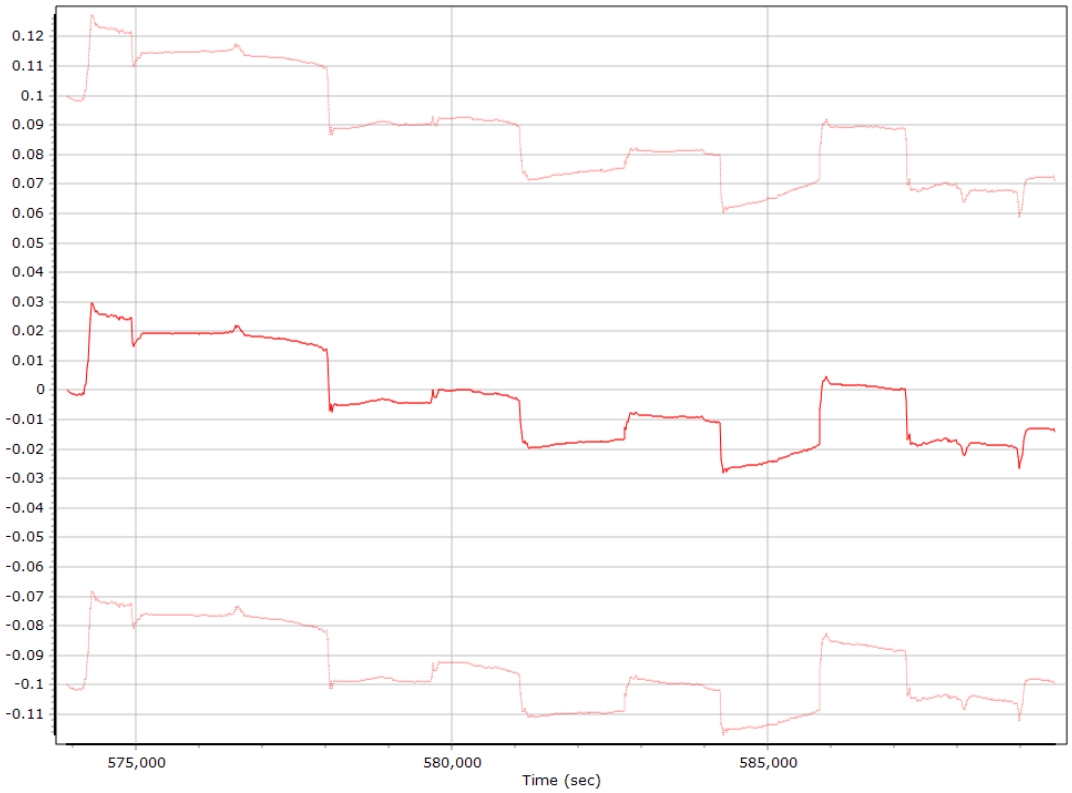
X Gyro Bias (deg/h)



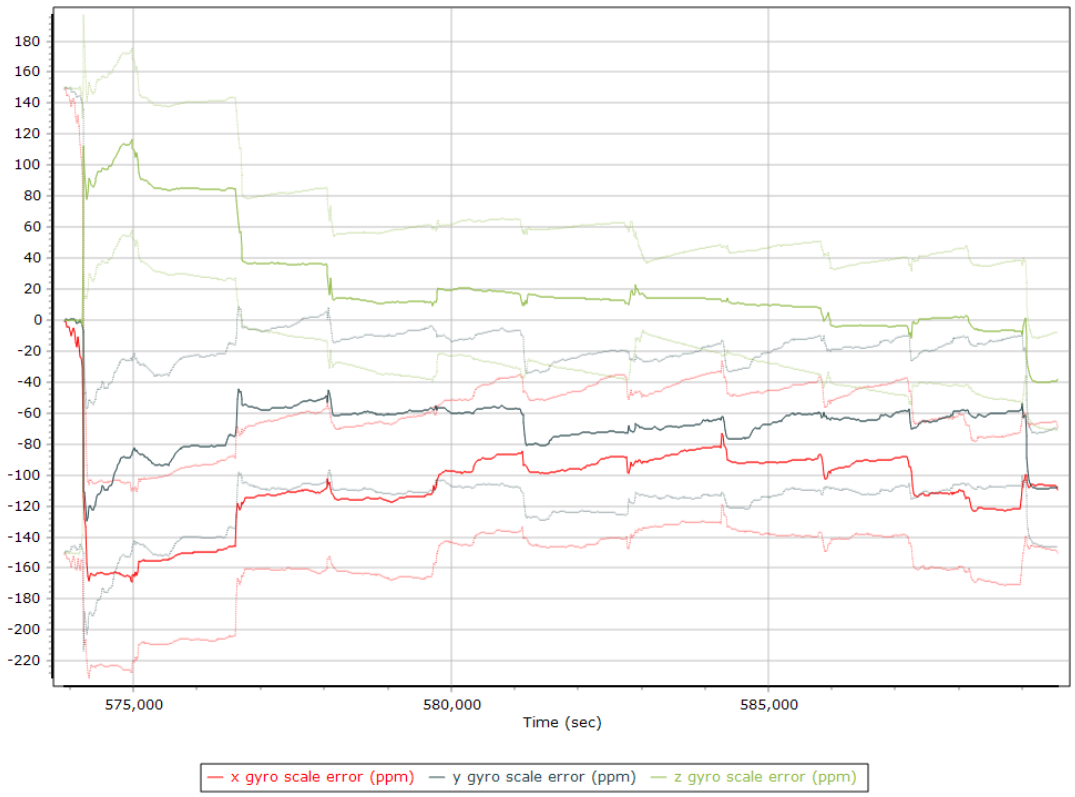
Y Gyro Bias (deg/h)



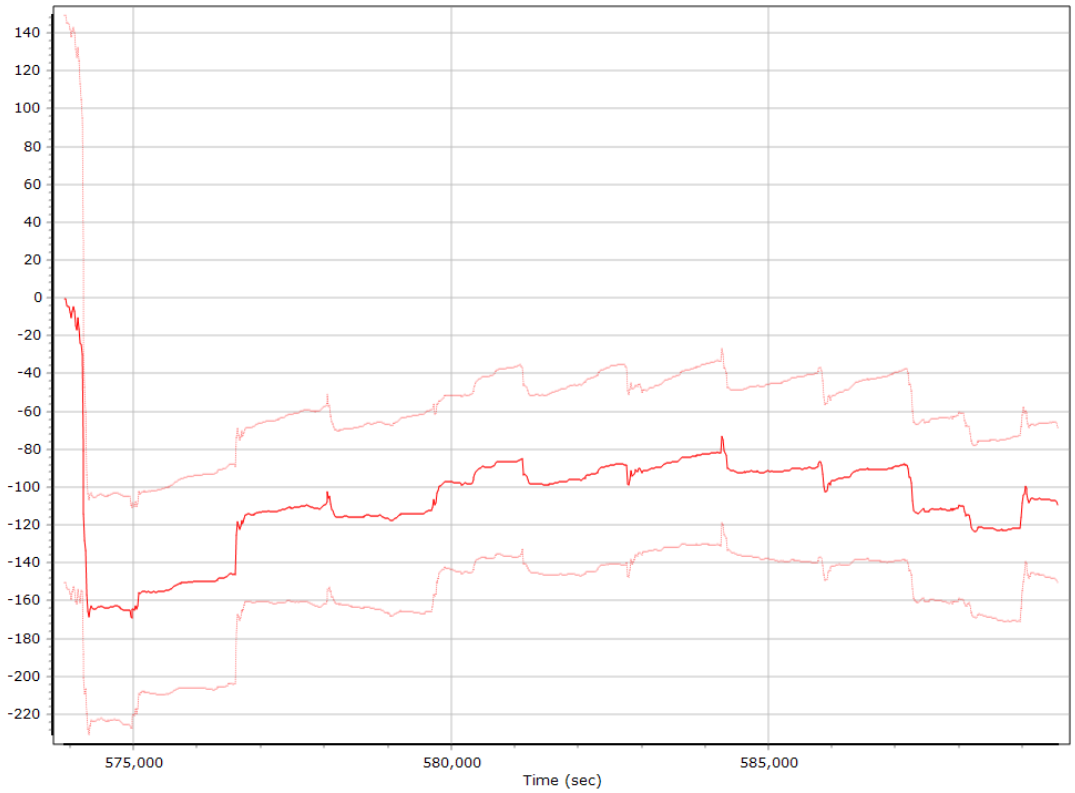
Z Gyro Bias (deg/h)



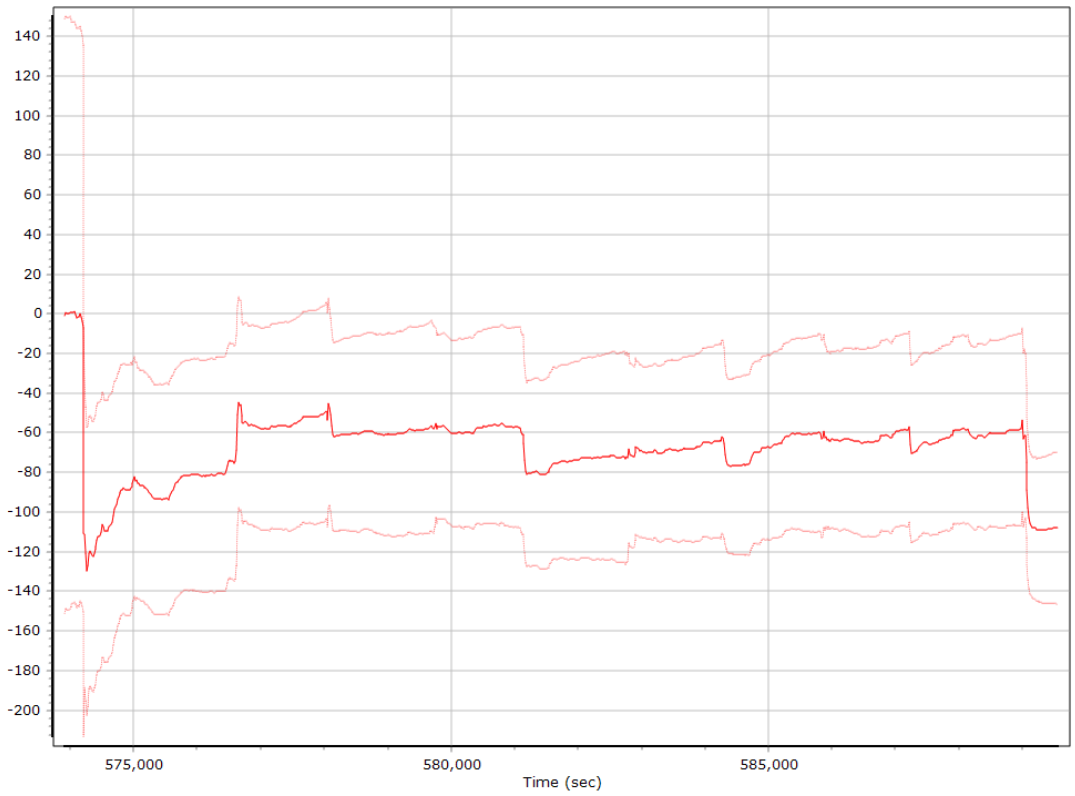
Gyro Scale Error (ppm)



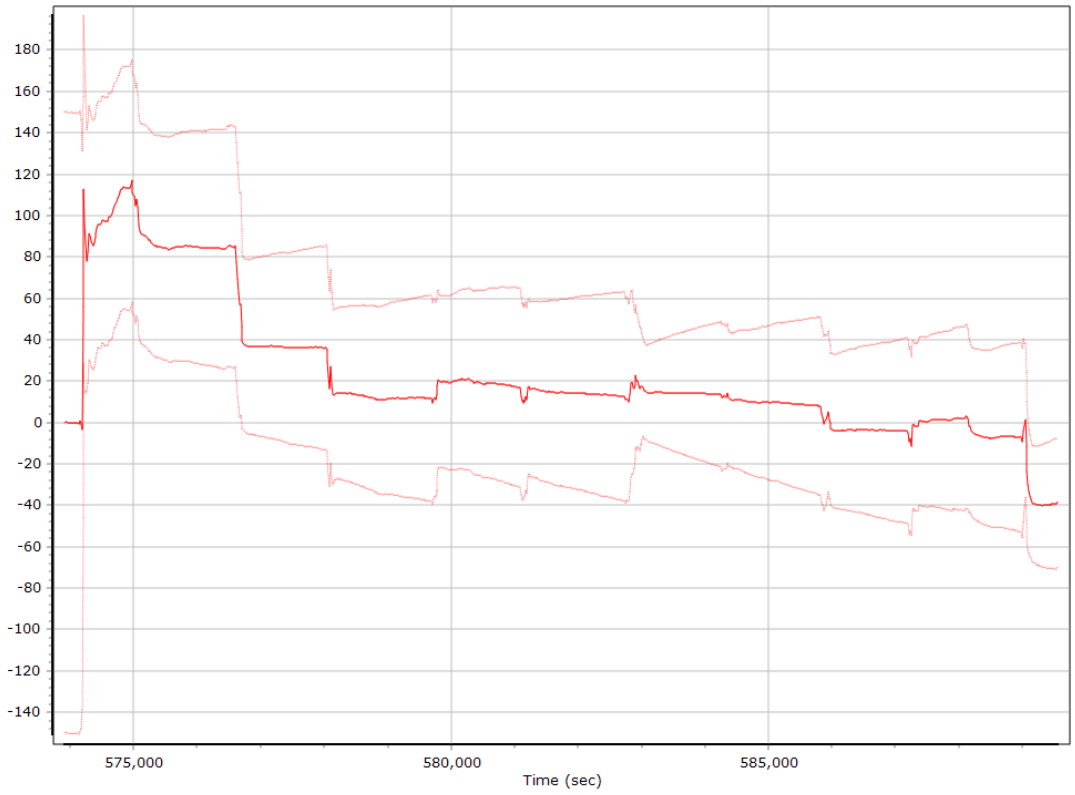
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

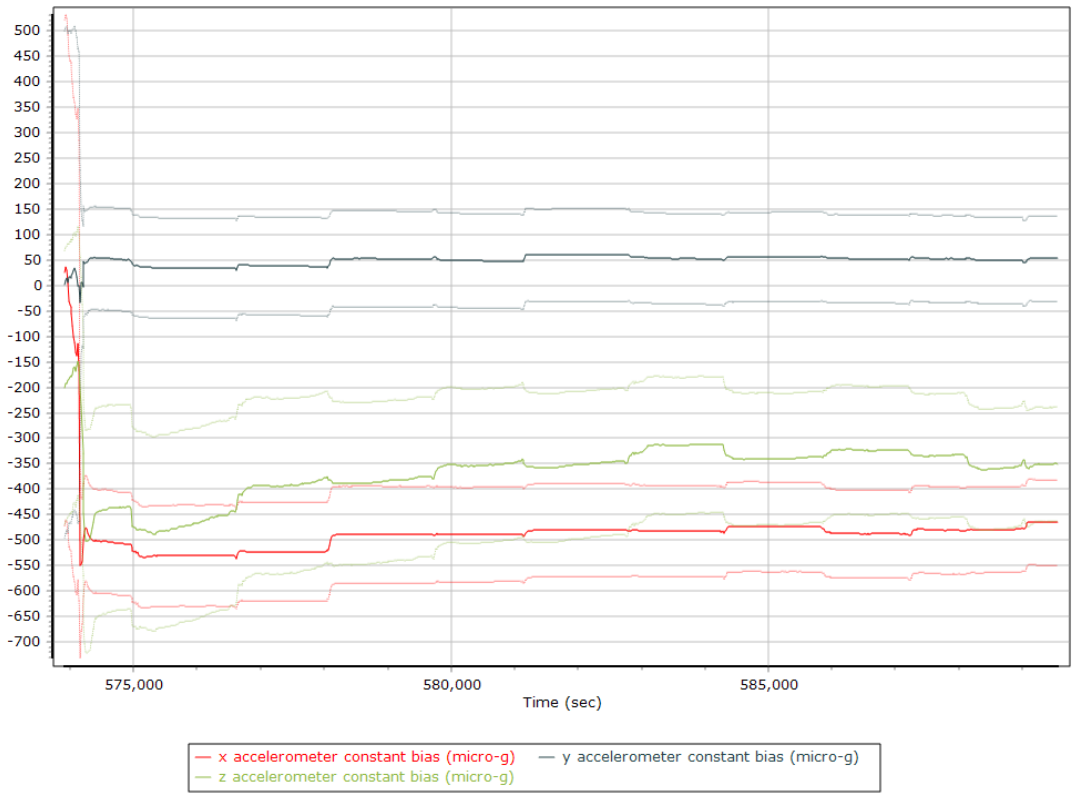


Z Gyro Scale Error (ppm)

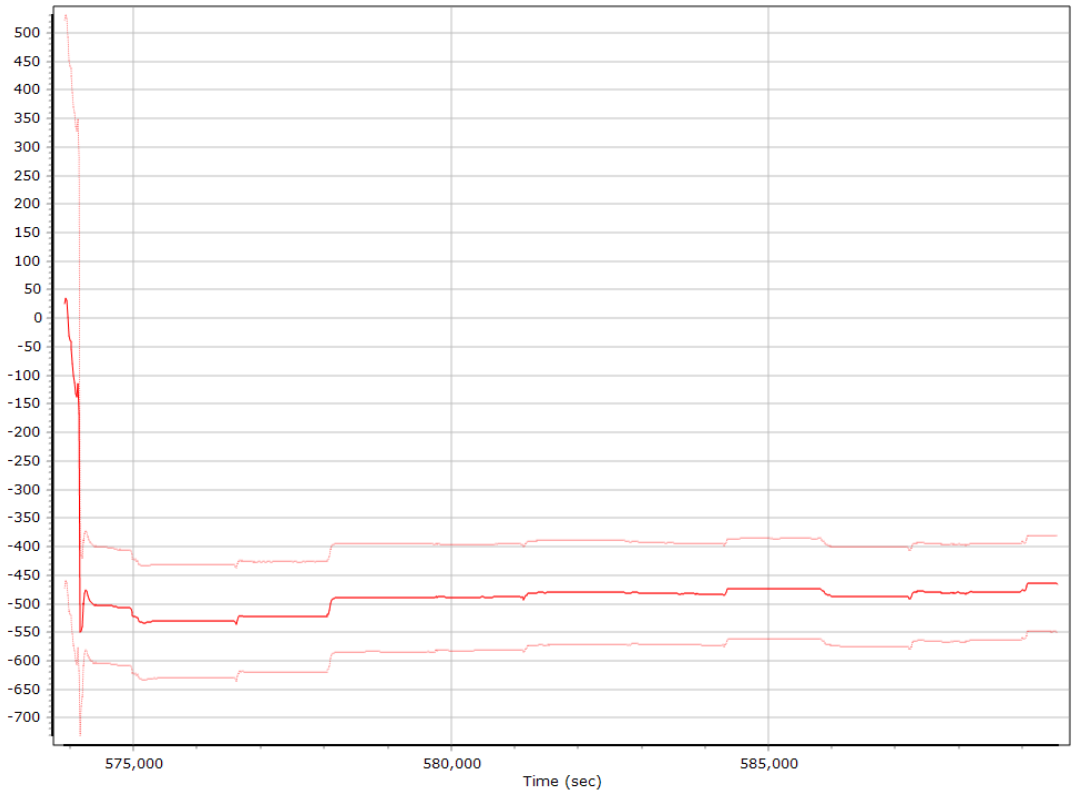


Forward Processed Estimated Constant Errors, Reference Frame

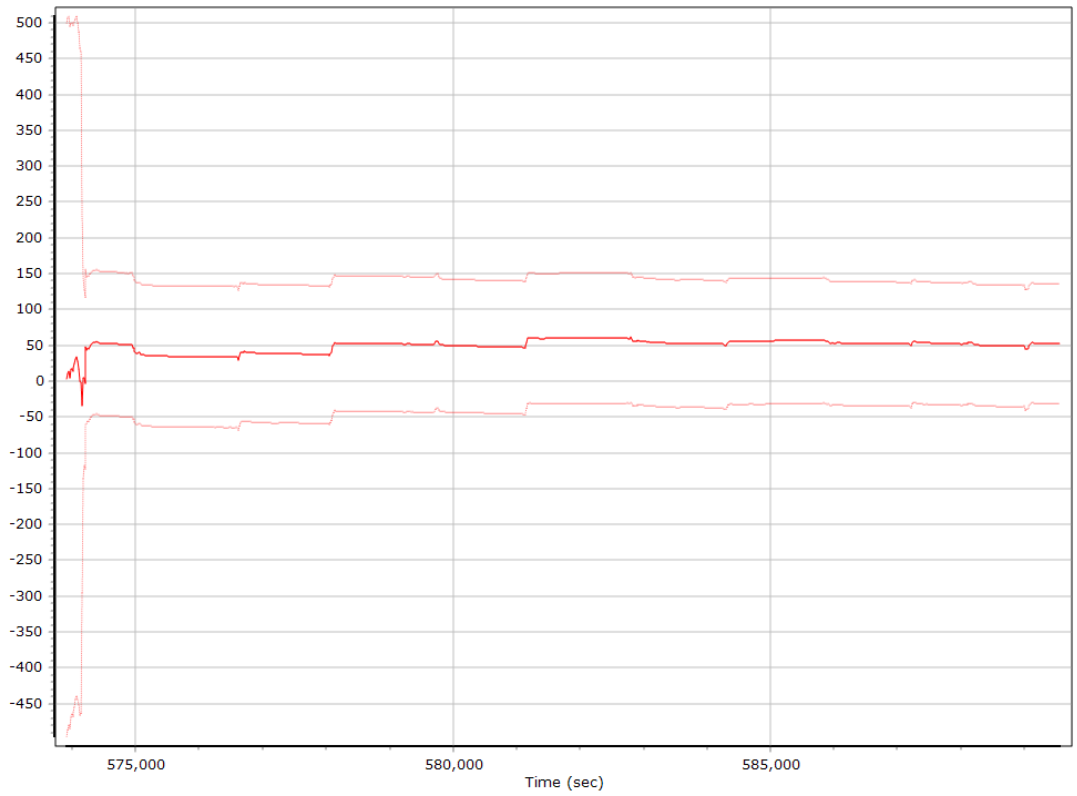
Accelerometer Bias (micro-g)



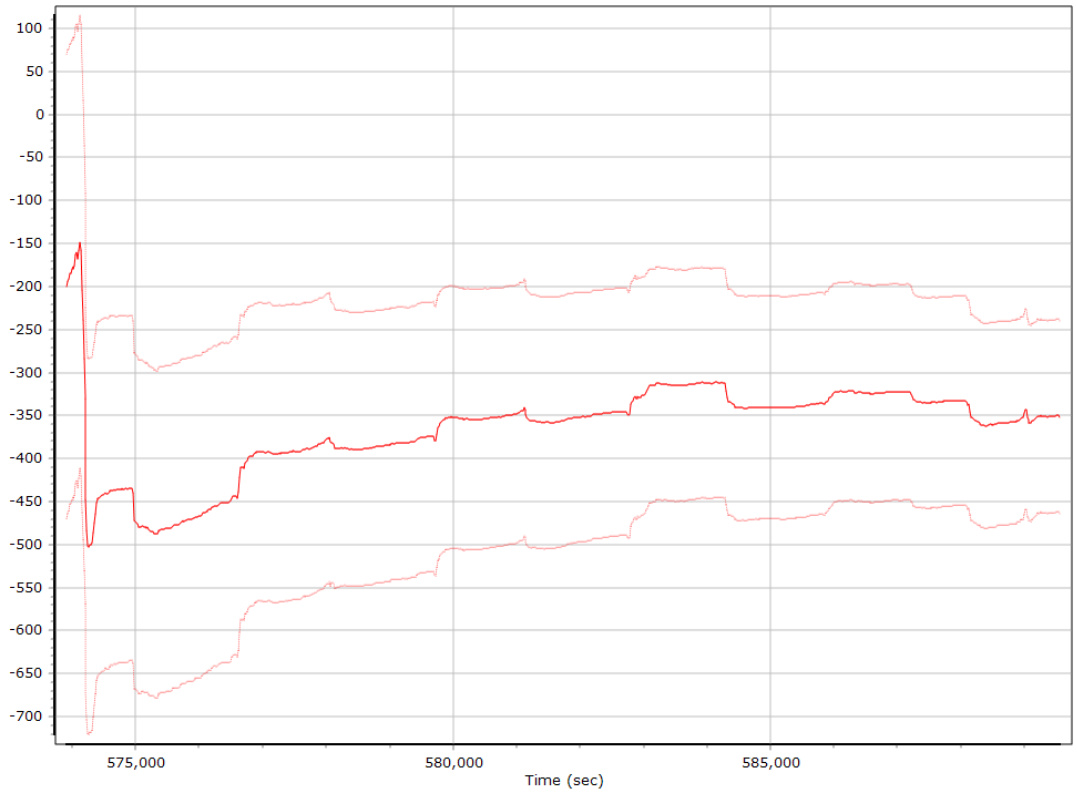
X Accelerometer Bias (micro-g)



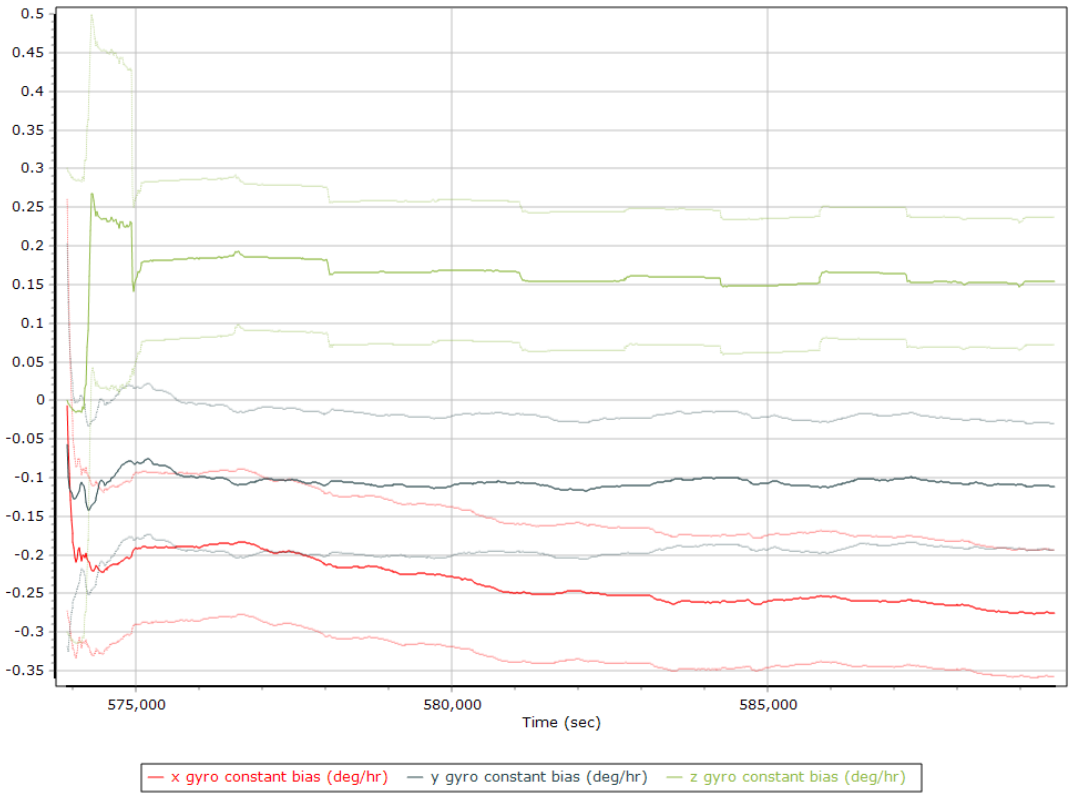
Y Accelerometer Bias (micro-g)



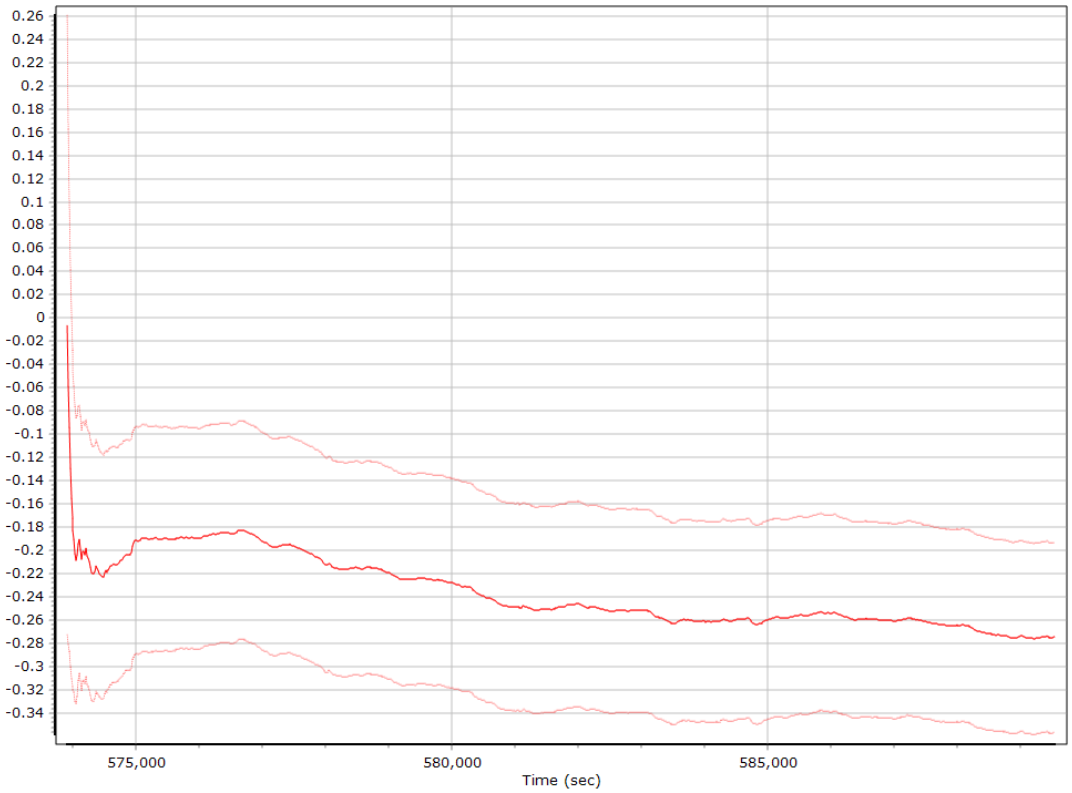
Z Accelerometer Bias (micro-g)



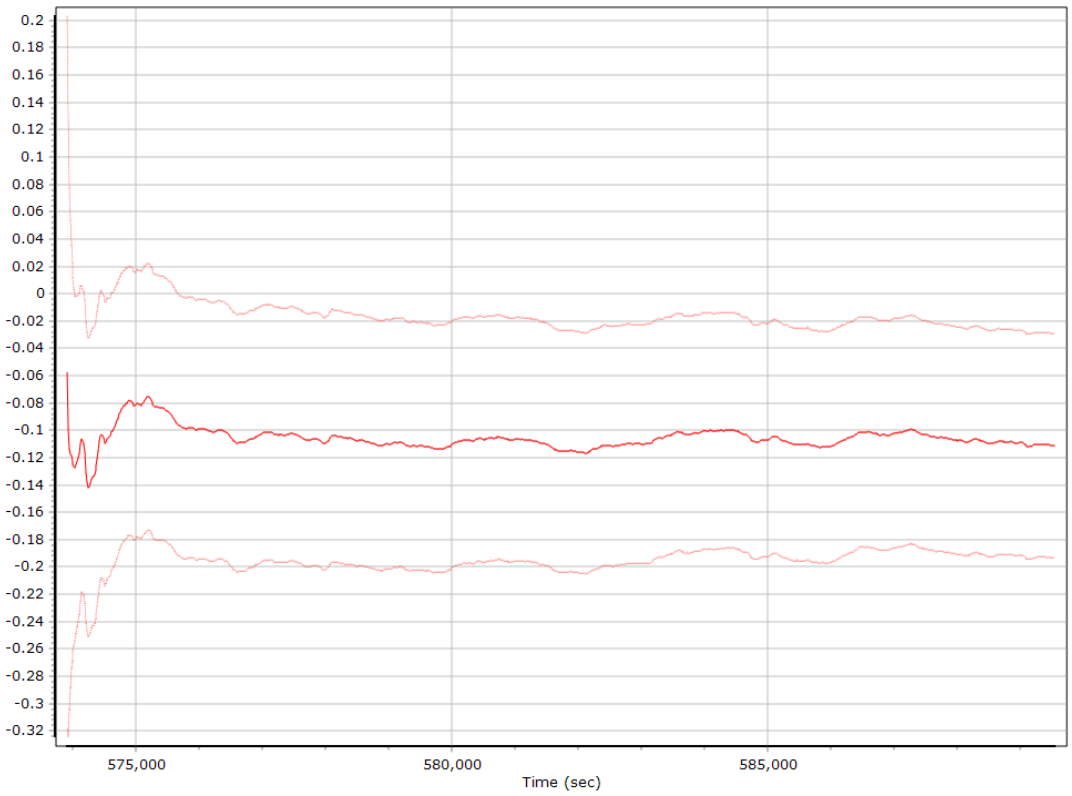
Gyro Bias (deg/h)



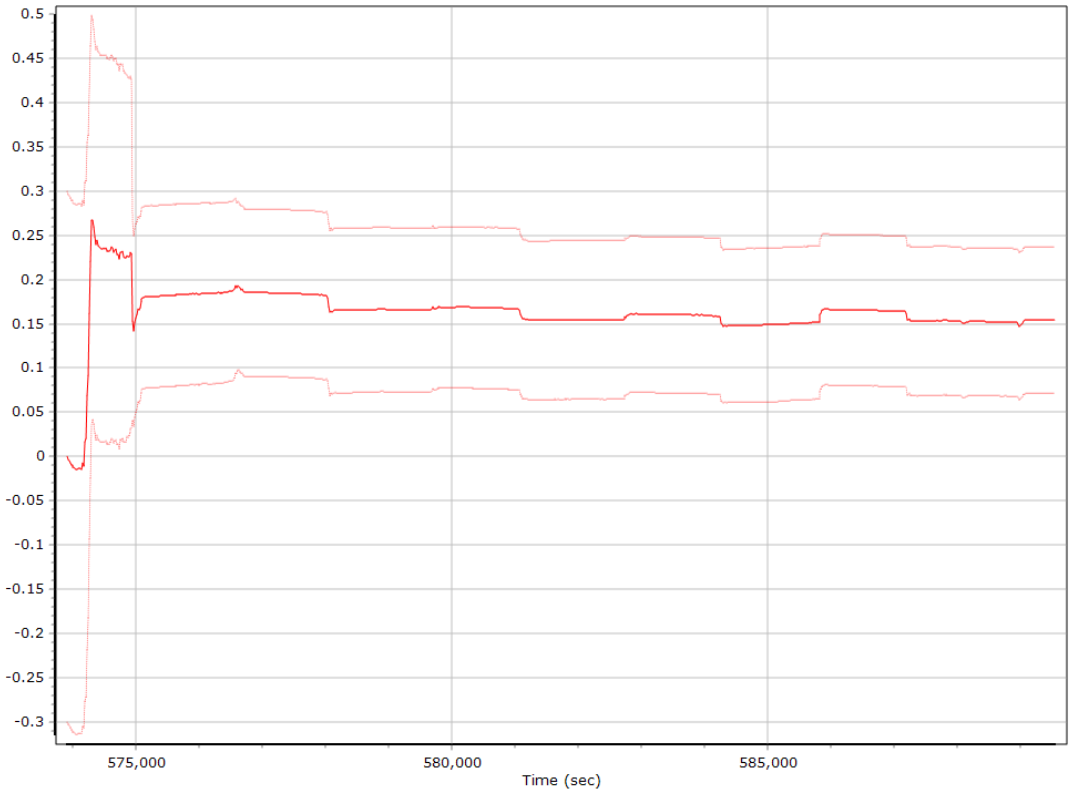
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

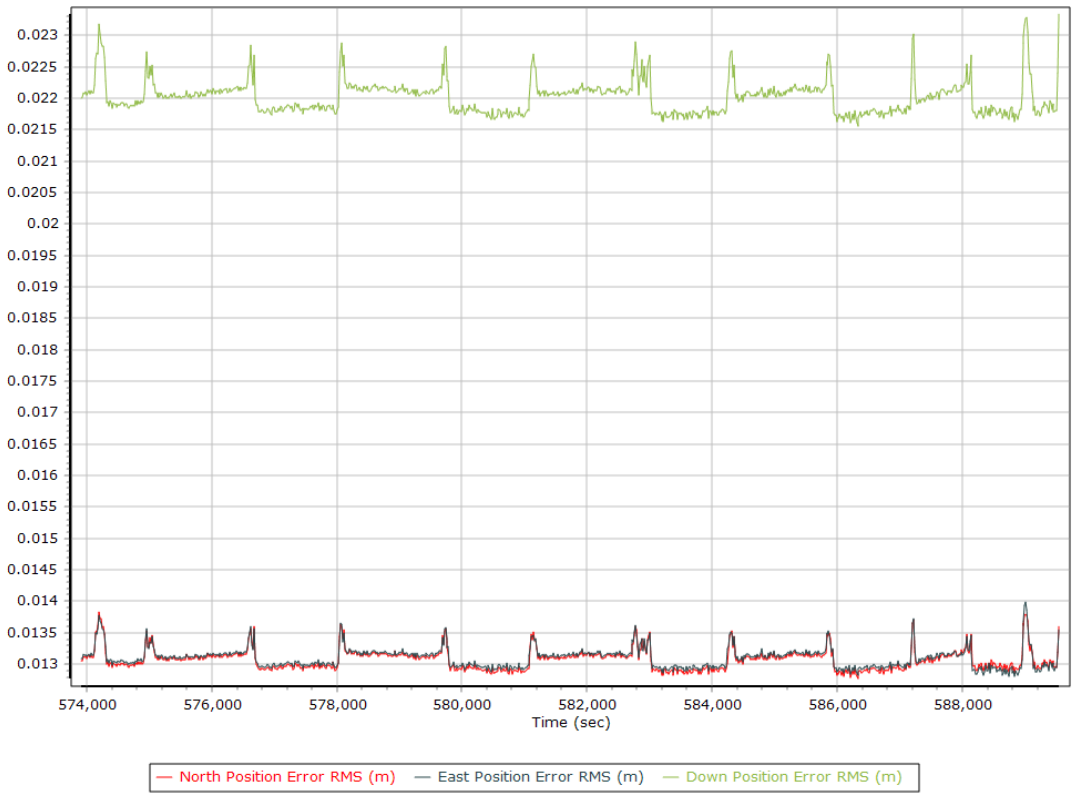


Z Gyro Bias (deg/h)



Smoothed Performance Metrics

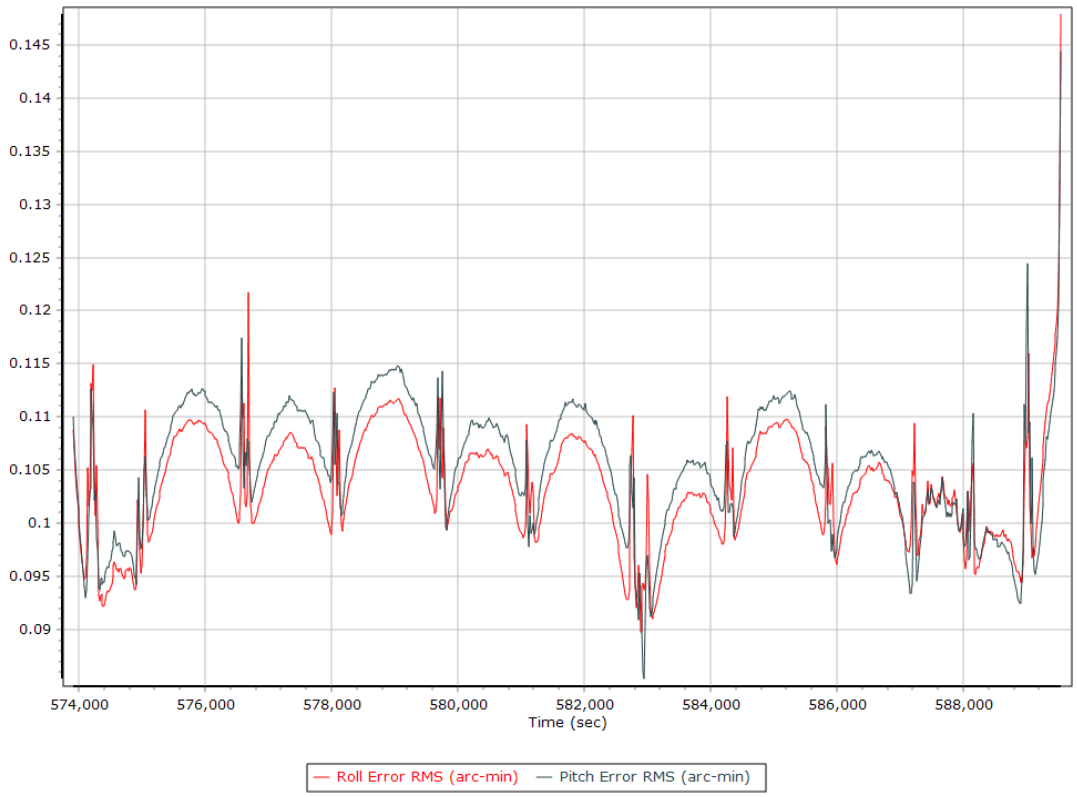
Position Error RMS (m)



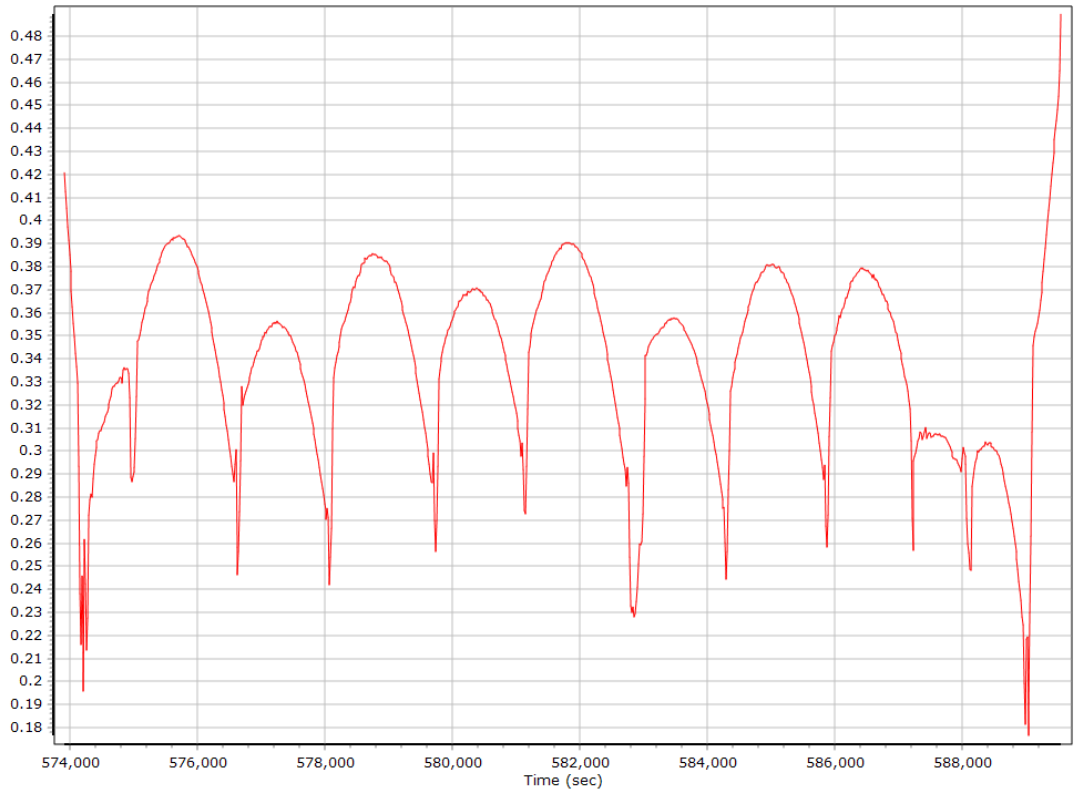
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)



Heading Error RMS (arc-min)

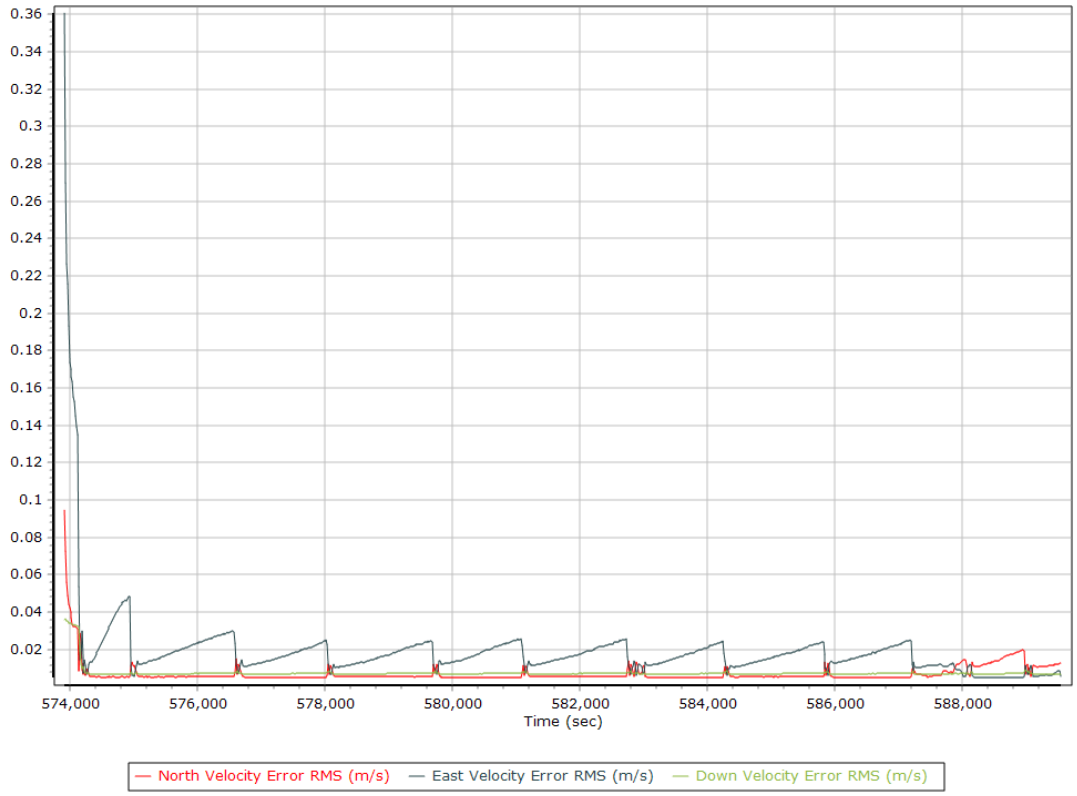


Forward Processed Performance Metrics

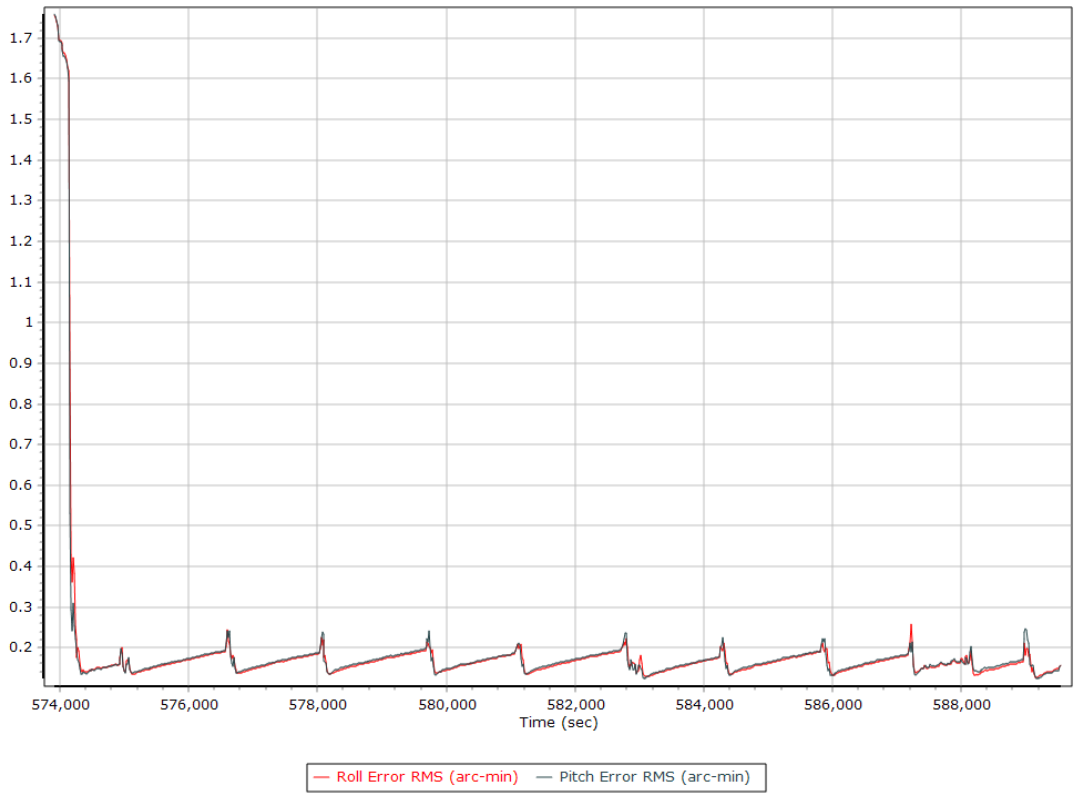
Position Error RMS (m)



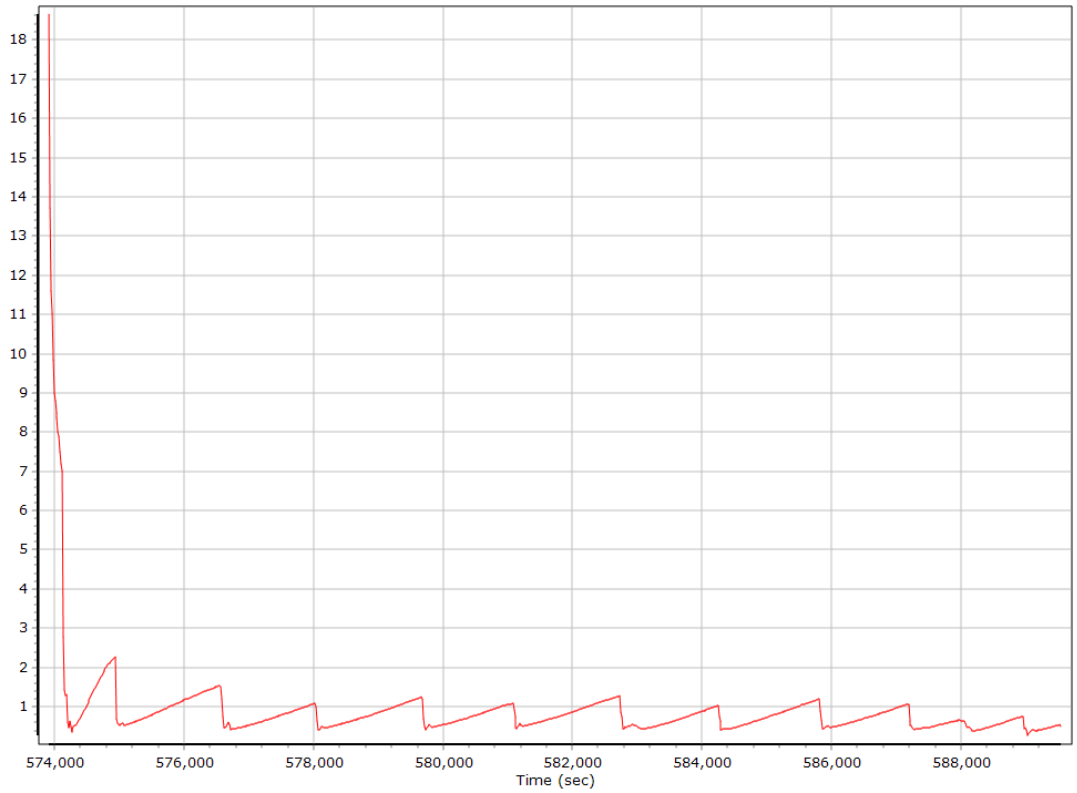
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

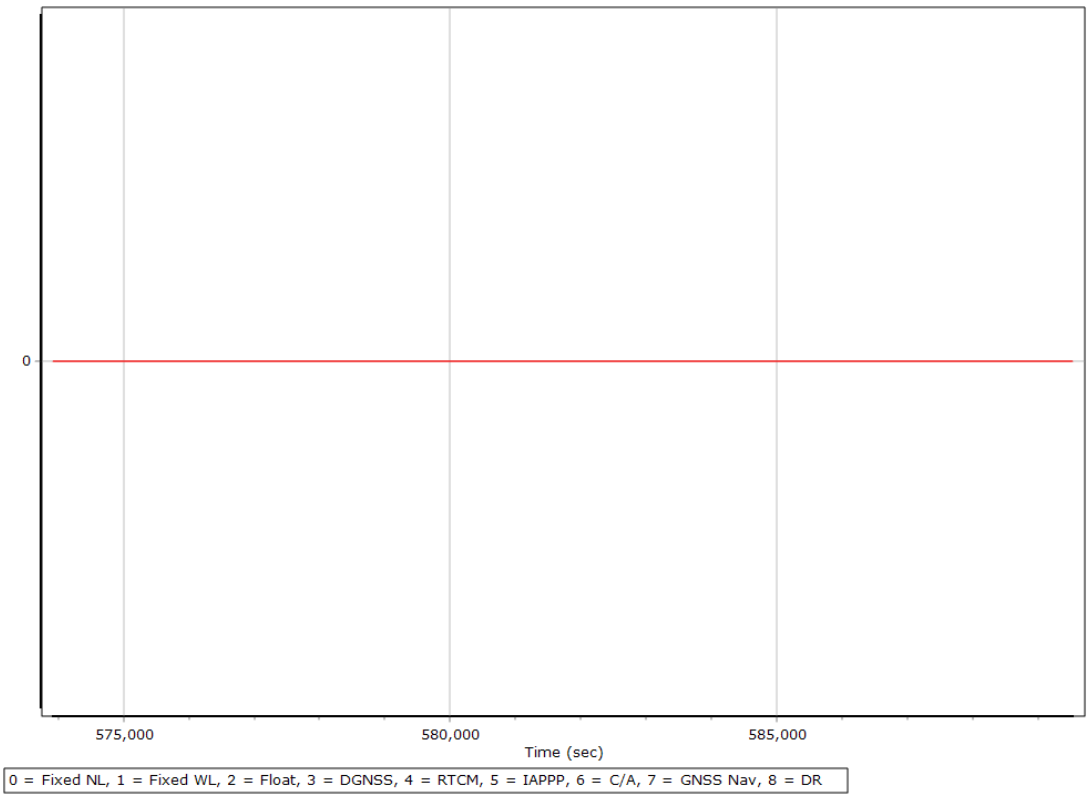


Heading Error RMS (arc-min)

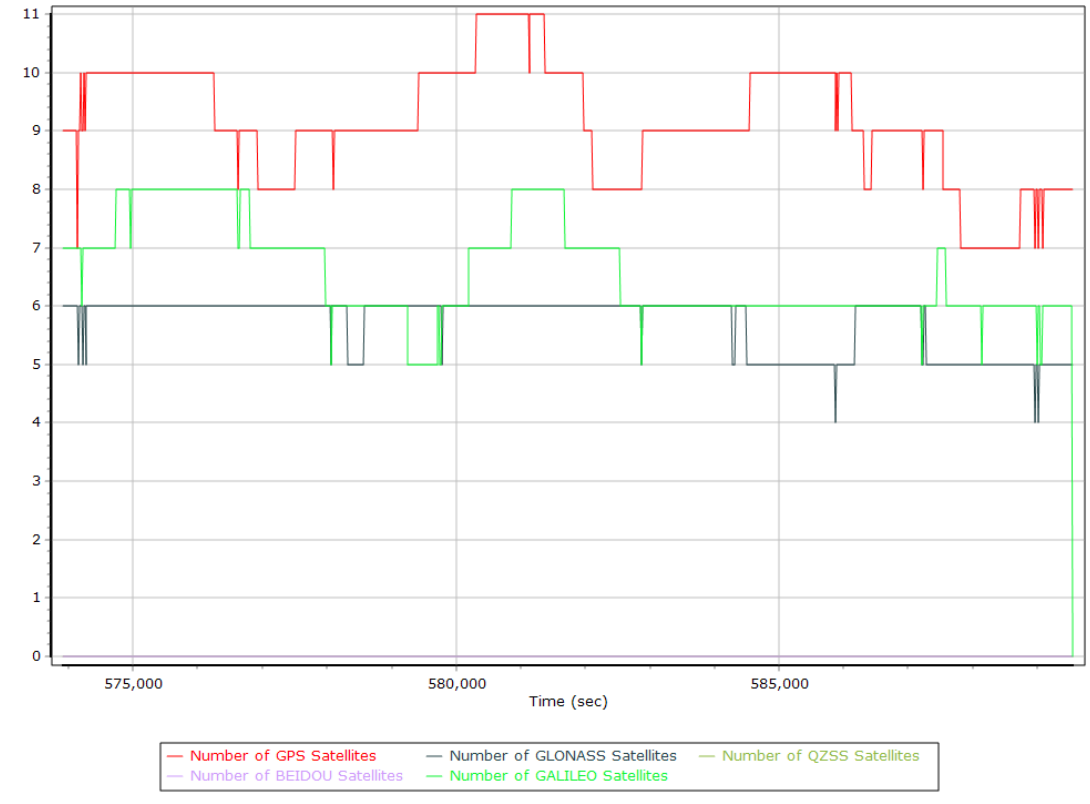


Forward Processed Solution Status

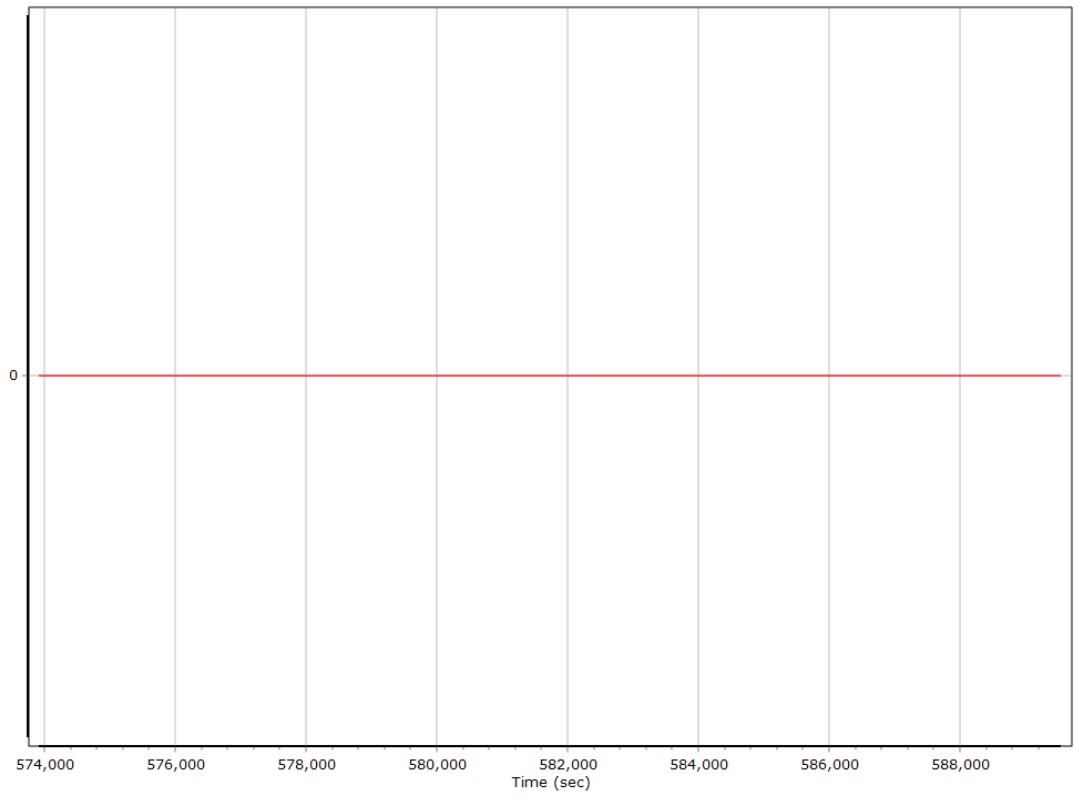
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12212020A_4040
Processing date	2022-01-05 15:12:32
Mission date	2020-12-21 19:22:42
Mission duration	04:12:14.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201221_192223_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3560.20g	GLONASS Broadcast Ephemeris
Ephm3560.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12212020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201221_192223_INS-GPS_1.raw		
Last raw data file	201221_192223_INS-GPS_1.raw		
Start GPS week	2137		
Start time	156143.053 (12/21/2020 7:22:23 PM)		
End time	171278.712 (12/21/2020 11:34:38 PM)		
Start of fine alignment	156394.799 (12/21/2020 7:26:34 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

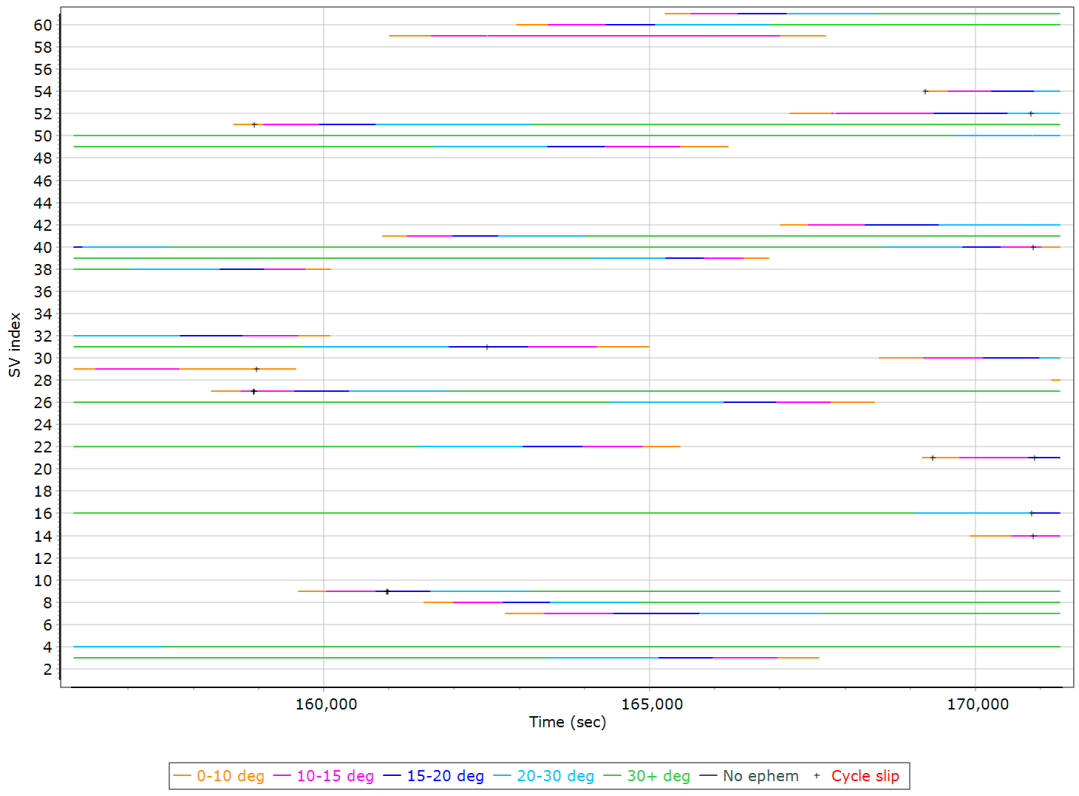
Rover Data QC

Raw IMU Import QC Summary

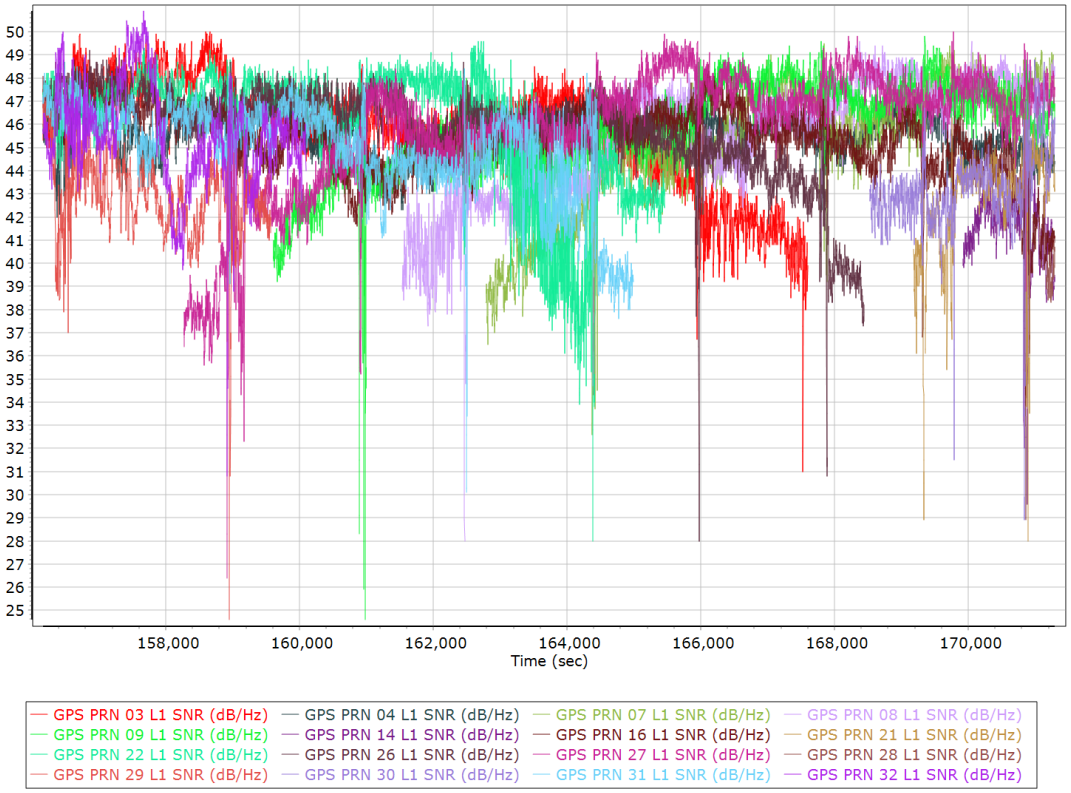
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12212020A_4040.log
IMU Records Processed	3026682
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

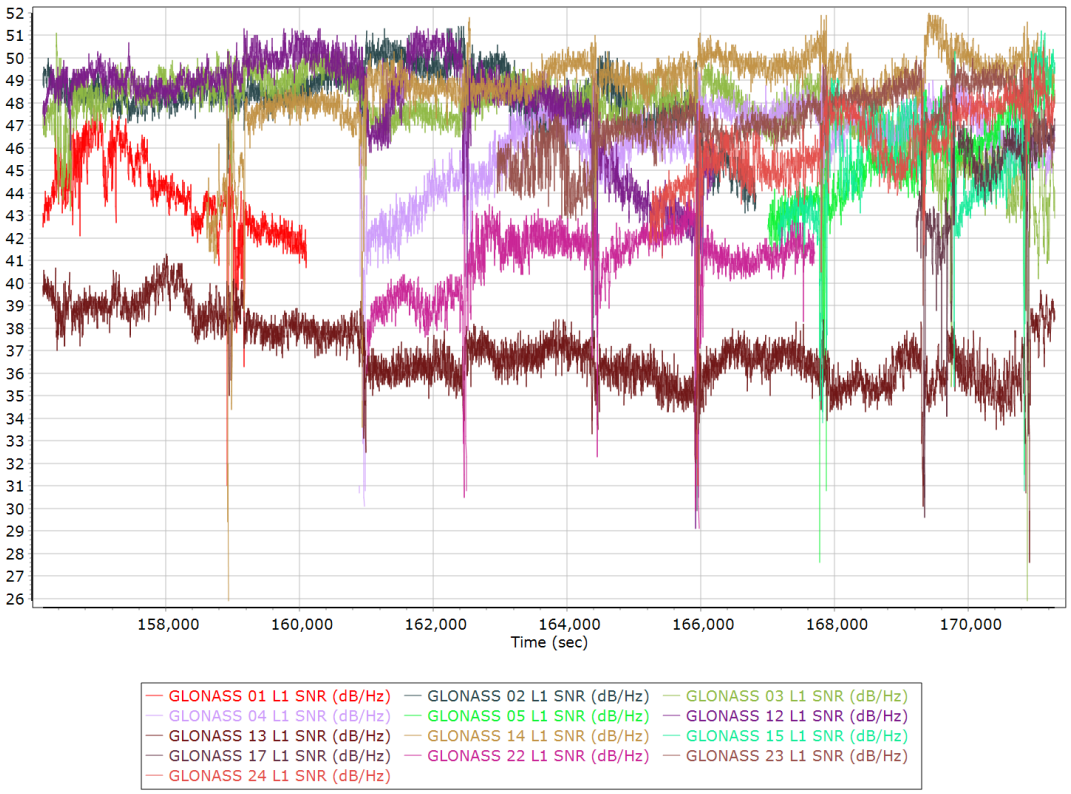
GPS/GLONASS L1 Satellite Lock/Elevation



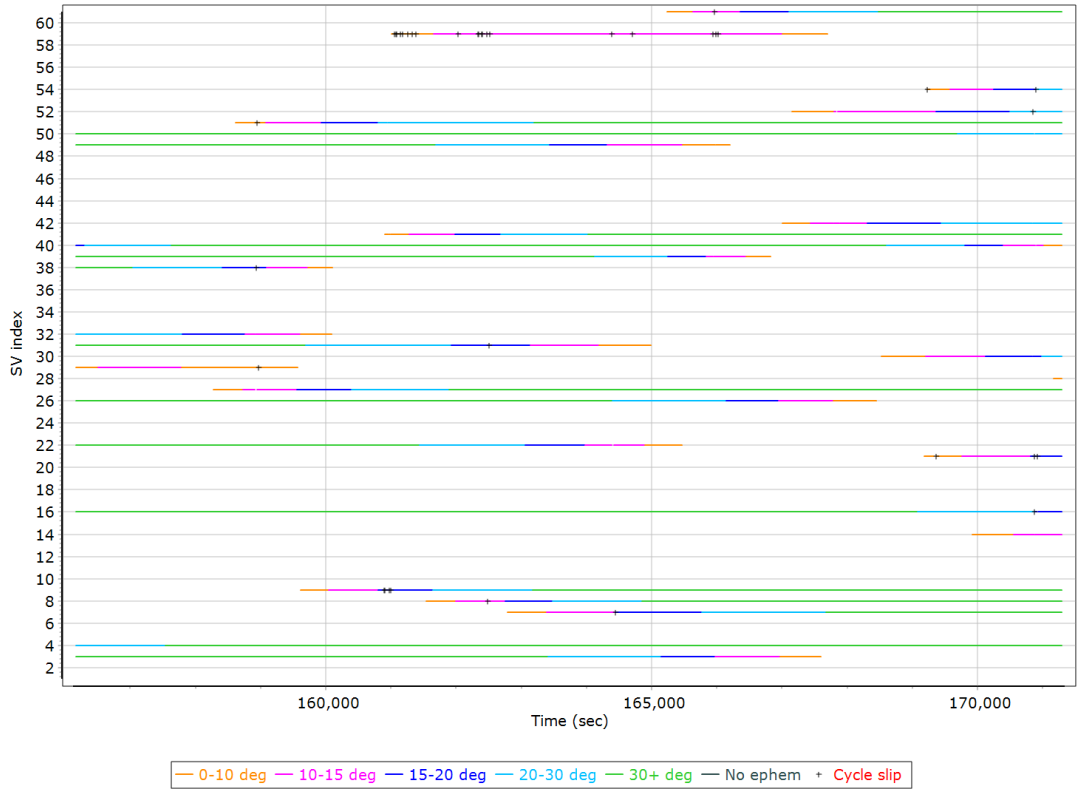
GPS L1 SNR



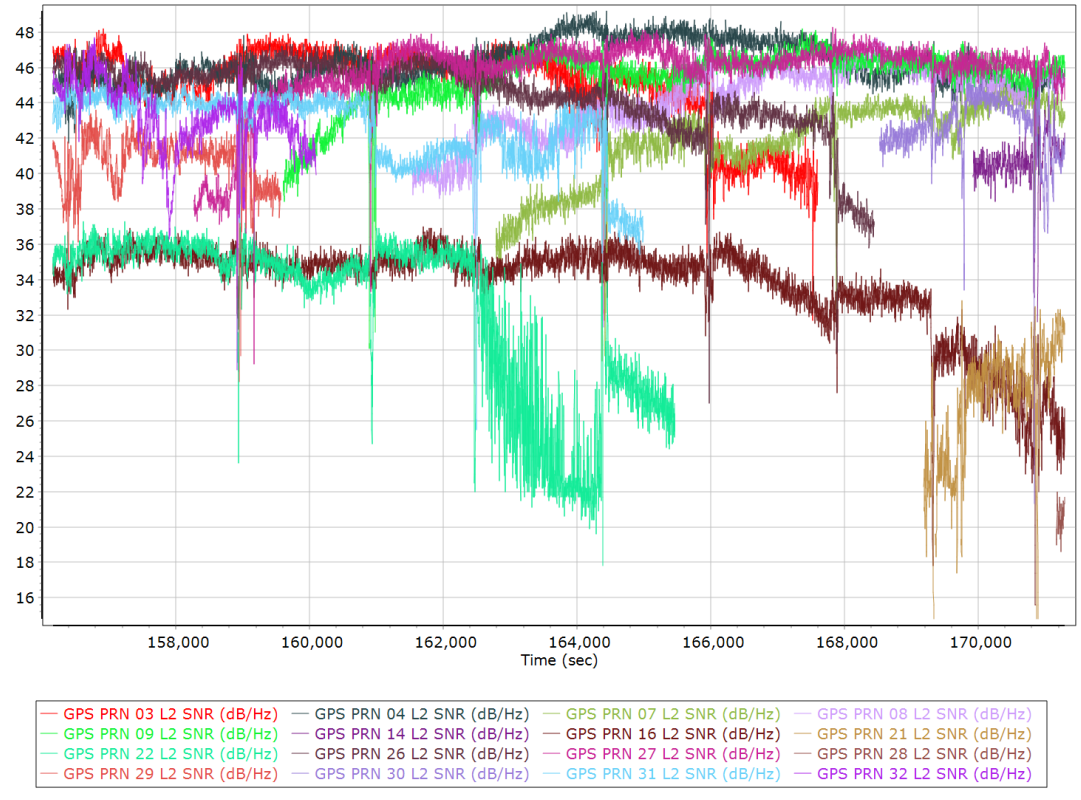
GLONASS L1 SNR



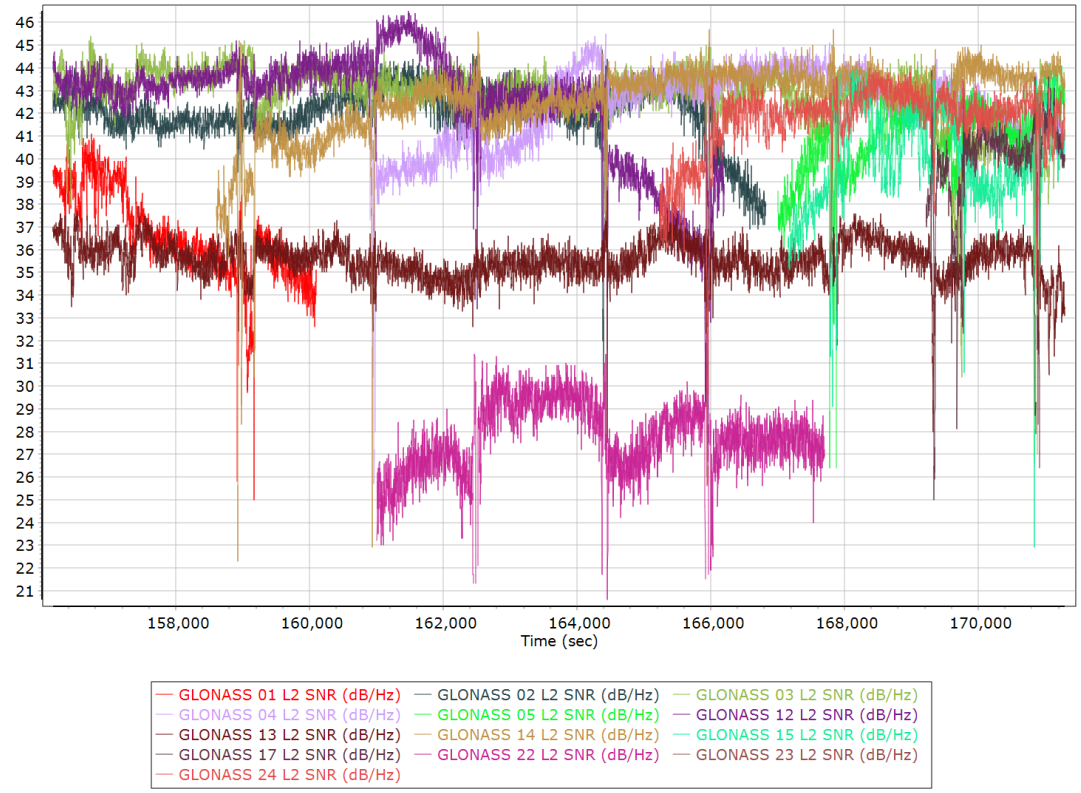
GPS/GLONASS L2 Satellite Lock/Elevation



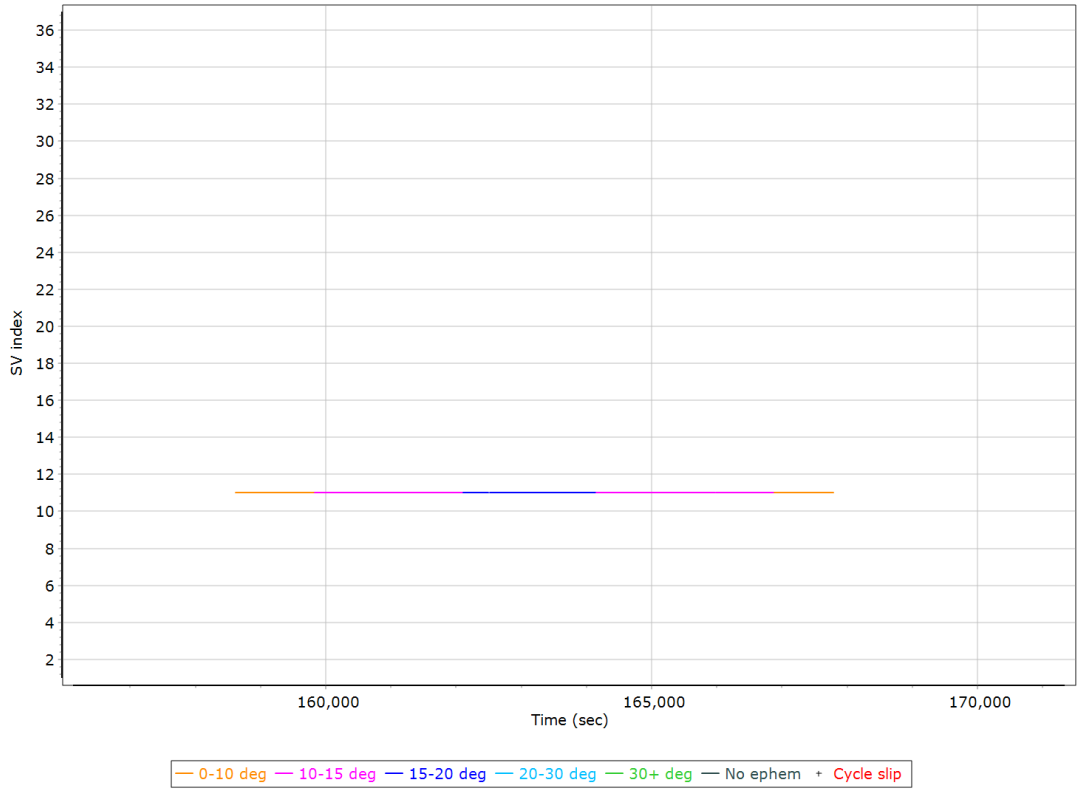
GPS L2 SNR



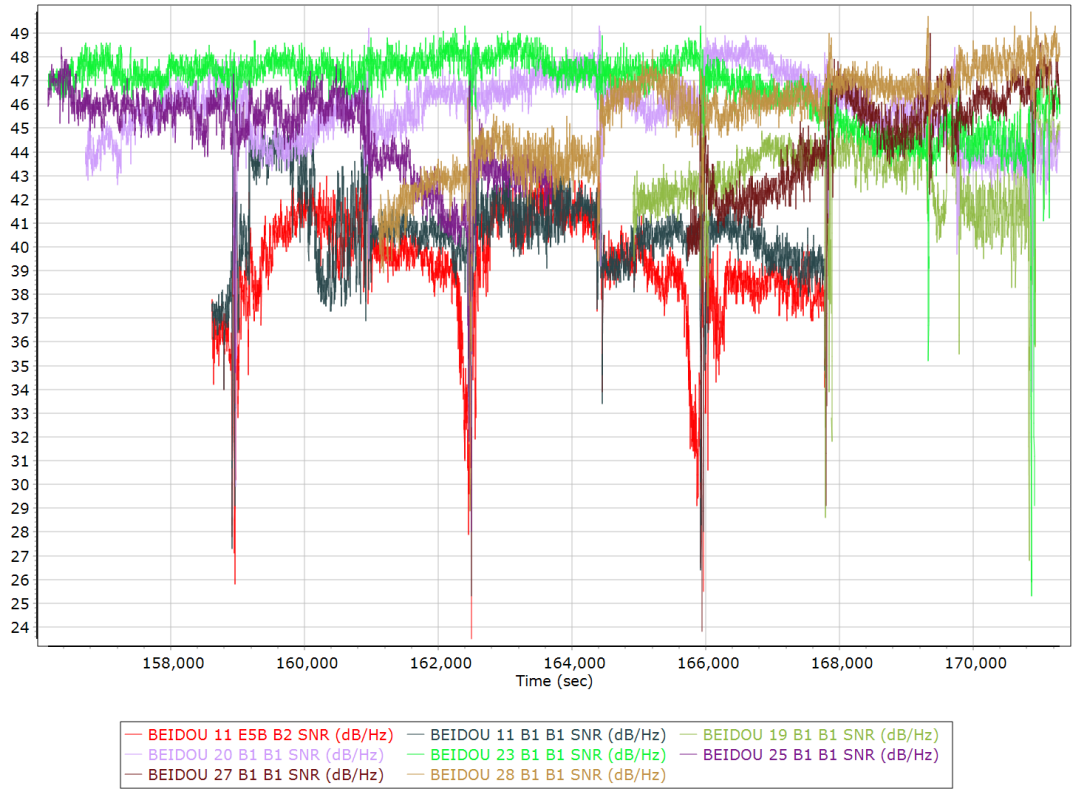
GLONASS L2 SNR



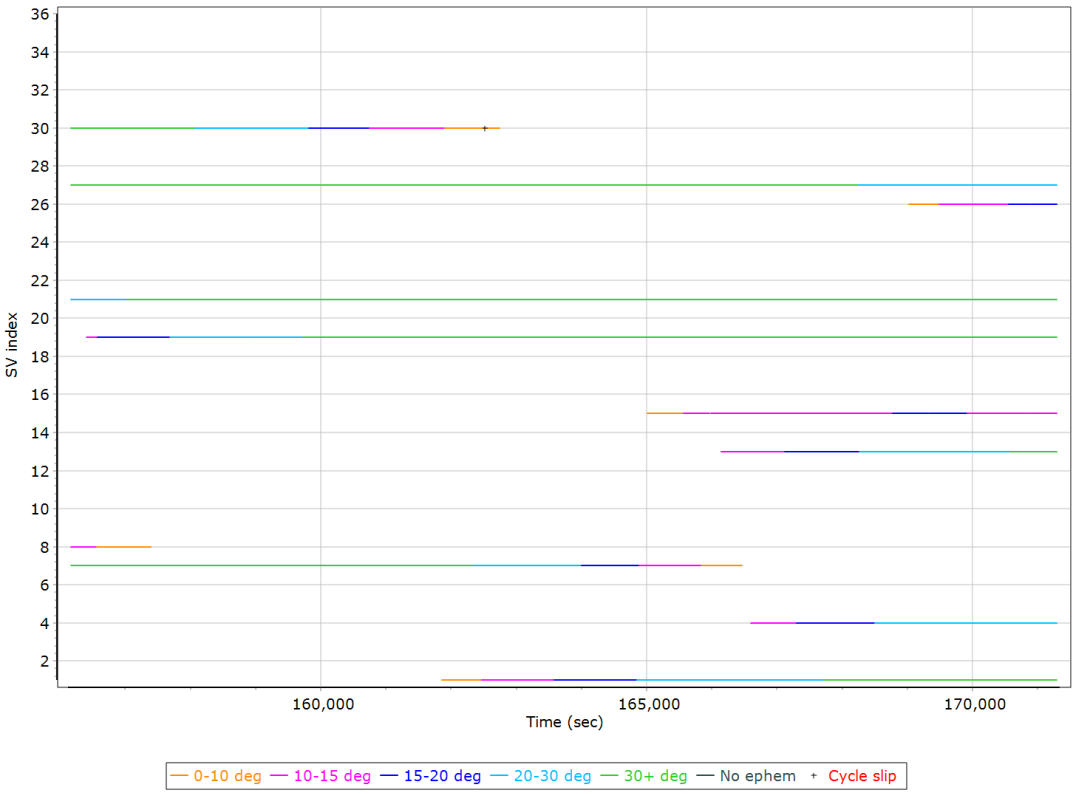
BEIDOU Satellite Lock/Elevation



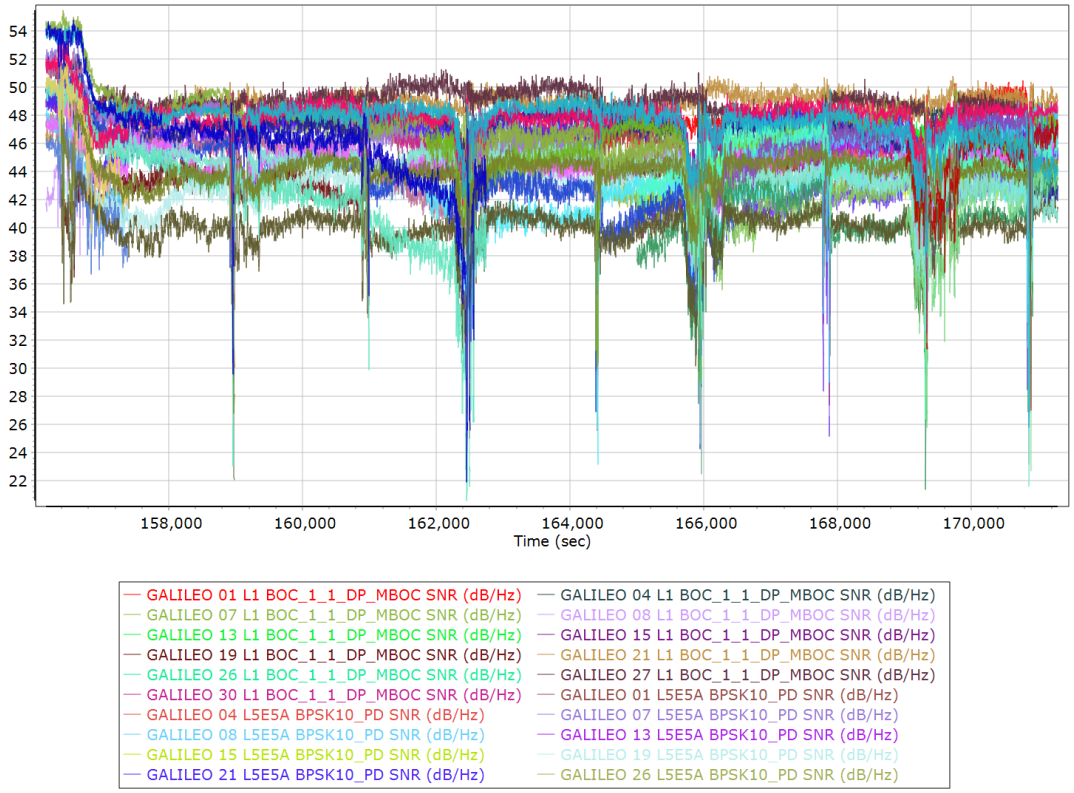
BEIDOU SNR



GALILEO Satellite Lock/Elevation

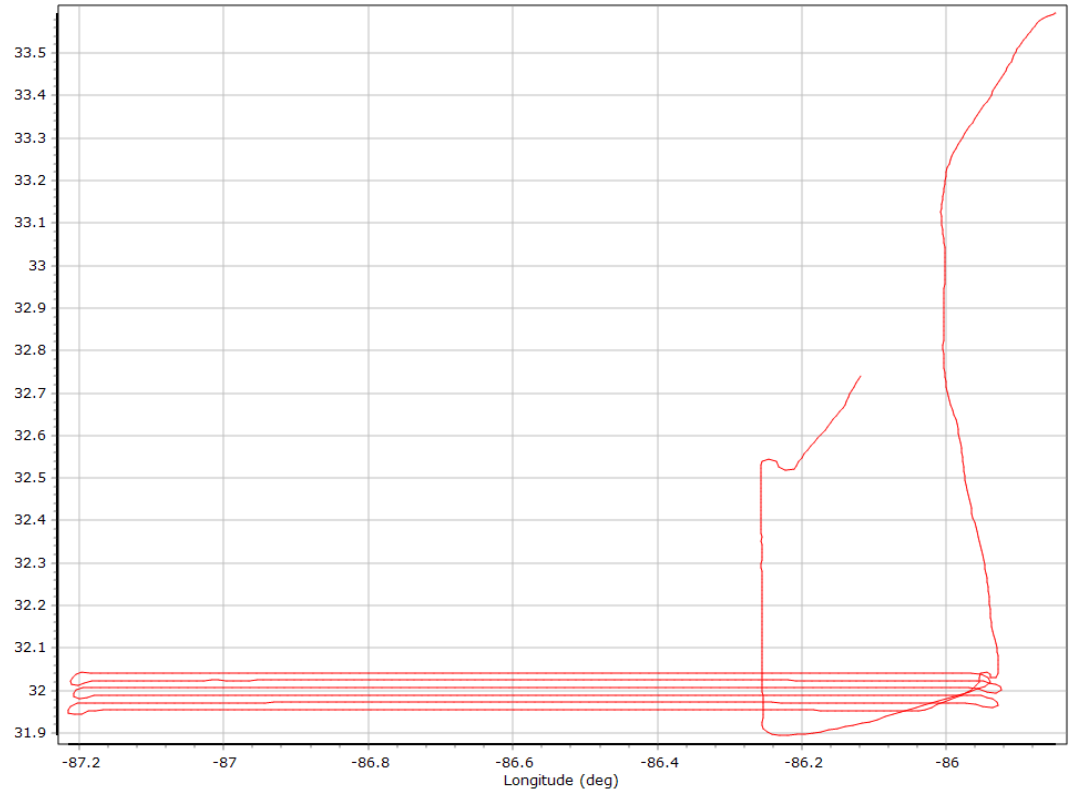


GALILEO SNR

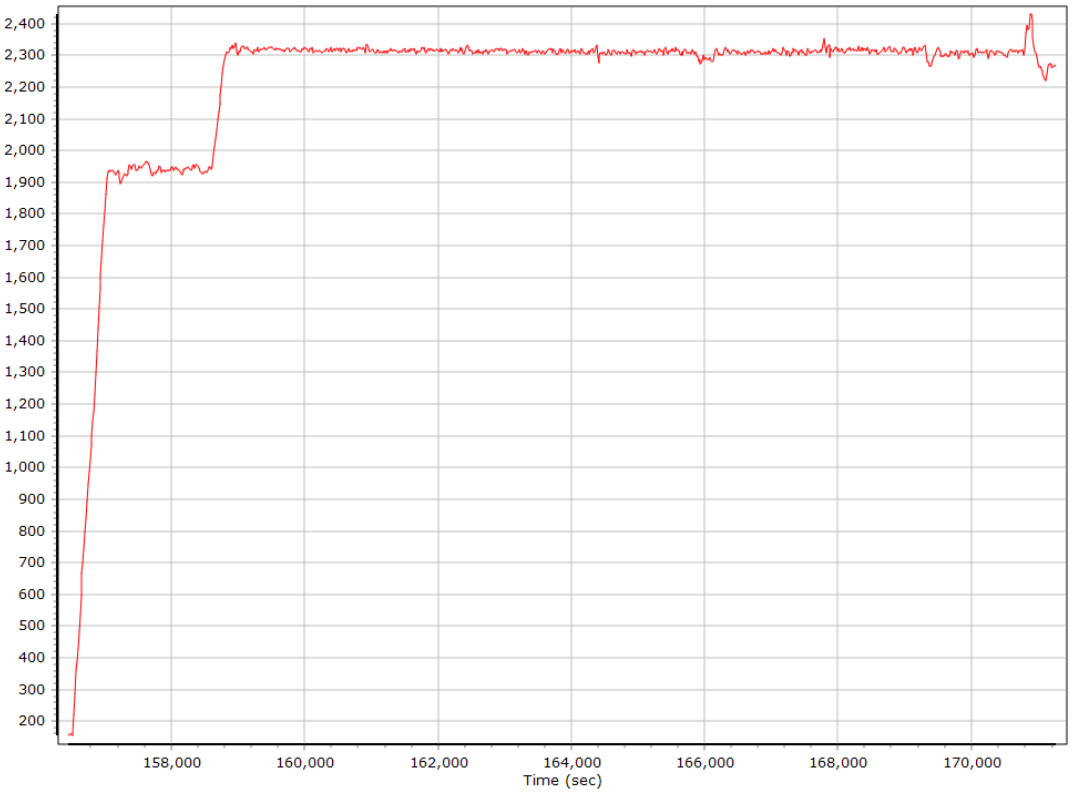

54
52
50
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46
44
42
40
38
36
34
32
30
28
26
24
22
158,000
160,000
162,000
164,000
166,000
168,000
170,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

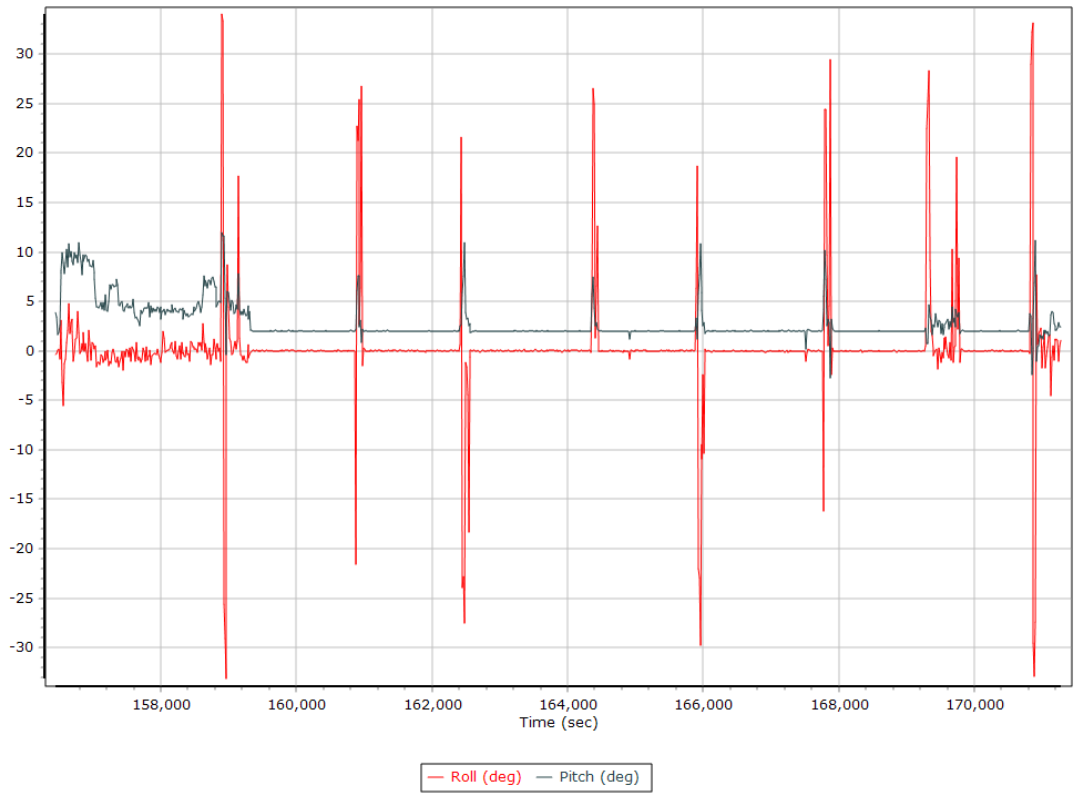
Top View



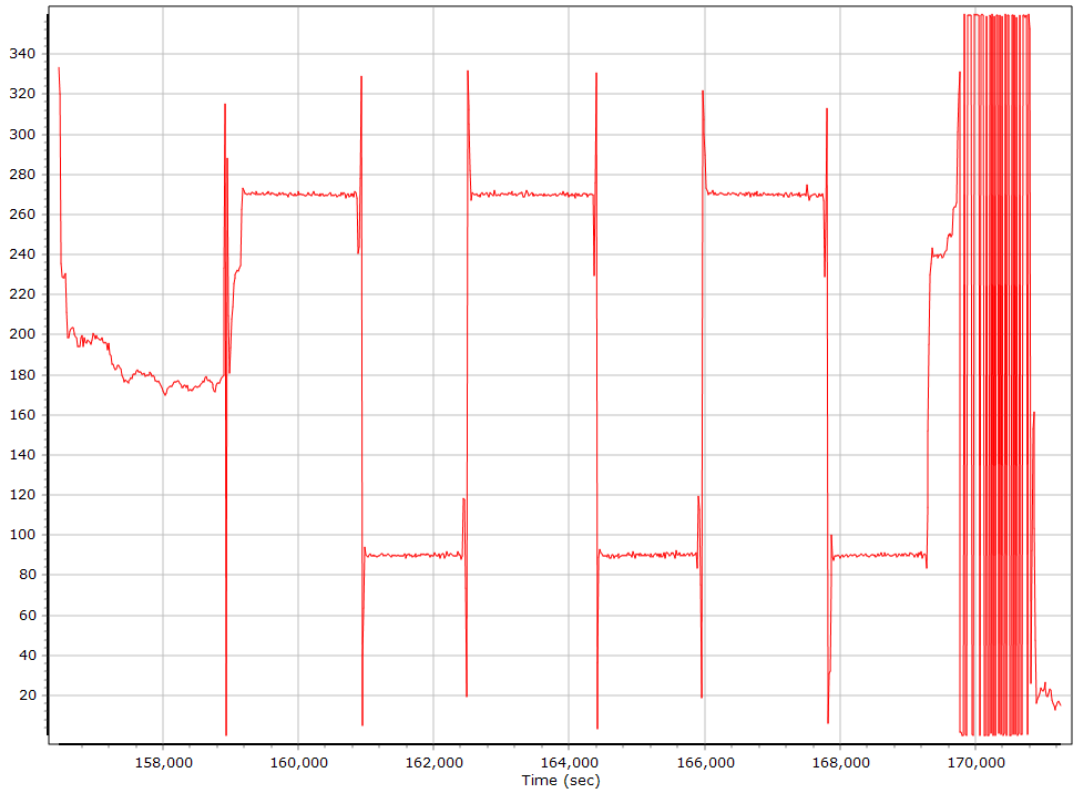
Altitude



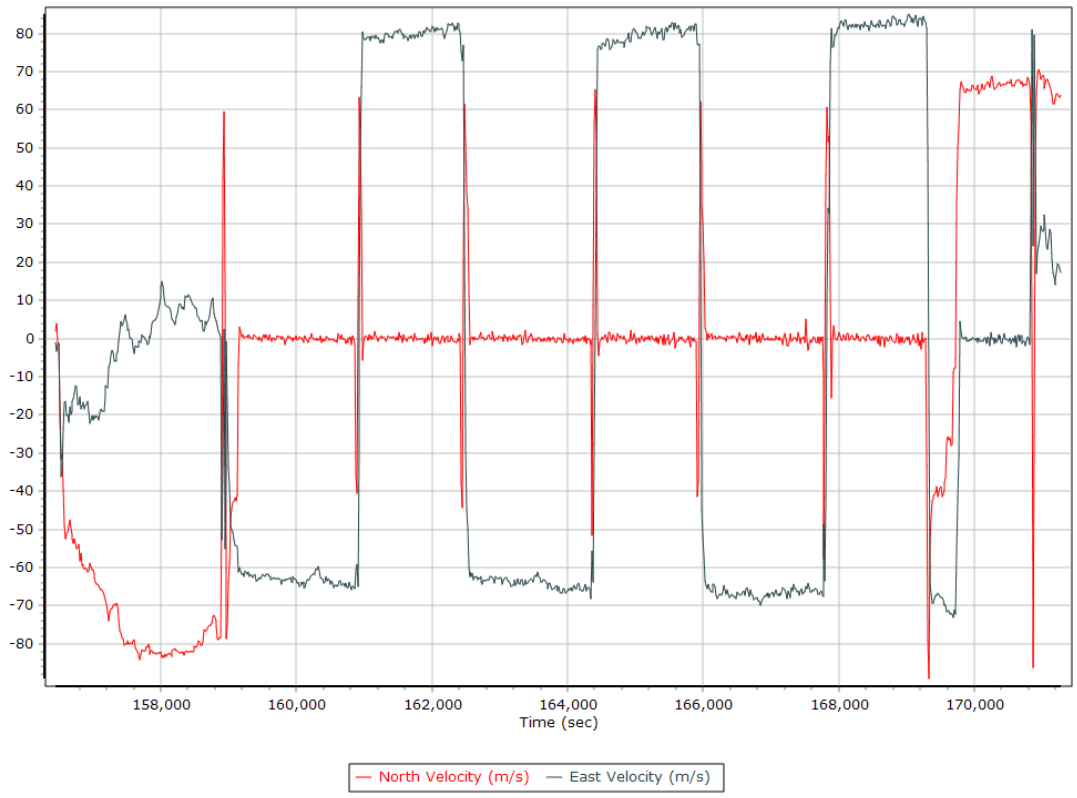
Roll/Pitch



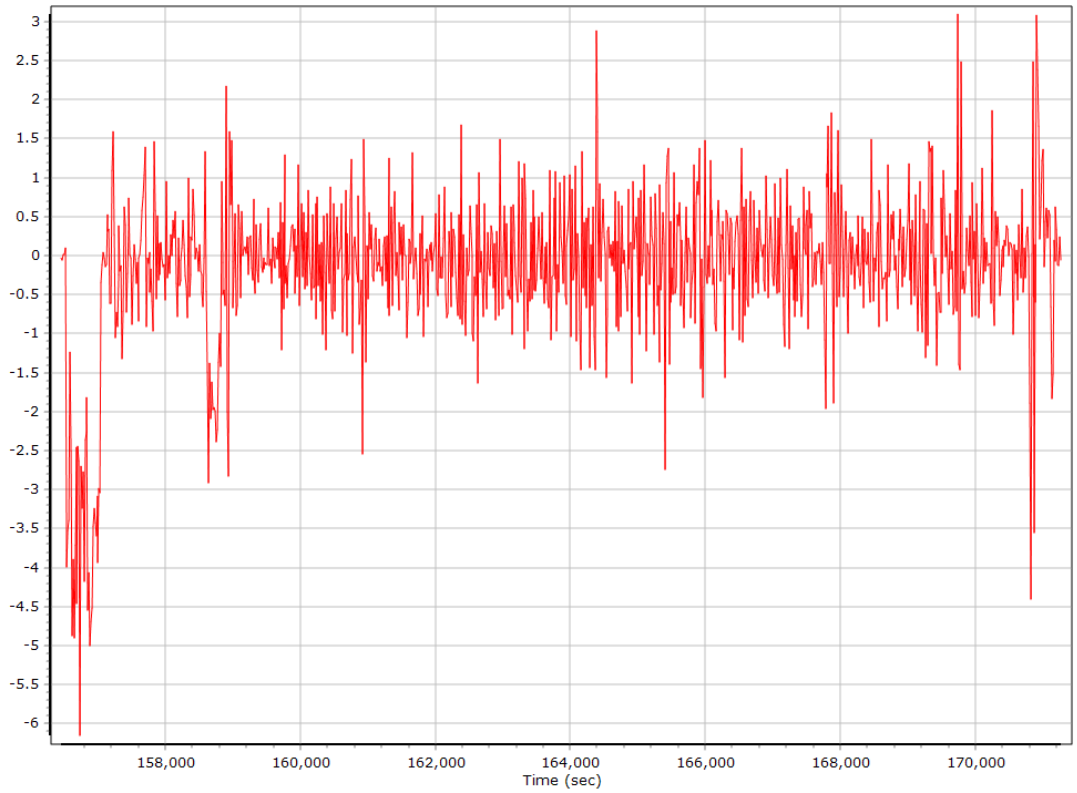
Heading



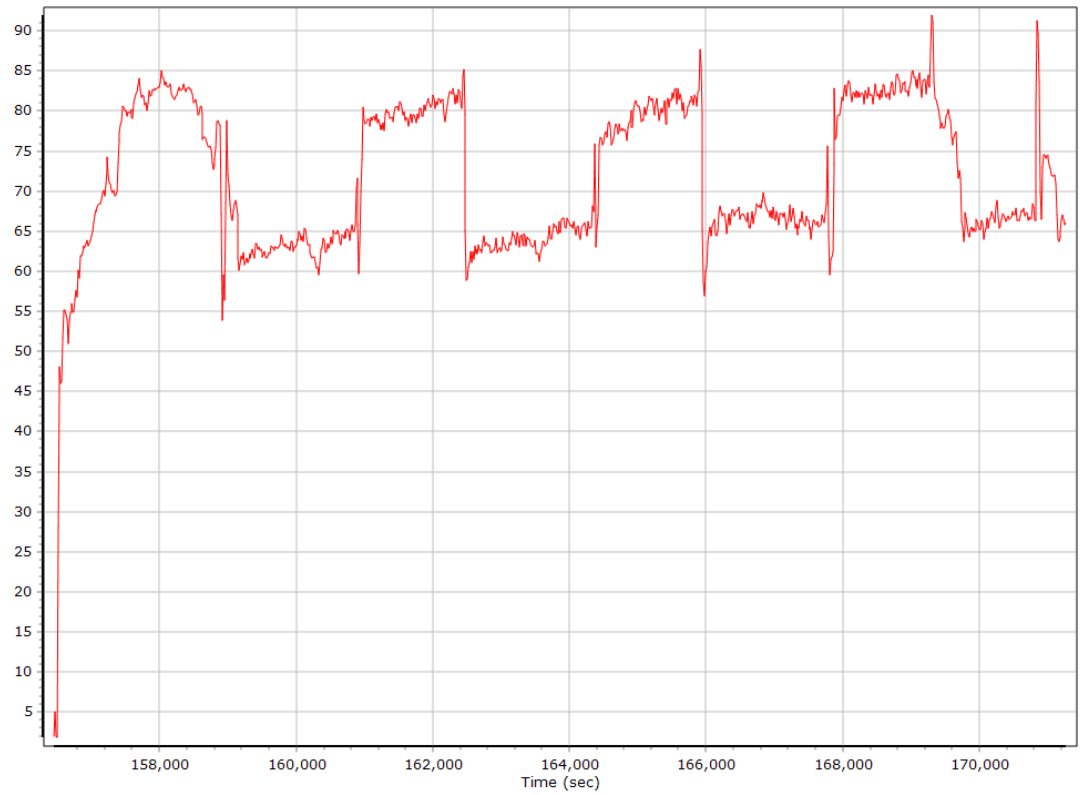
North/East Velocity



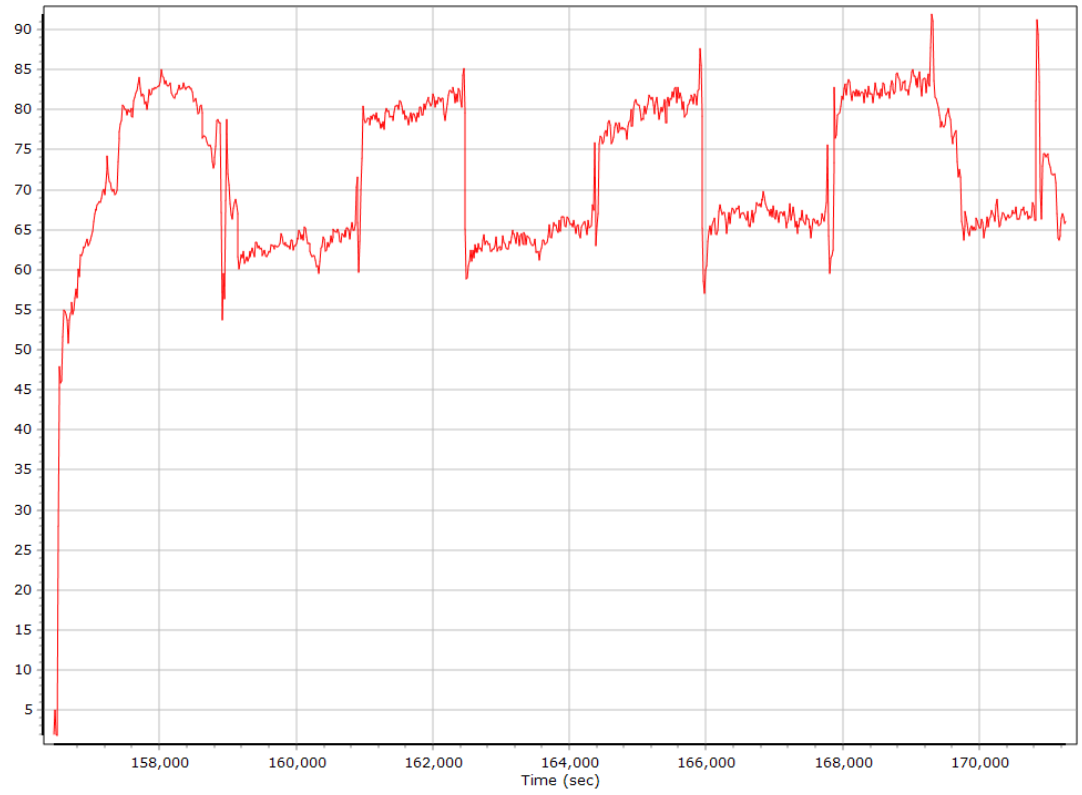
Down Velocity



Total Speed



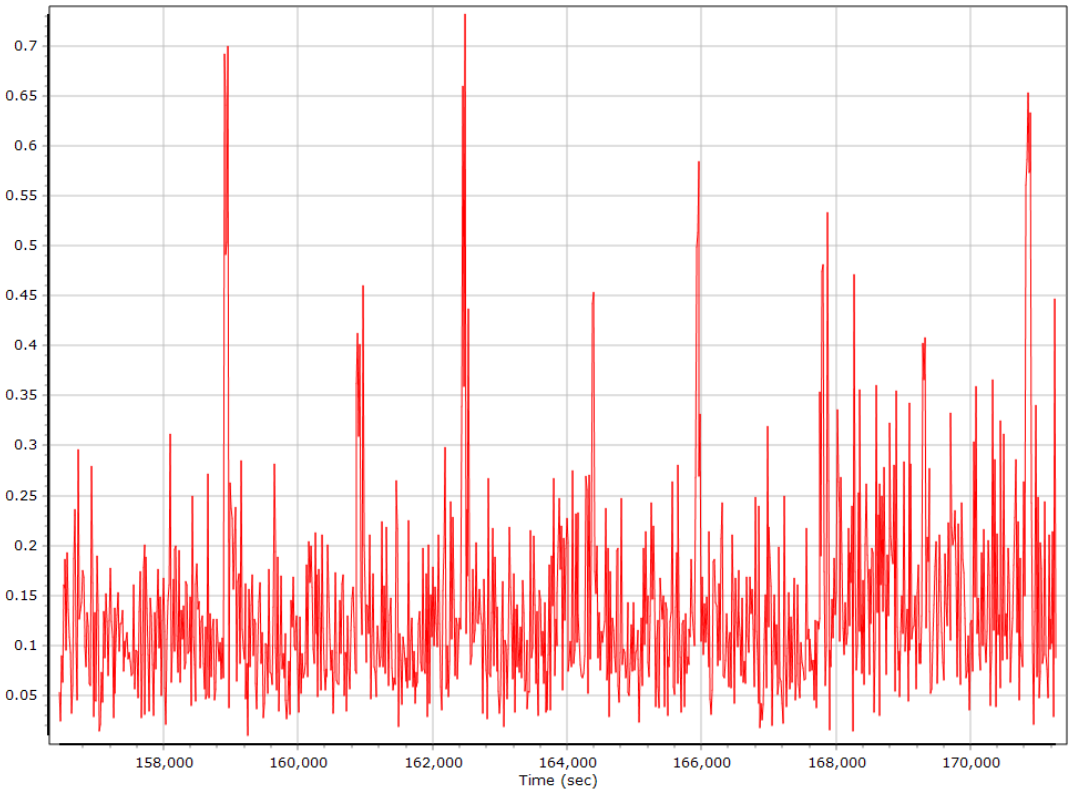
Ground Speed



Body Acceleration



Total Body Acceleration

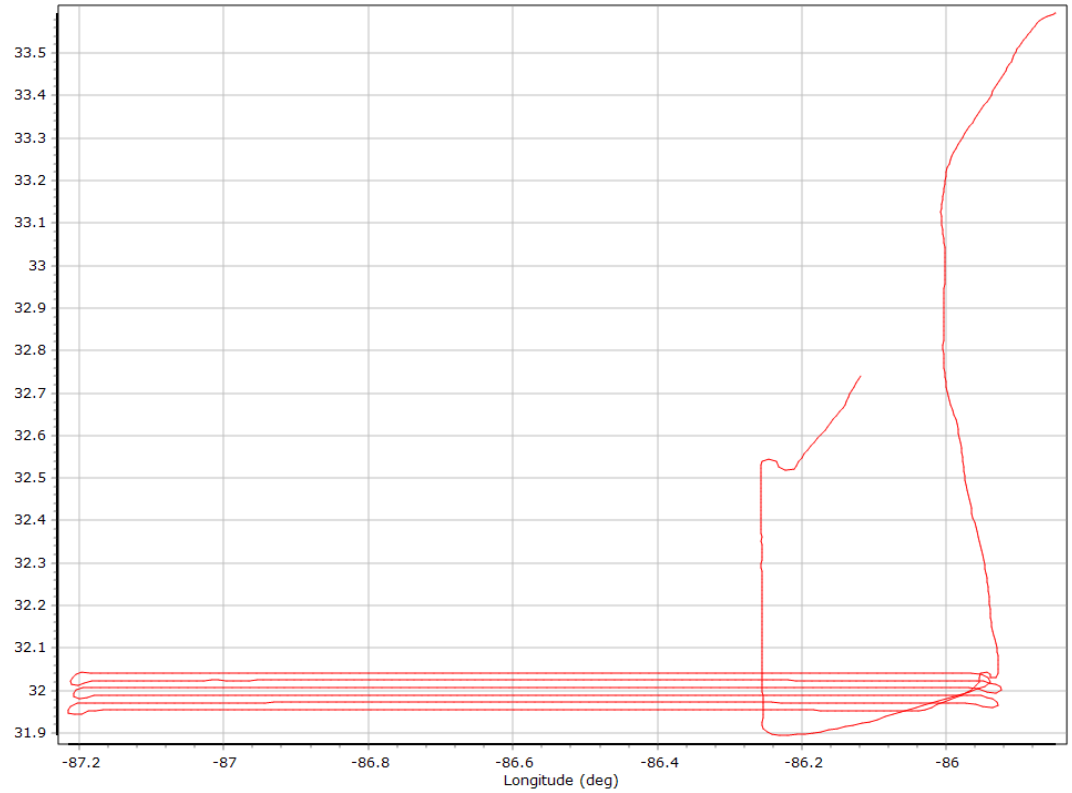


Body Angular Rate

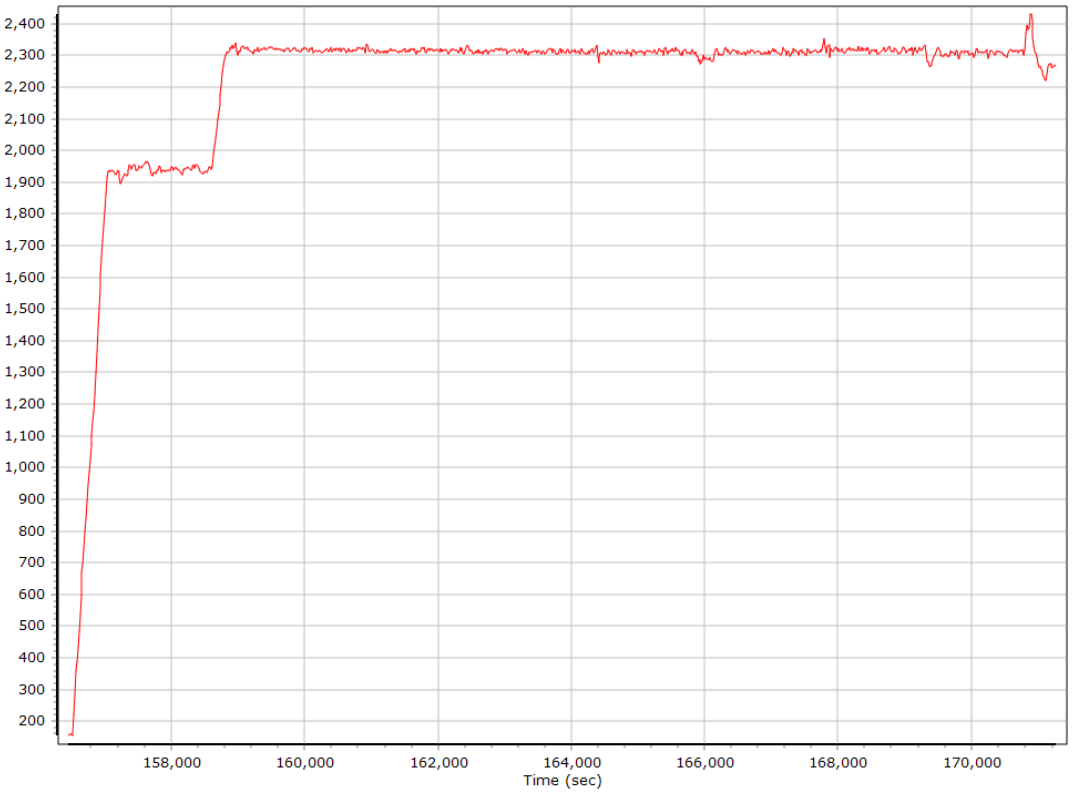


Forward Processed Trajectory Information

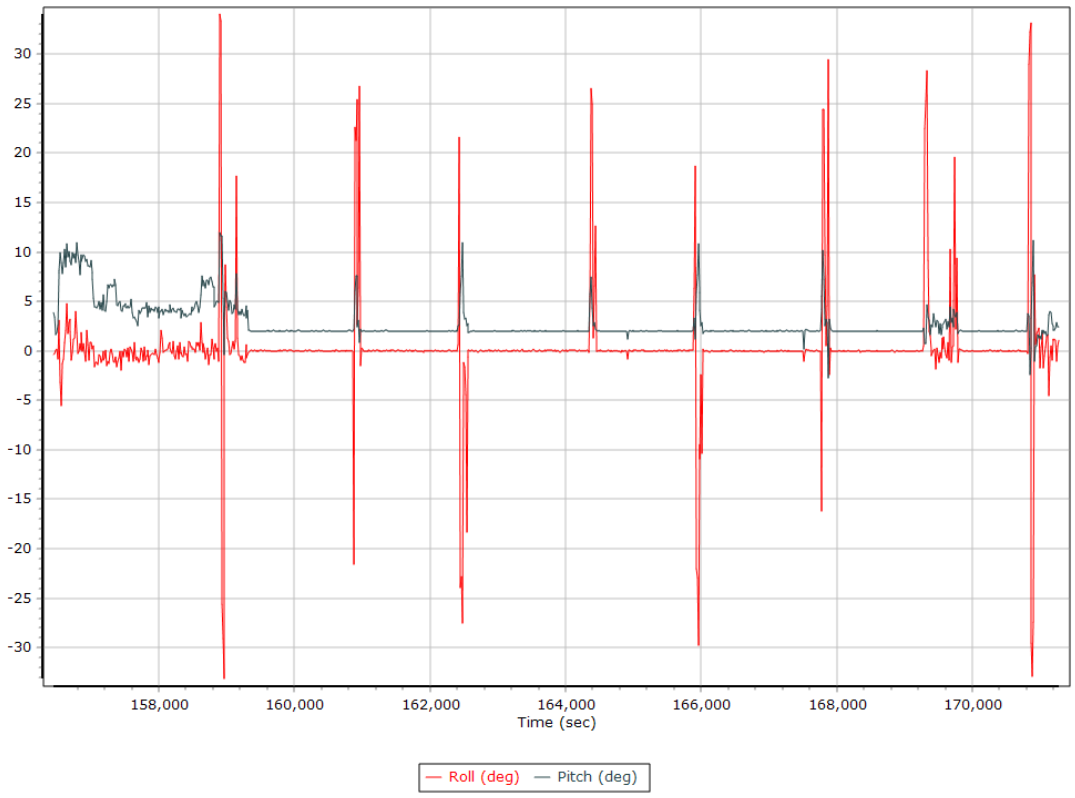
Top View



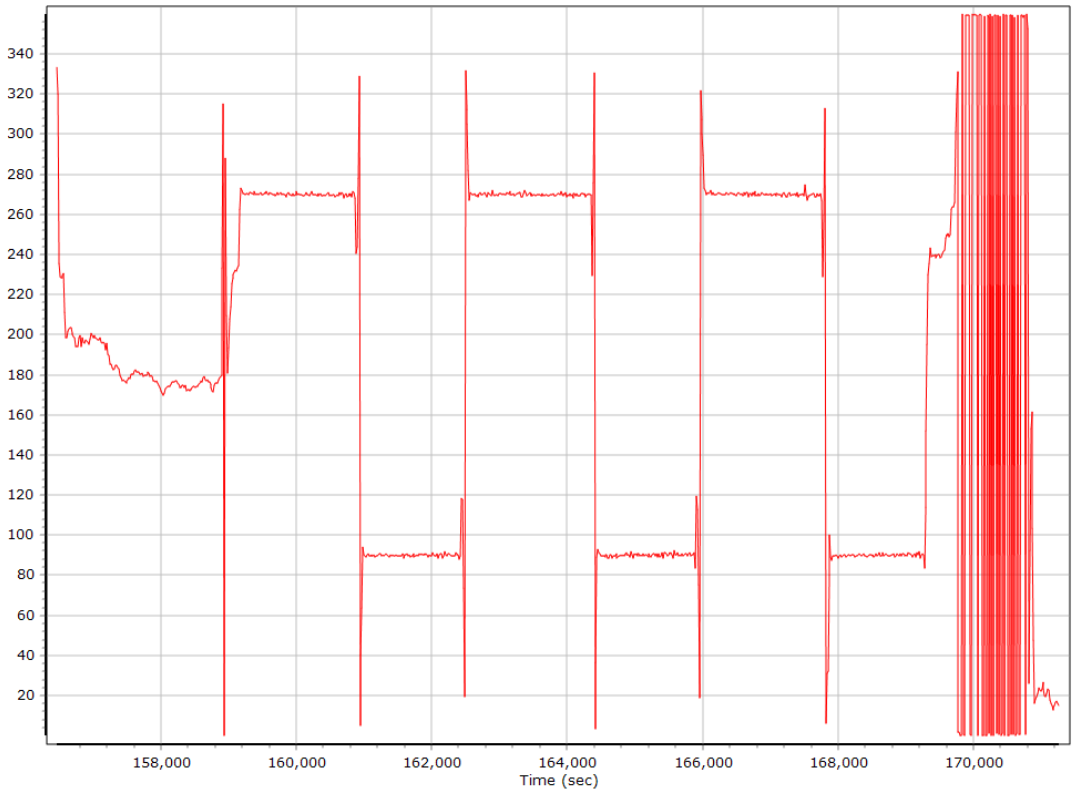
Altitude



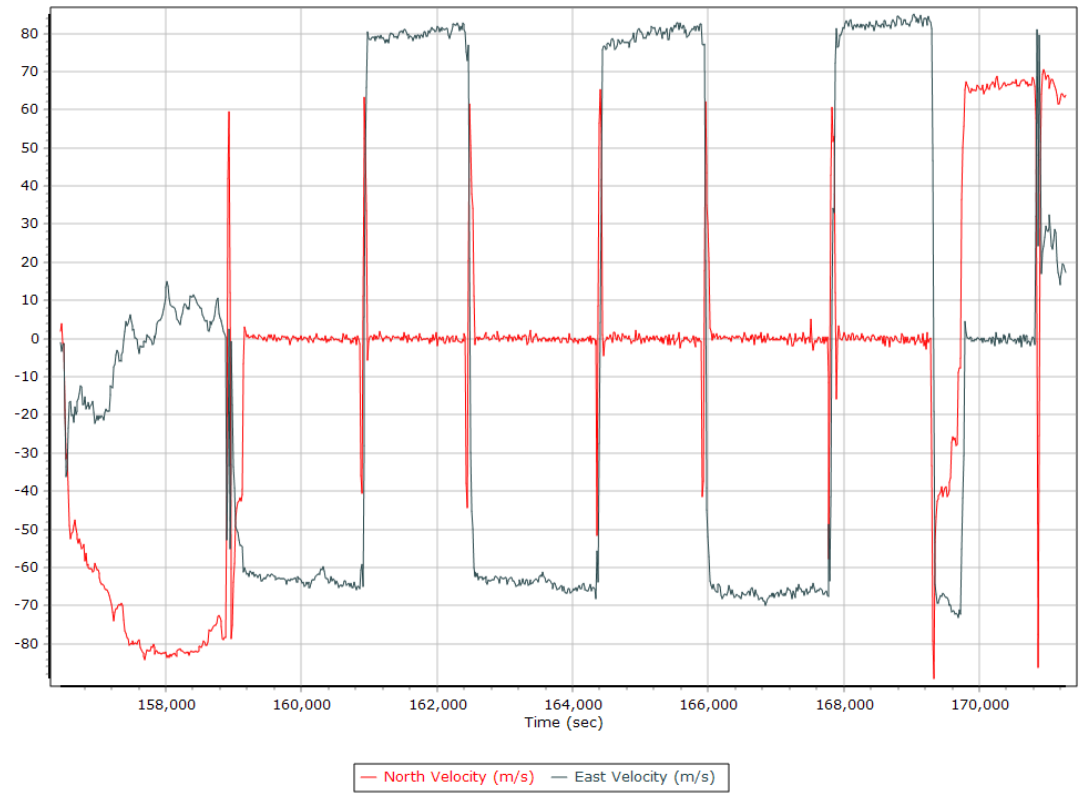
Roll/Pitch



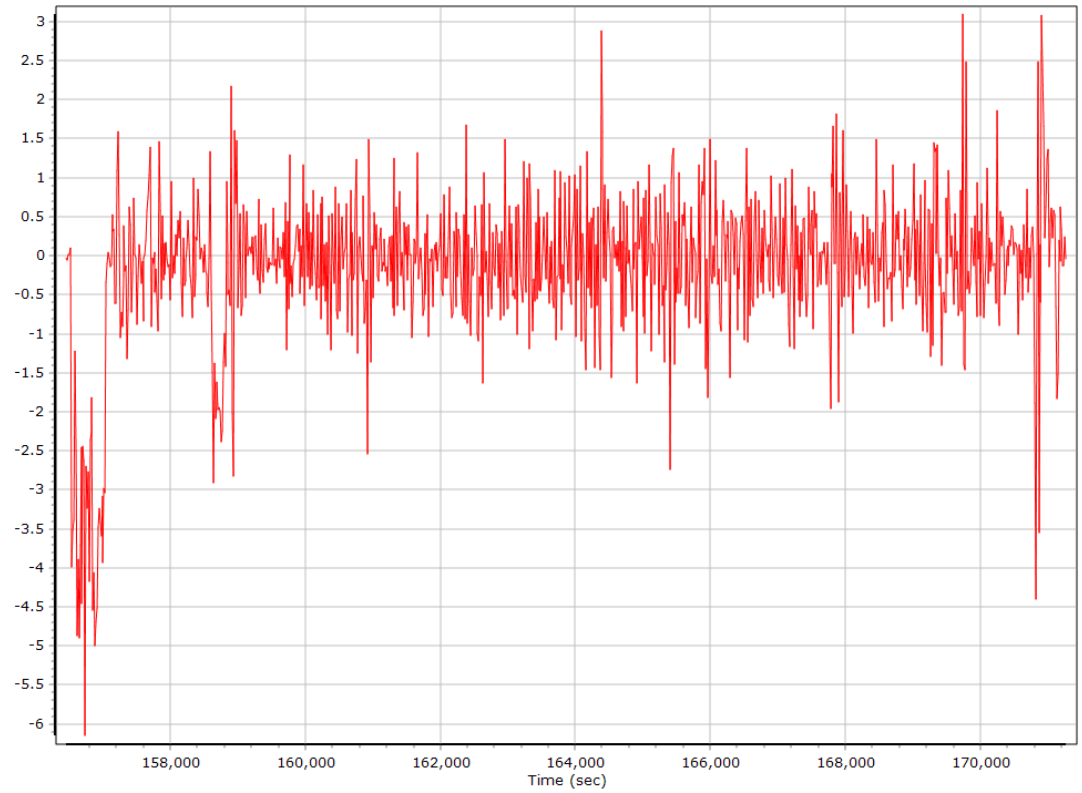
Heading



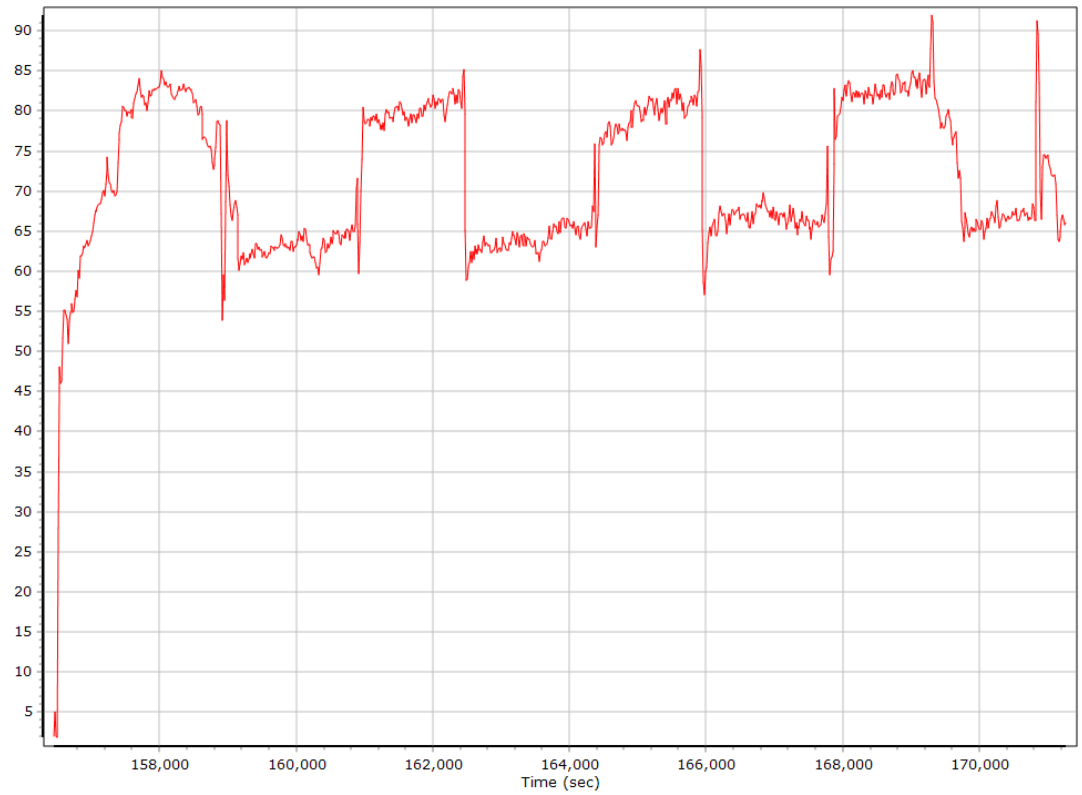
North/East Velocity



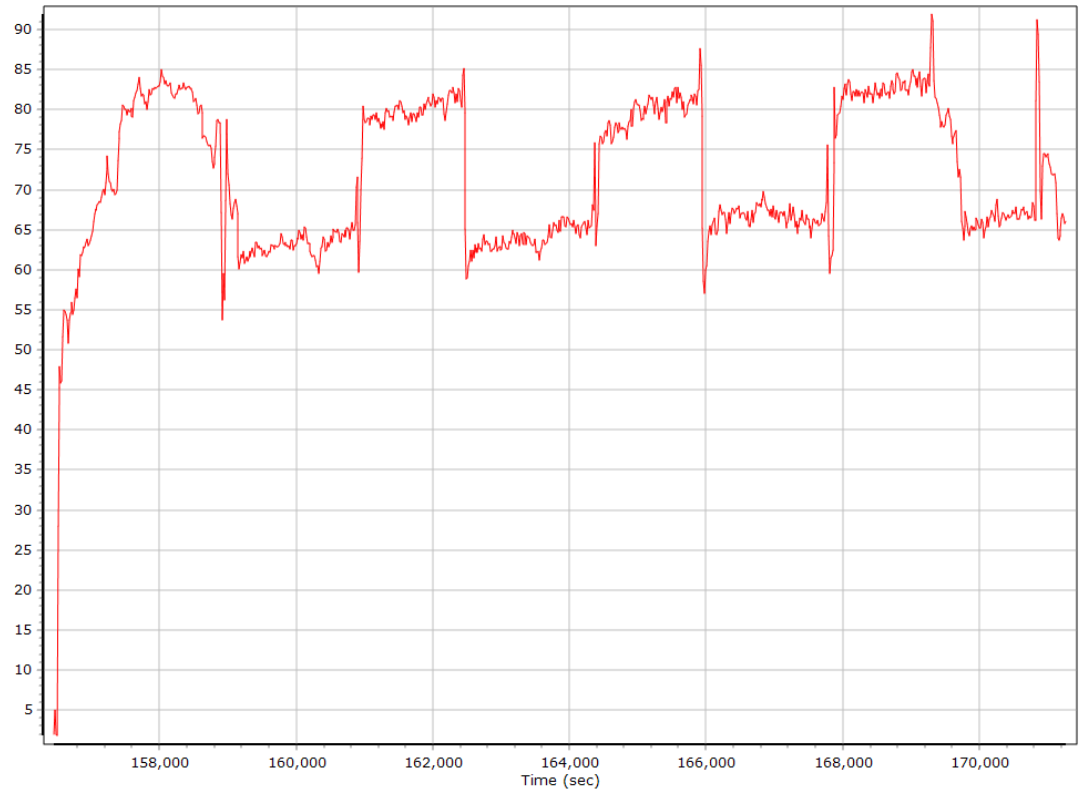
Down Velocity



Total Speed



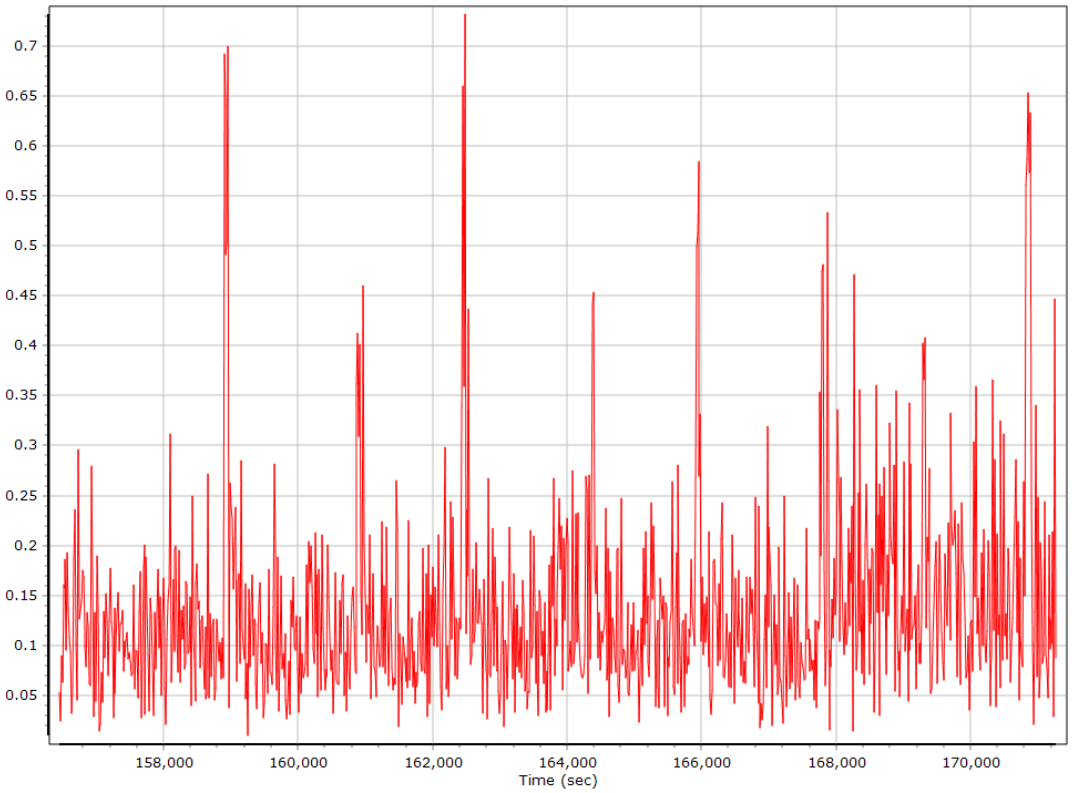
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

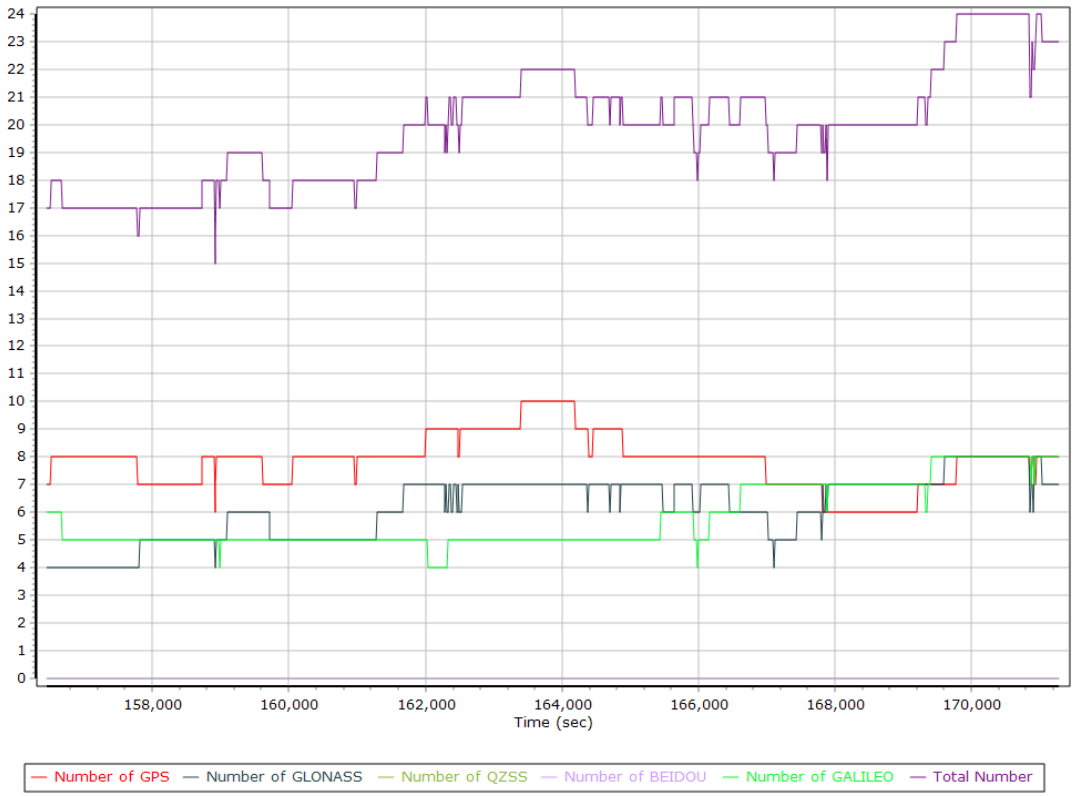


GNSS QC

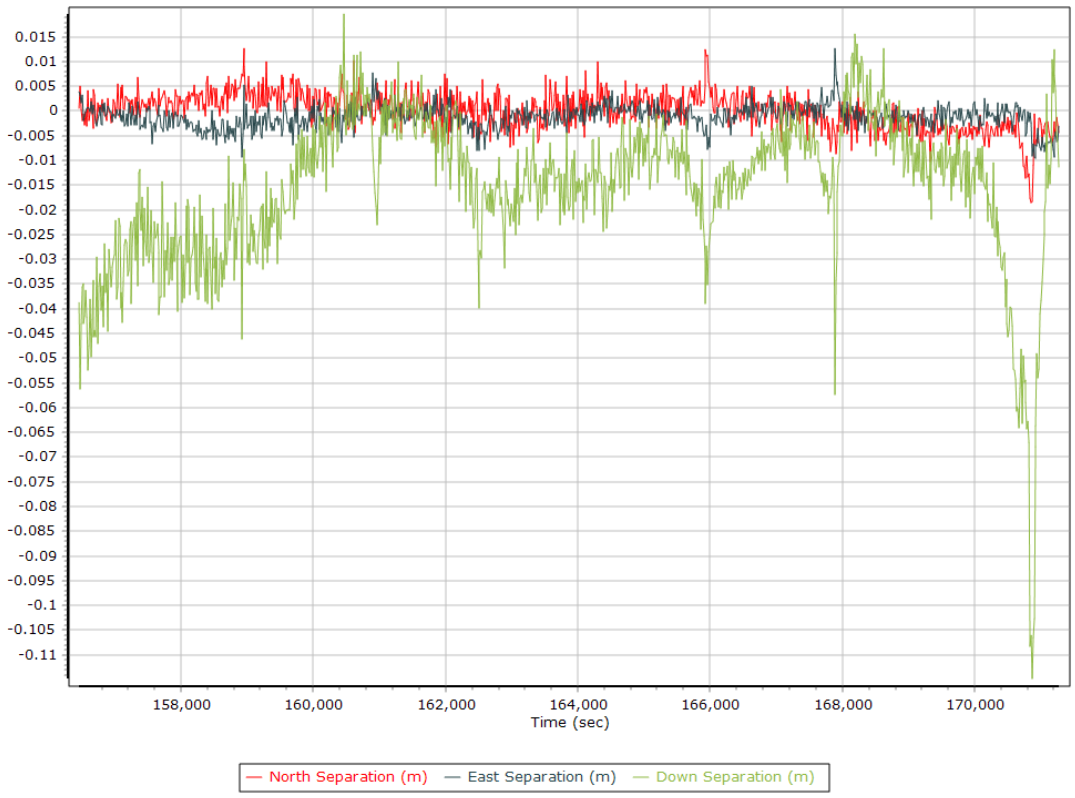
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	4	10	8
Number of GLONASS SV	4	8	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	4	8	6
Total number of SV	12	24	20
PDOP	1.04	2.29	1.21
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	15127.00	0.00	0.00
Percentage	100.00	0.00	0.00

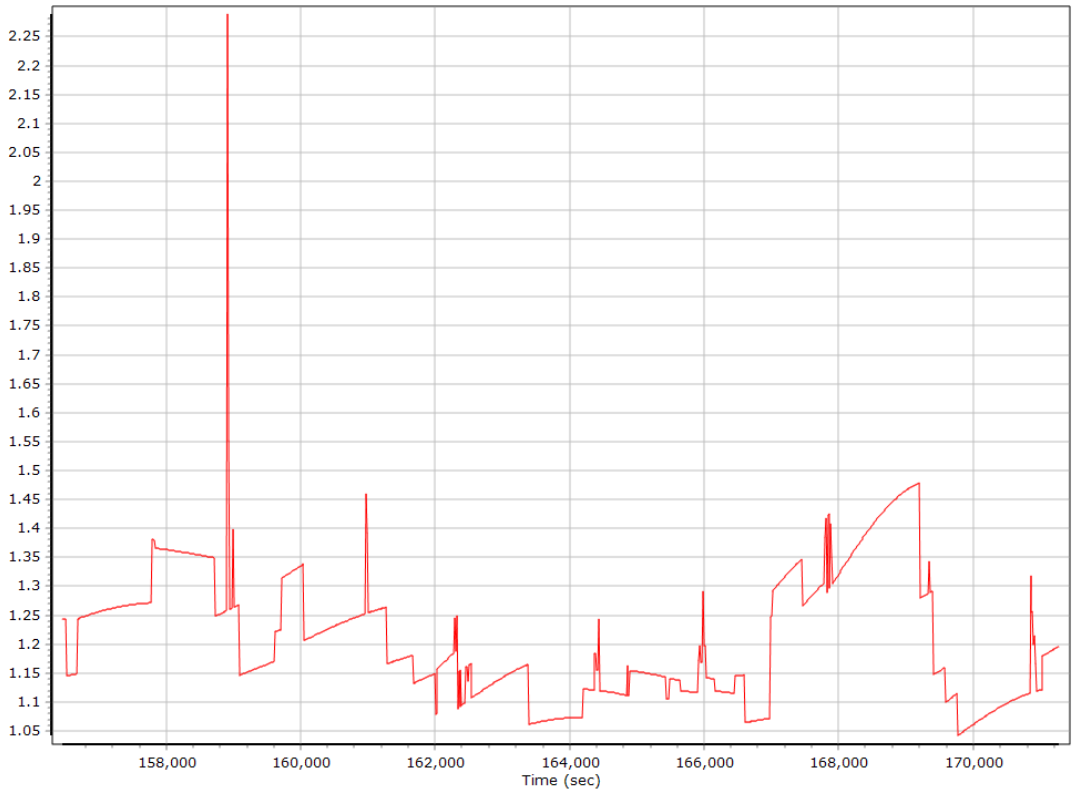
Num SVs in solution



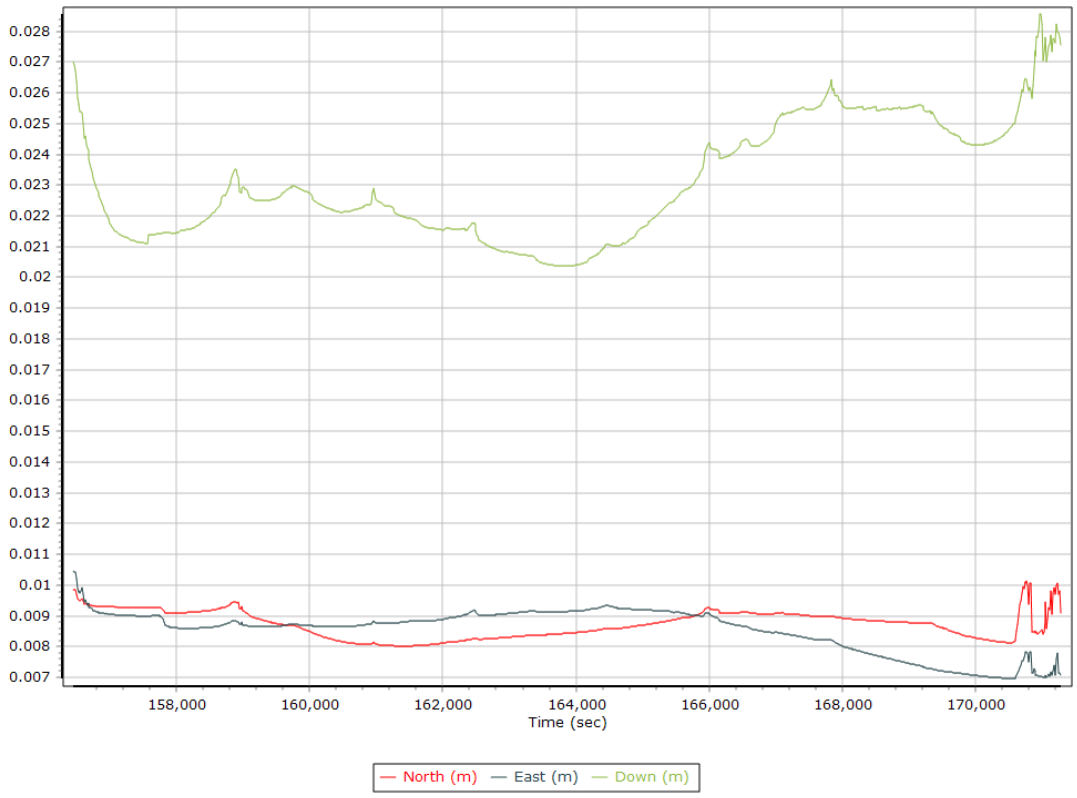
Forward/Reverse Separation



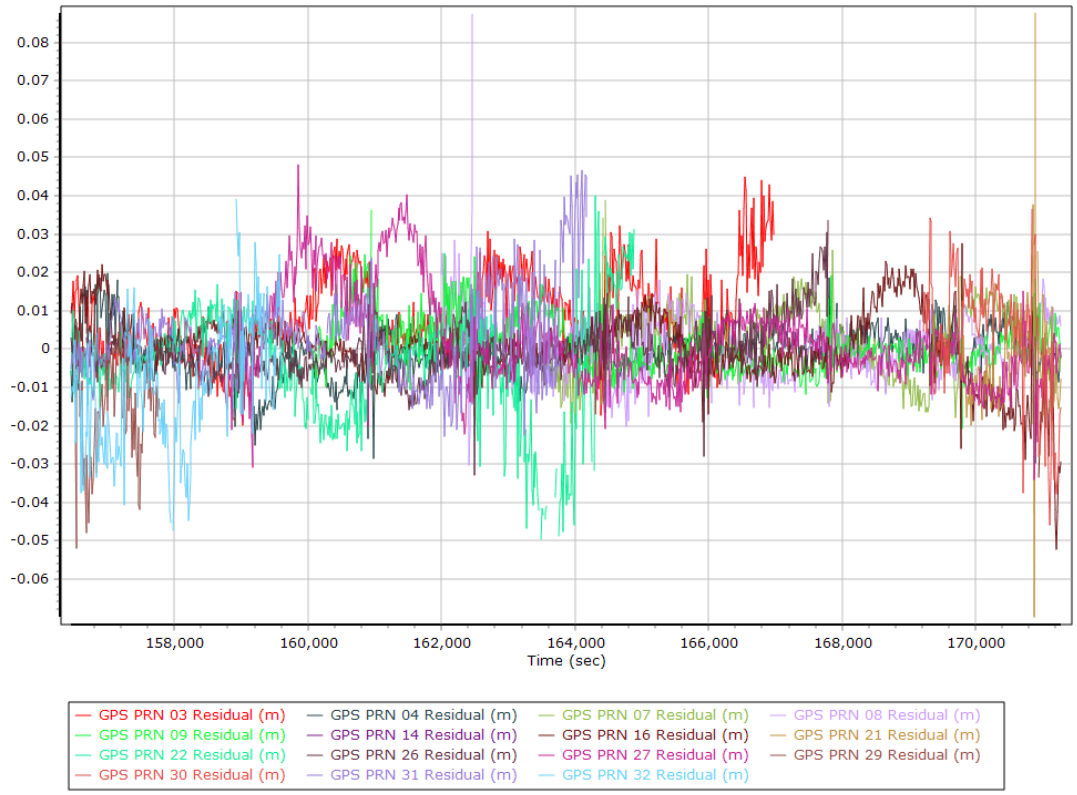
PDOP



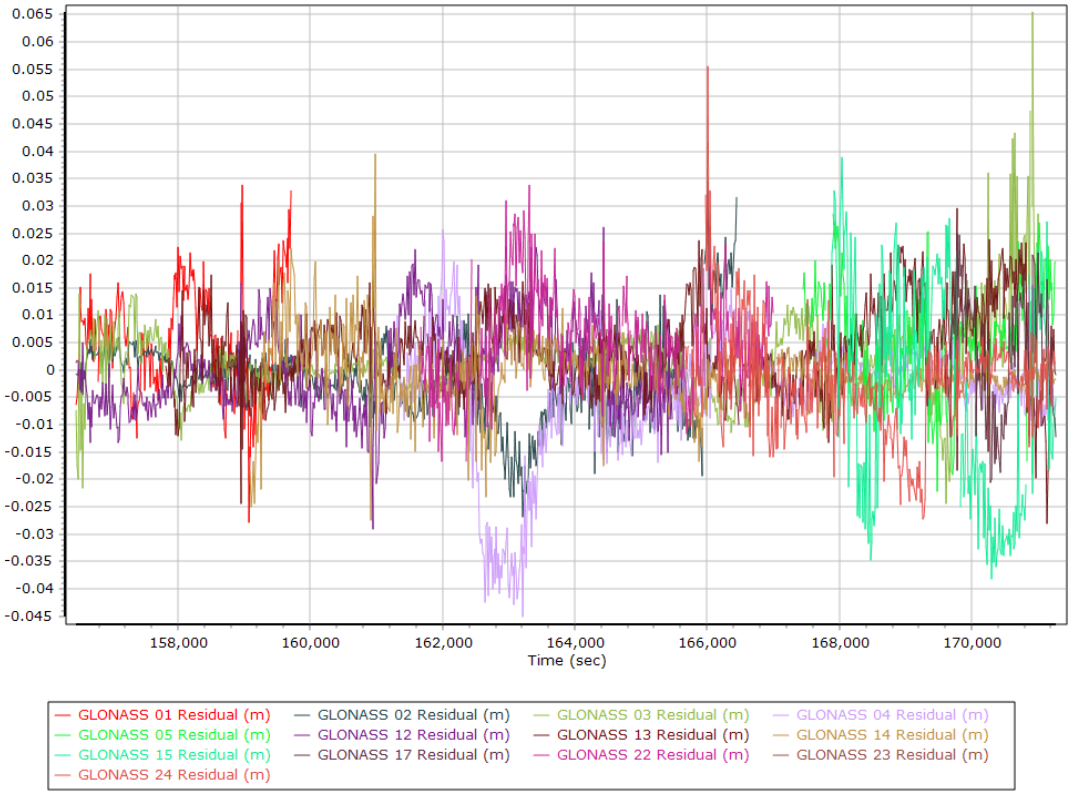
Estimated Position Accuracy



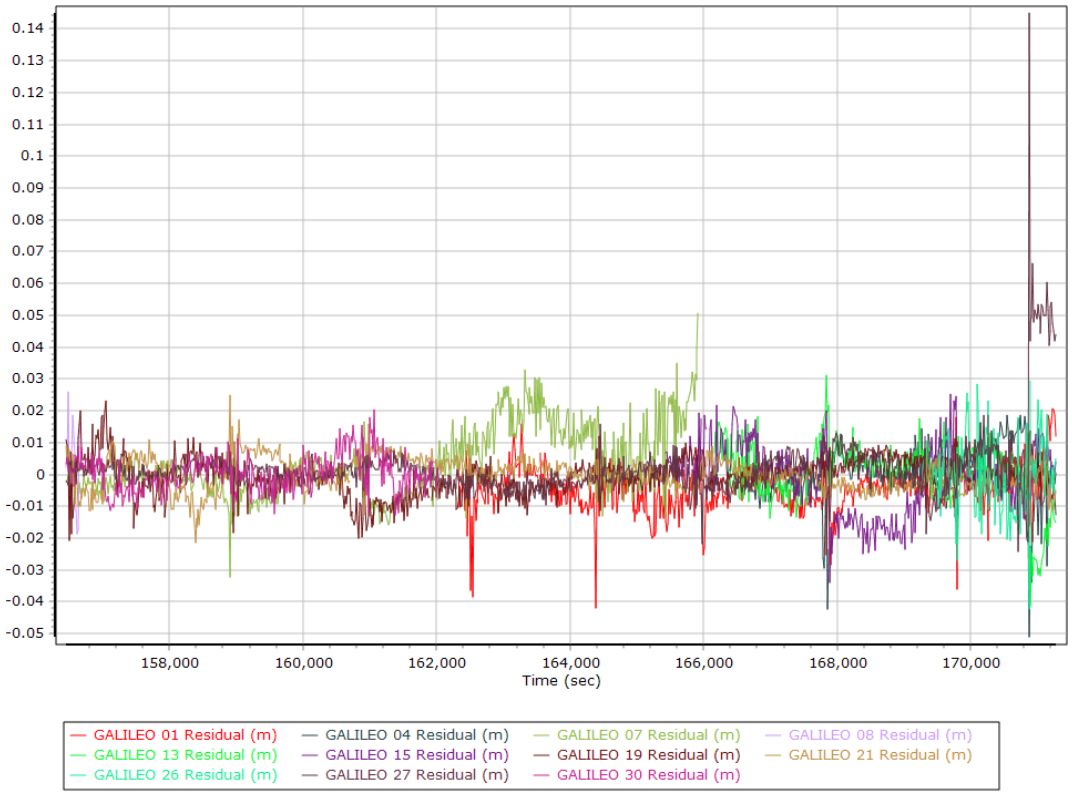
GPS Residuals



GLONASS Residuals



GALILEO Residuals



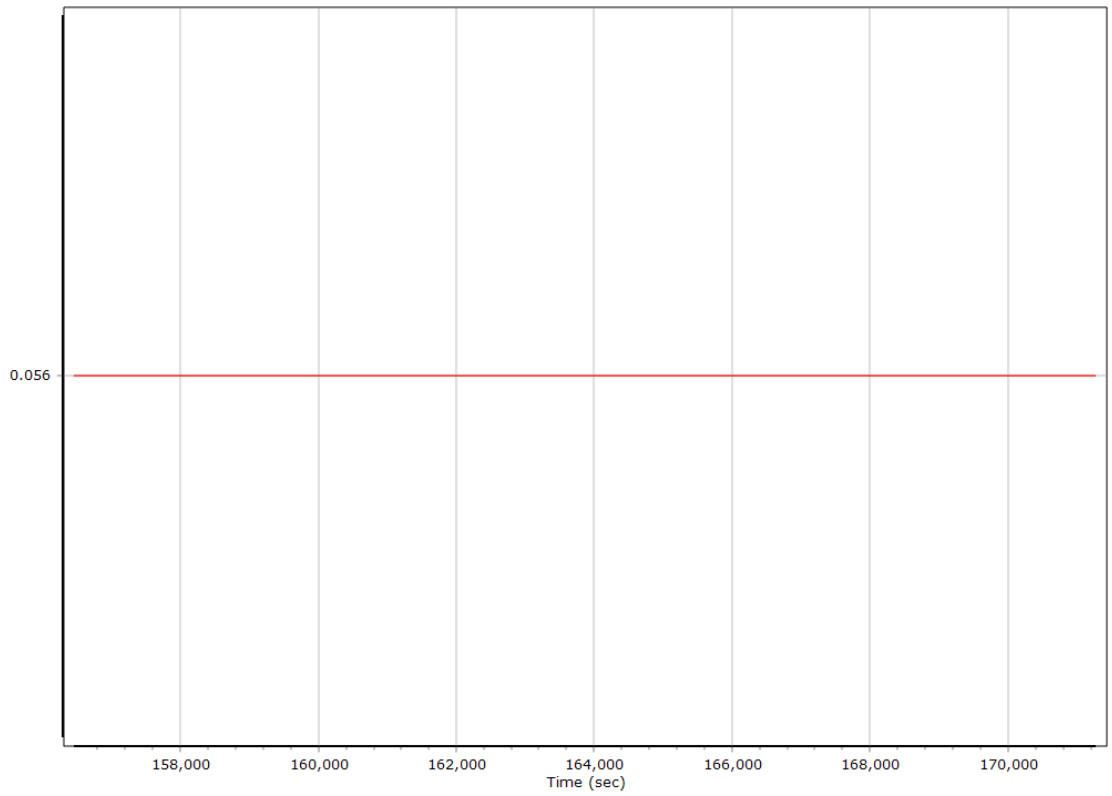
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	156144.000 (12/21/2020 7:22:24 PM)		
Processing end time	171278.000 (12/21/2020 11:34:38 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

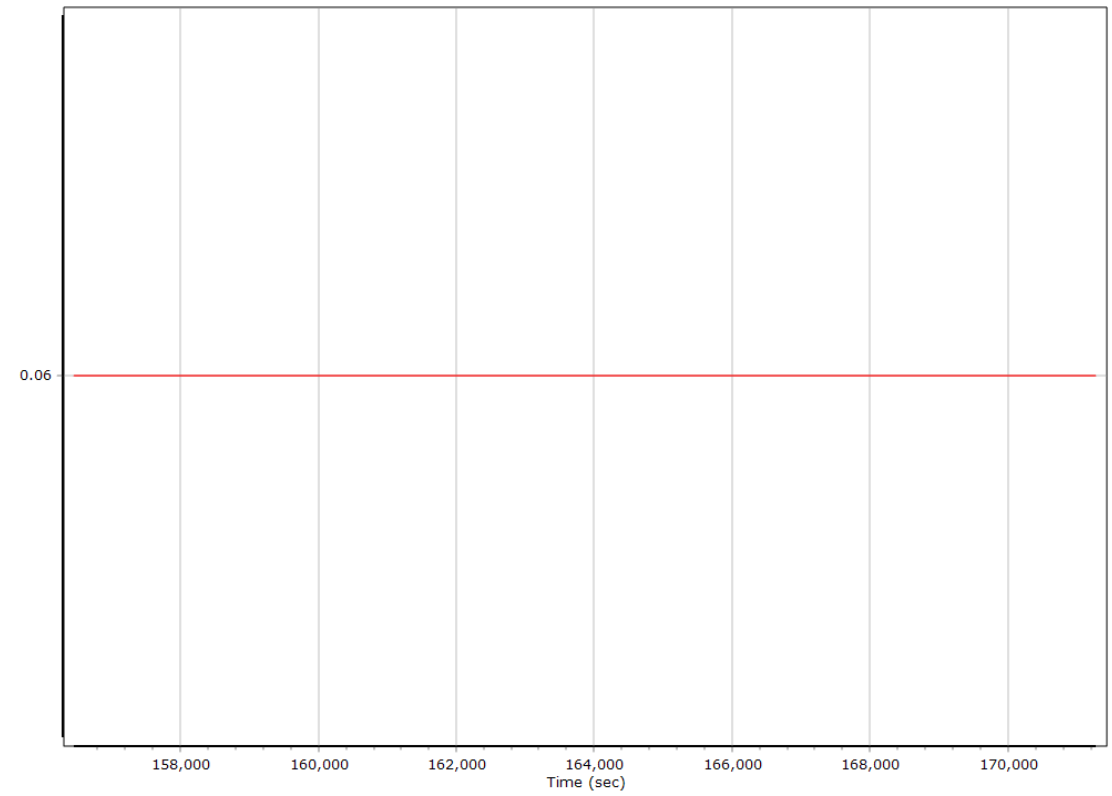
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

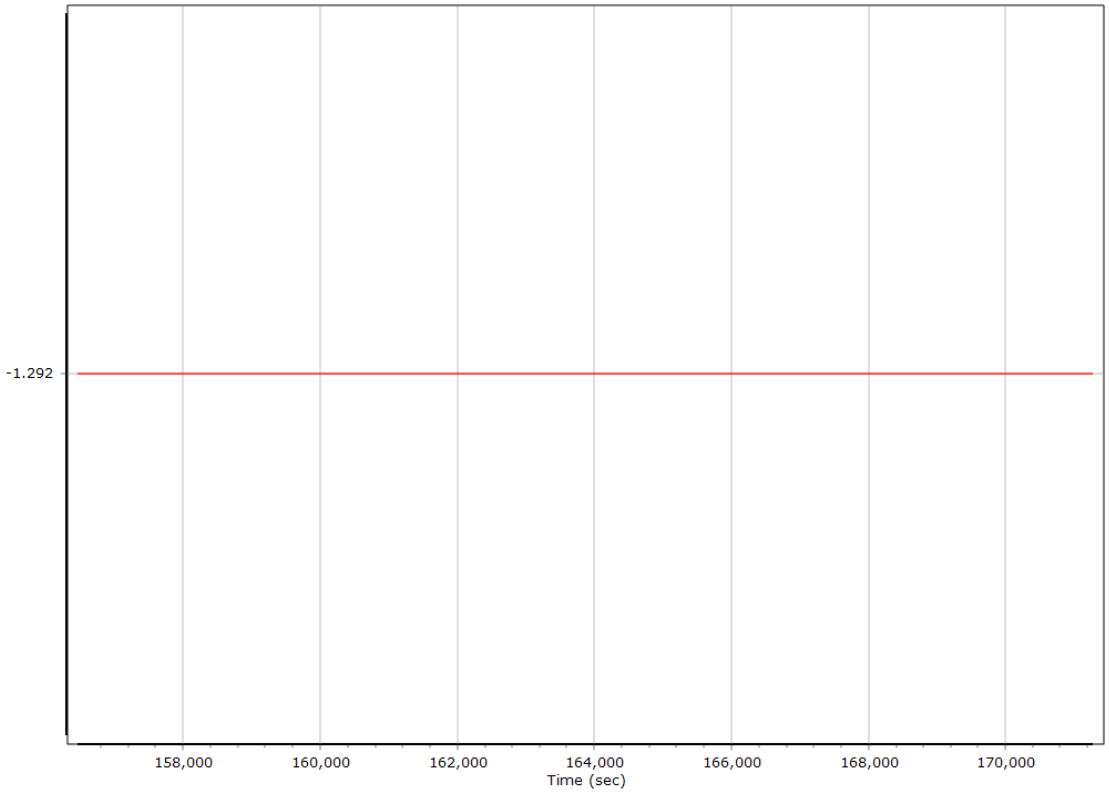
X Reference-Primary GNSS Lever Arm (m)



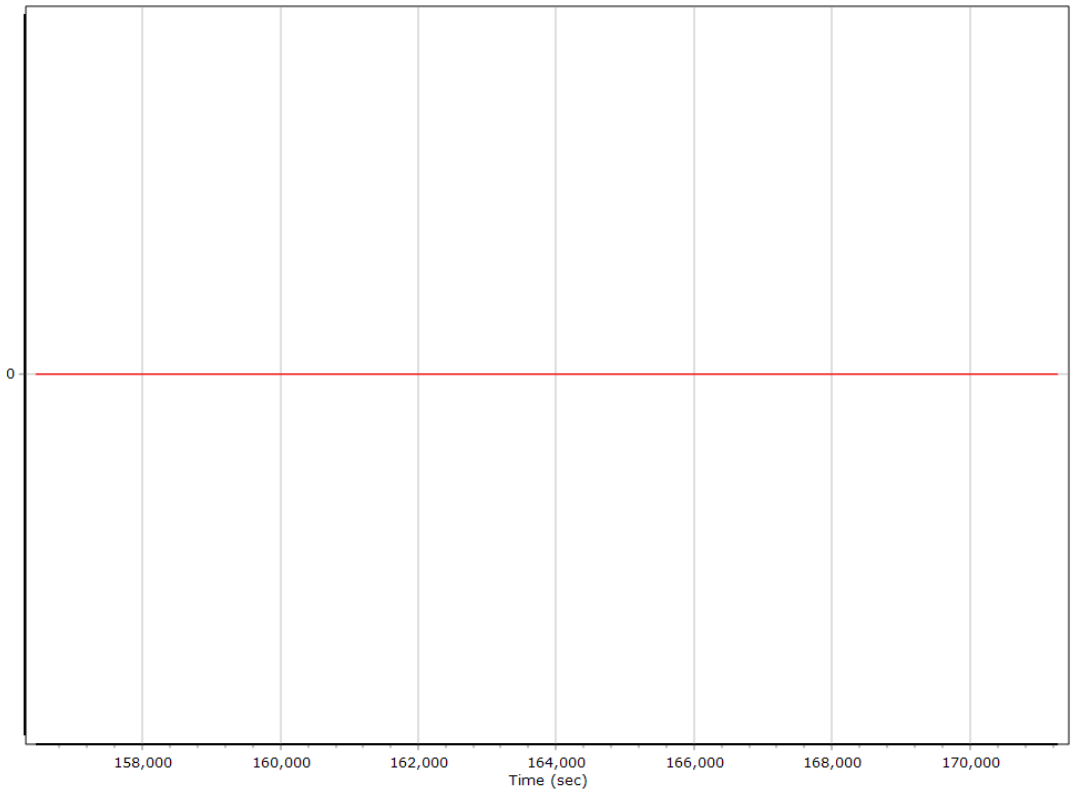
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



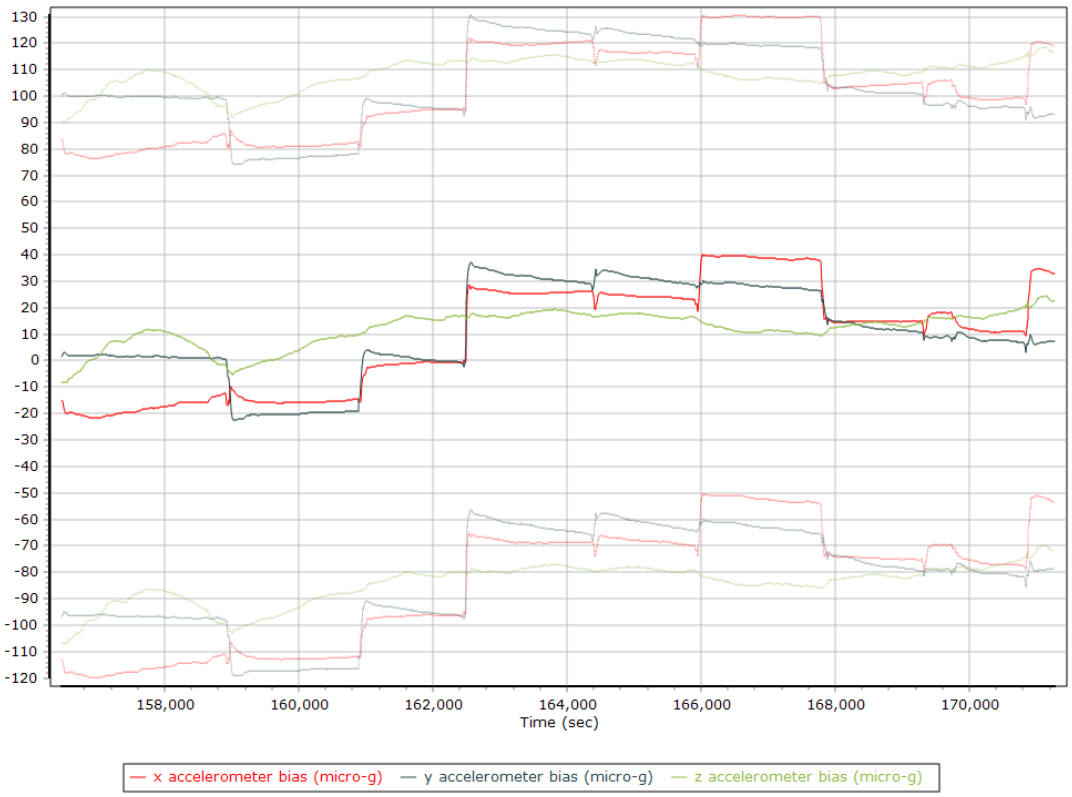
Reference-Primary GNSS Lever Arm Figure of Merit



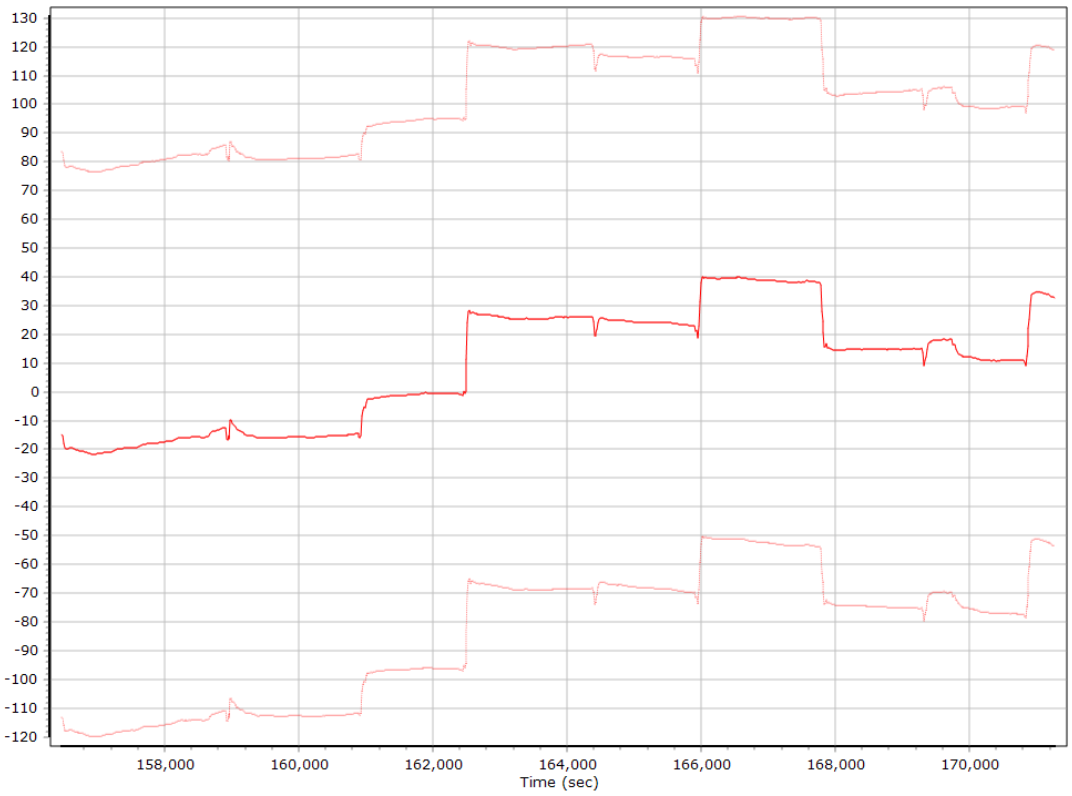
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

Accelerometer Bias (micro-g)



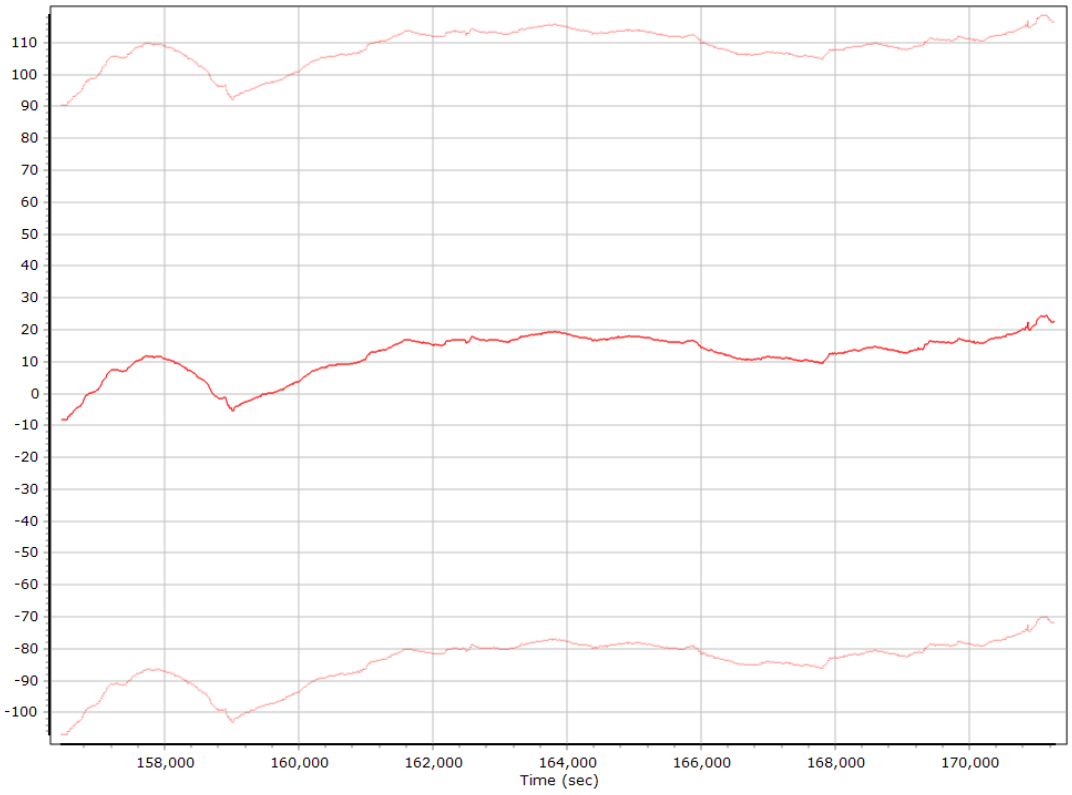
X Accelerometer Bias (micro-g)



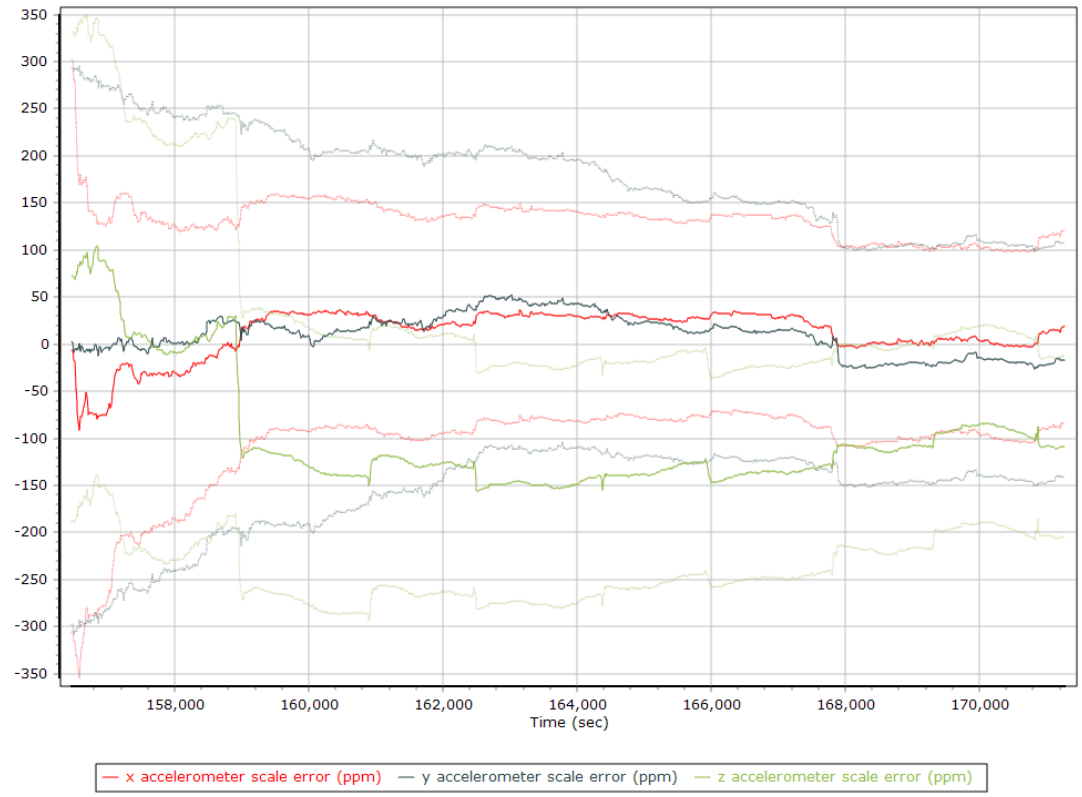
Y Accelerometer Bias (micro-g)



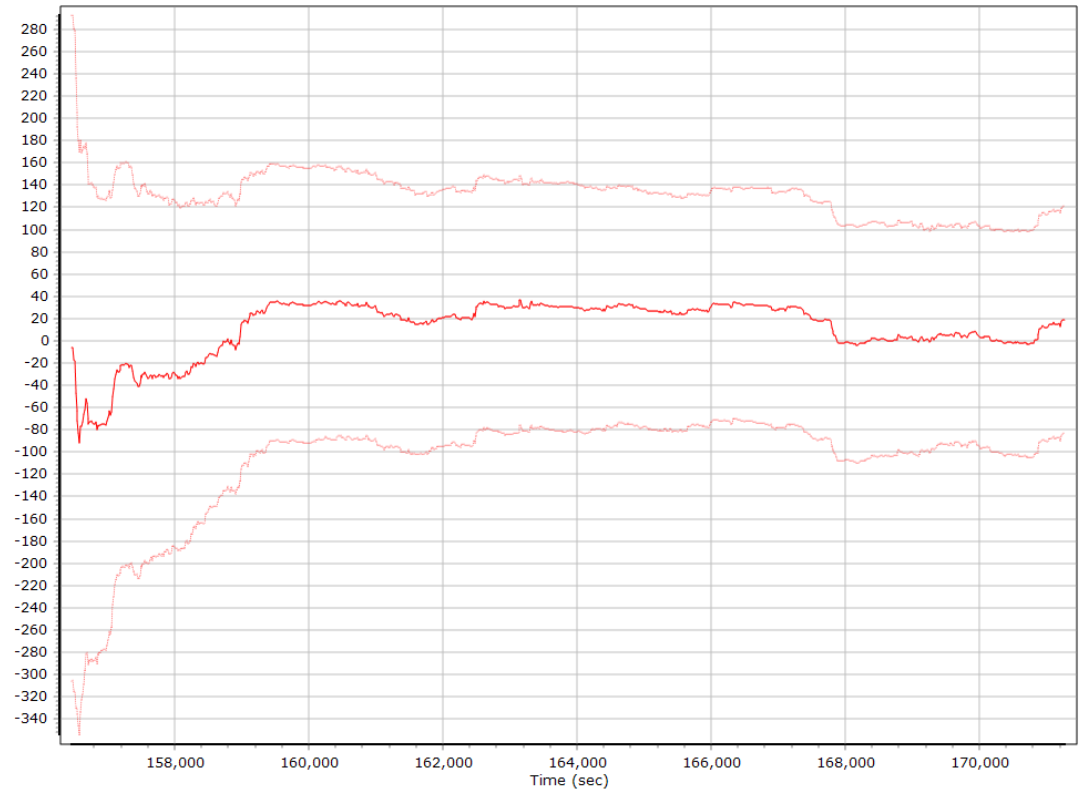
Z Accelerometer Bias (micro-g)



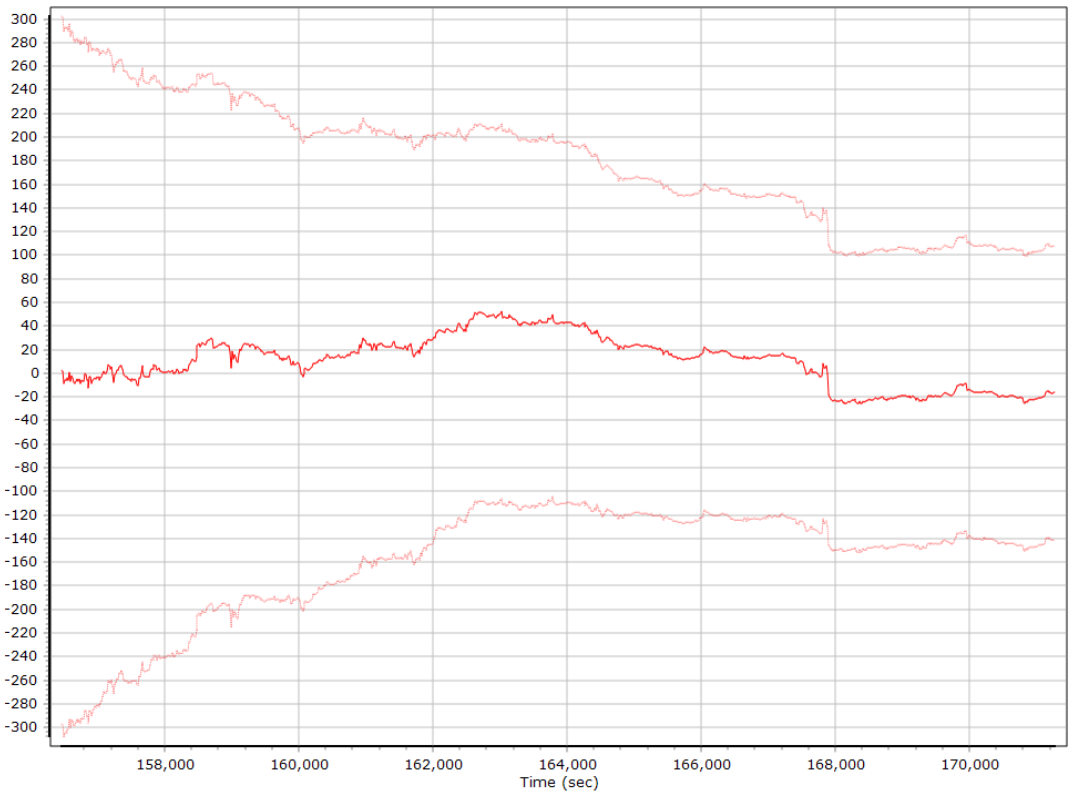
Accelerometer Scale Error (ppm)



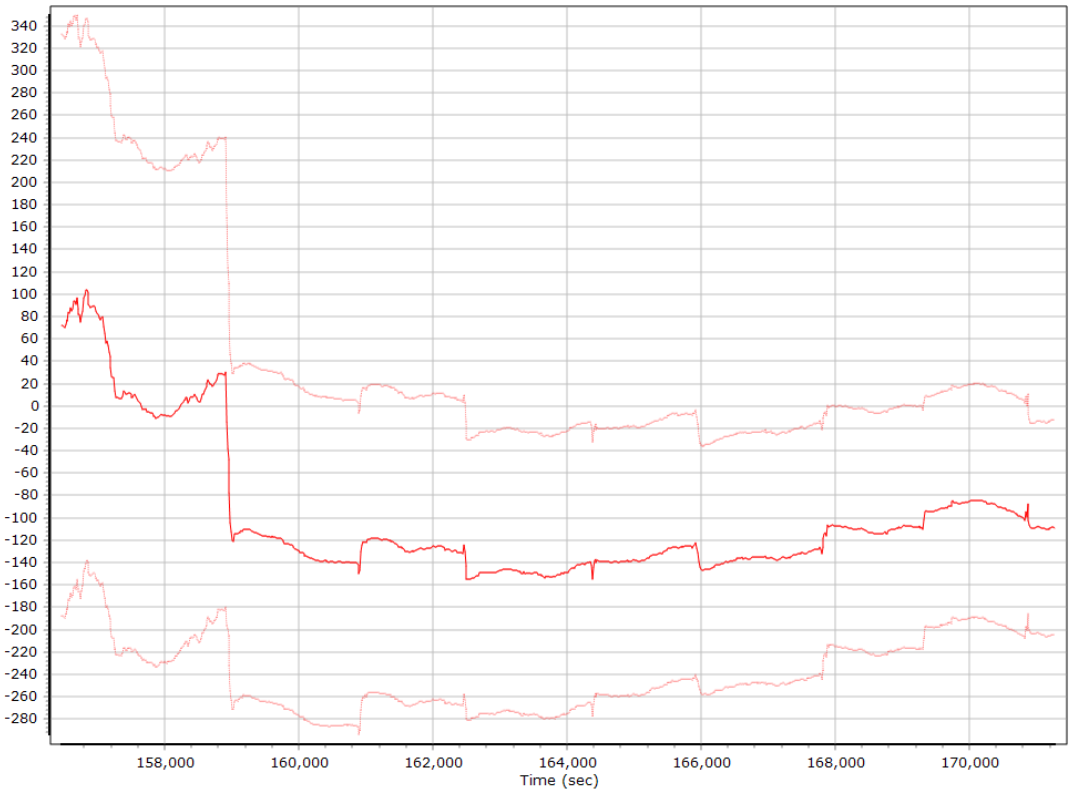
X Accelerometer Scale Error (ppm)



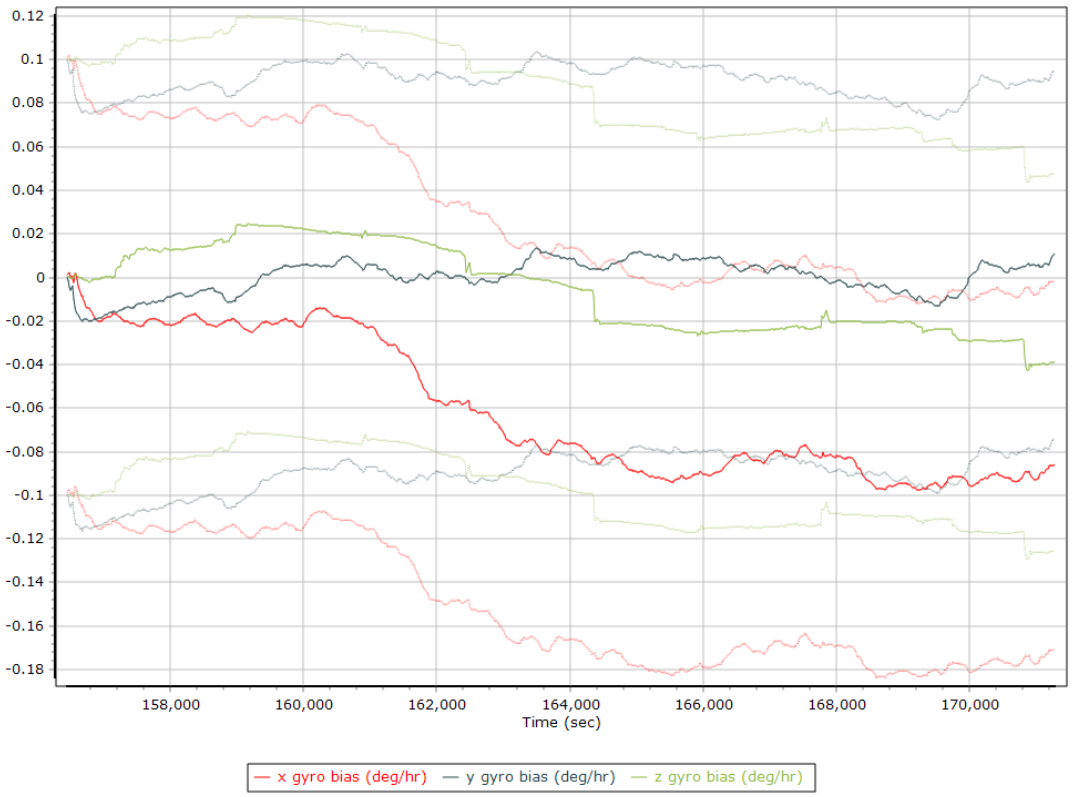
Y Accelerometer Scale Error (ppm)



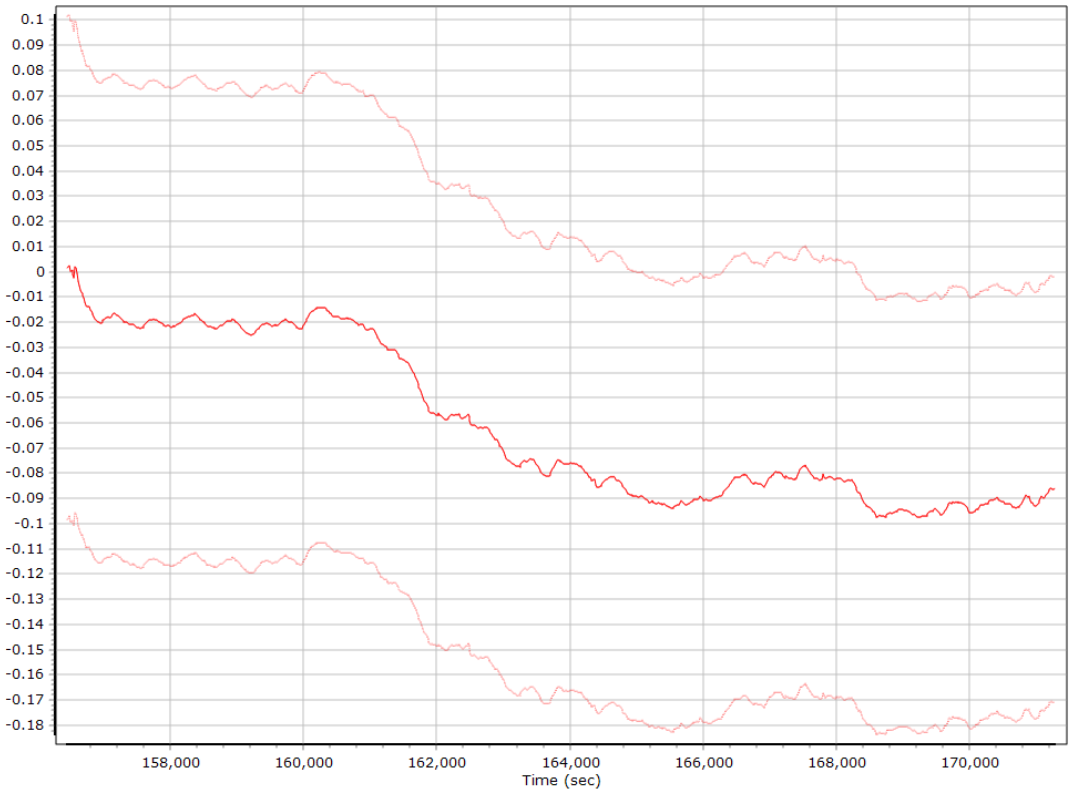
Z Accelerometer Scale Error (ppm)



Gyro Bias (deg/h)



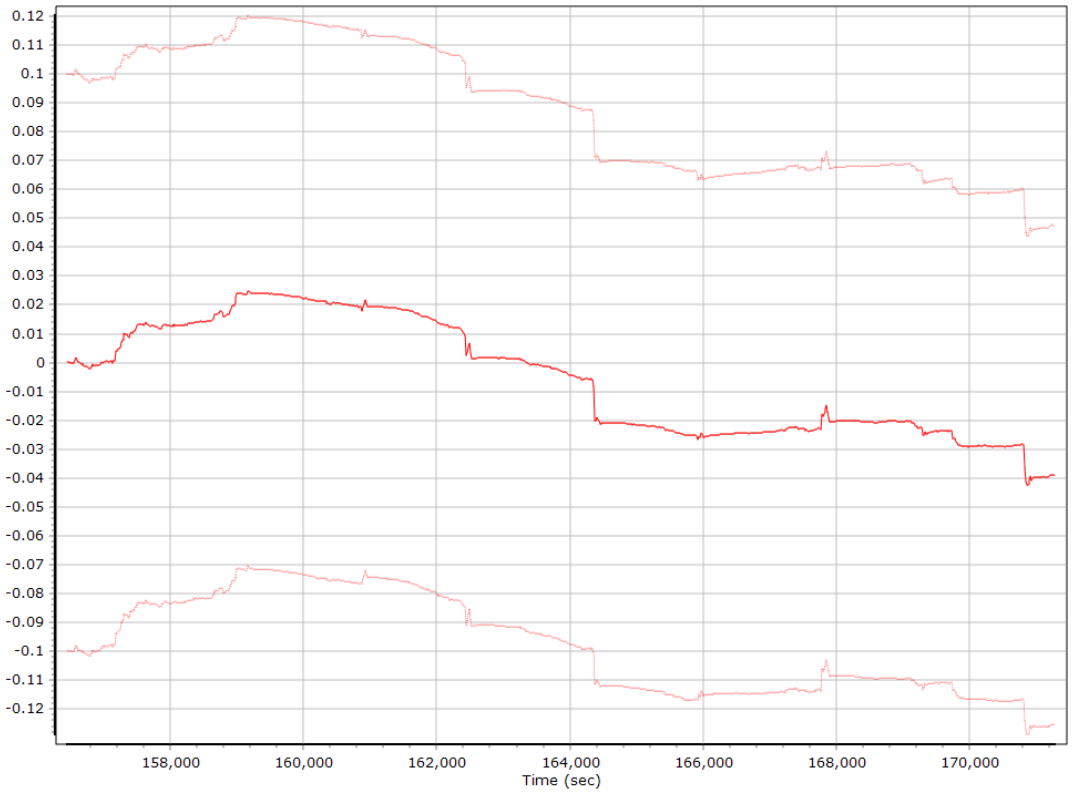
X Gyro Bias (deg/h)



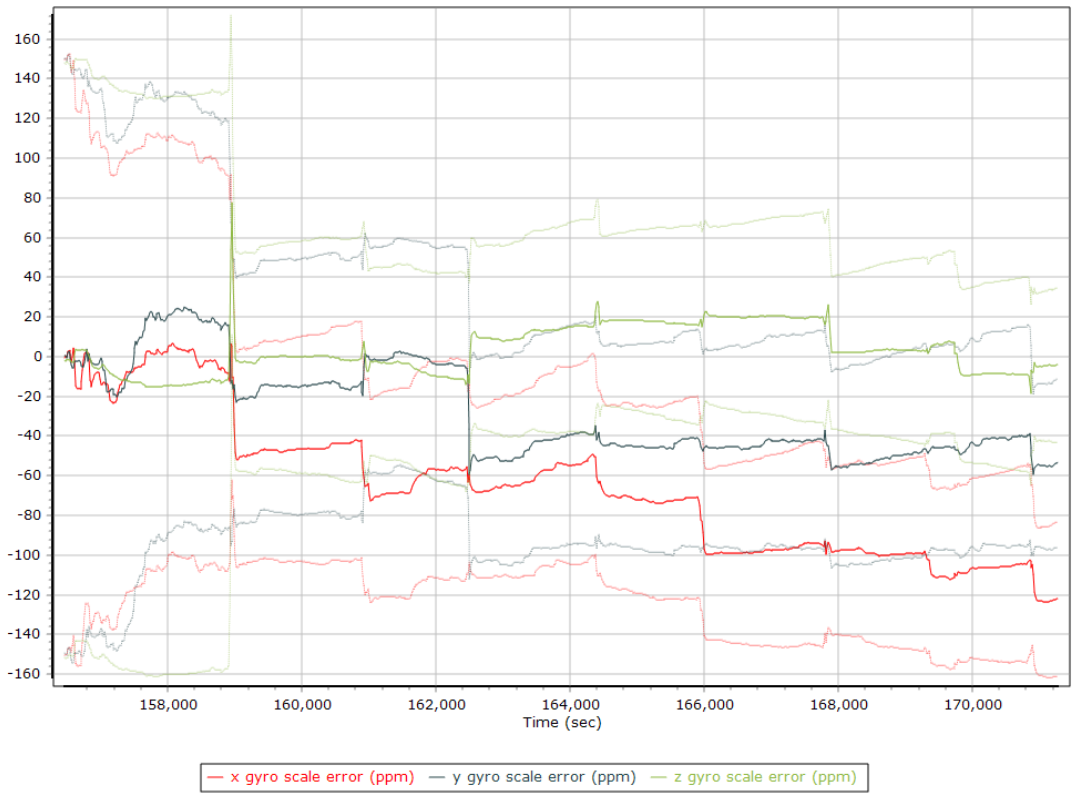
Y Gyro Bias (deg/h)



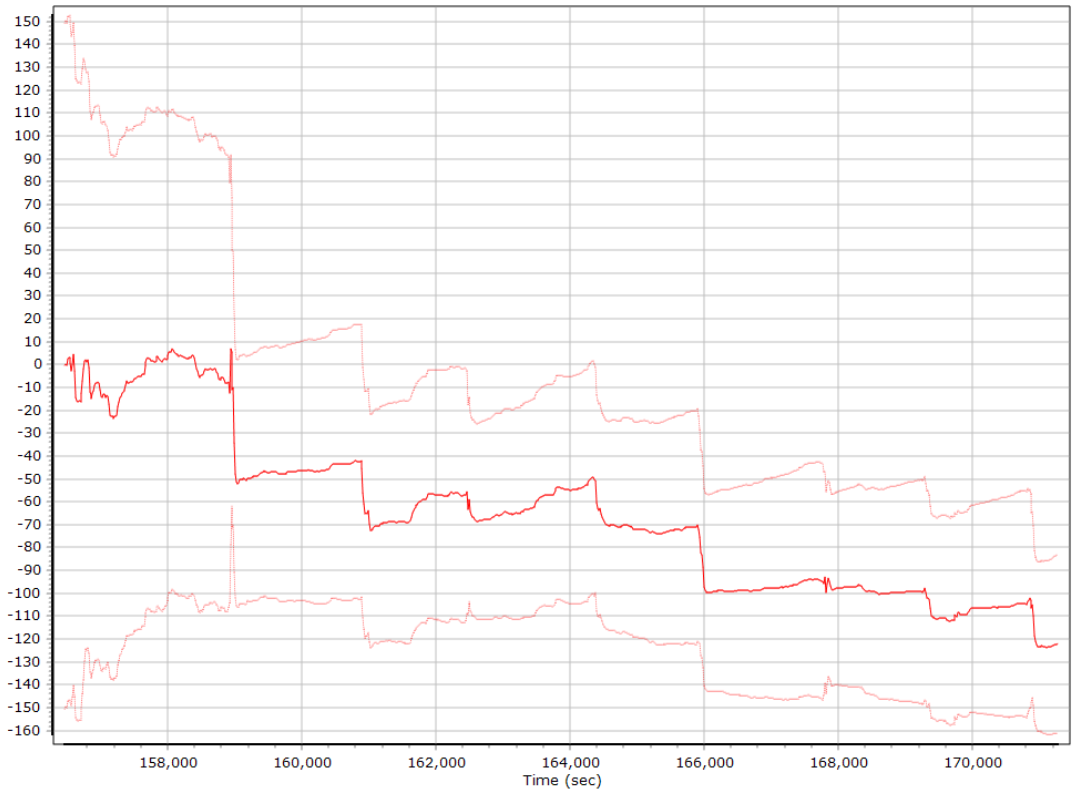
Z Gyro Bias (deg/h)



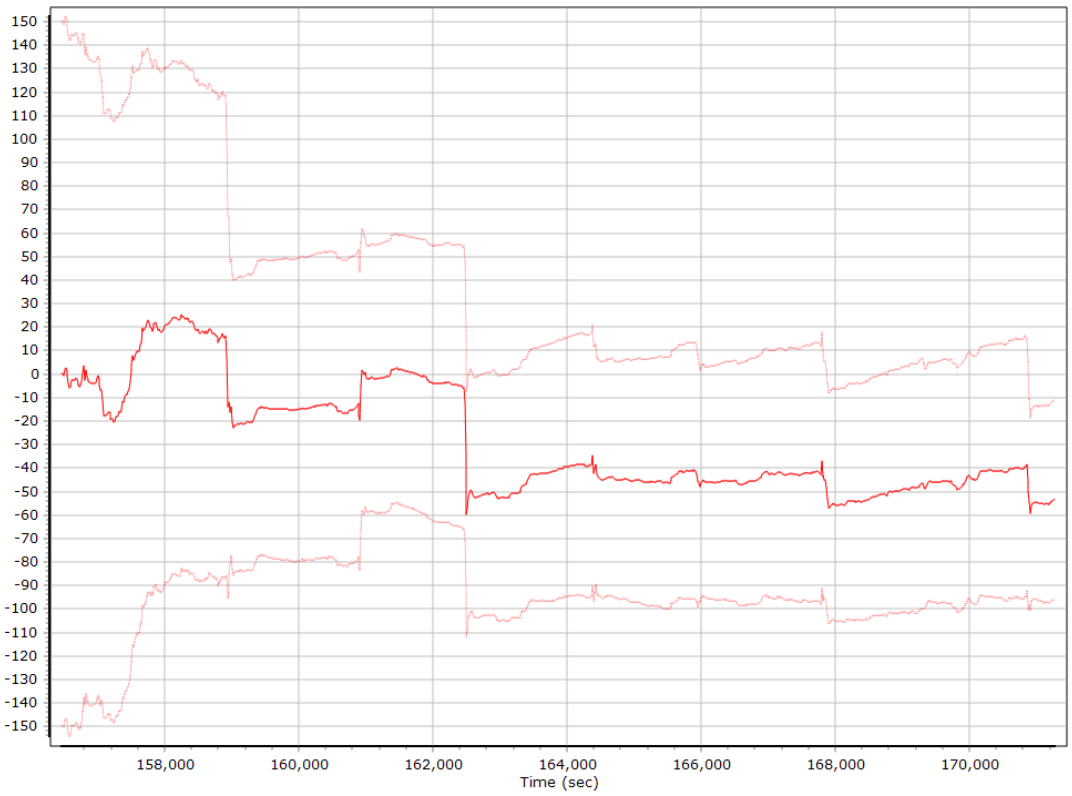
Gyro Scale Error (ppm)



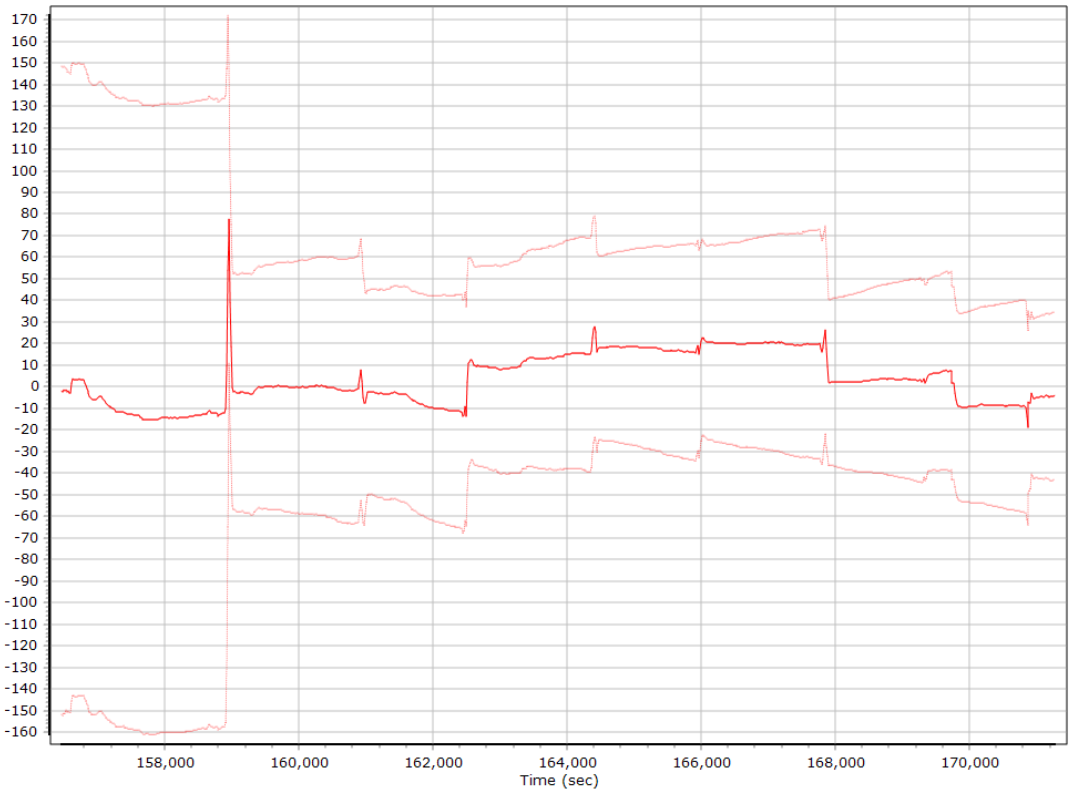
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

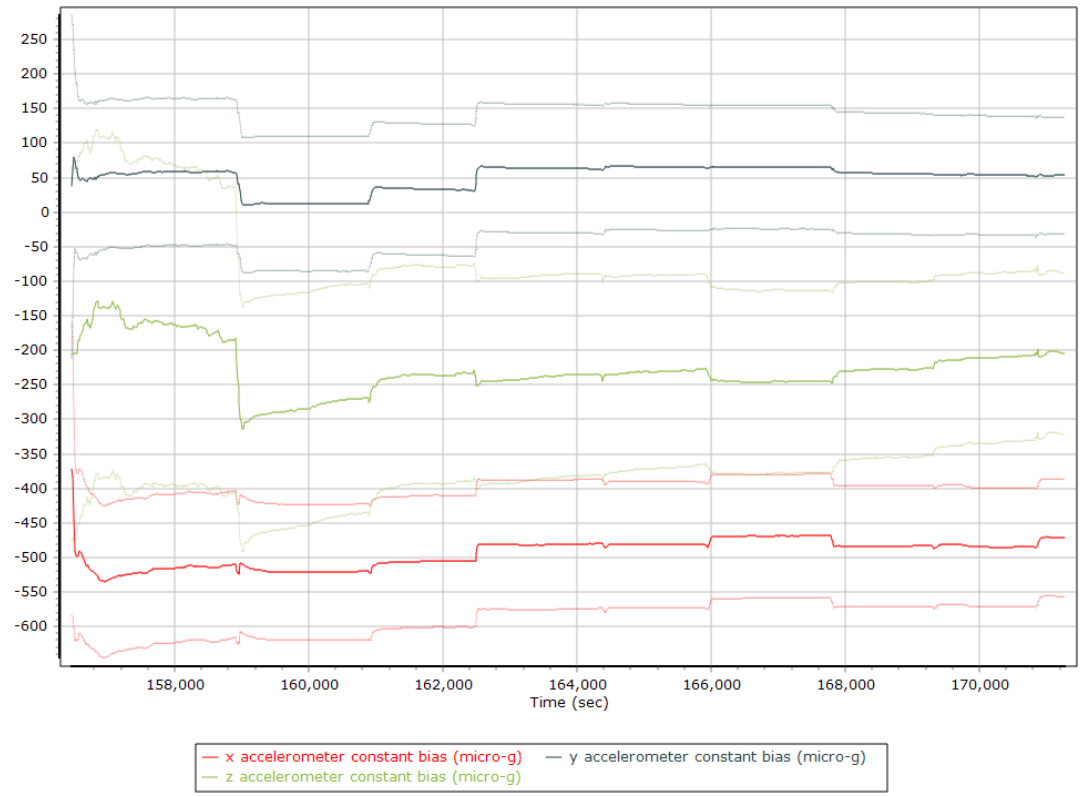


Z Gyro Scale Error (ppm)

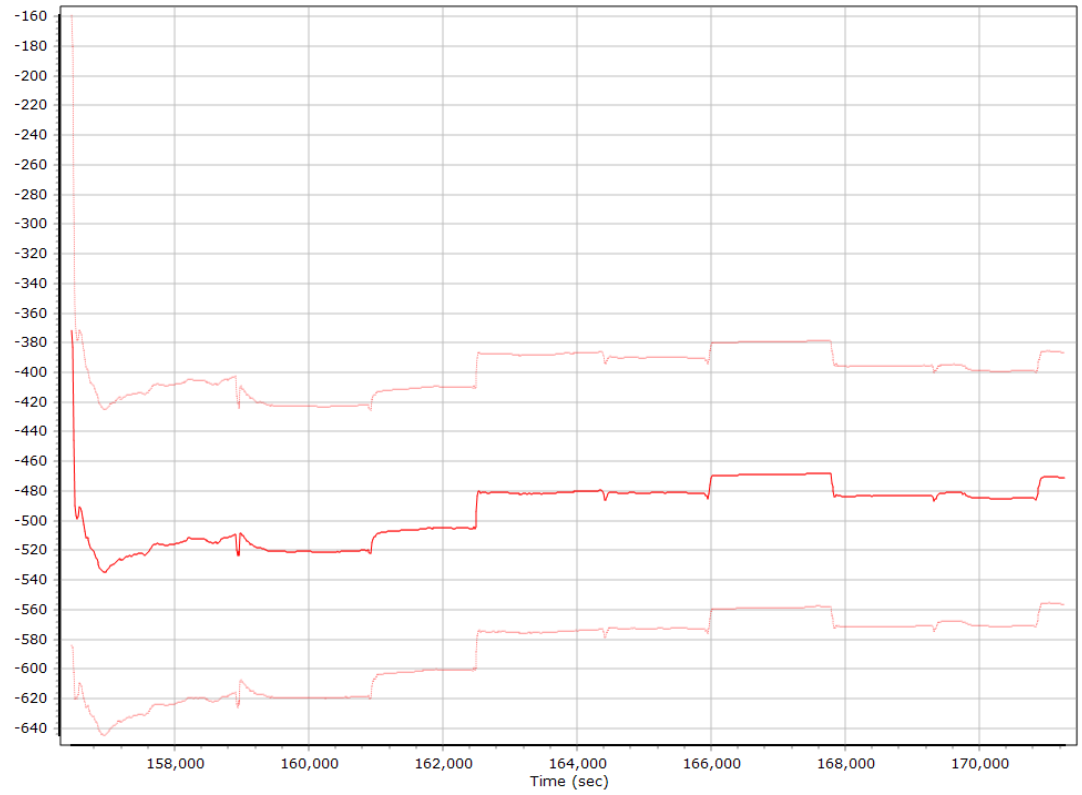


Forward Processed Estimated Constant Errors, Reference Frame

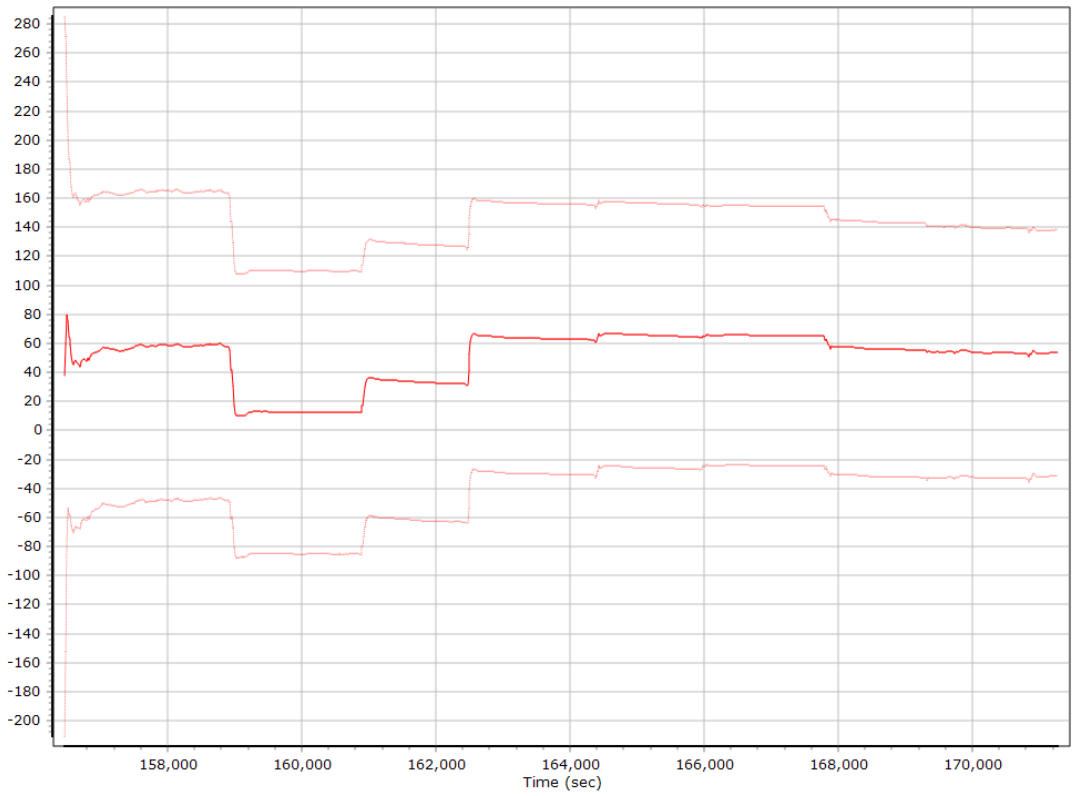
Accelerometer Bias (micro-g)



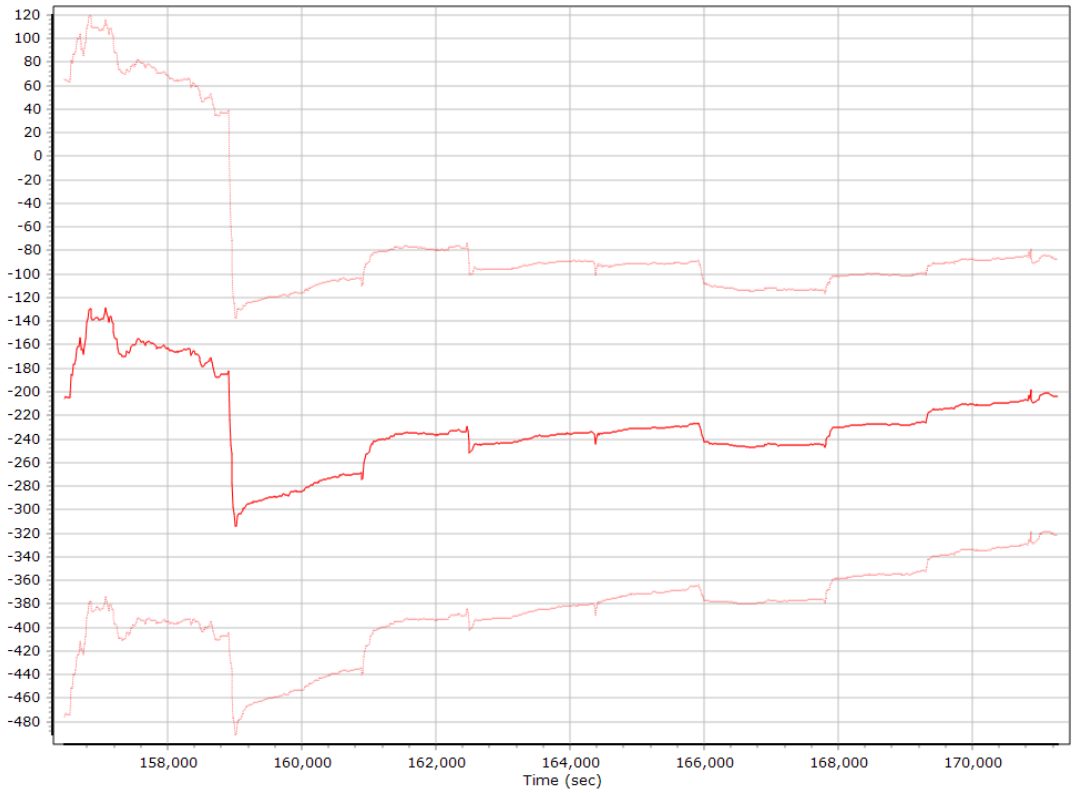
X Accelerometer Bias (micro-g)



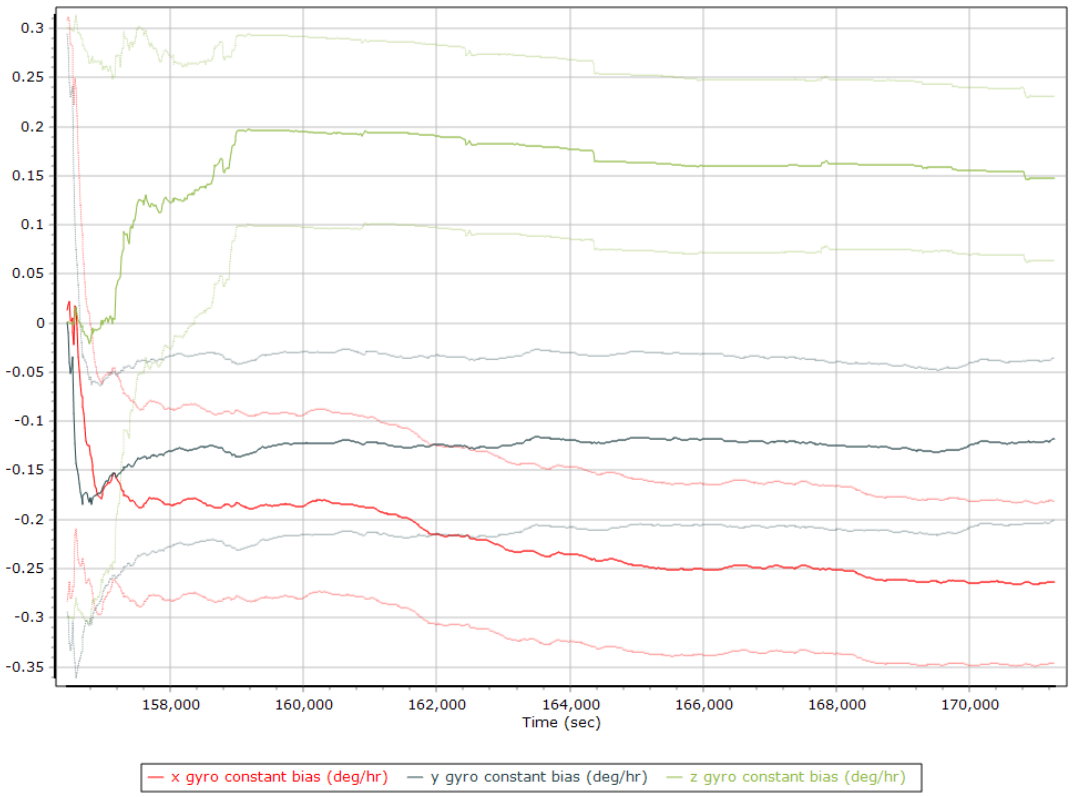
Y Accelerometer Bias (micro-g)



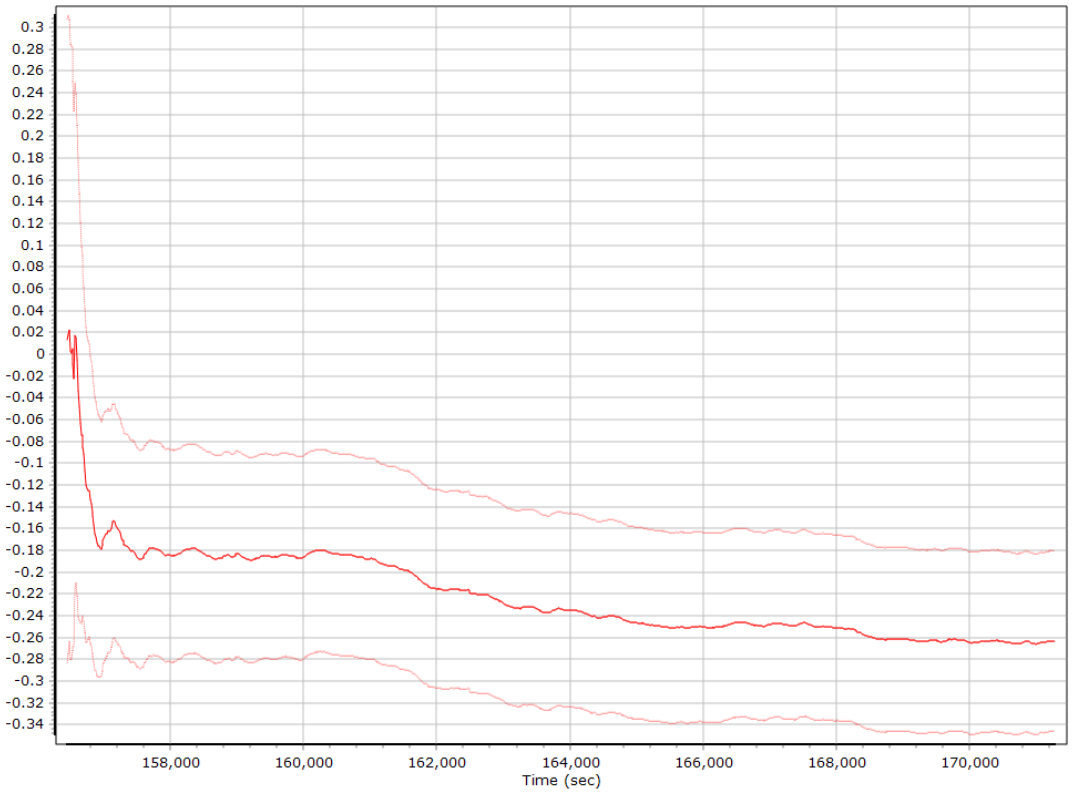
Z Accelerometer Bias (micro-g)



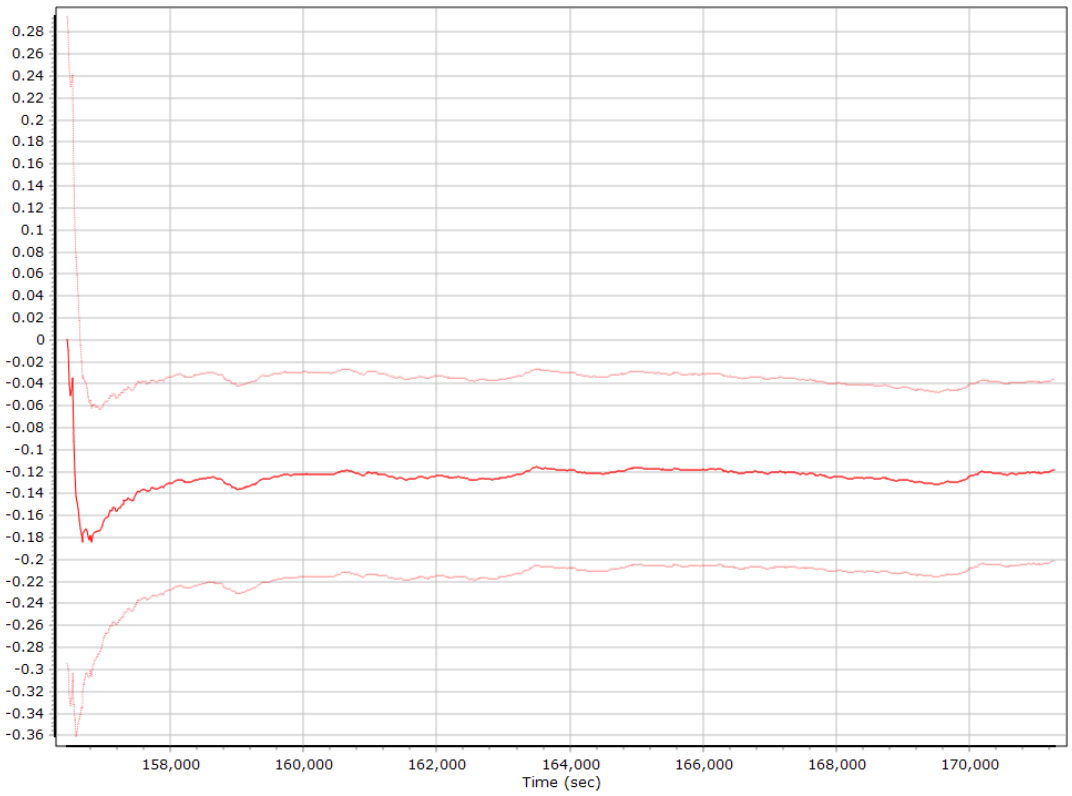
Gyro Bias (deg/h)



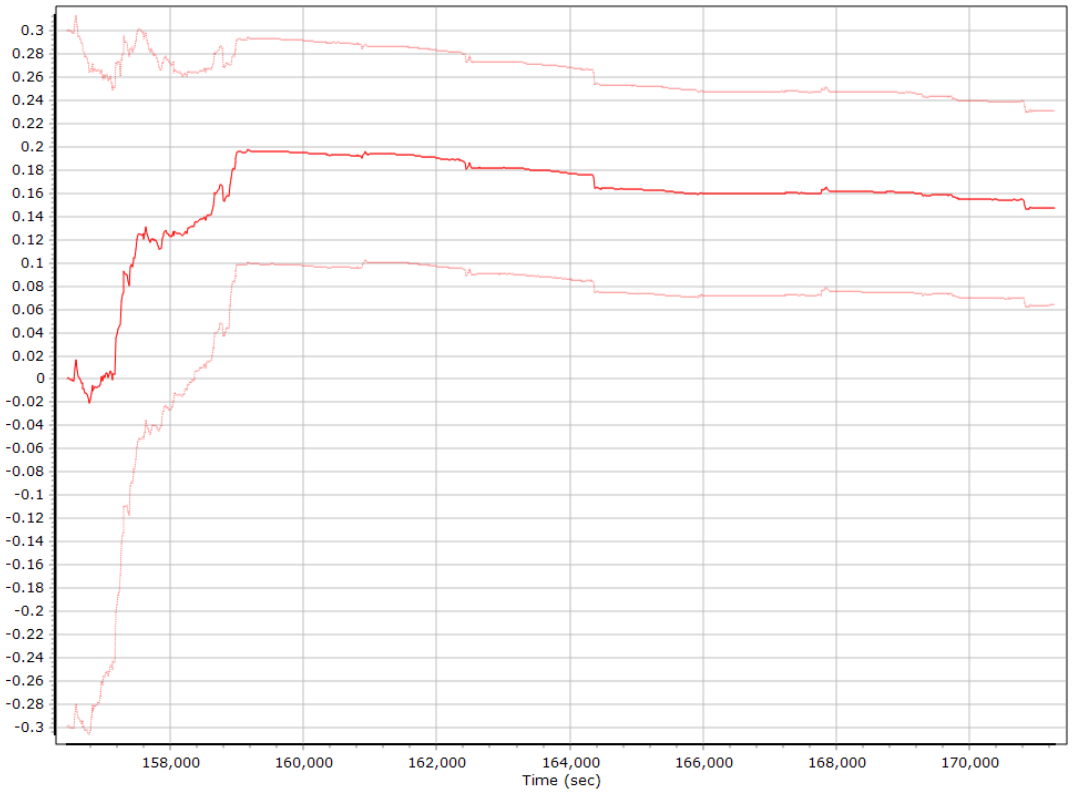
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)



Z Gyro Bias (deg/h)

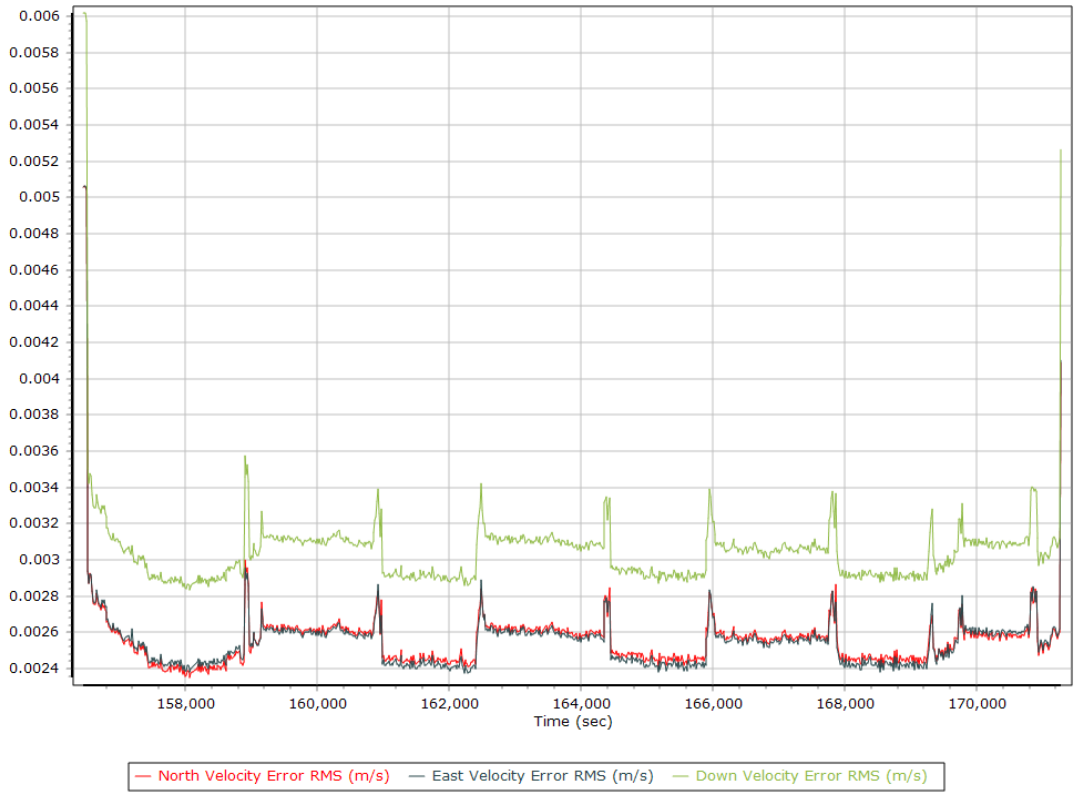


Smoothed Performance Metrics

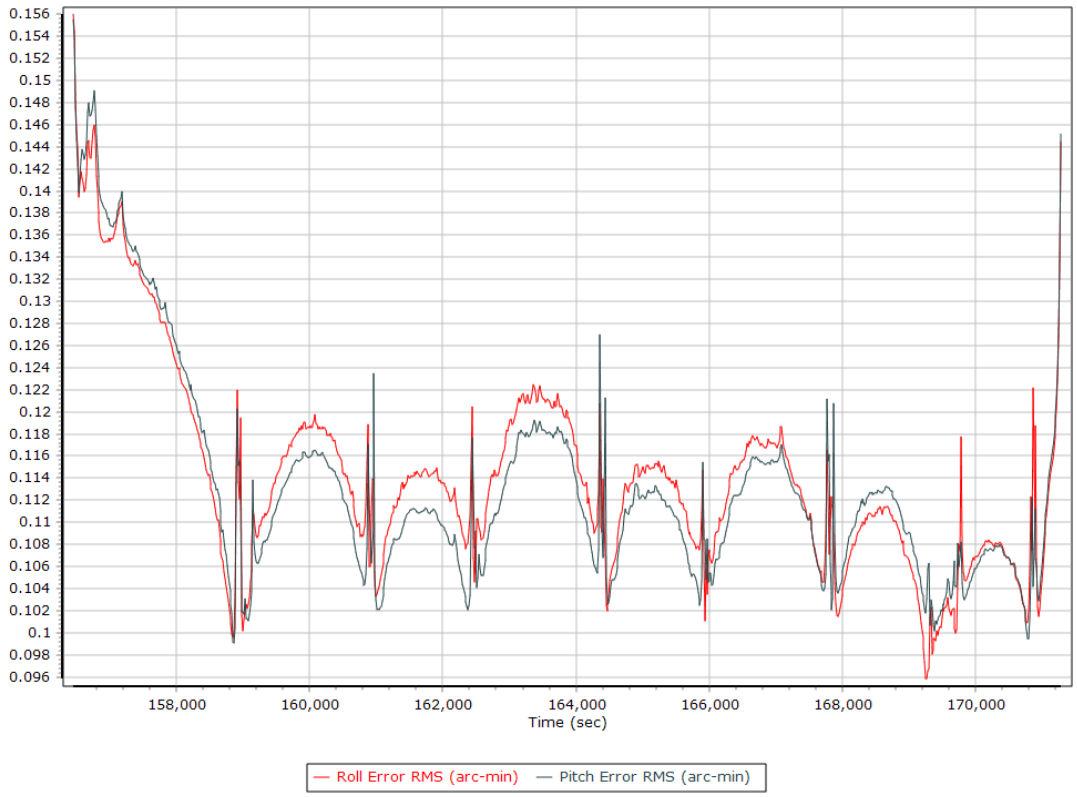
Position Error RMS (m)



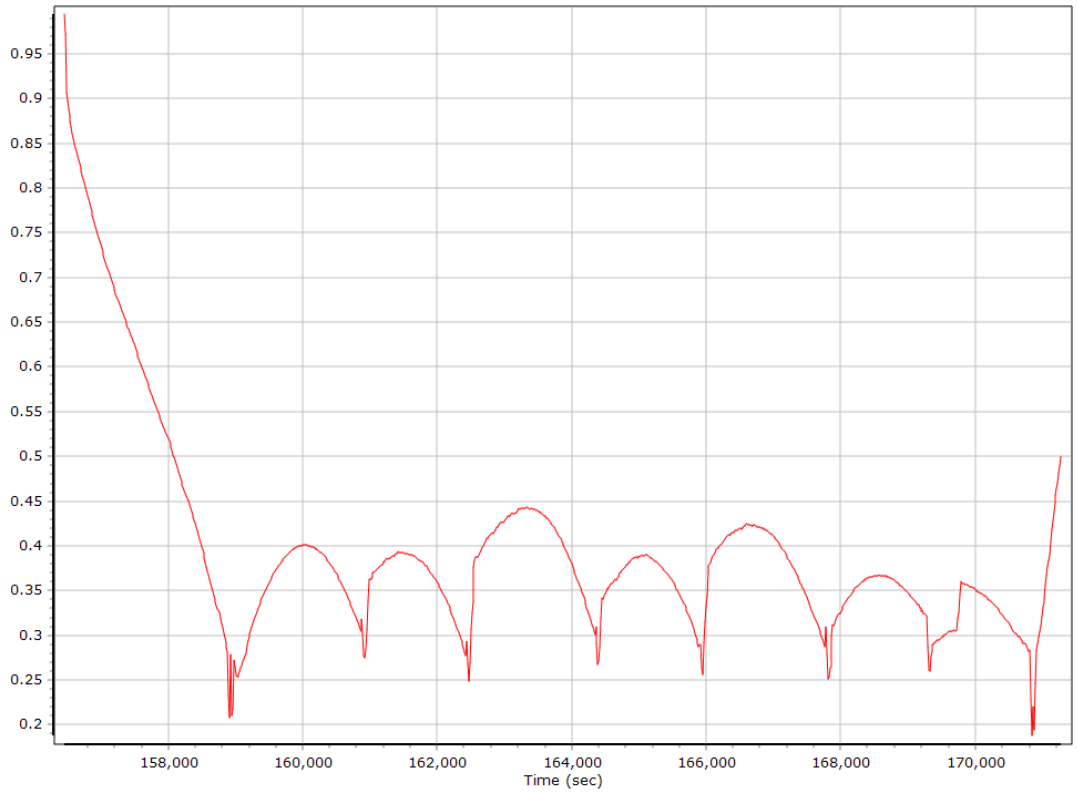
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

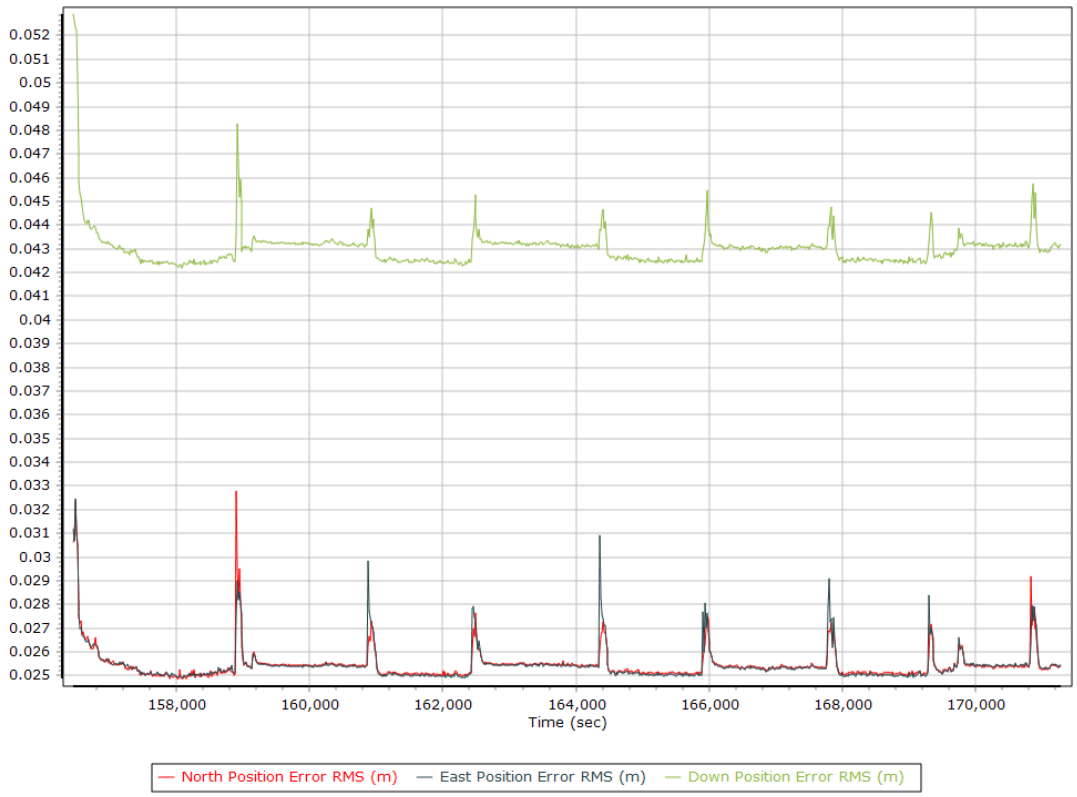


Heading Error RMS (arc-min)

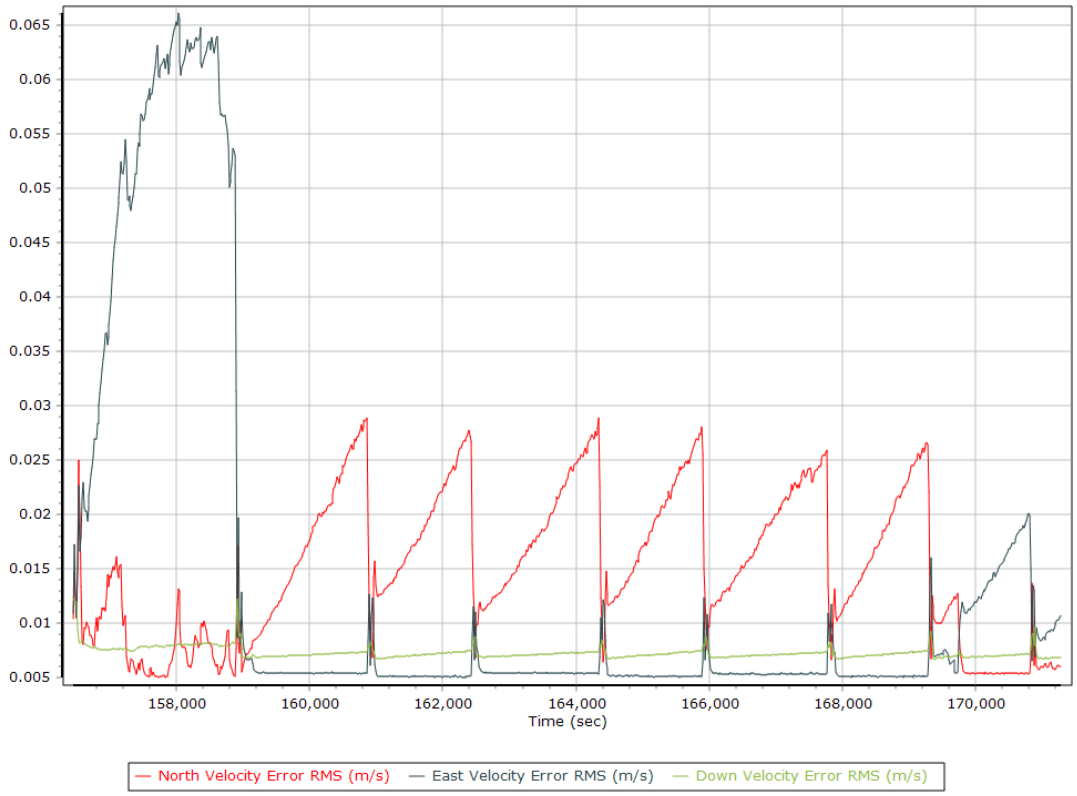


Forward Processed Performance Metrics

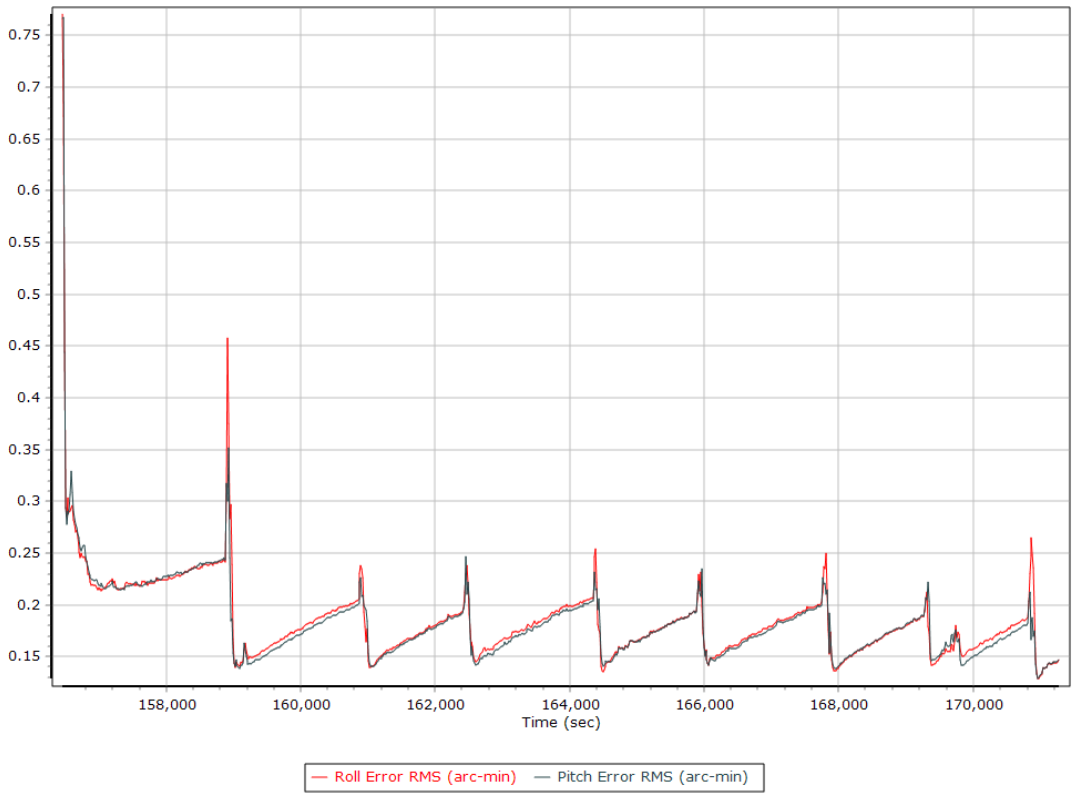
Position Error RMS (m)



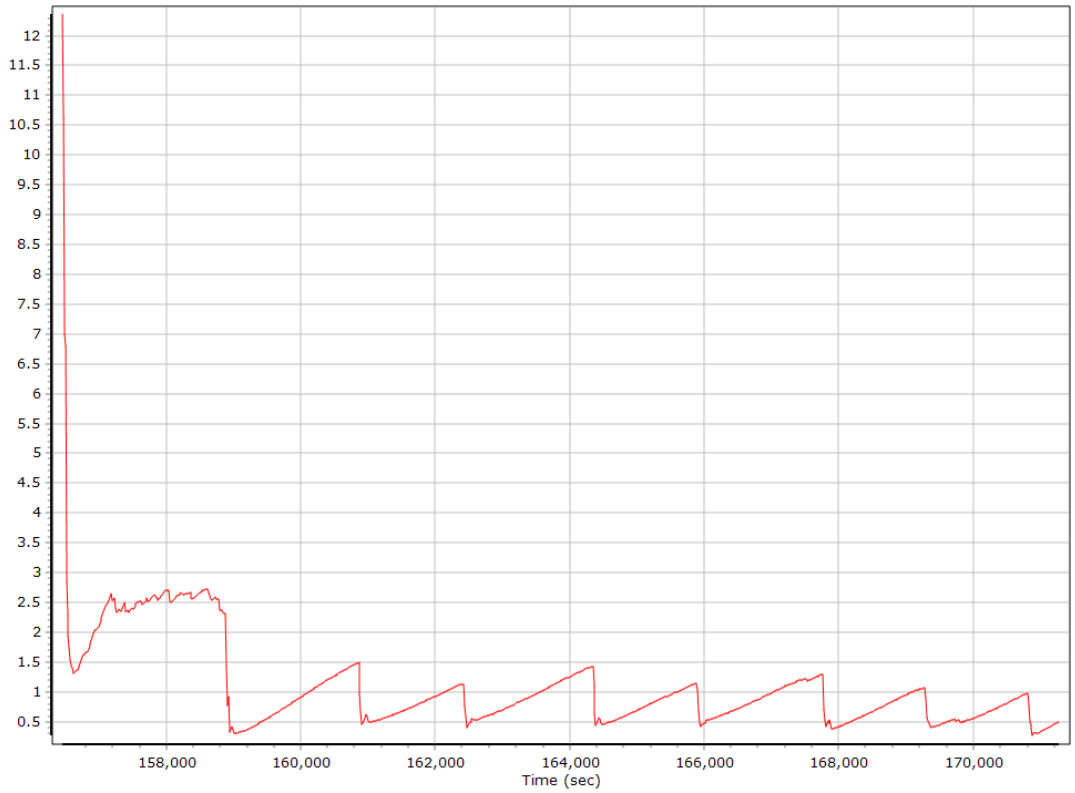
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

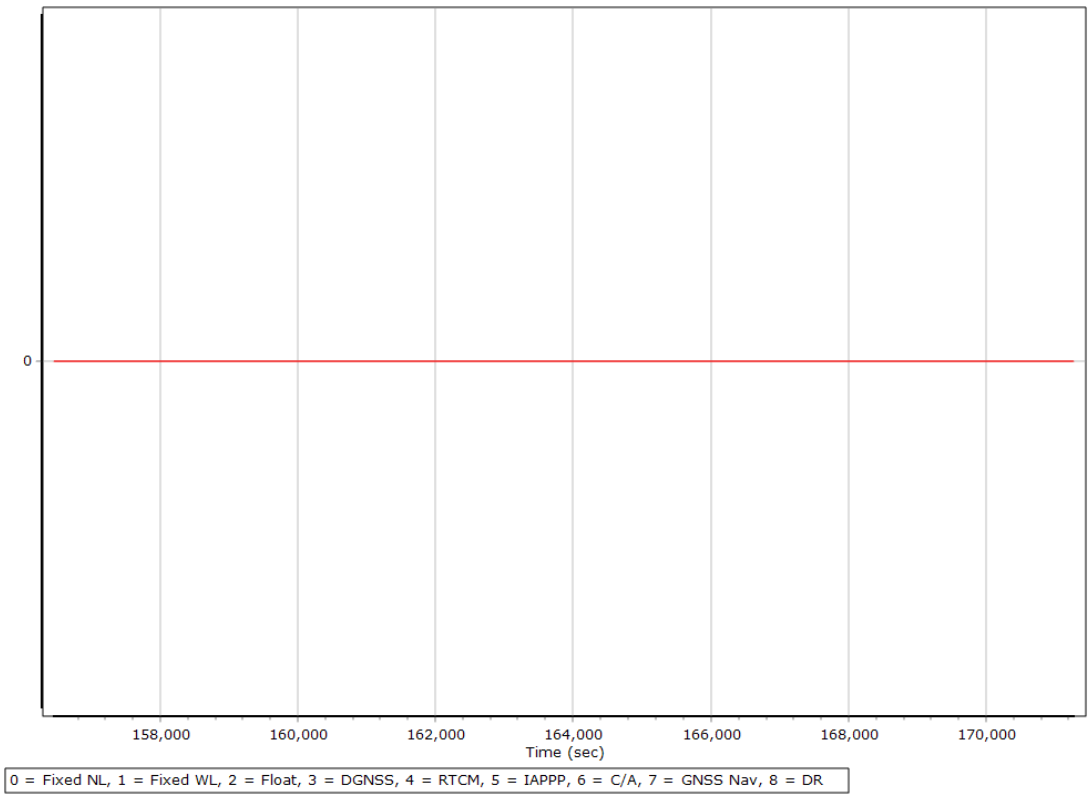


Heading Error RMS (arc-min)

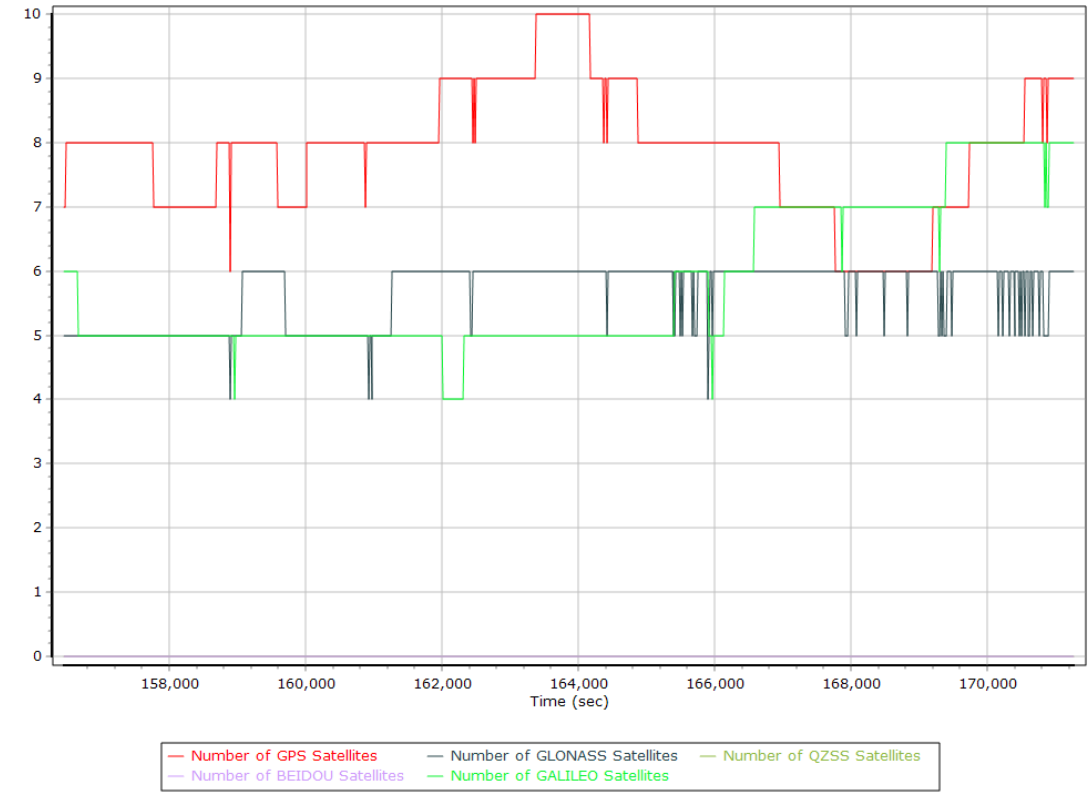


Forward Processed Solution Status

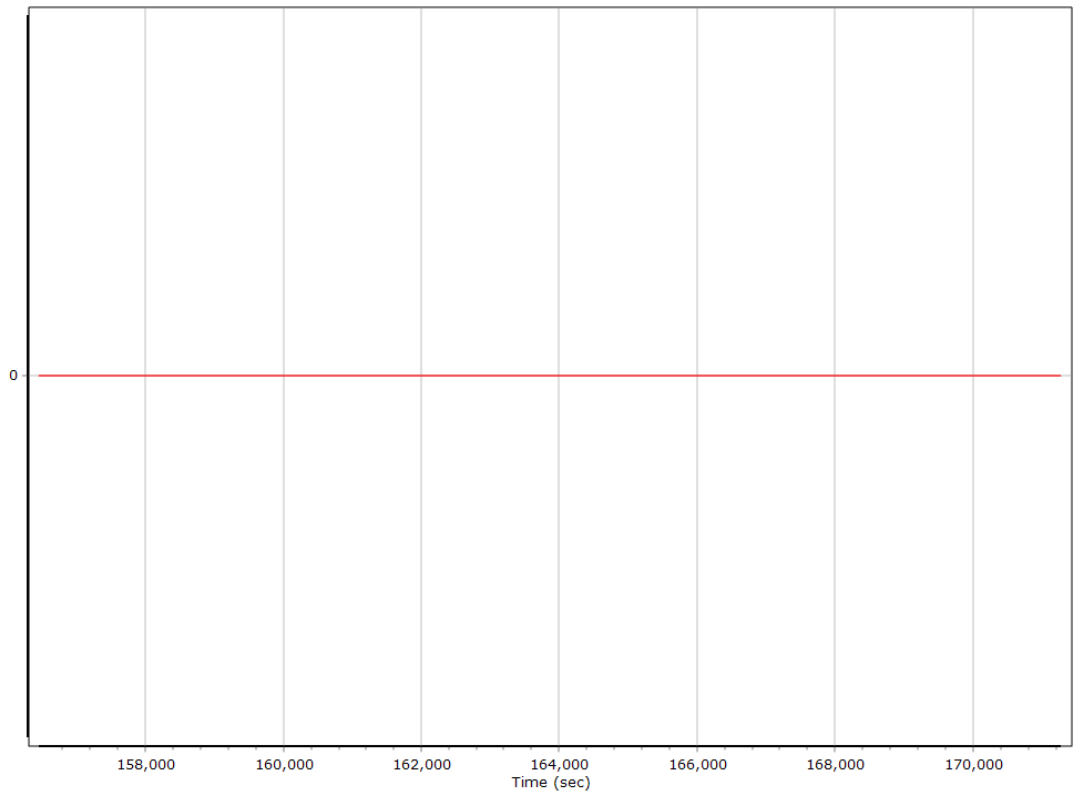
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12222020A_4040
Processing date	2022-01-05 15:14:43
Mission date	2020-12-22 14:44:27
Mission duration	05:09:41.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201222_144408_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3570.20g	GLONASS Broadcast Ephemeris
Ephm3570.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12222020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201222_144408_INS-GPS_1.raw		
Last raw data file	201222_144408_INS-GPS_1.raw		
Start GPS week	2137		
Start time	225848.733 (12/22/2020 2:44:08 PM)		
End time	244421.988 (12/22/2020 7:53:41 PM)		
Start of fine alignment	226070.378 (12/22/2020 2:47:50 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

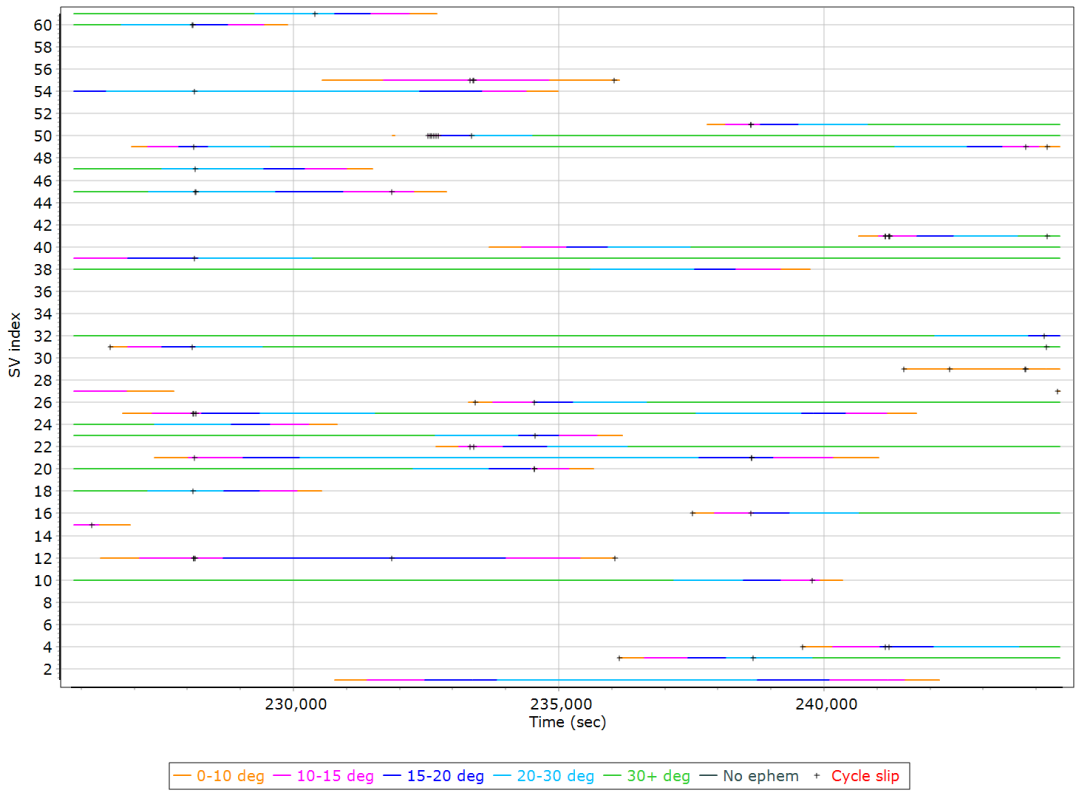
Rover Data QC

Raw IMU Import QC Summary

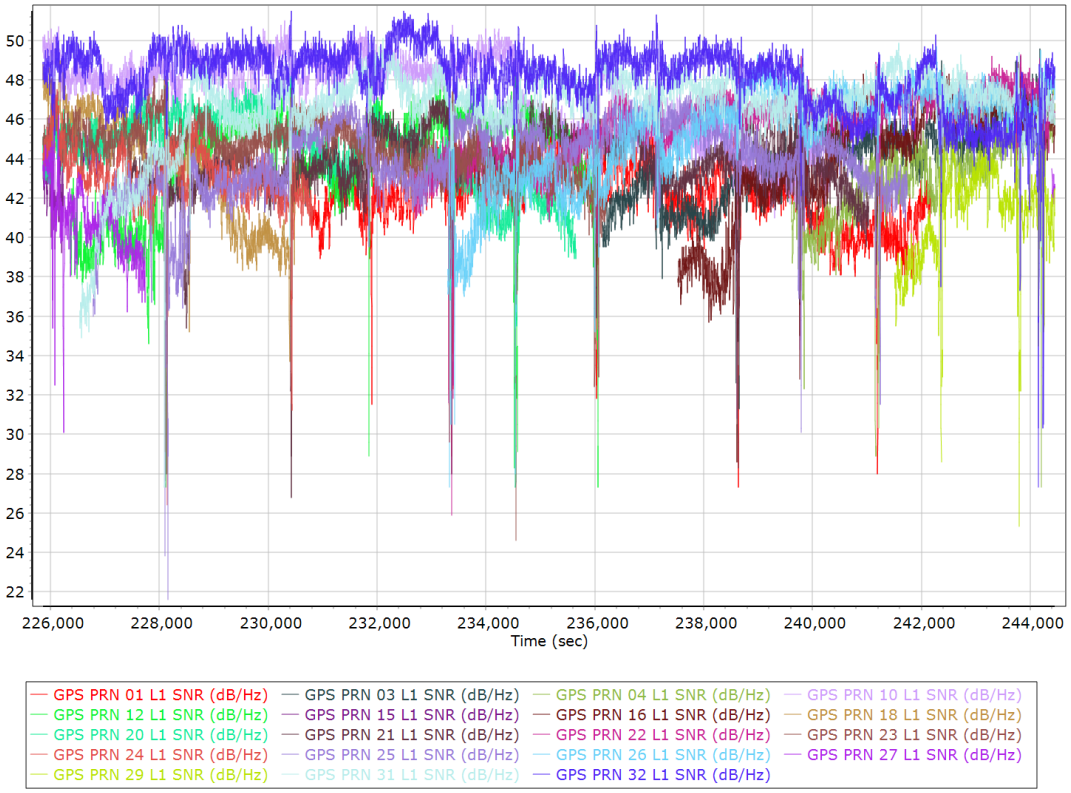
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12222020A_4040.log
IMU Records Processed	3715681
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

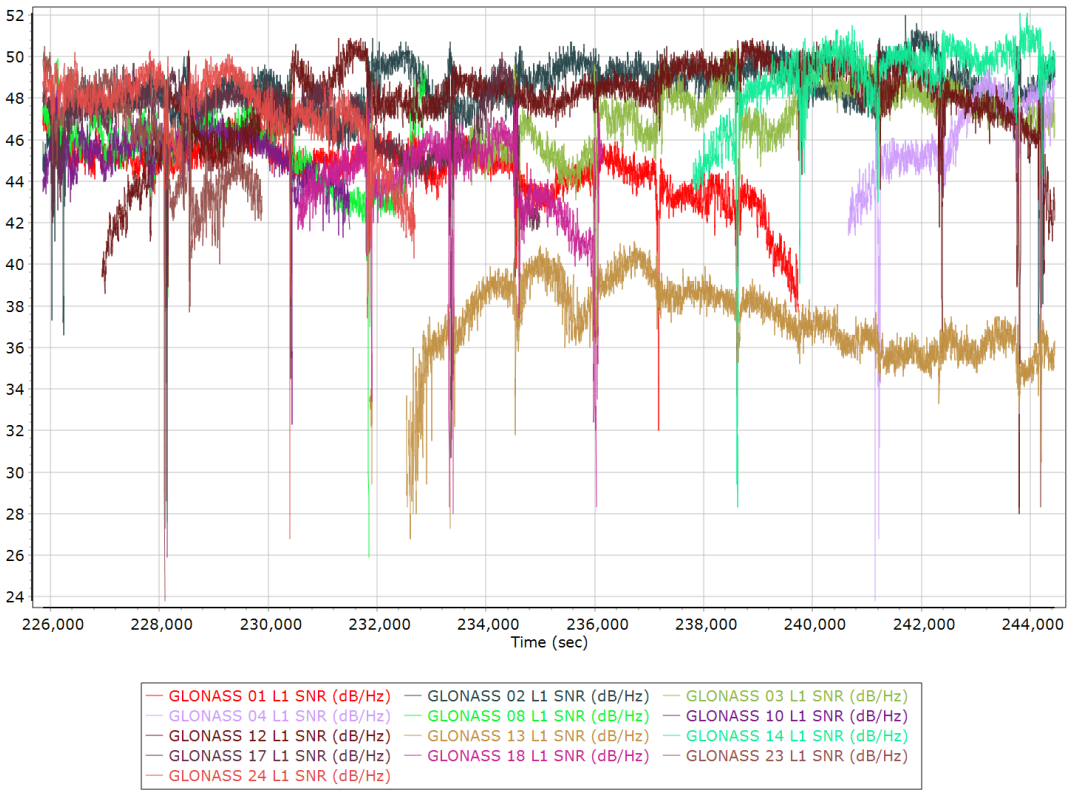
GPS/GLONASS L1 Satellite Lock/Elevation



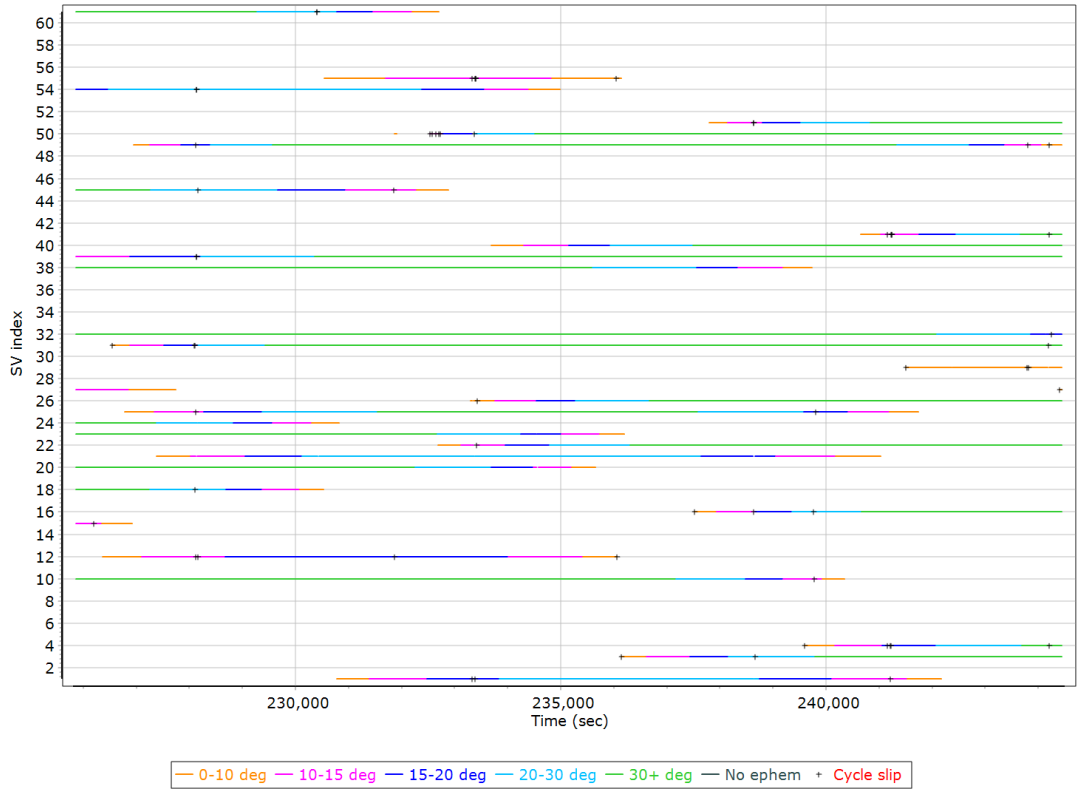
GPS L1 SNR



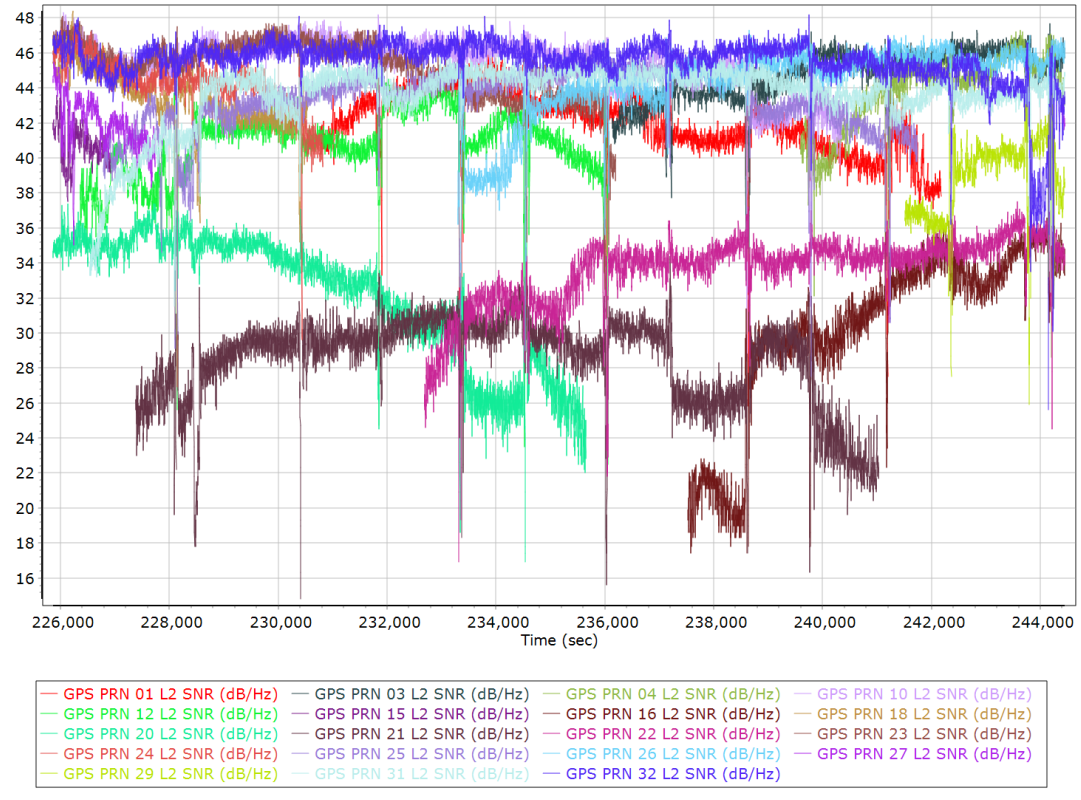
GLONASS L1 SNR



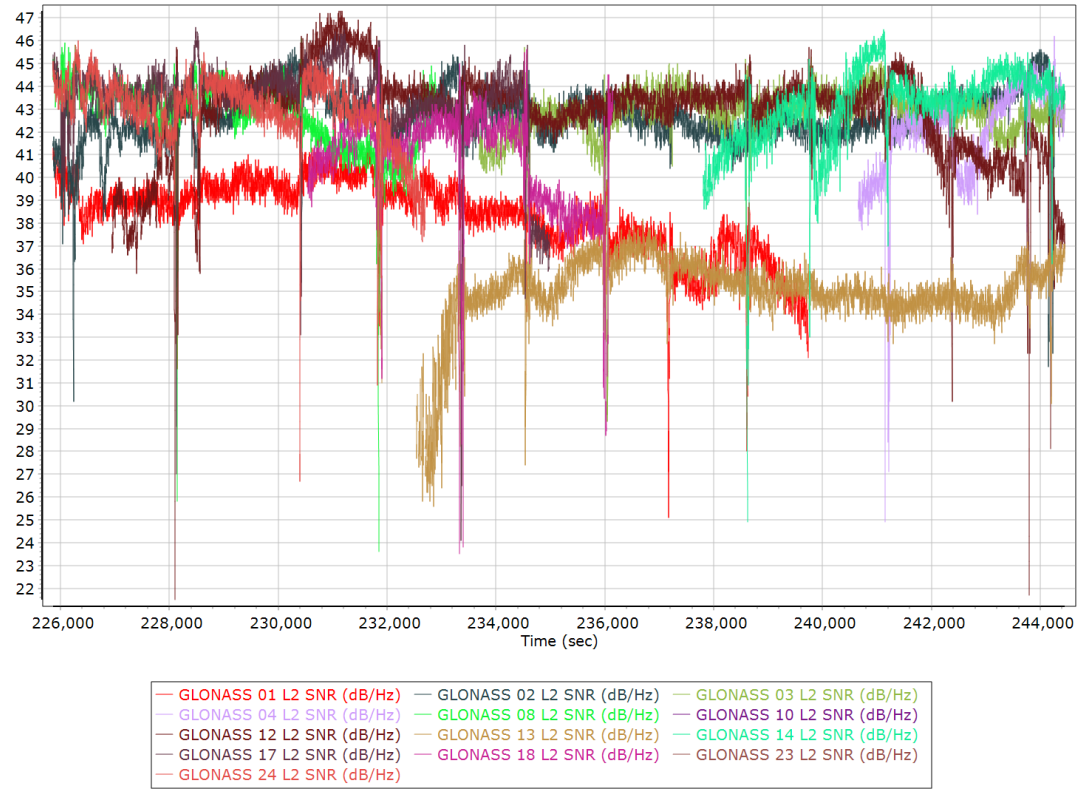
GPS/GLONASS L2 Satellite Lock/Elevation



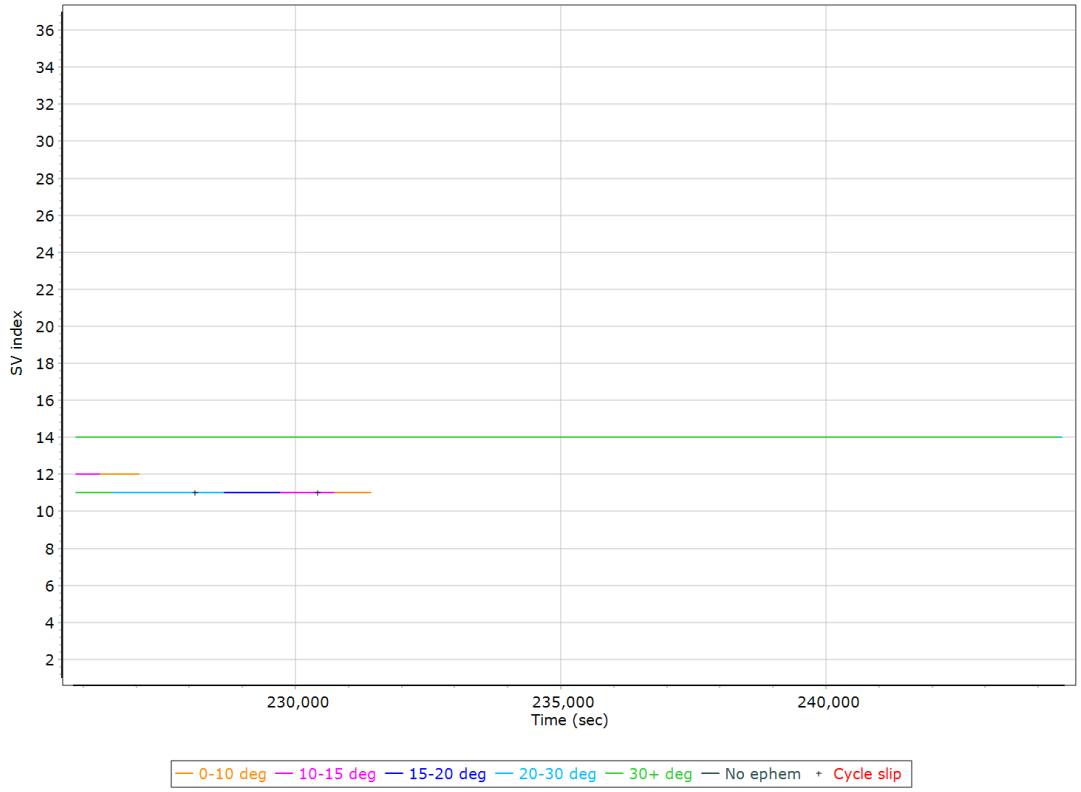
GPS L2 SNR



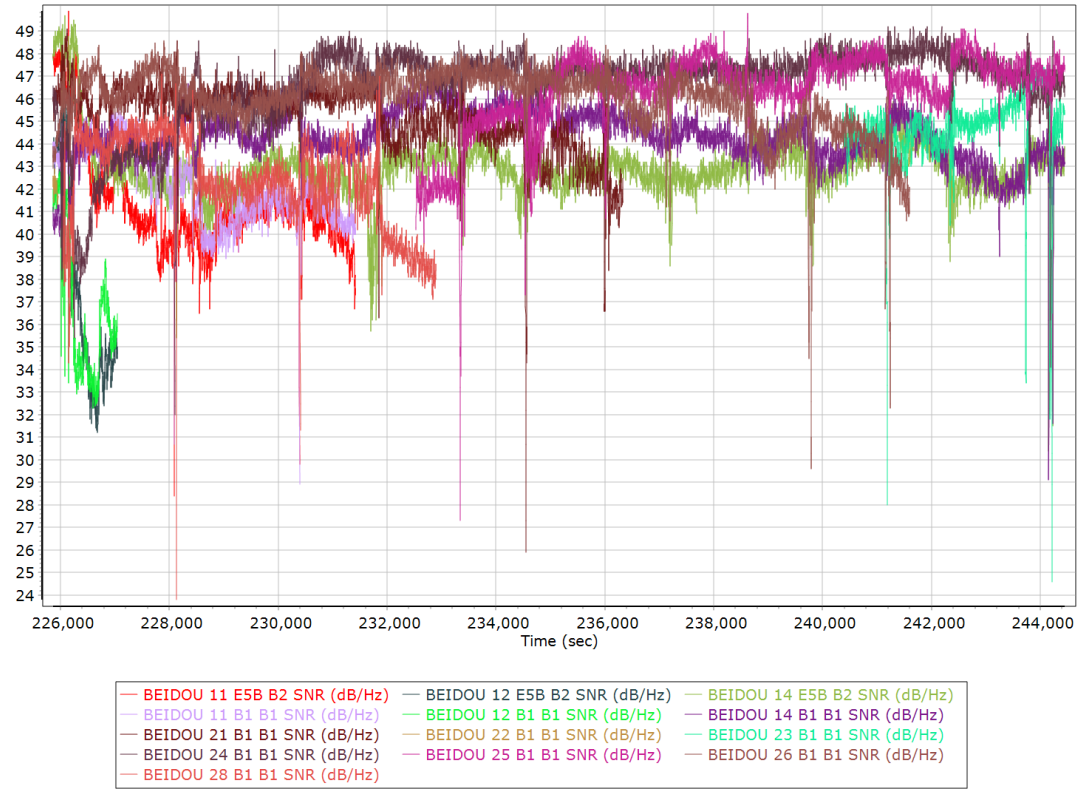
GLONASS L2 SNR



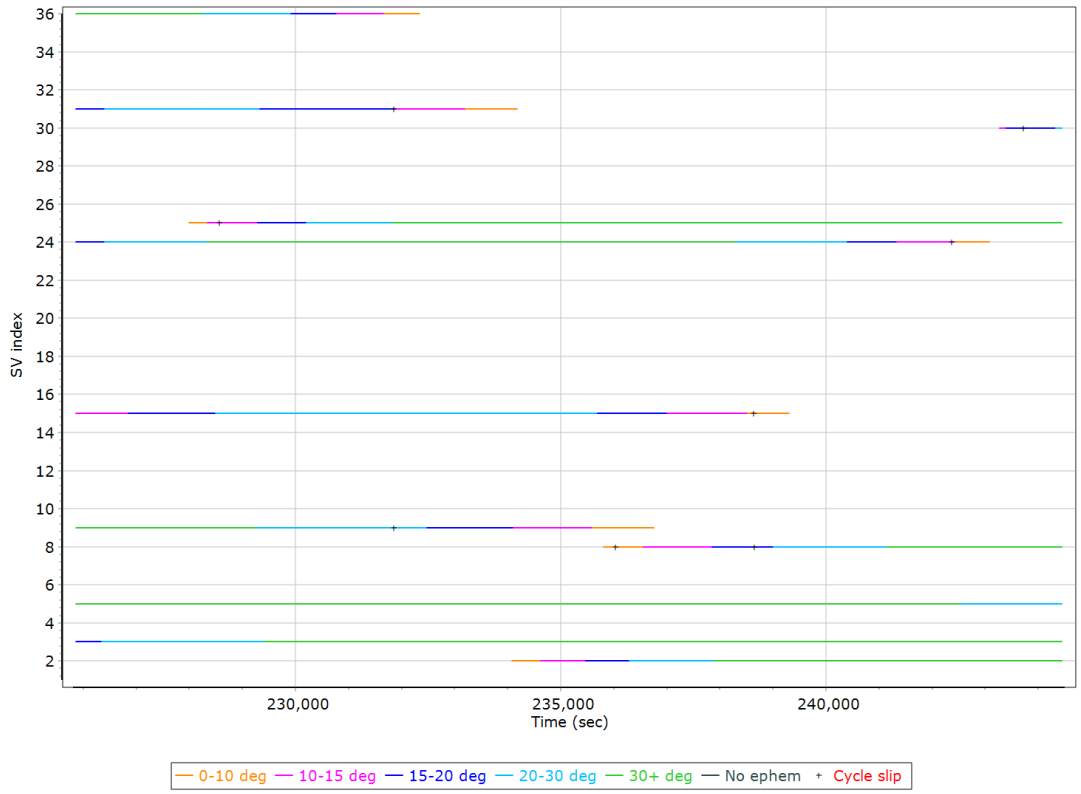
BEIDOU Satellite Lock/Elevation



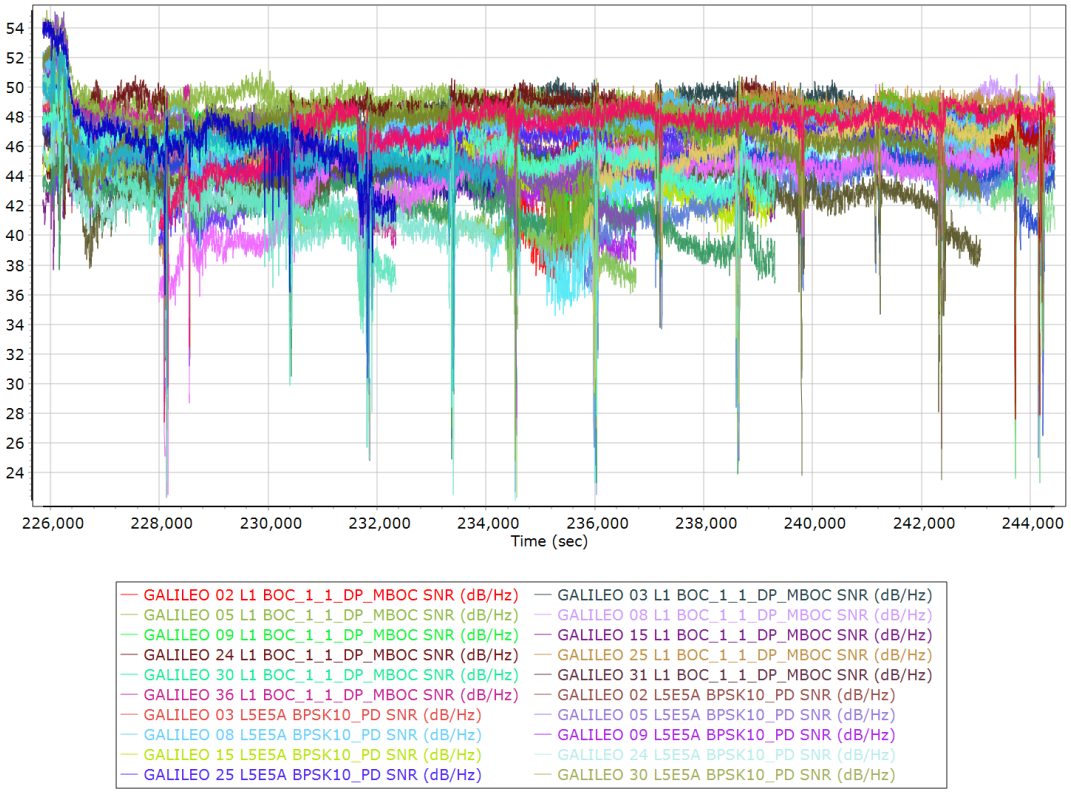
BEIDOU SNR



GALILEO Satellite Lock/Elevation

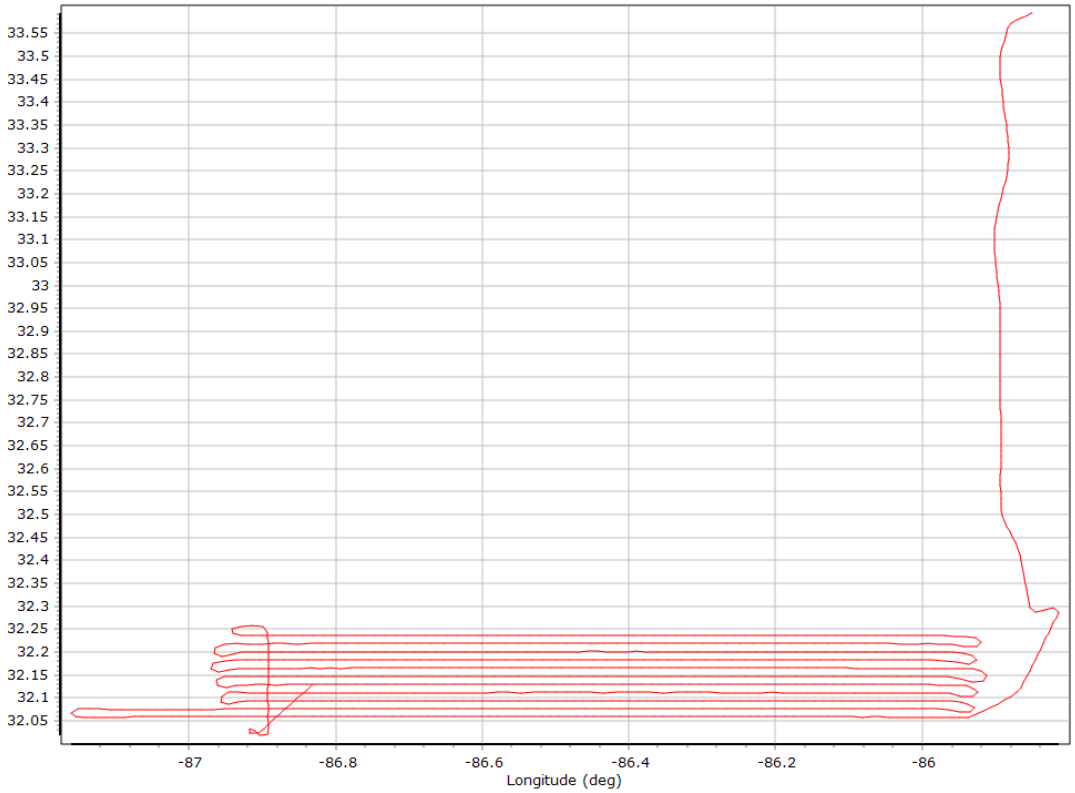


GALILEO SNR

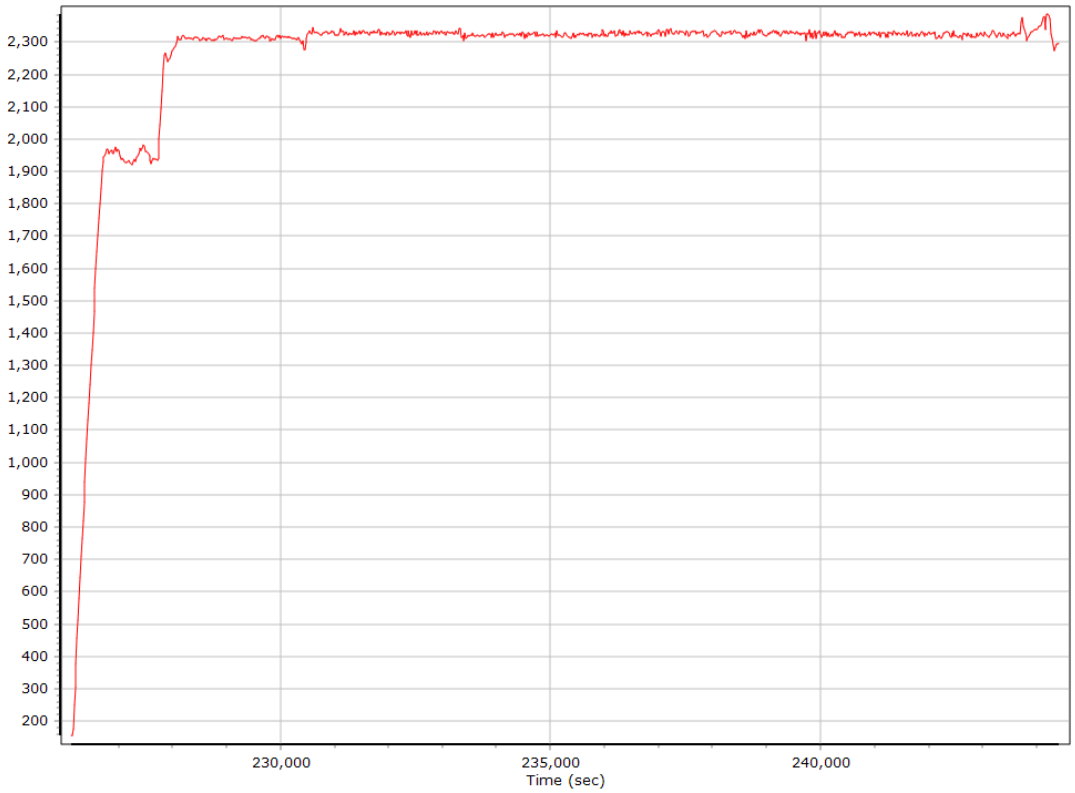

54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
226,000
228,000
230,000
232,000
234,000
236,000
238,000
240,000
242,000
244,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 36 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 05 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 24 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 25 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

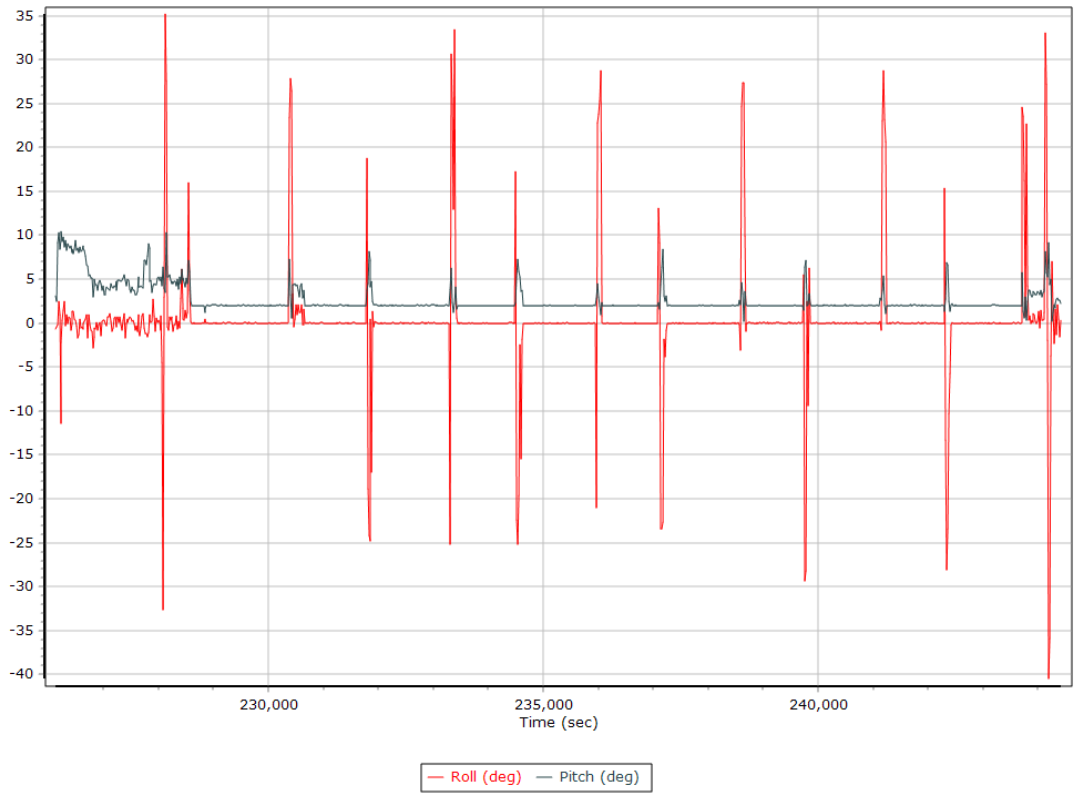
Top View



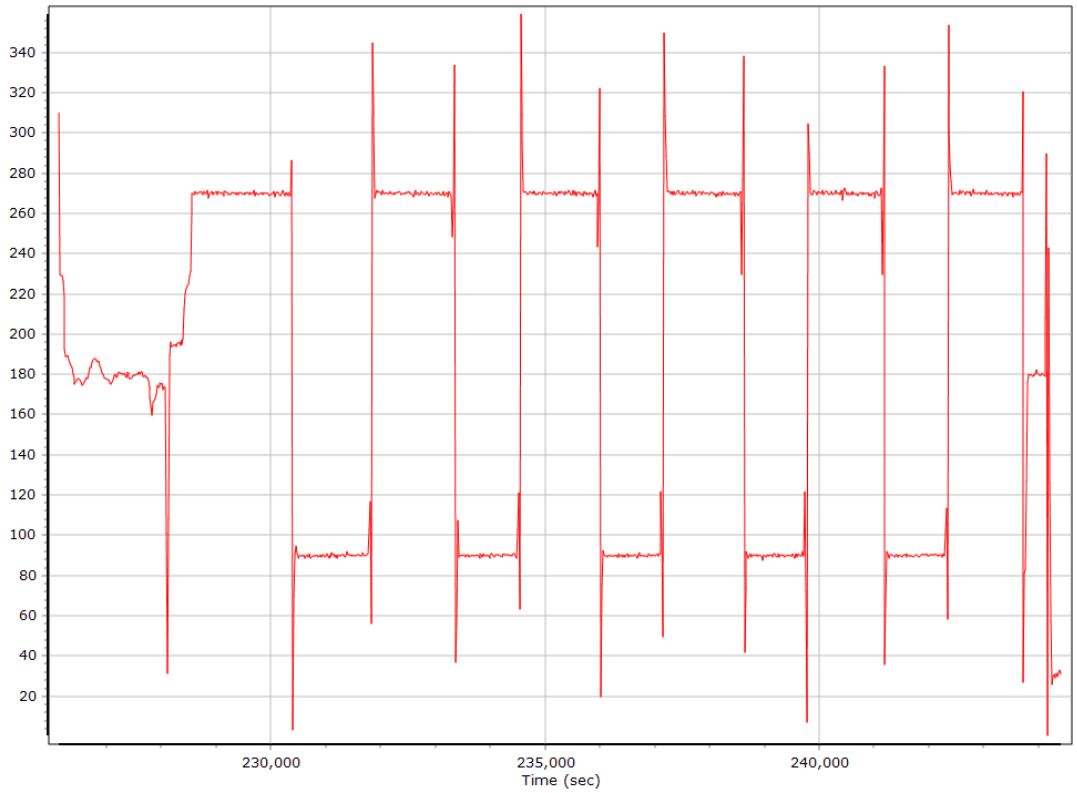
Altitude



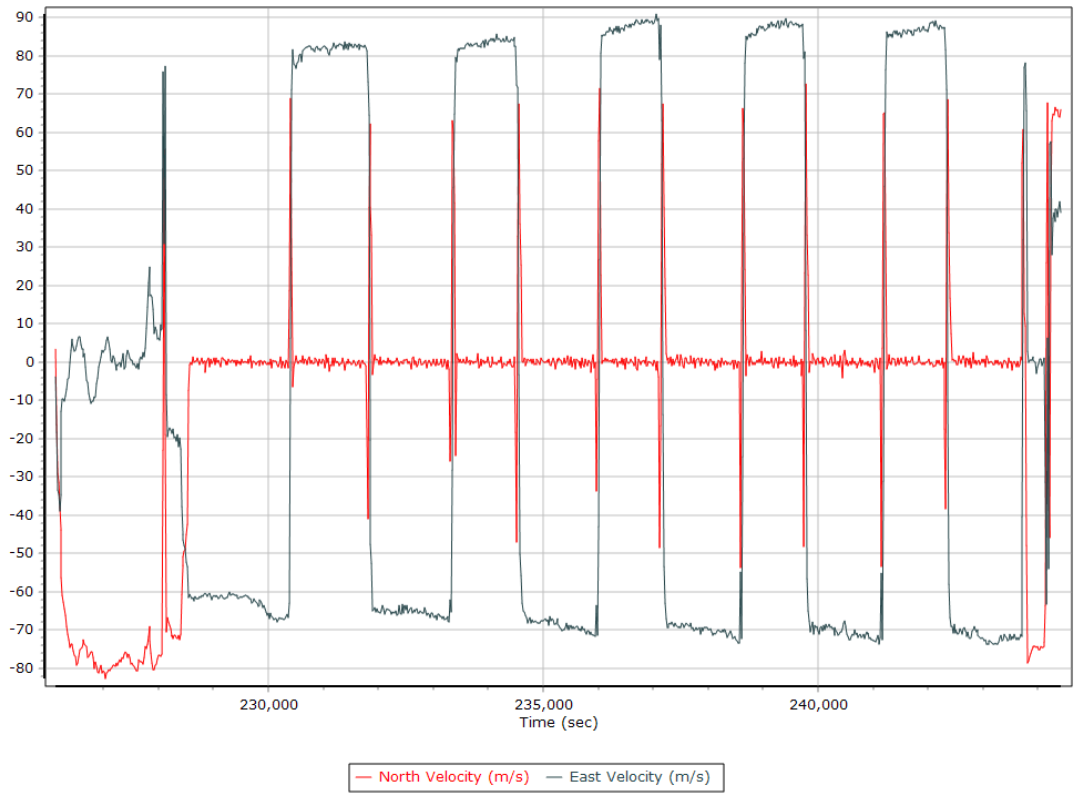
Roll/Pitch



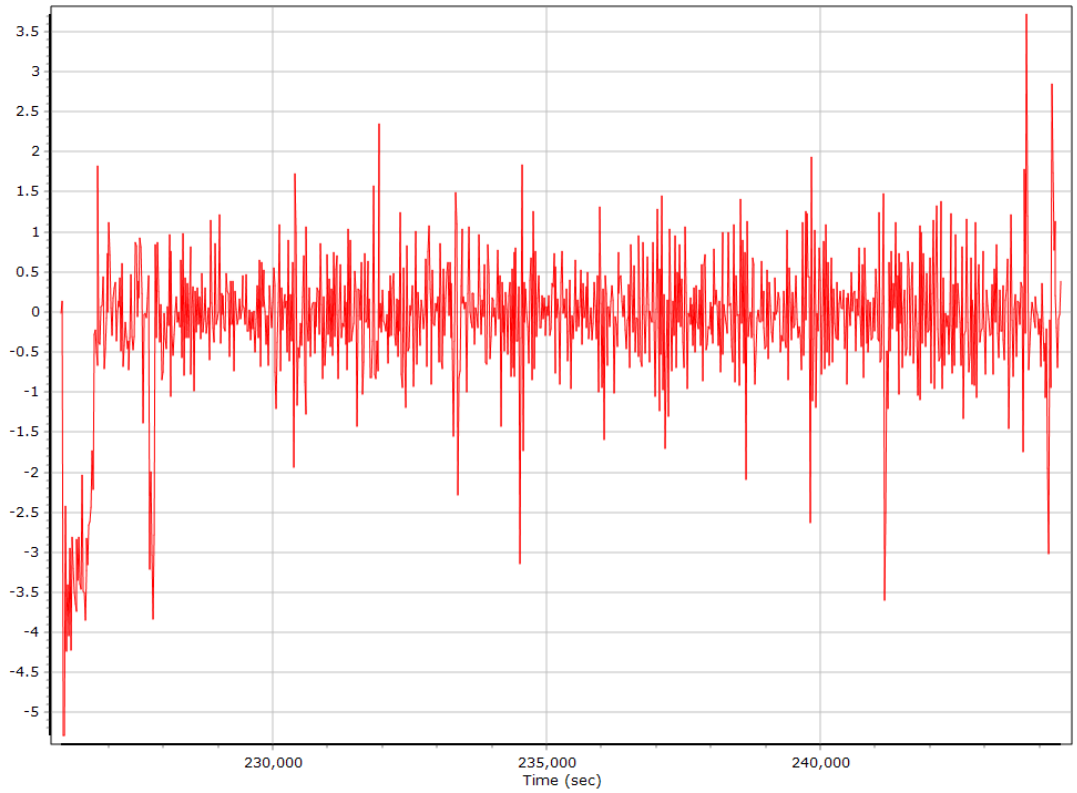
Heading



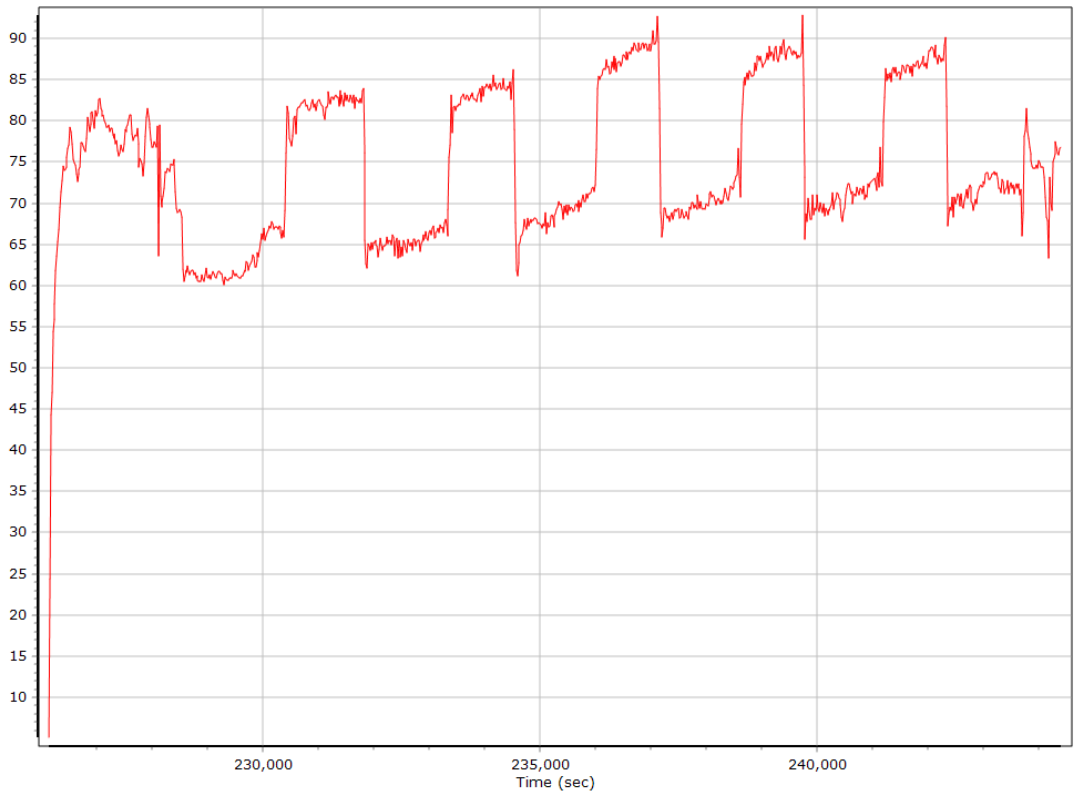
North/East Velocity



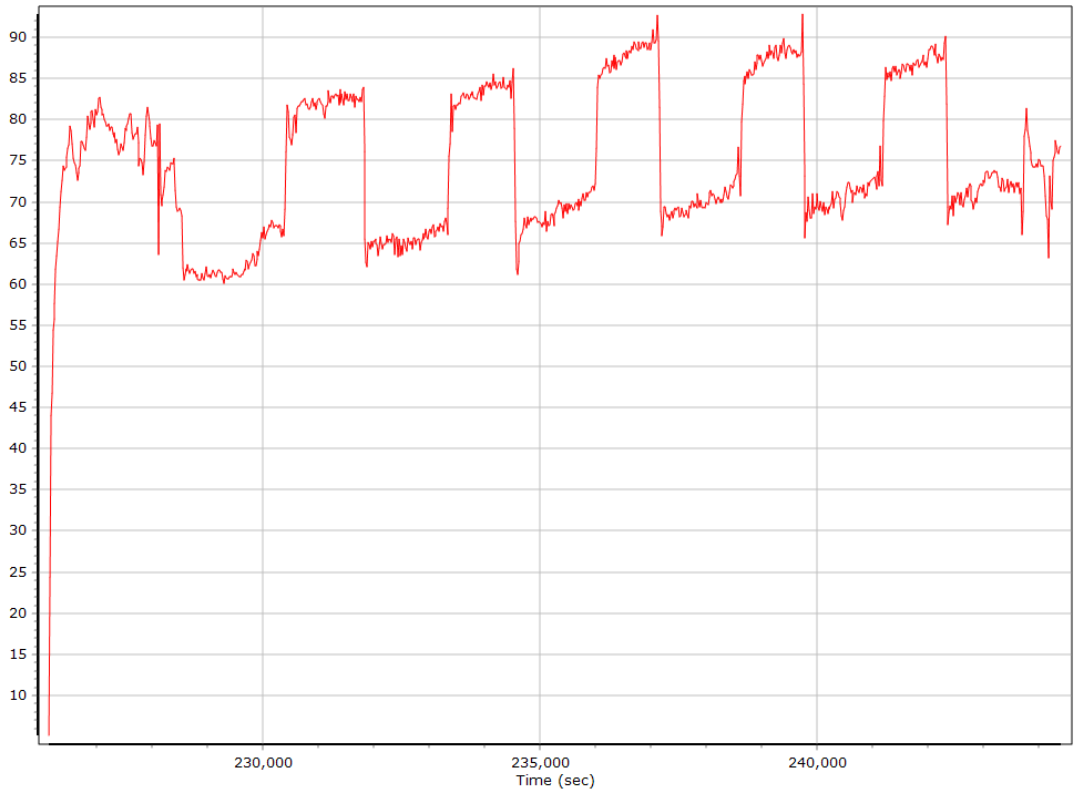
Down Velocity



Total Speed



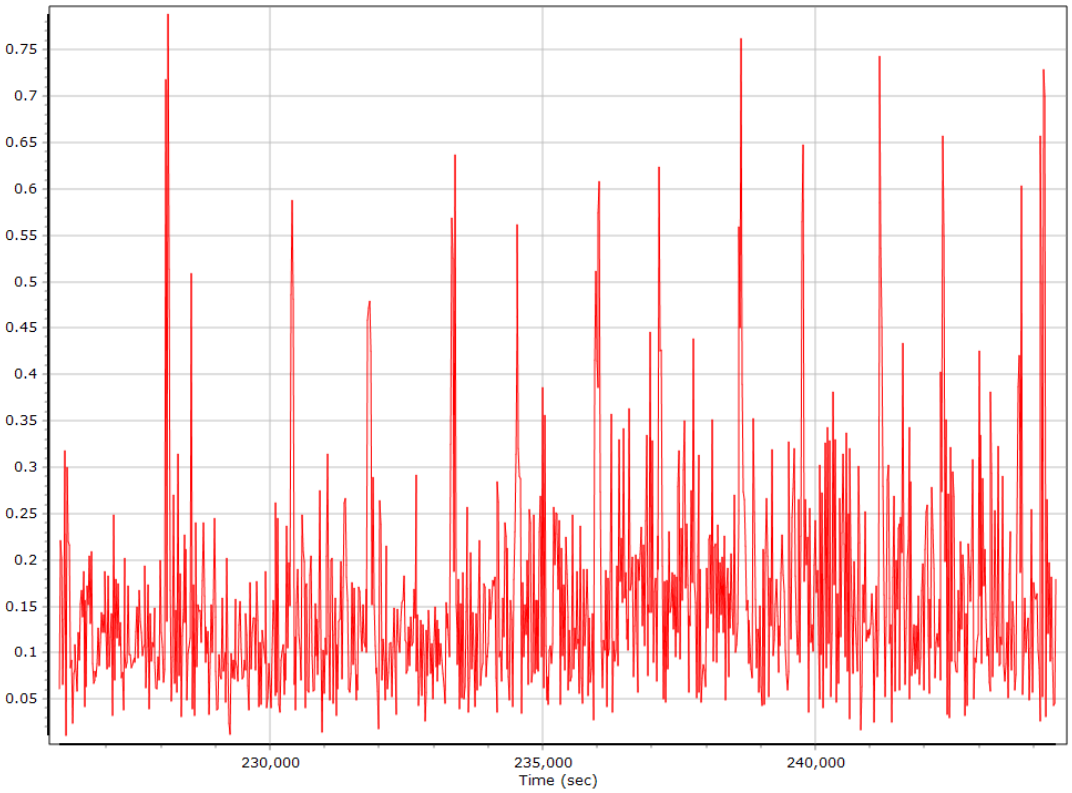
Ground Speed



Body Acceleration



Total Body Acceleration

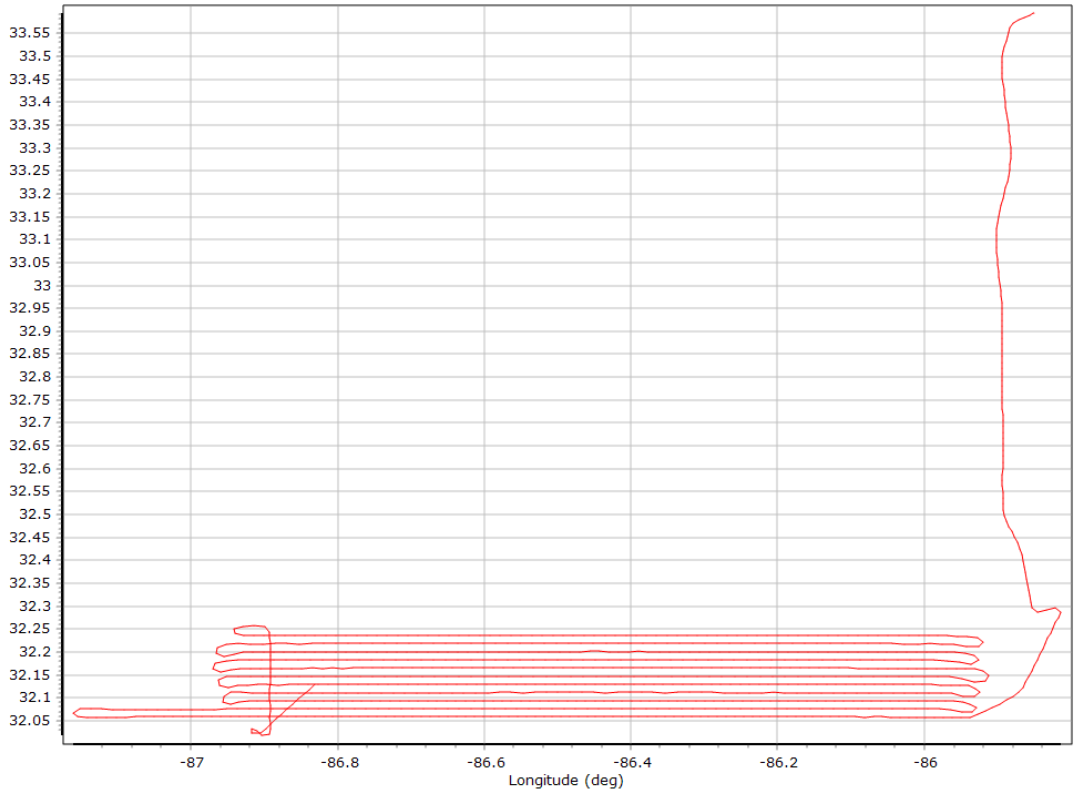


Body Angular Rate

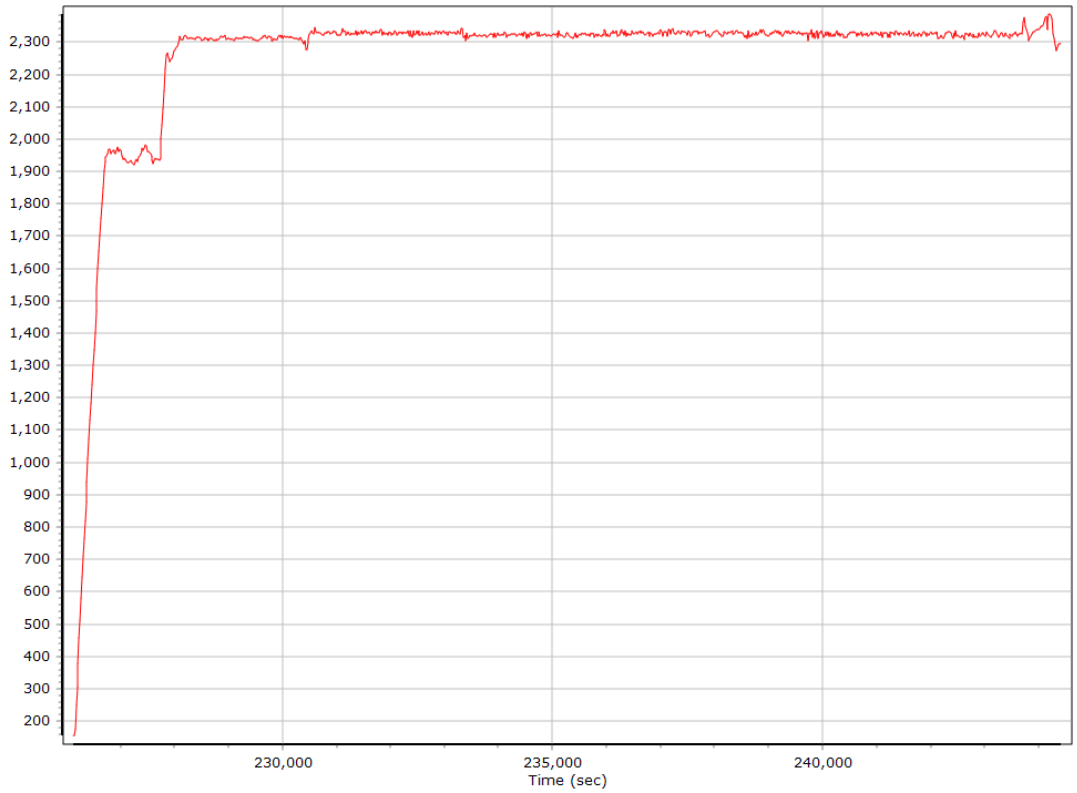


Forward Processed Trajectory Information

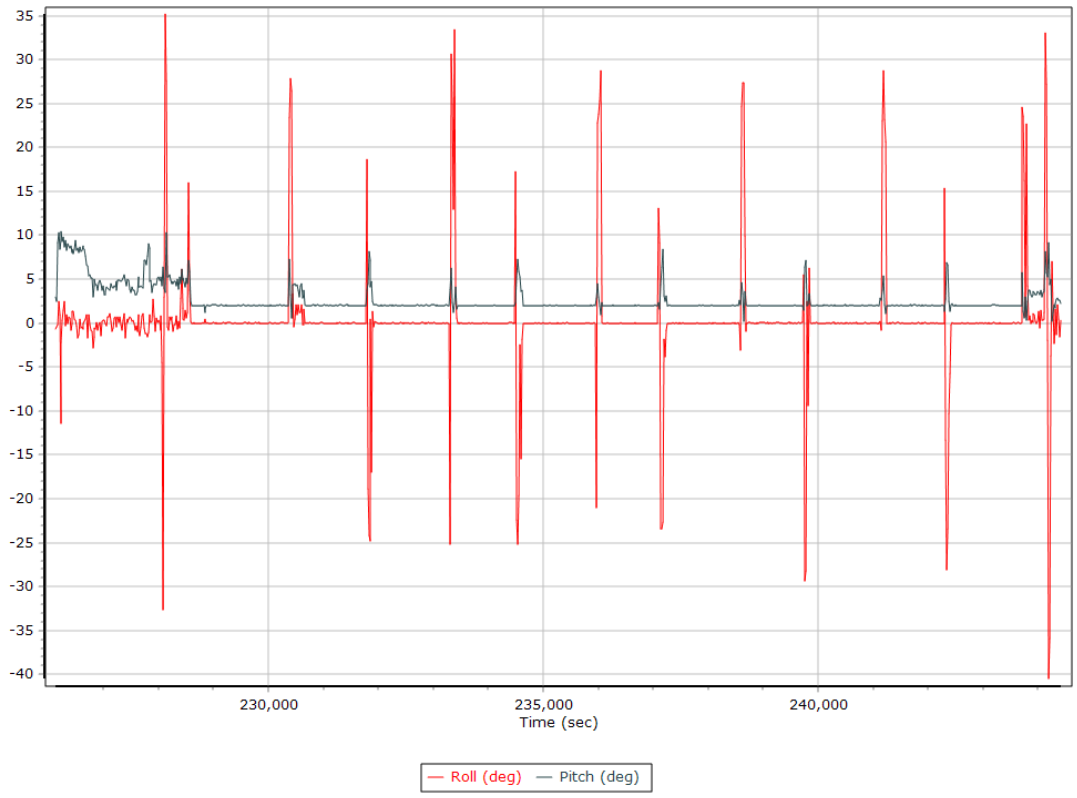
Top View



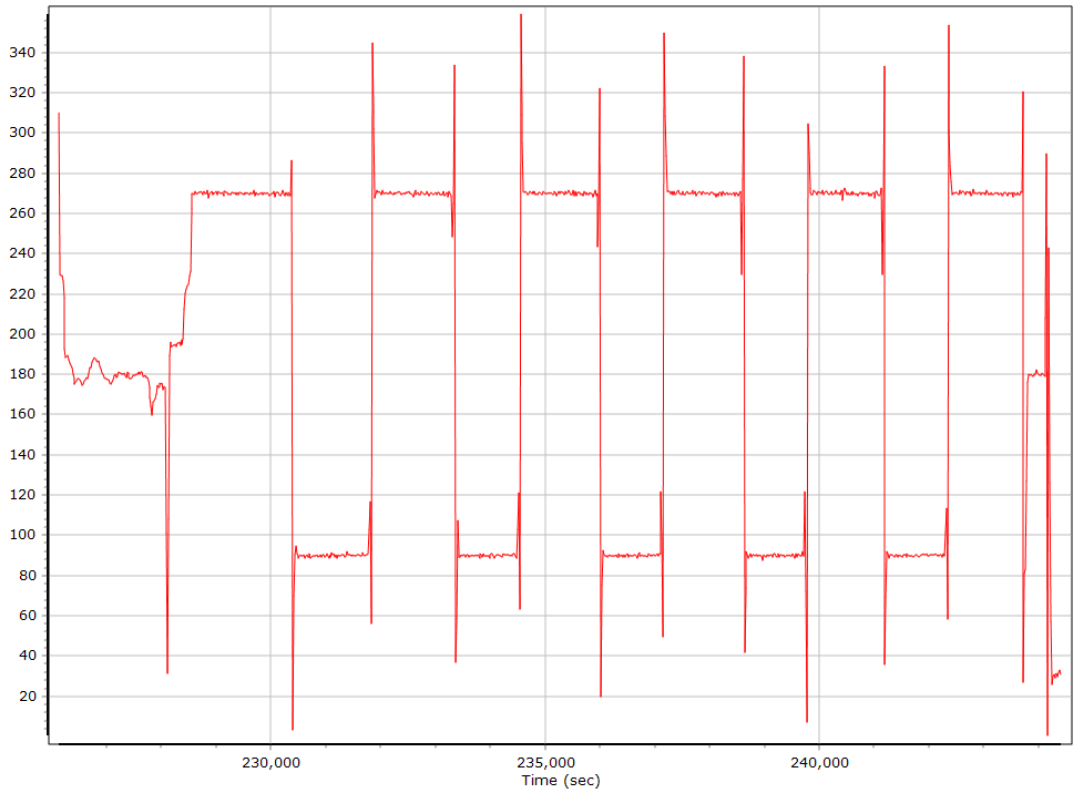
Altitude



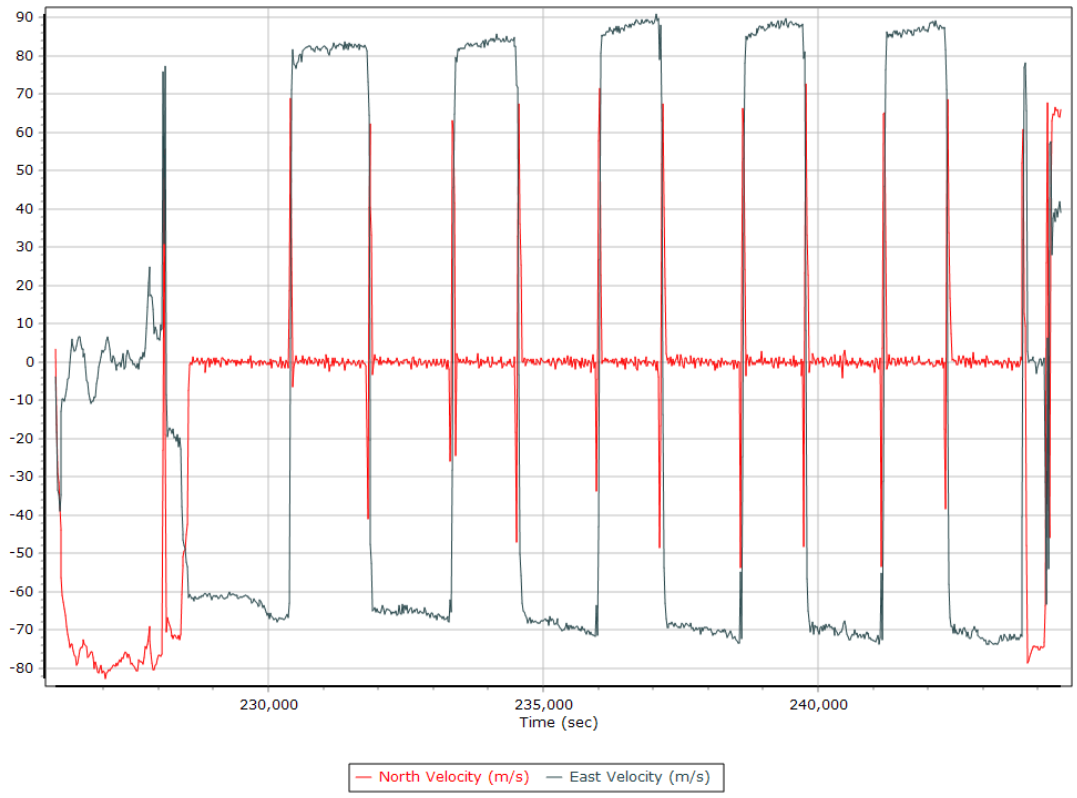
Roll/Pitch



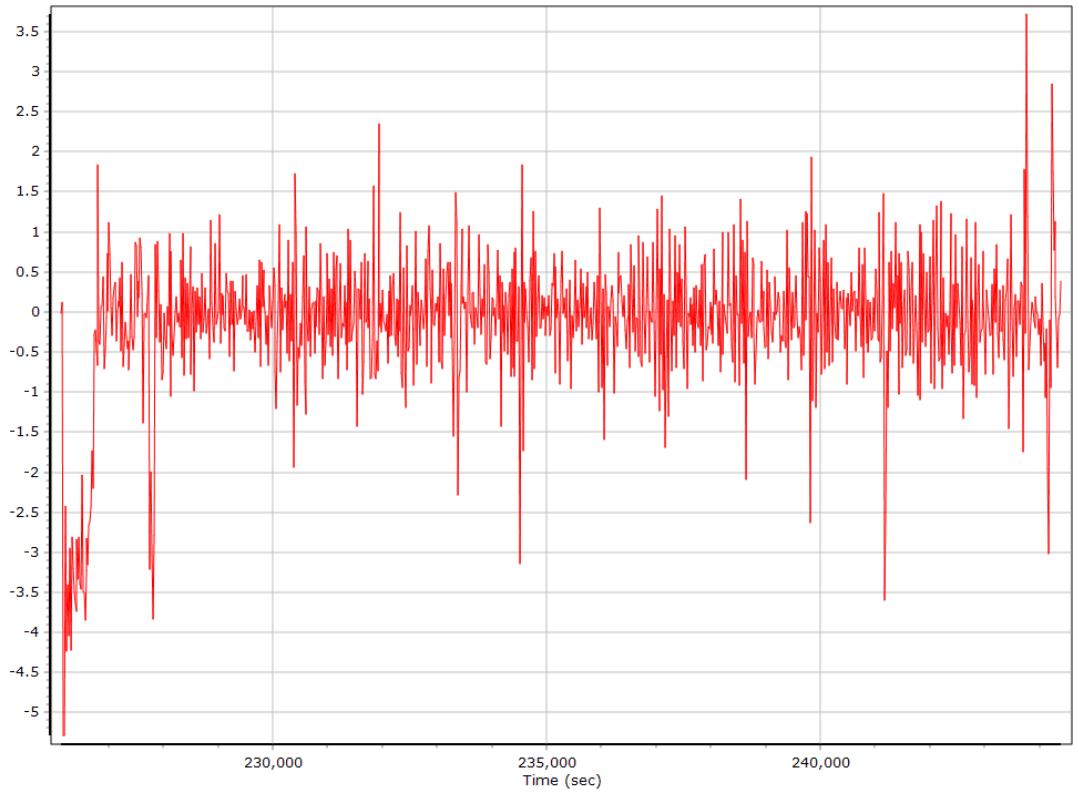
Heading



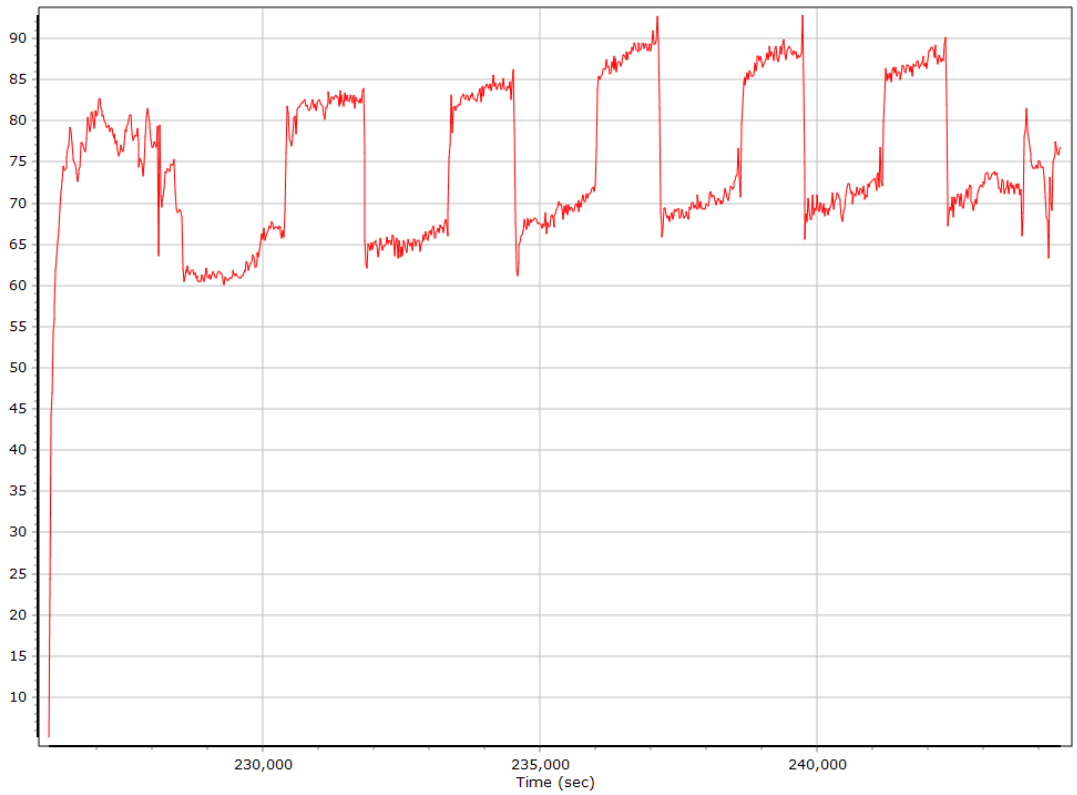
North/East Velocity



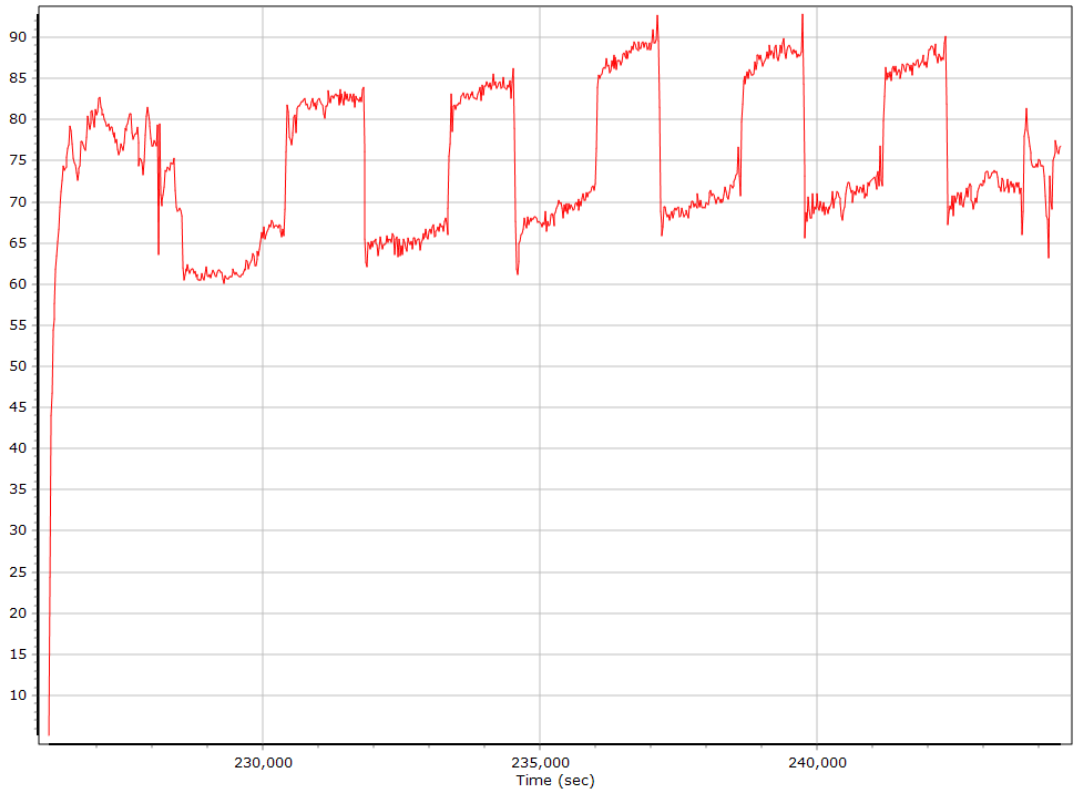
Down Velocity



Total Speed



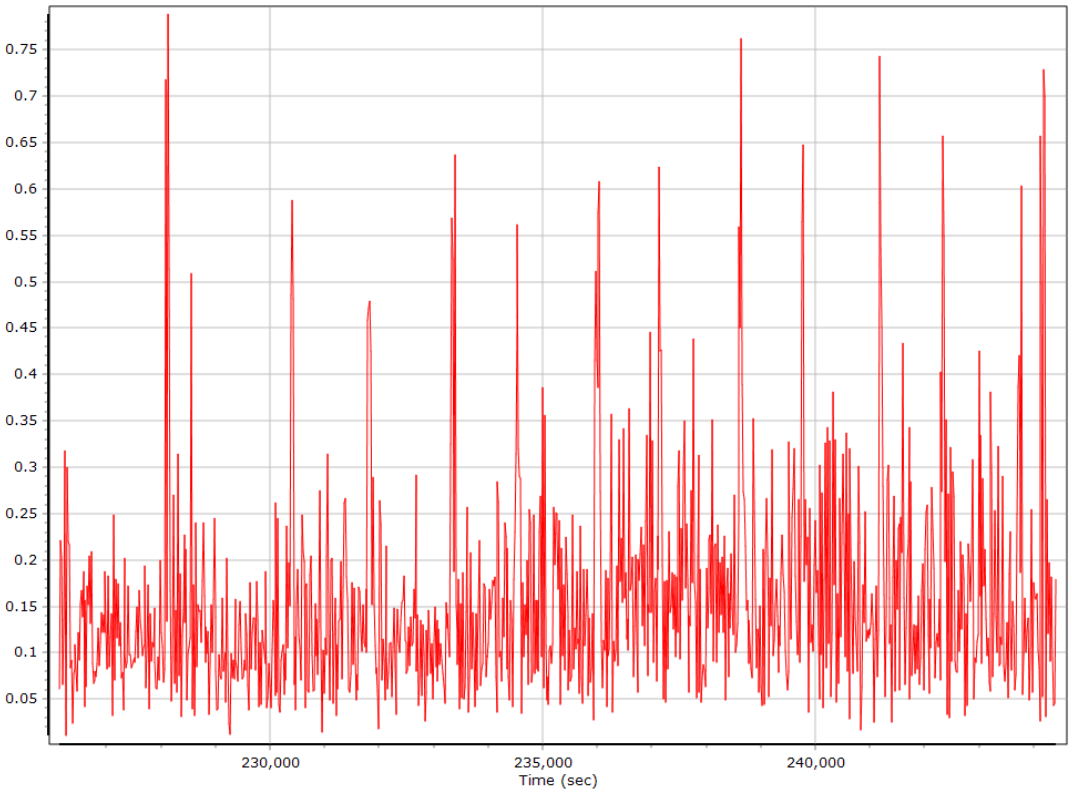
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

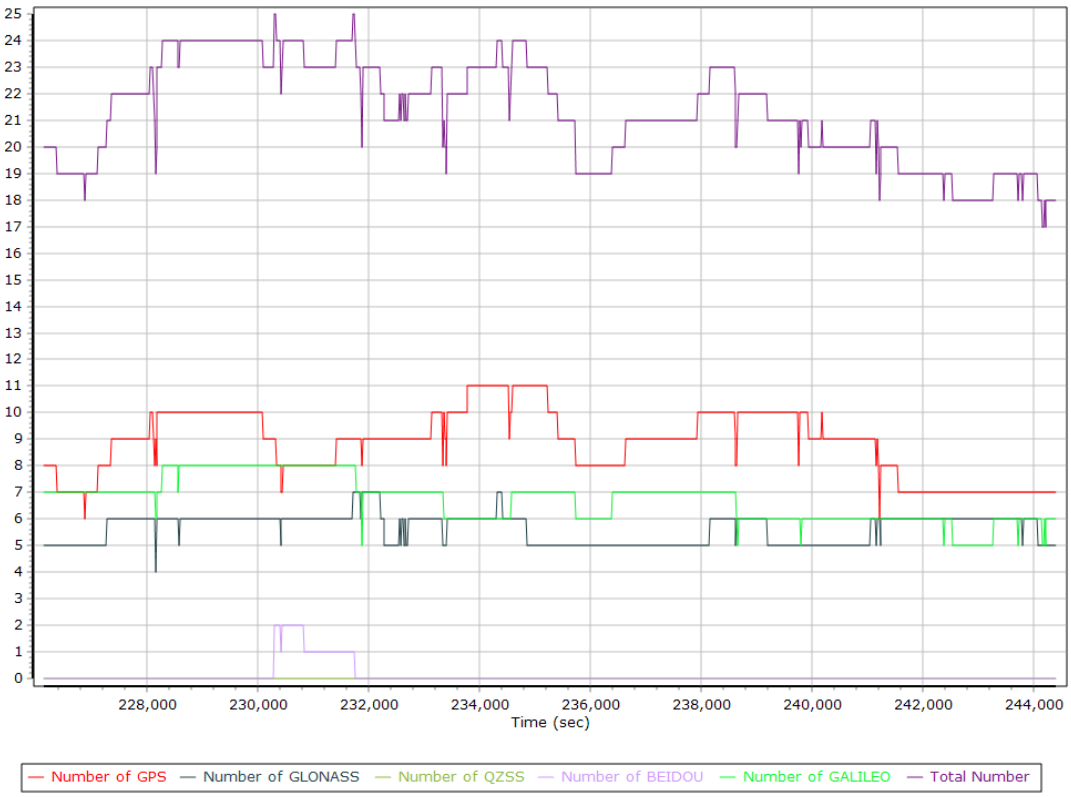


GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	11	9
Number of GLONASS SV	4	7	6
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	2	0
Number of GALILEO SV	5	8	7
Total number of SV	16	25	21
PDOP	0.98	1.77	1.19
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	18540.00	0.00	0.00
Percentage	100.00	0.00	0.00

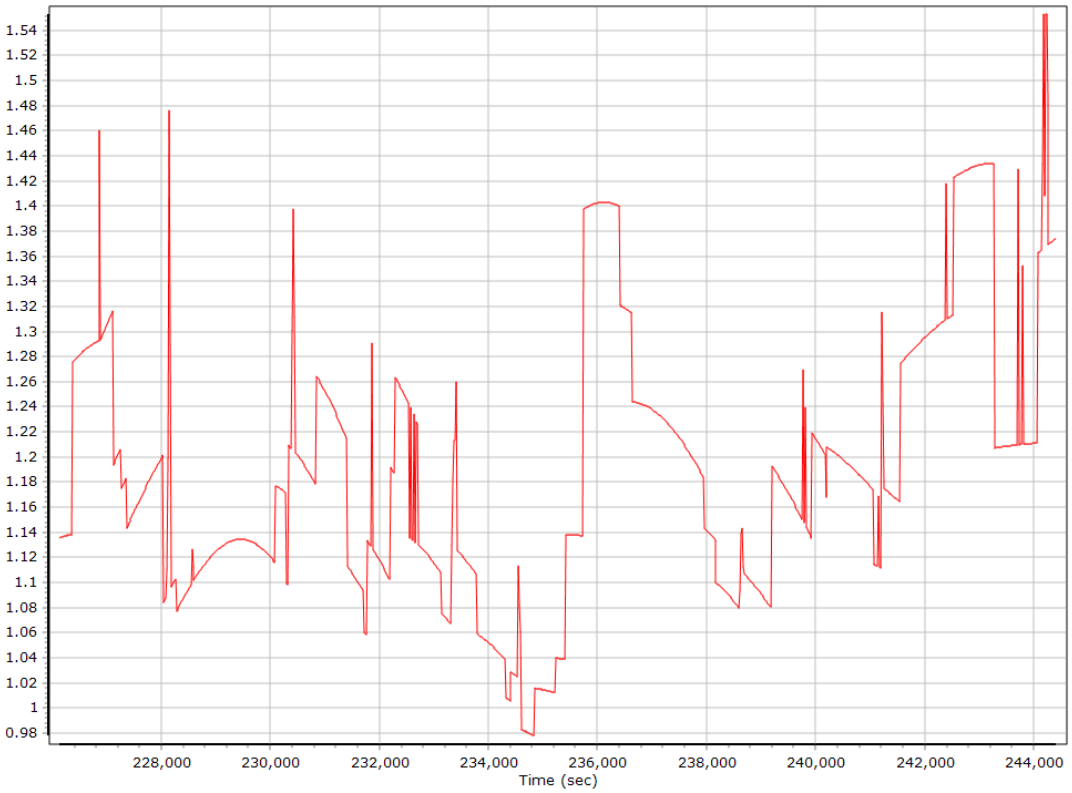
Num SVs in solution



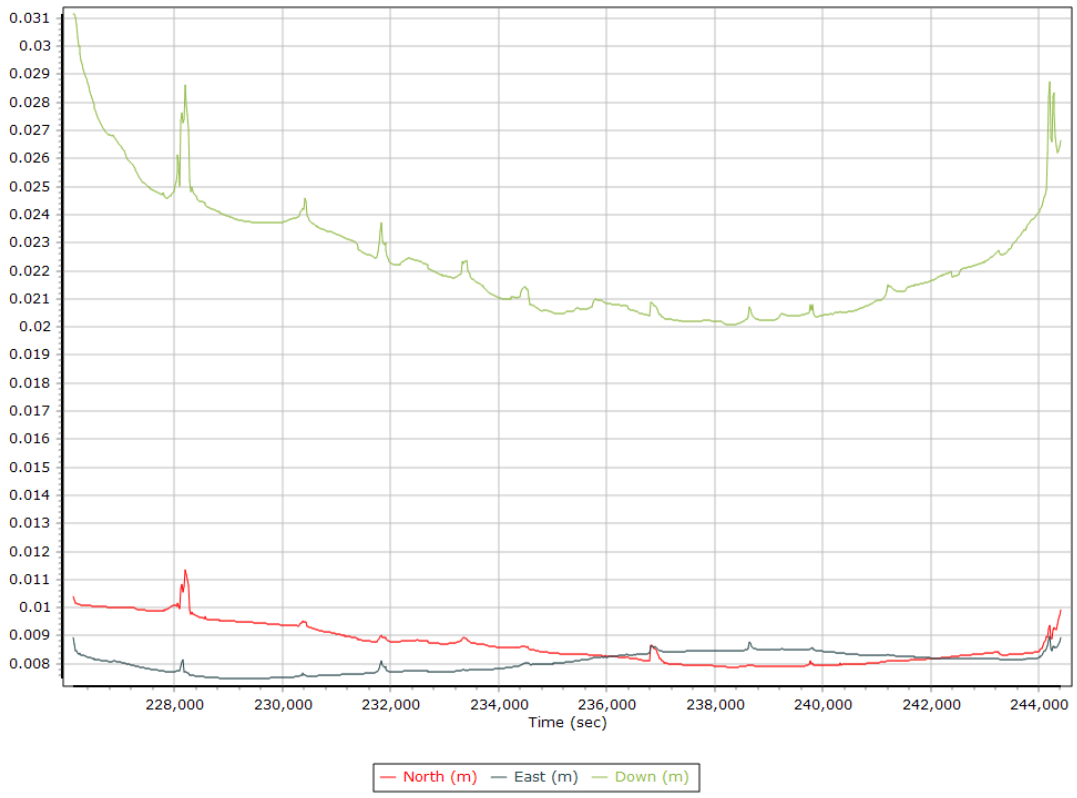
Forward/Reverse Separation



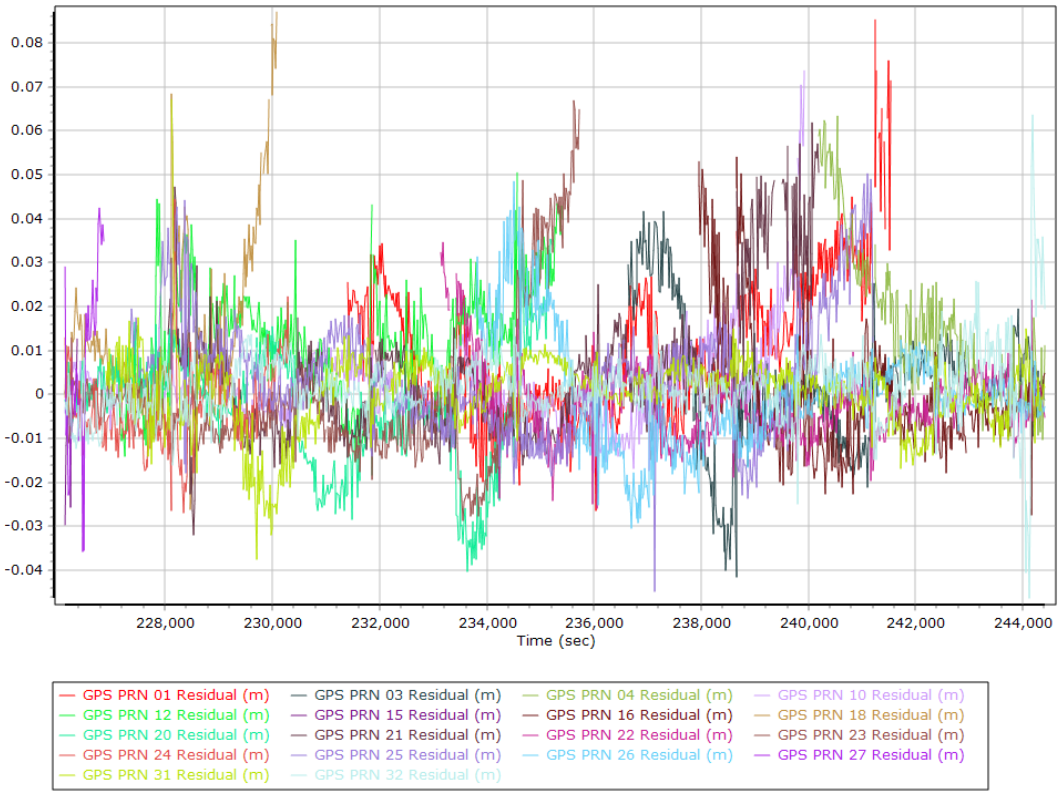
PDOP



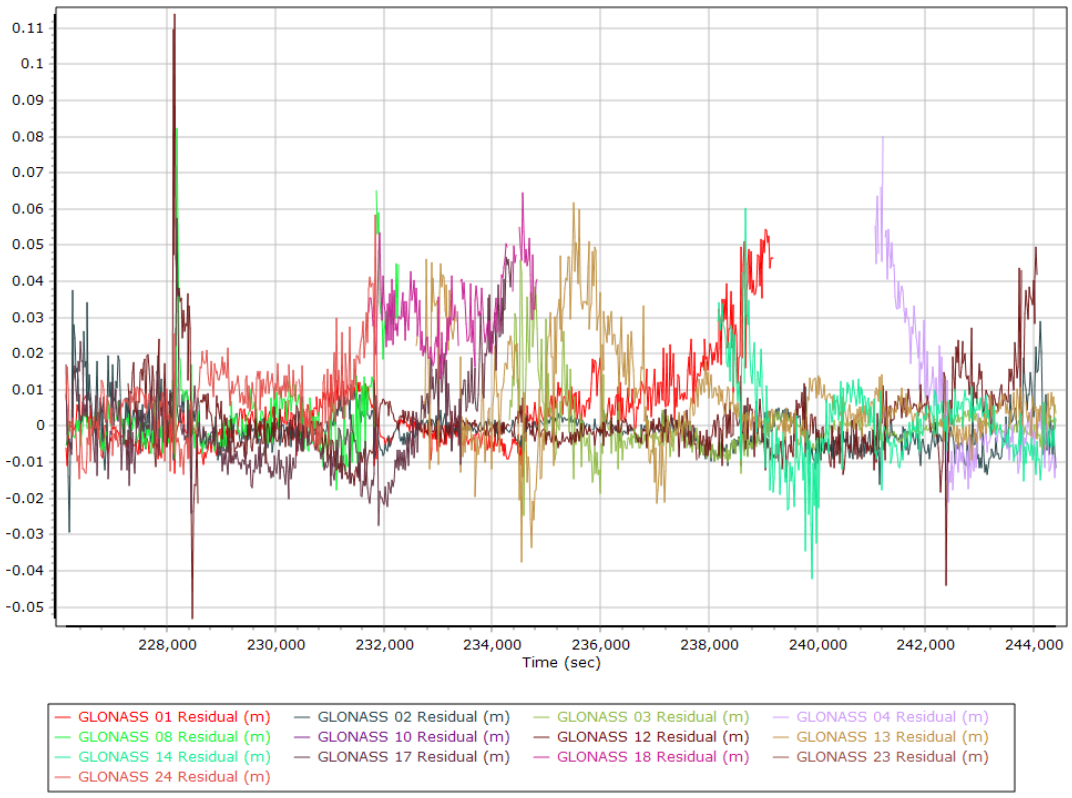
Estimated Position Accuracy



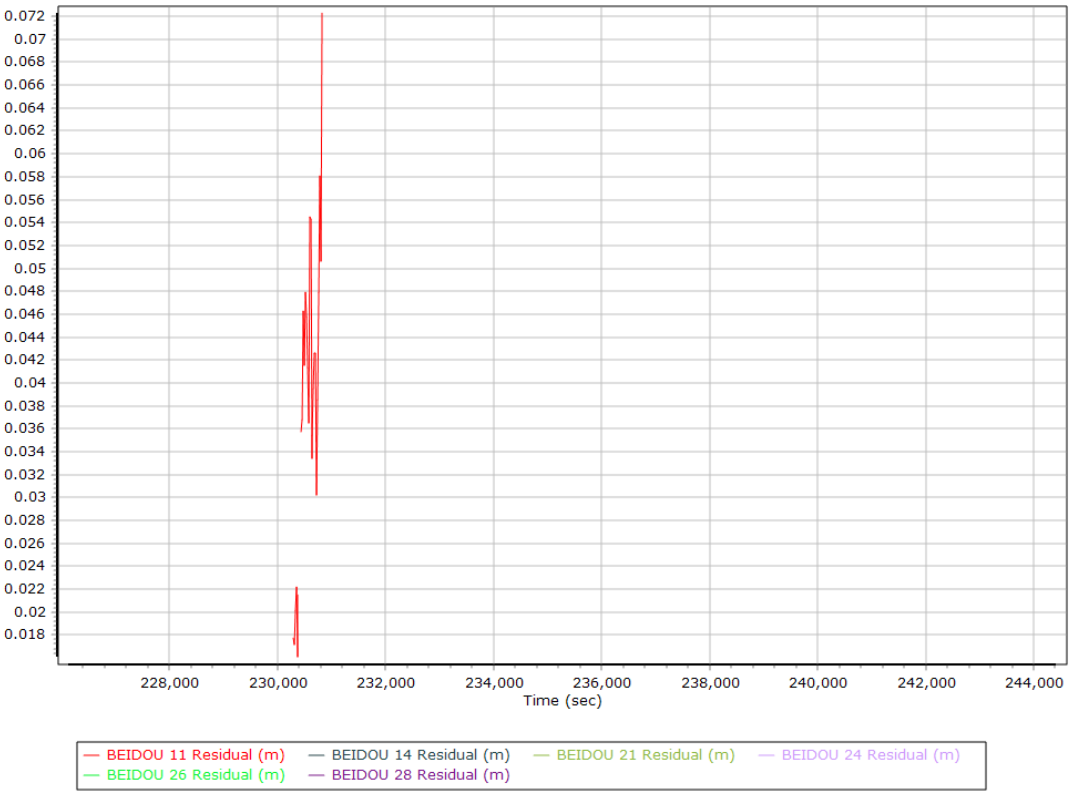
GPS Residuals



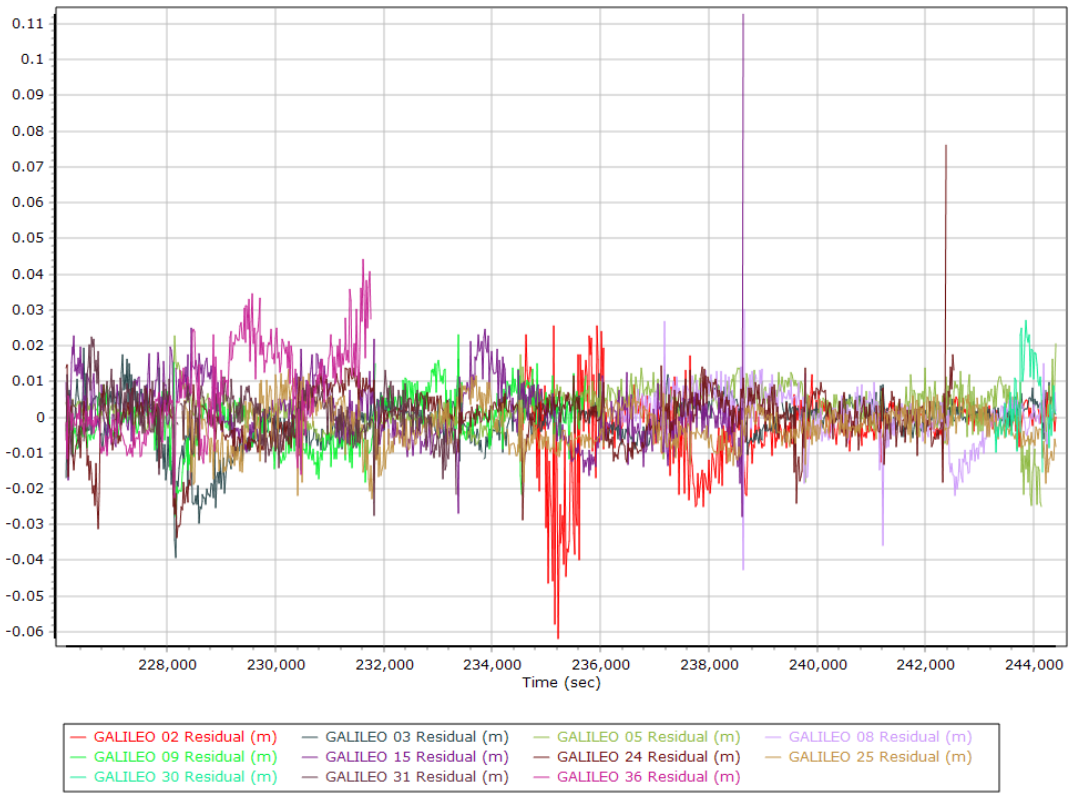
GLONASS Residuals



BEIDOU Residuals



GALILEO Residuals



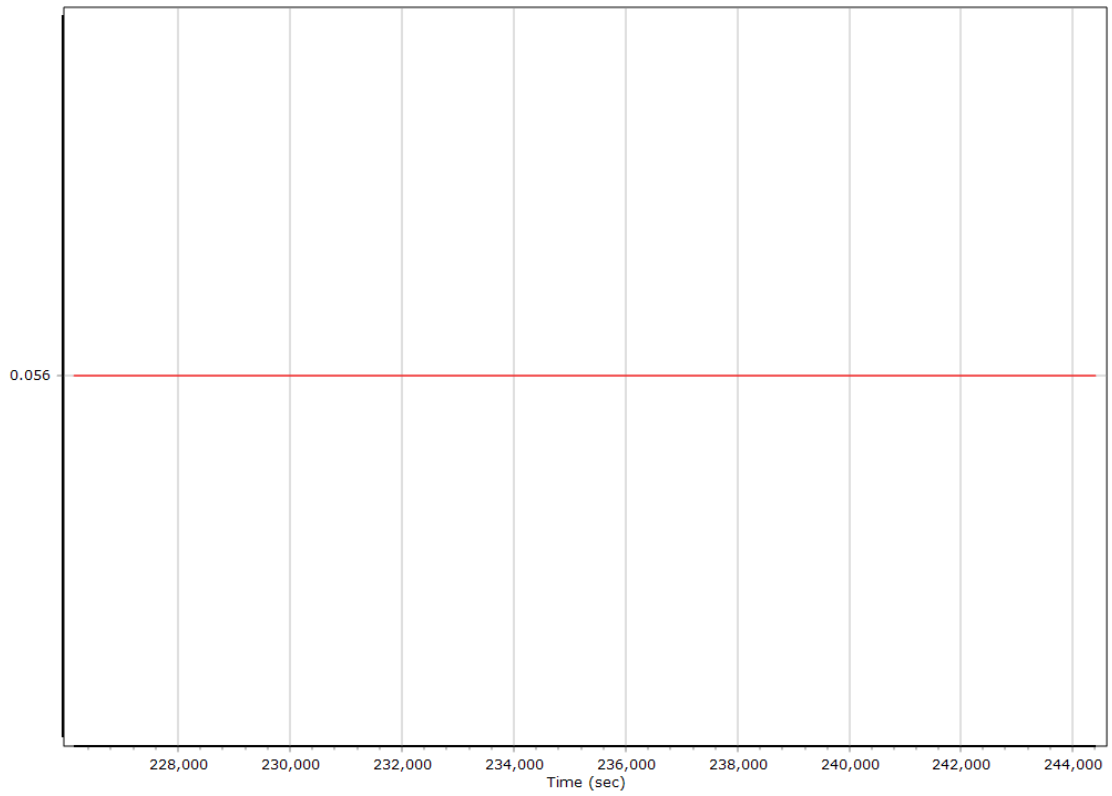
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	225849.000 (12/22/2020 2:44:09 PM)		
Processing end time	244430.000 (12/22/2020 7:53:50 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

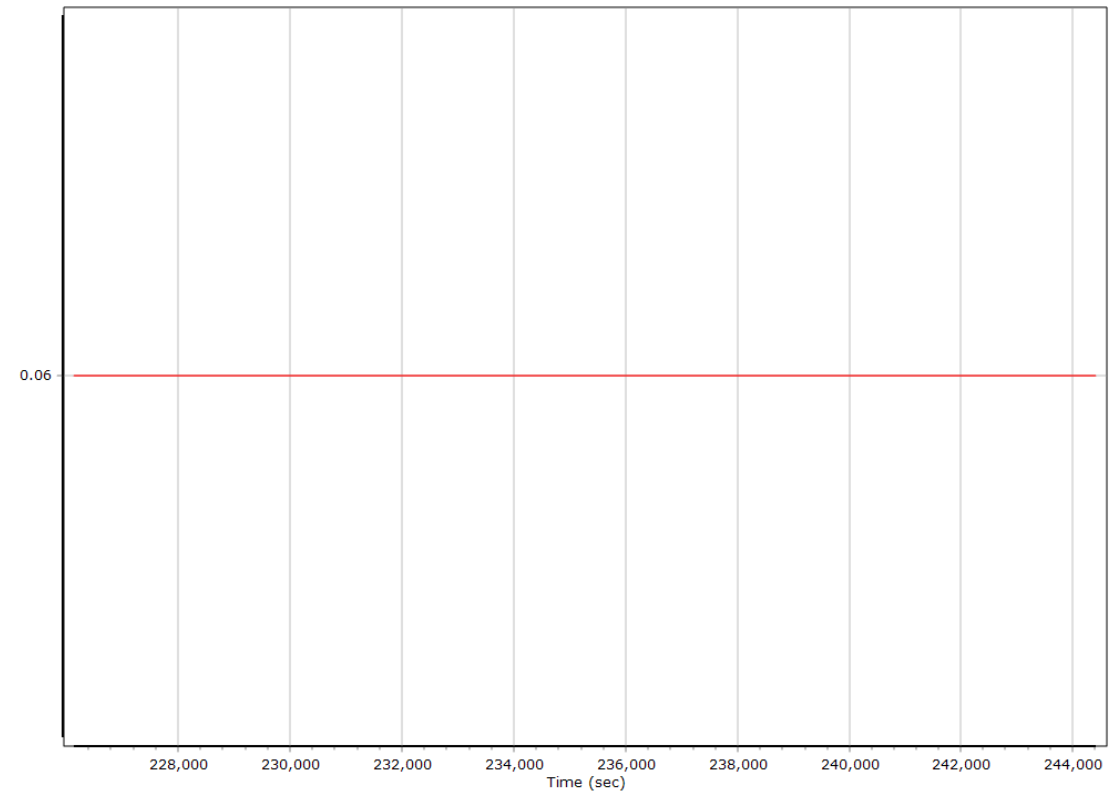
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

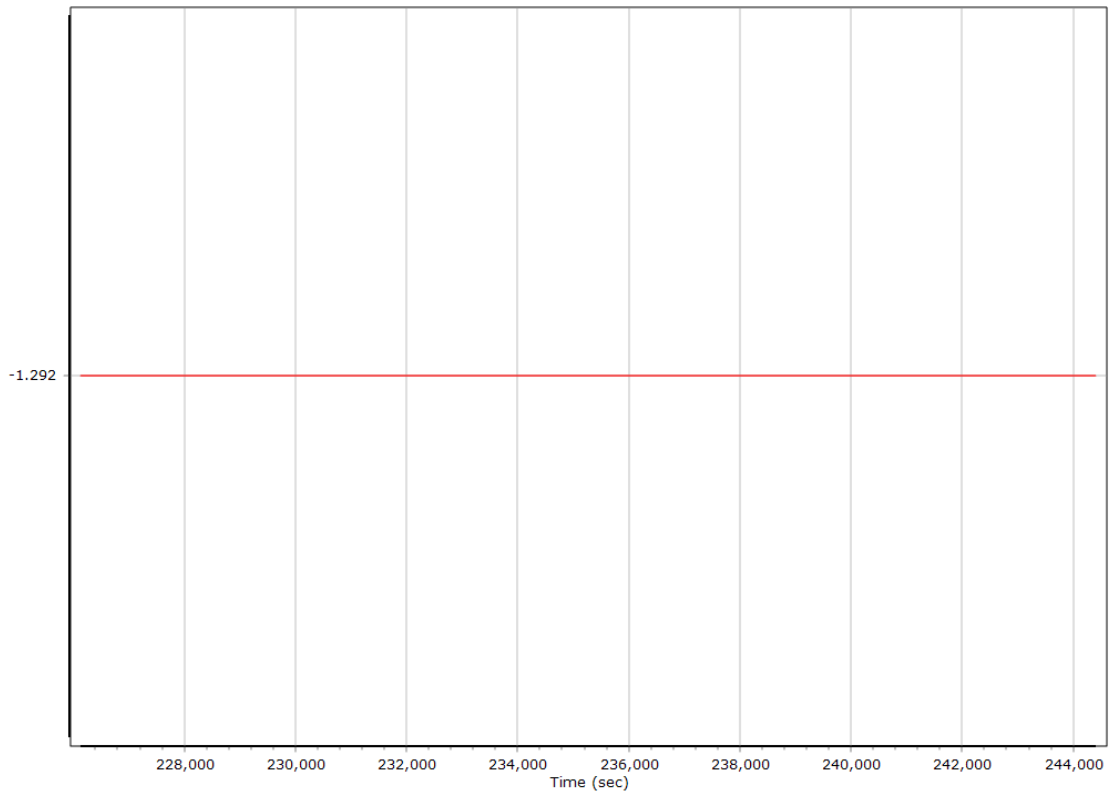
X Reference-Primary GNSS Lever Arm (m)



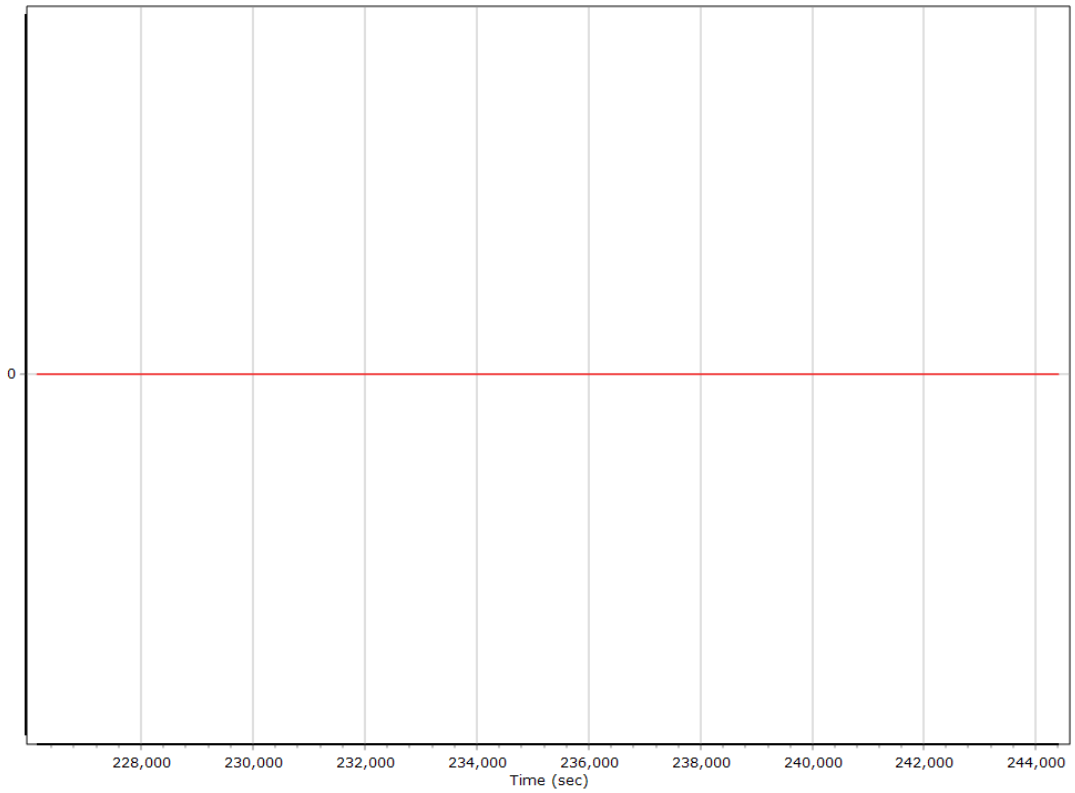
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



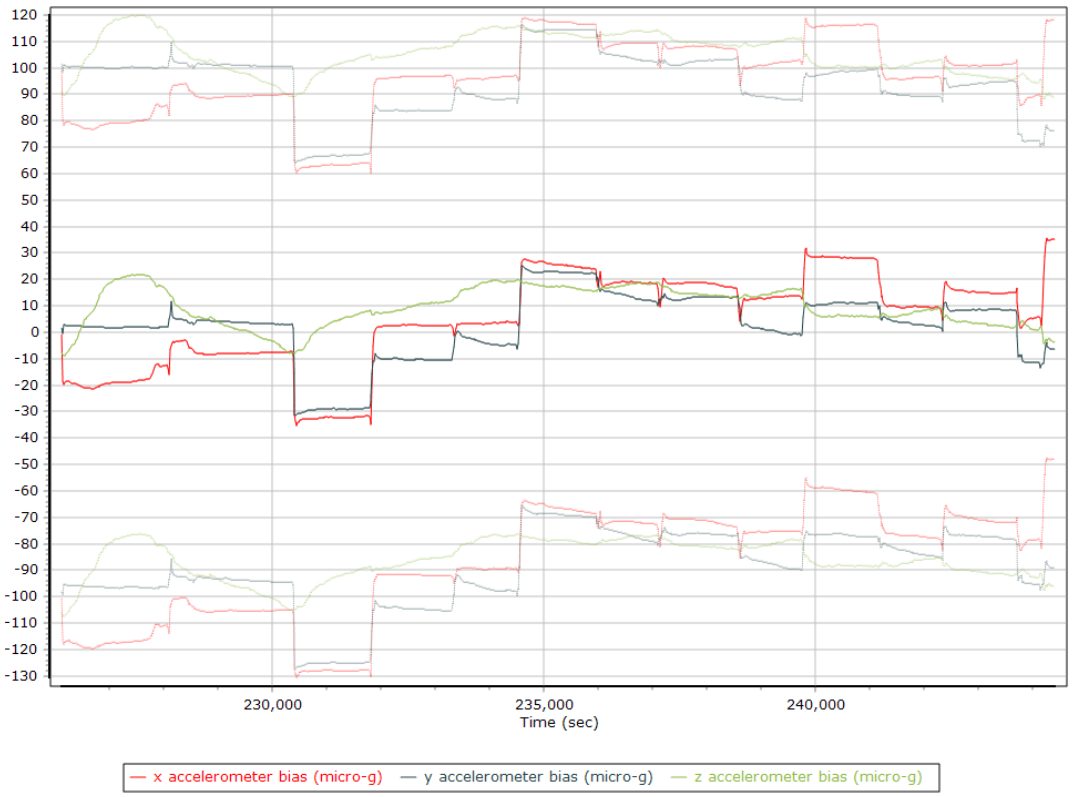
Reference-Primary GNSS Lever Arm Figure of Merit



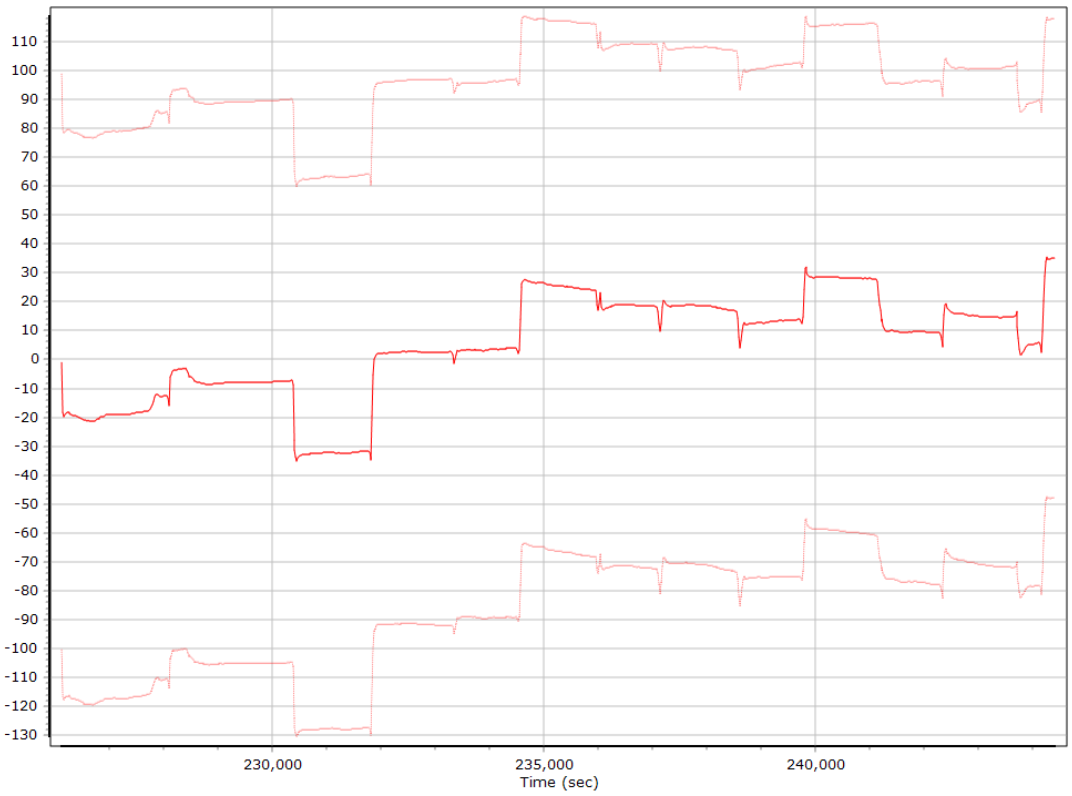
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

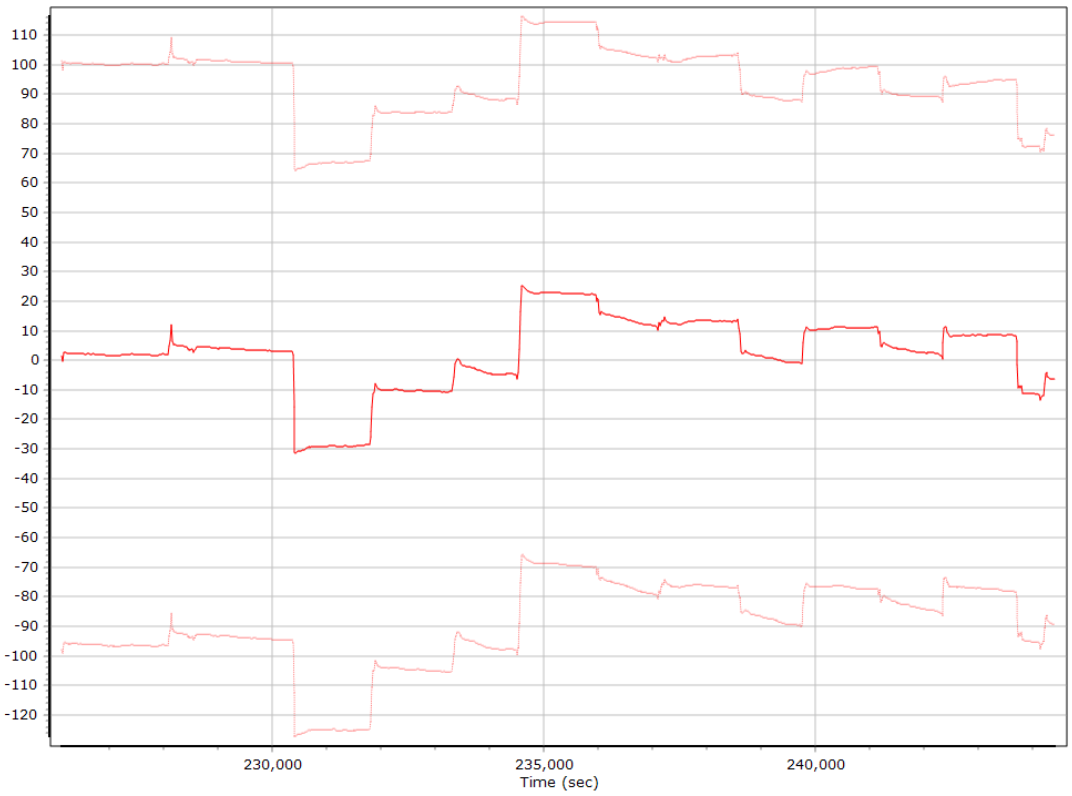
Accelerometer Bias (micro-g)



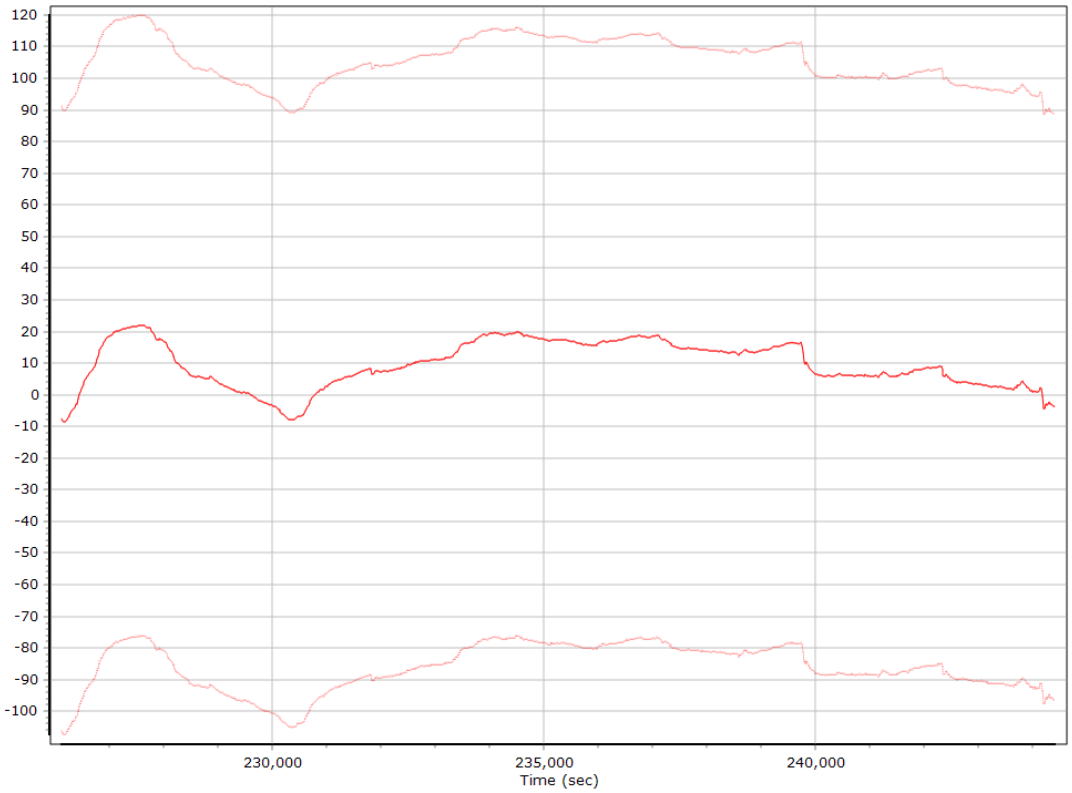
X Accelerometer Bias (micro-g)



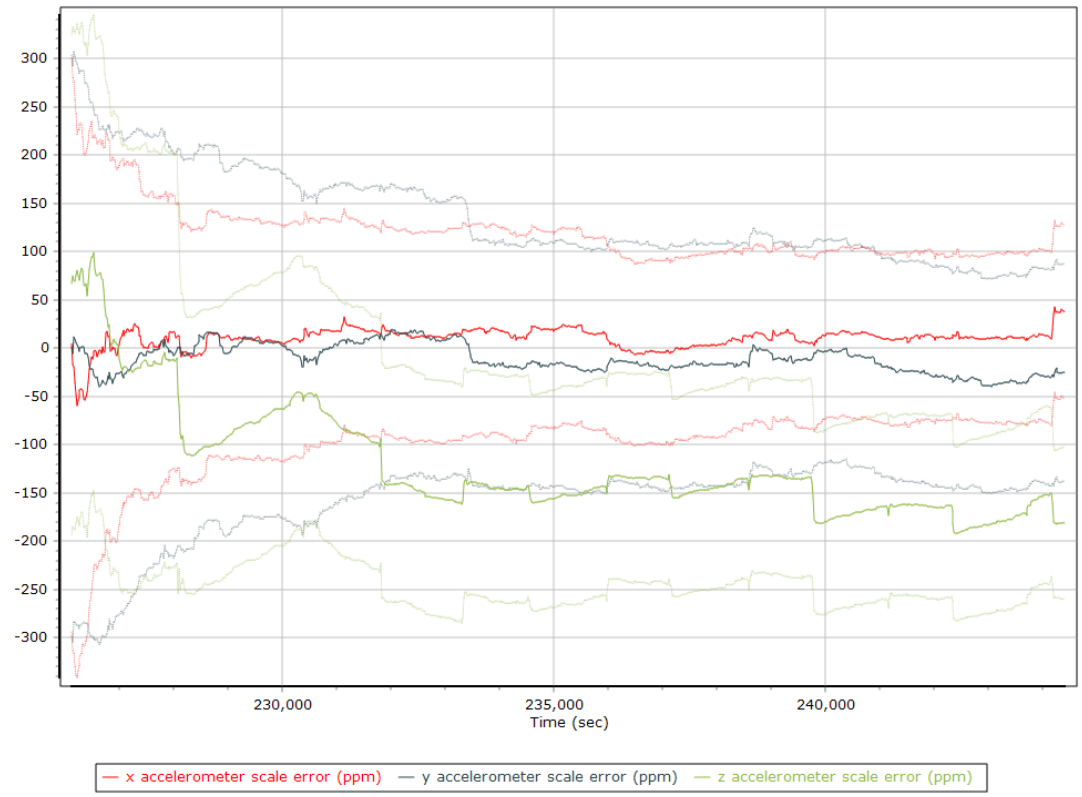
Y Accelerometer Bias (micro-g)



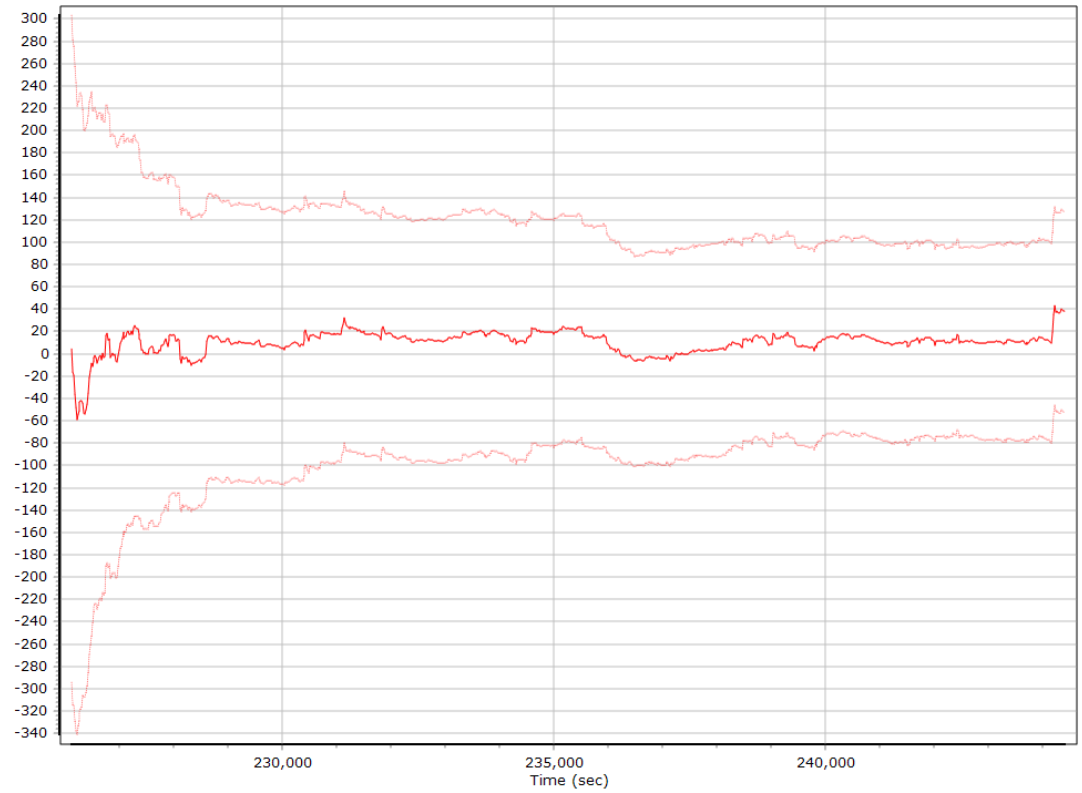
Z Accelerometer Bias (micro-g)



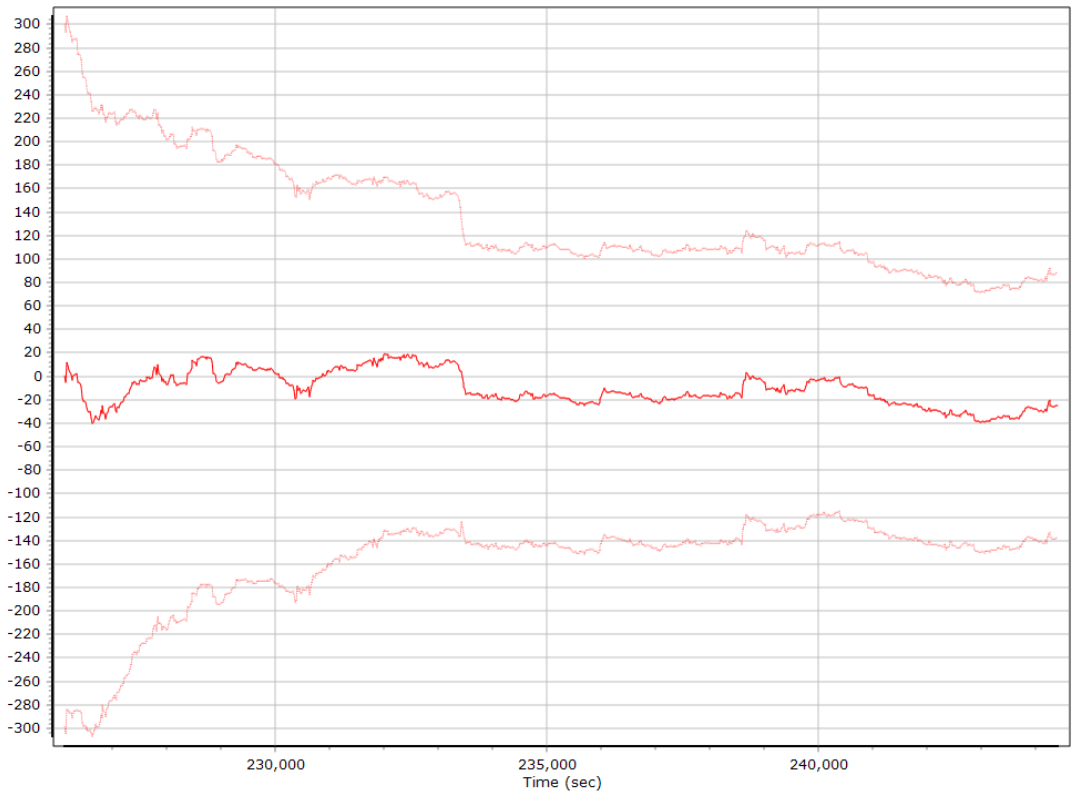
Accelerometer Scale Error (ppm)



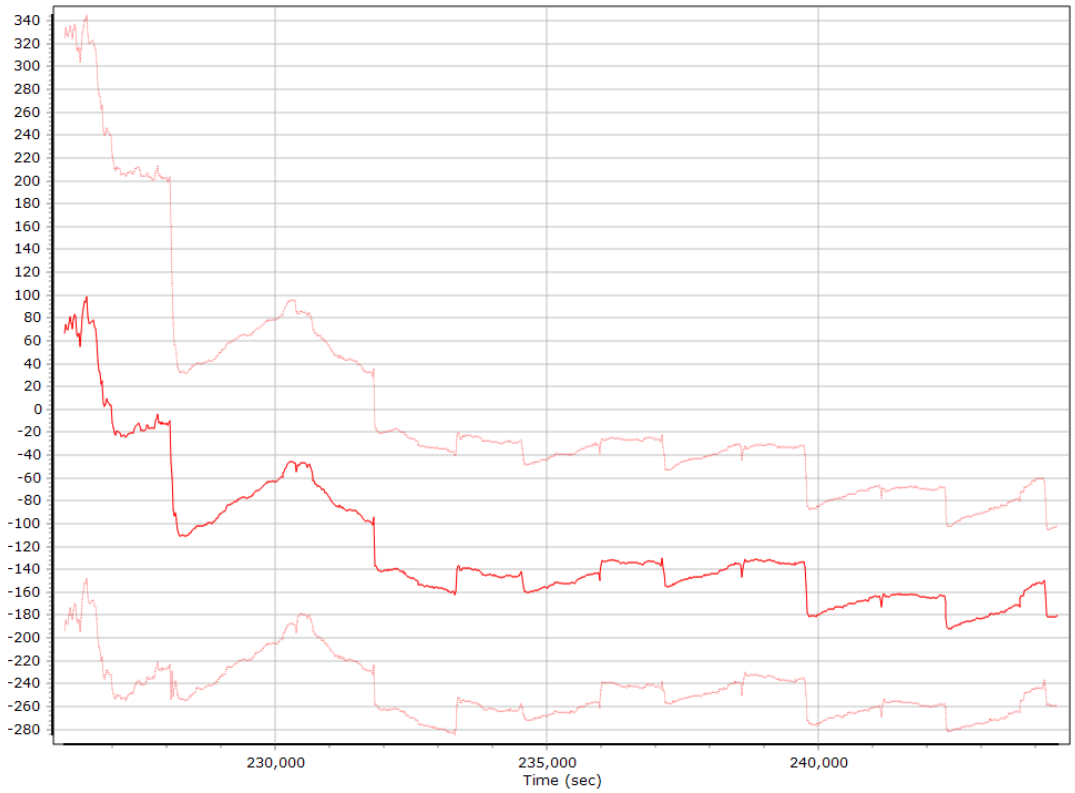
X Accelerometer Scale Error (ppm)



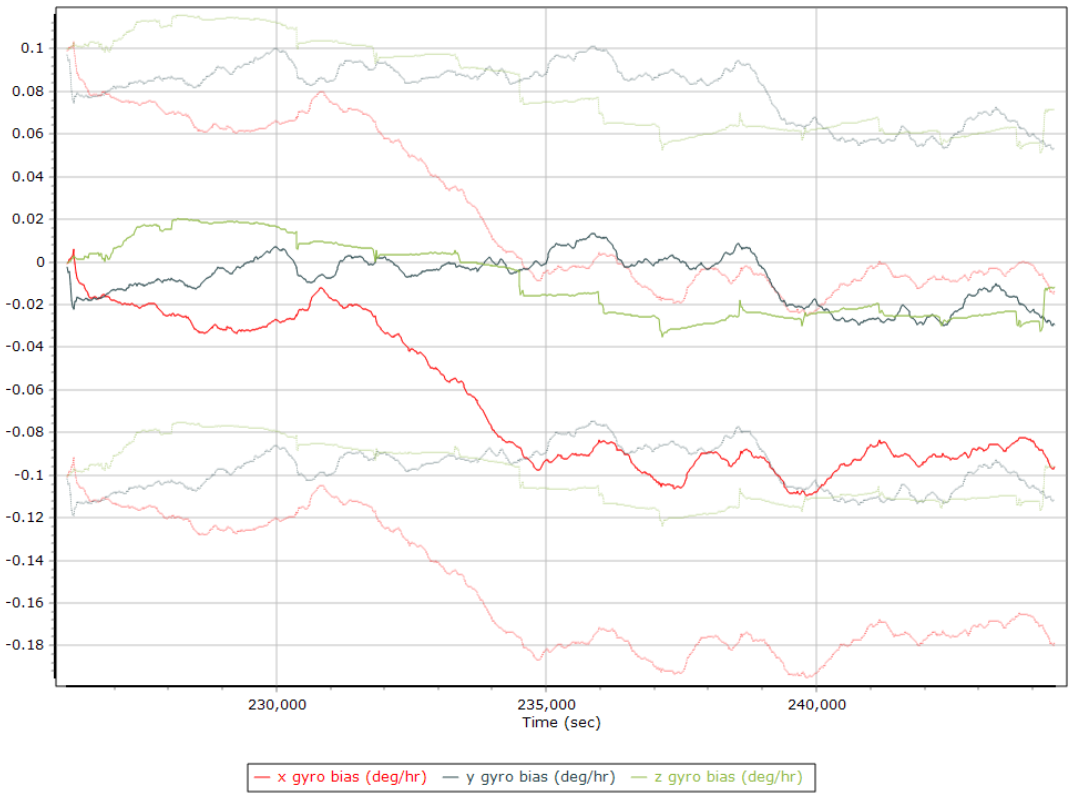
Y Accelerometer Scale Error (ppm)



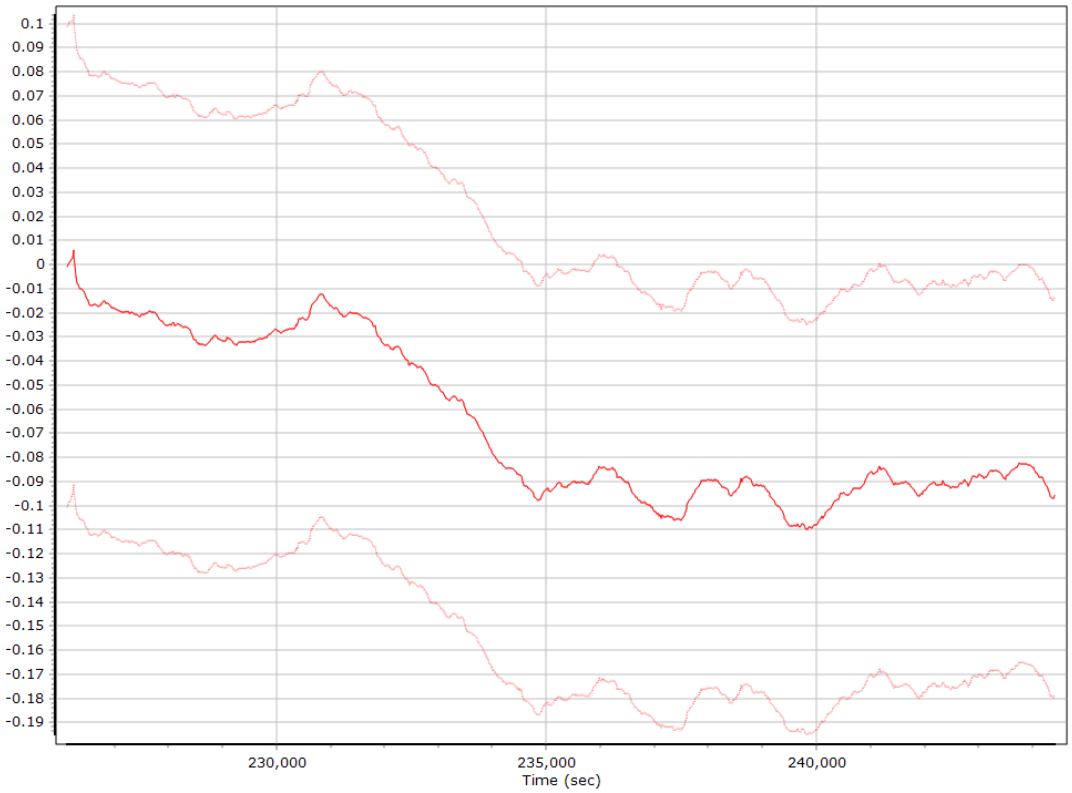
Z Accelerometer Scale Error (ppm)



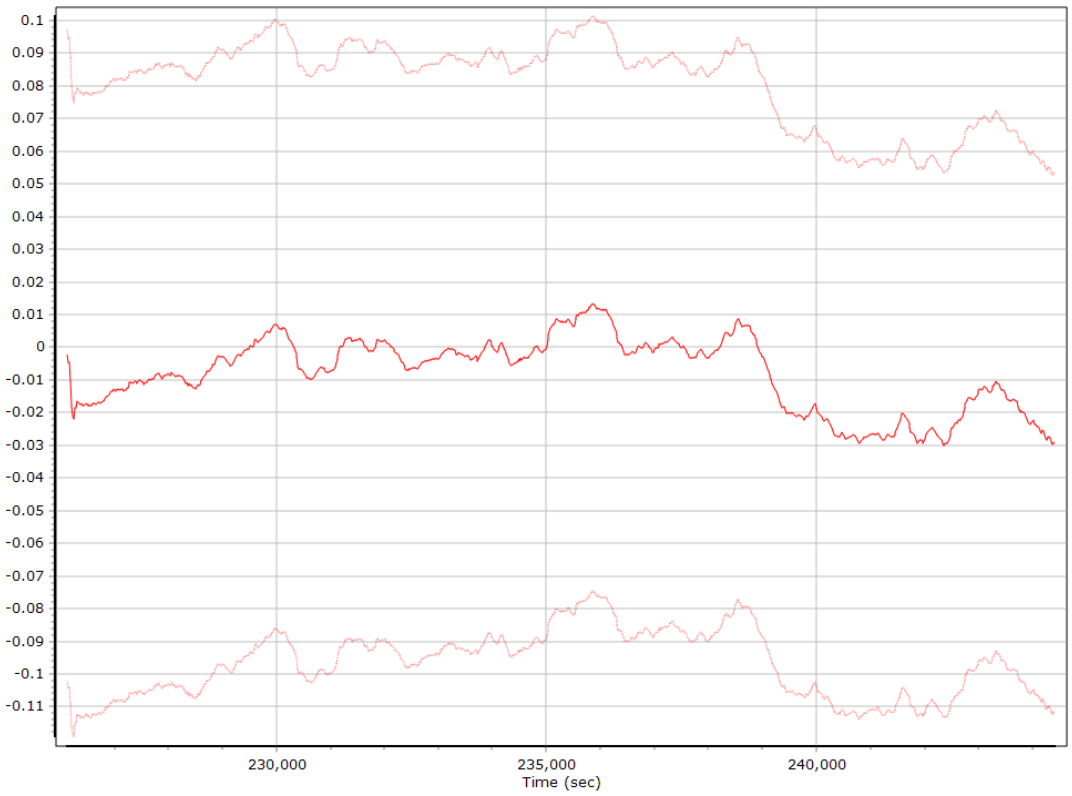
Gyro Bias (deg/h)



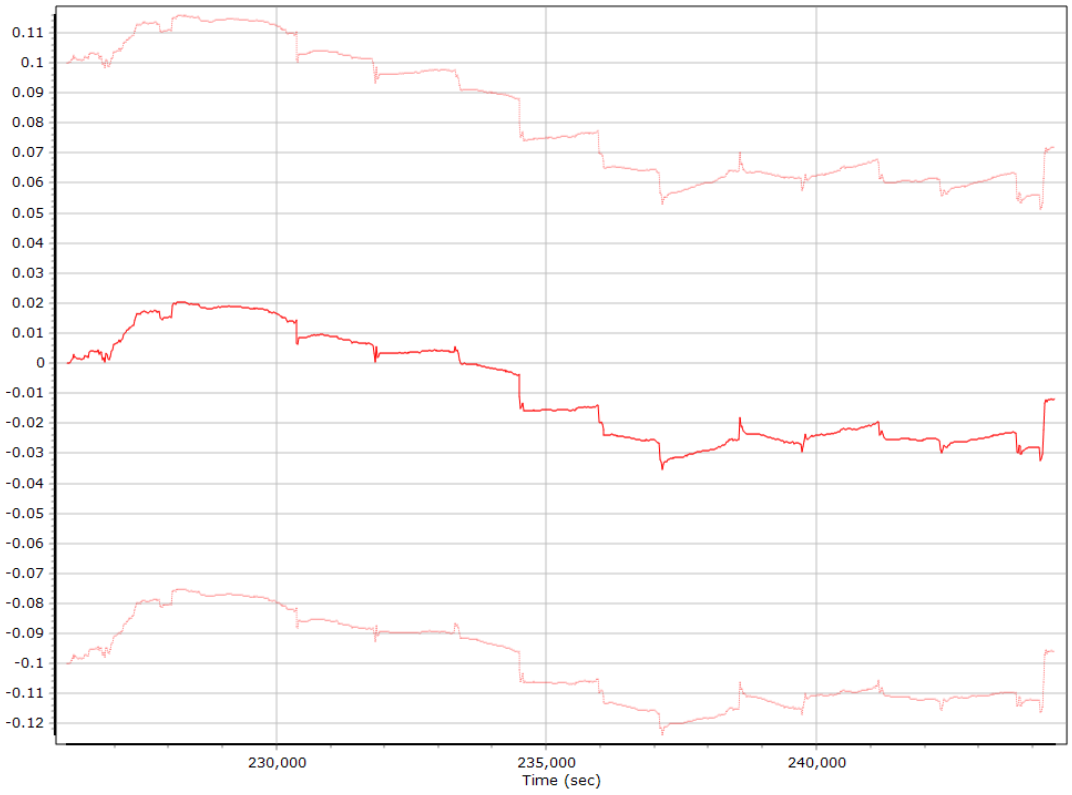
X Gyro Bias (deg/h)



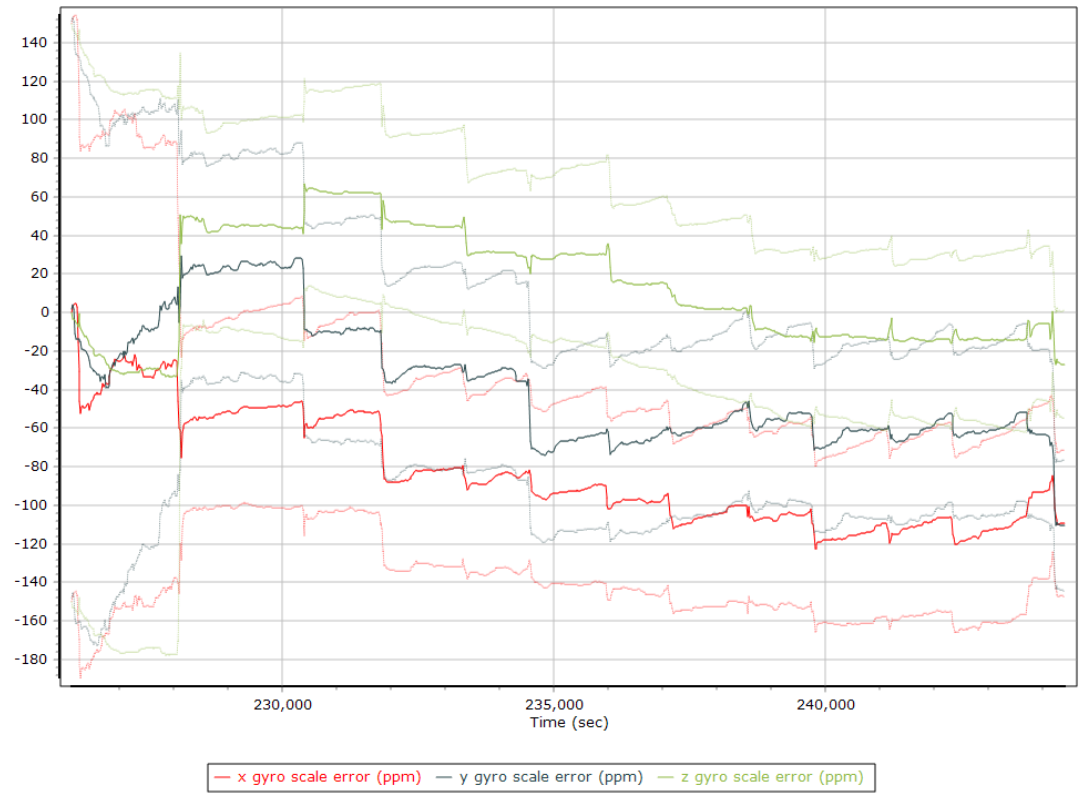
Y Gyro Bias (deg/h)



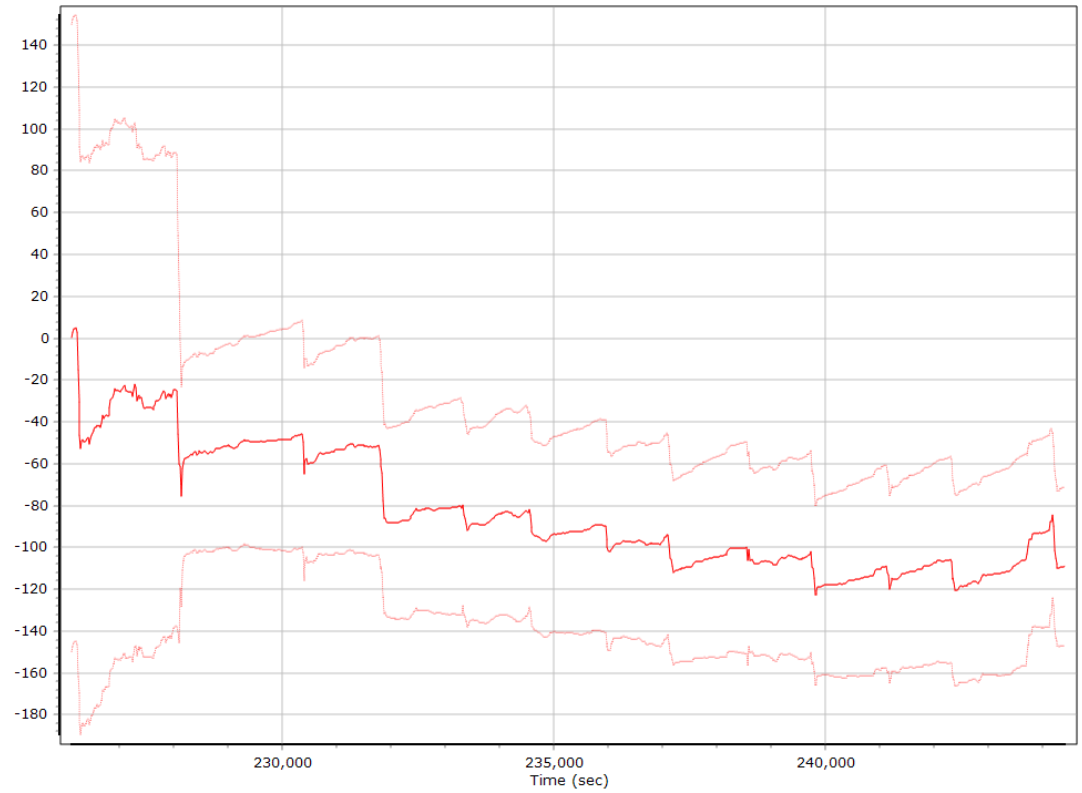
Z Gyro Bias (deg/h)



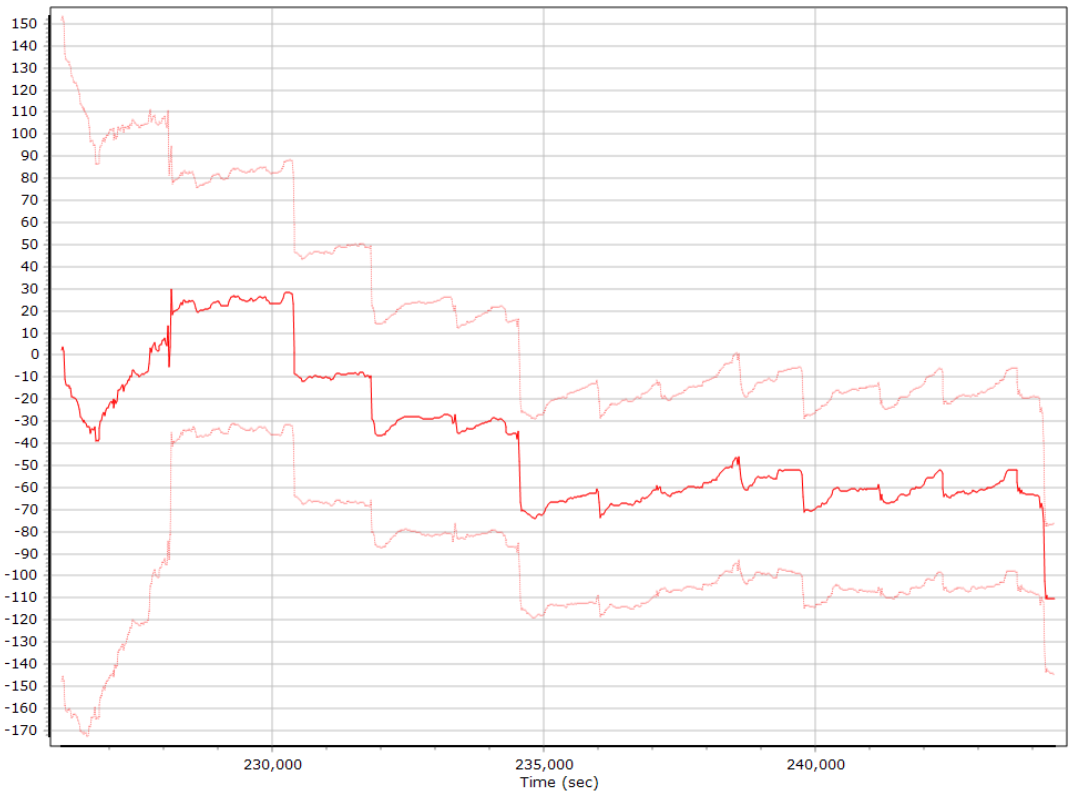
Gyro Scale Error (ppm)



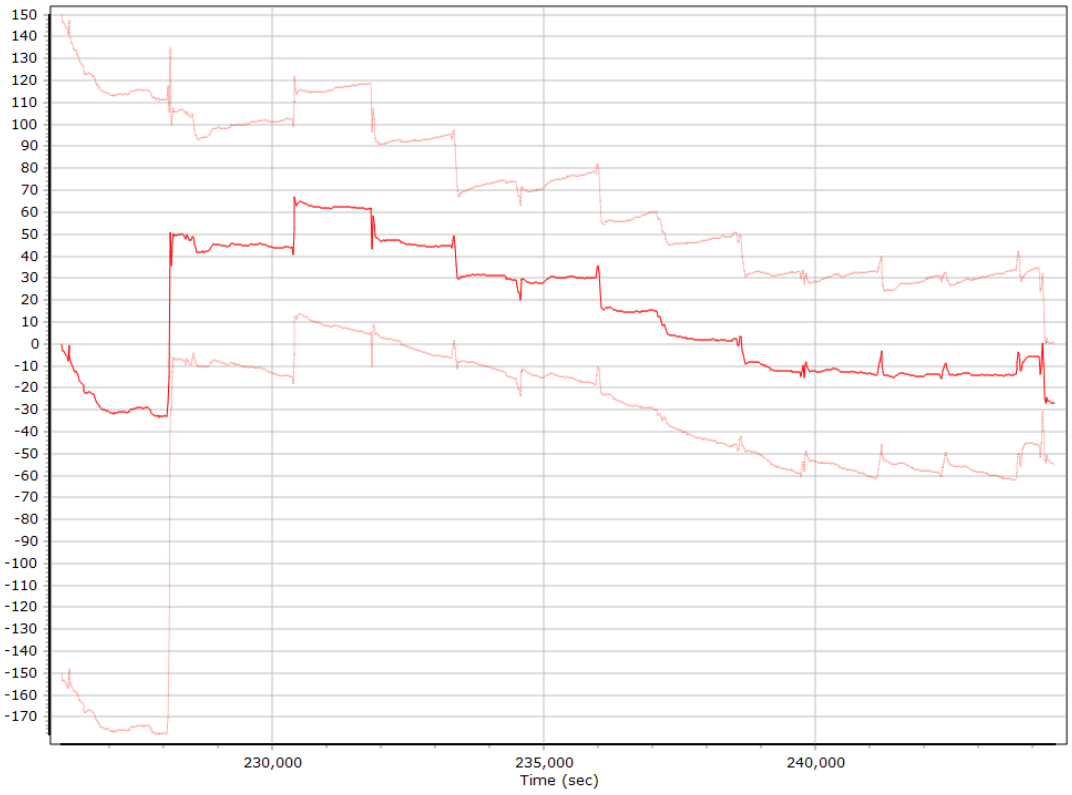
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

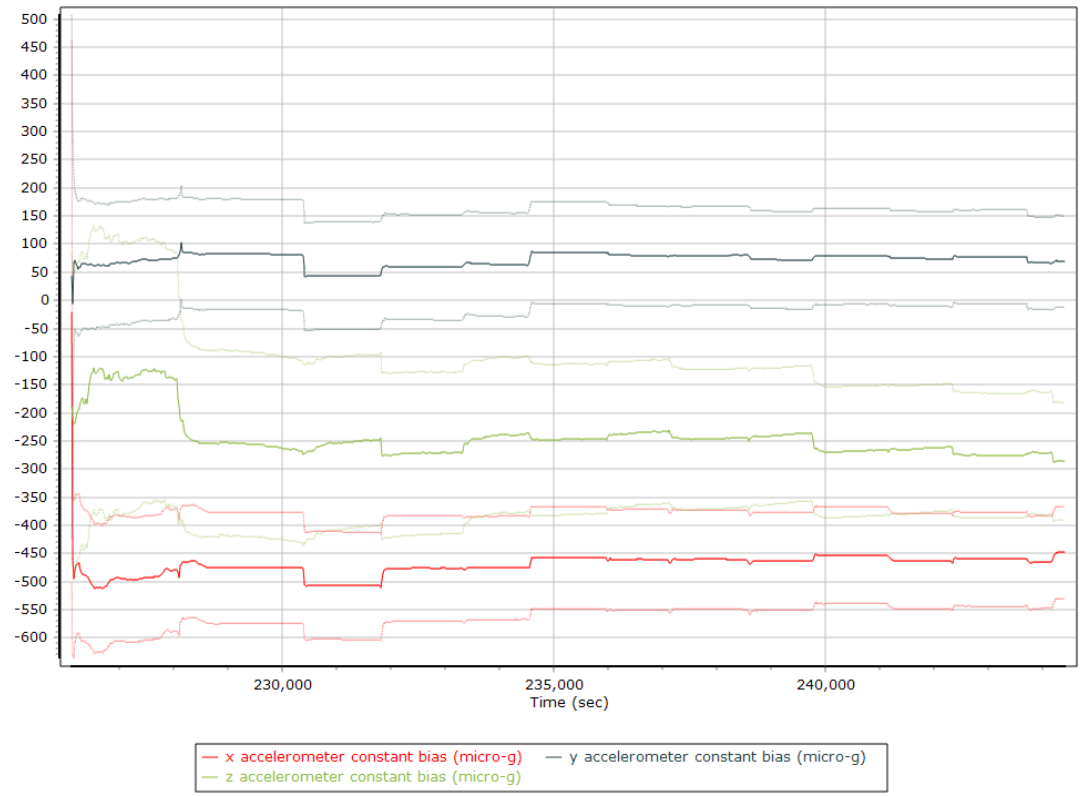


Z Gyro Scale Error (ppm)

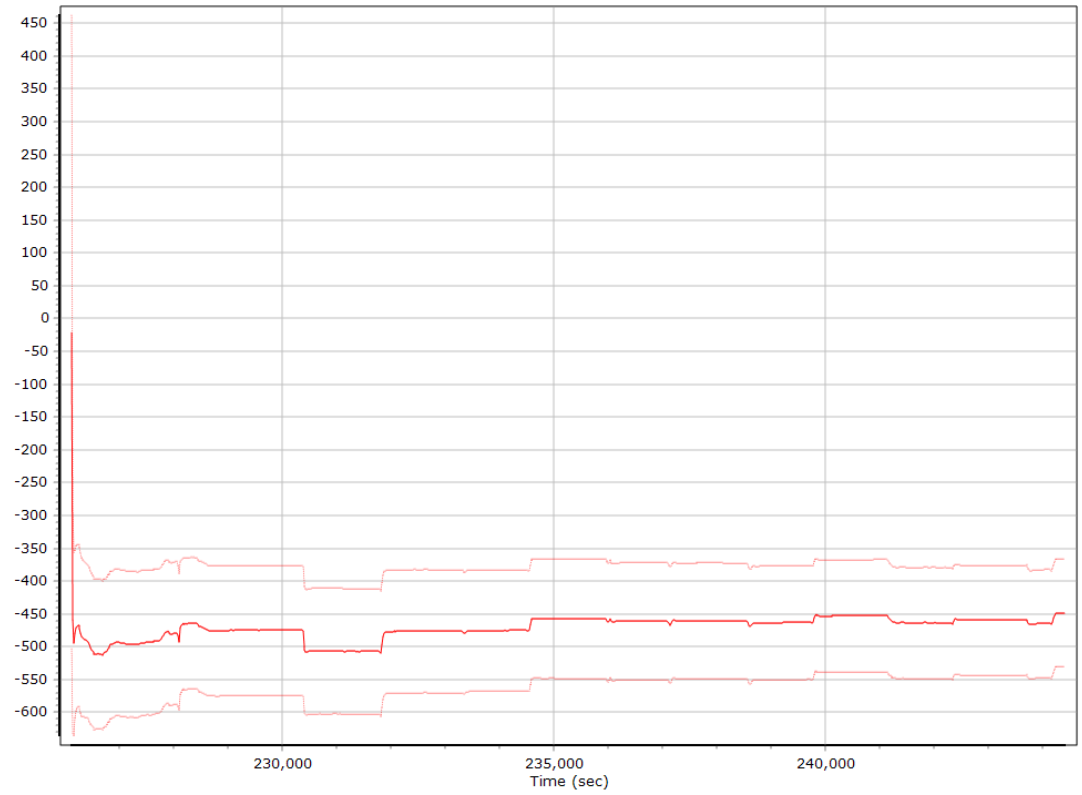


Forward Processed Estimated Constant Errors, Reference Frame

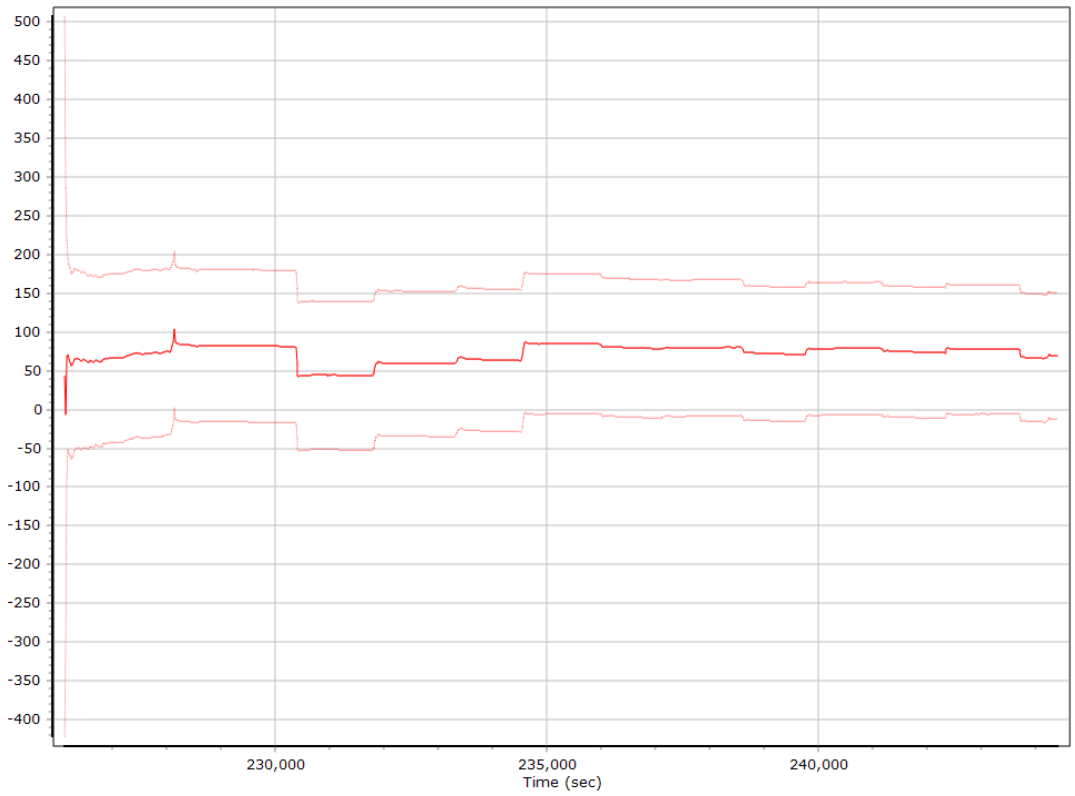
Accelerometer Bias (micro-g)



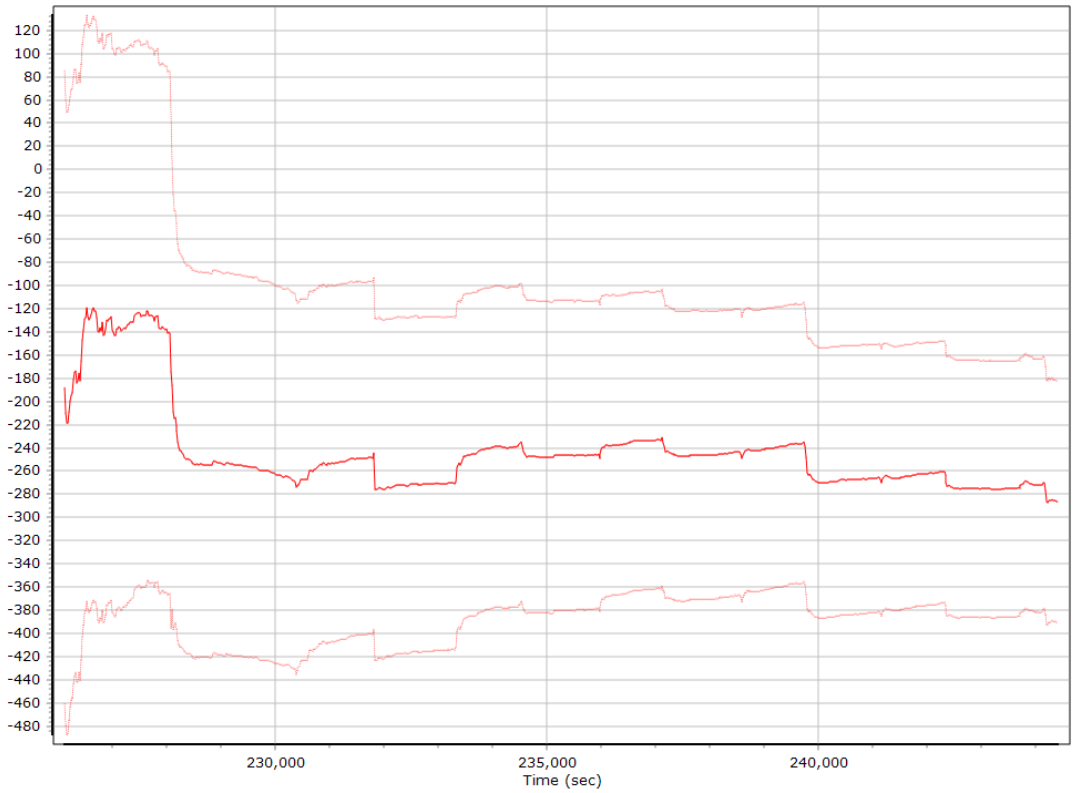
X Accelerometer Bias (micro-g)



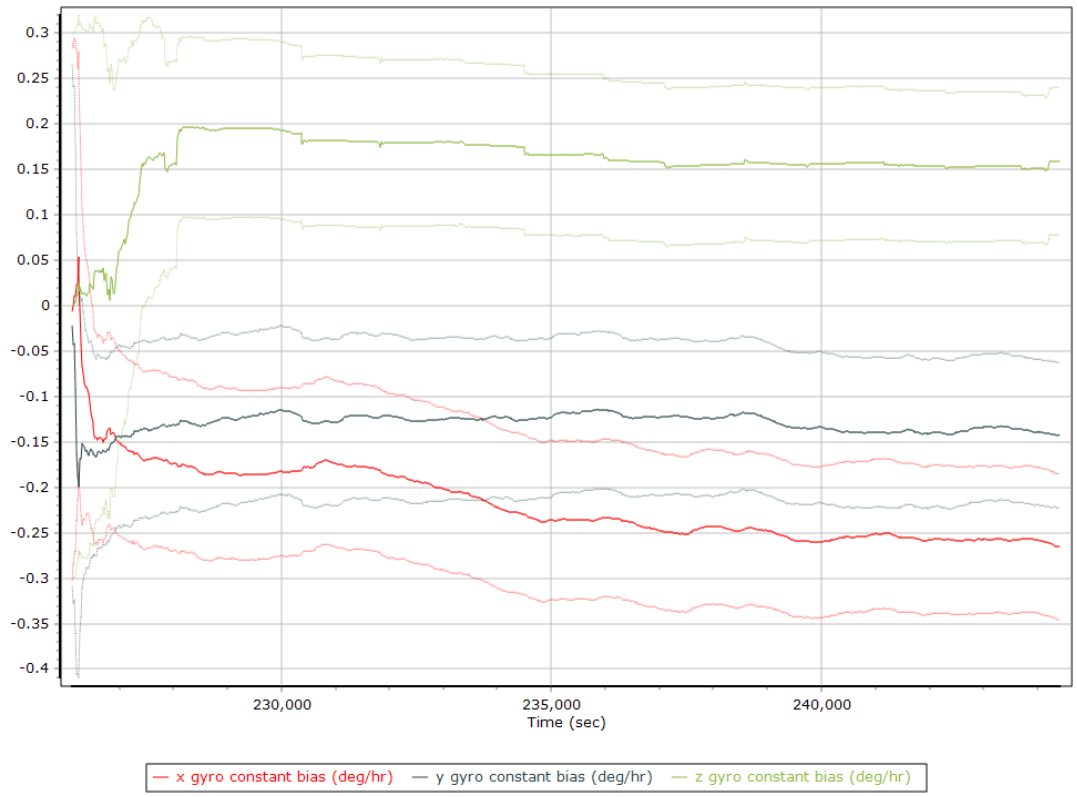
Y Accelerometer Bias (micro-g)



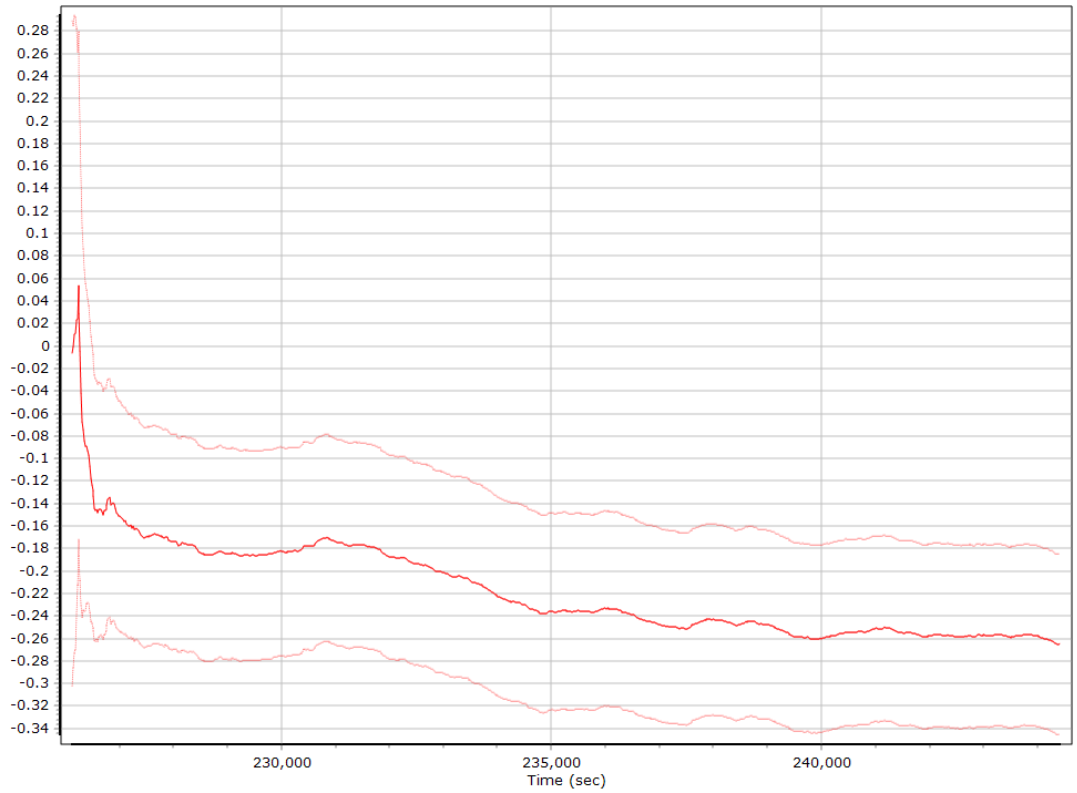
Z Accelerometer Bias (micro-g)



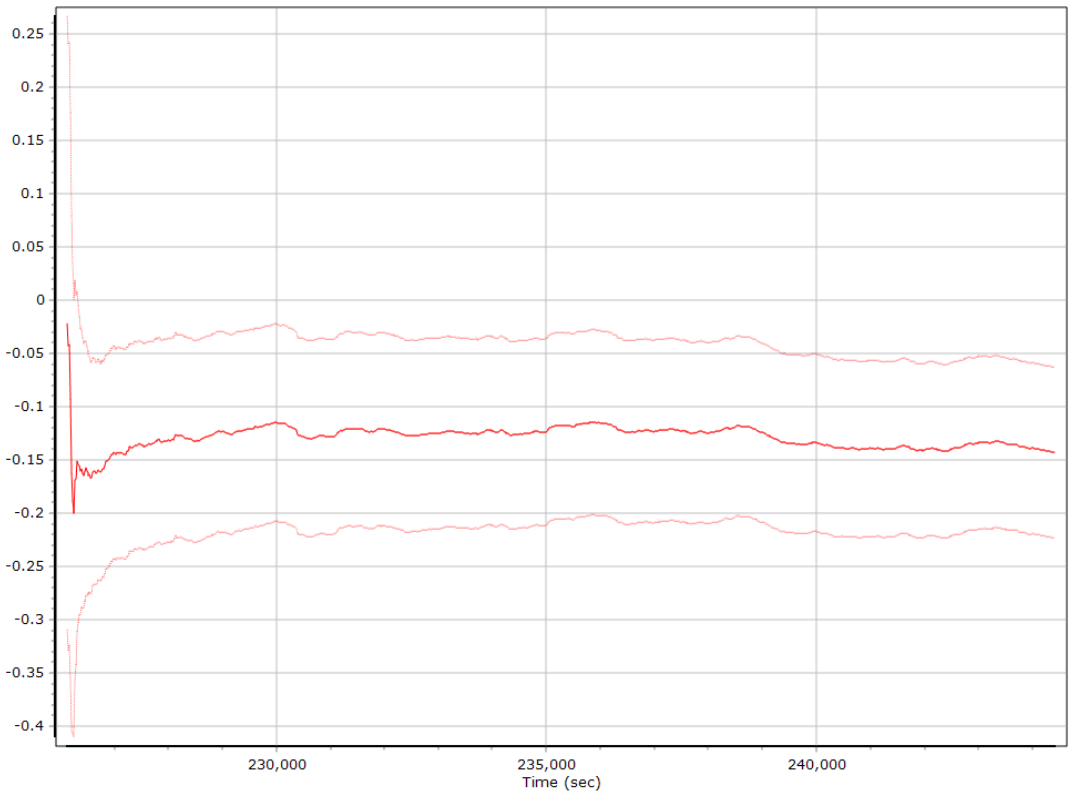
Gyro Bias (deg/h)



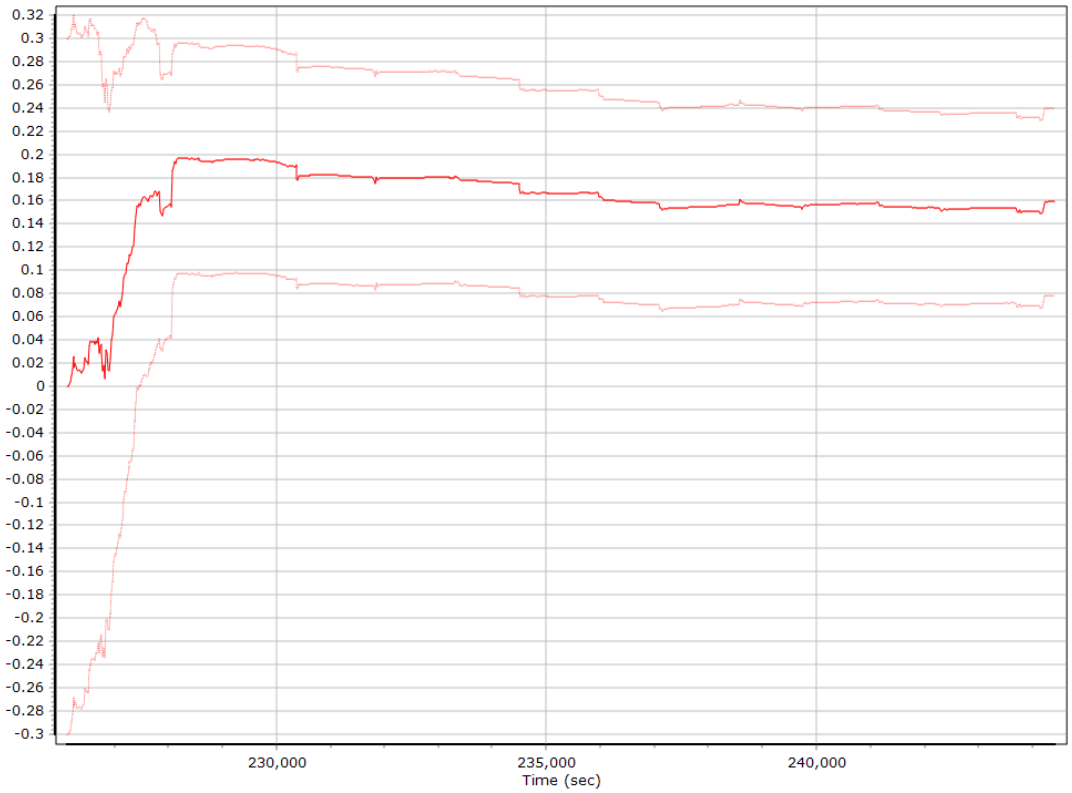
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

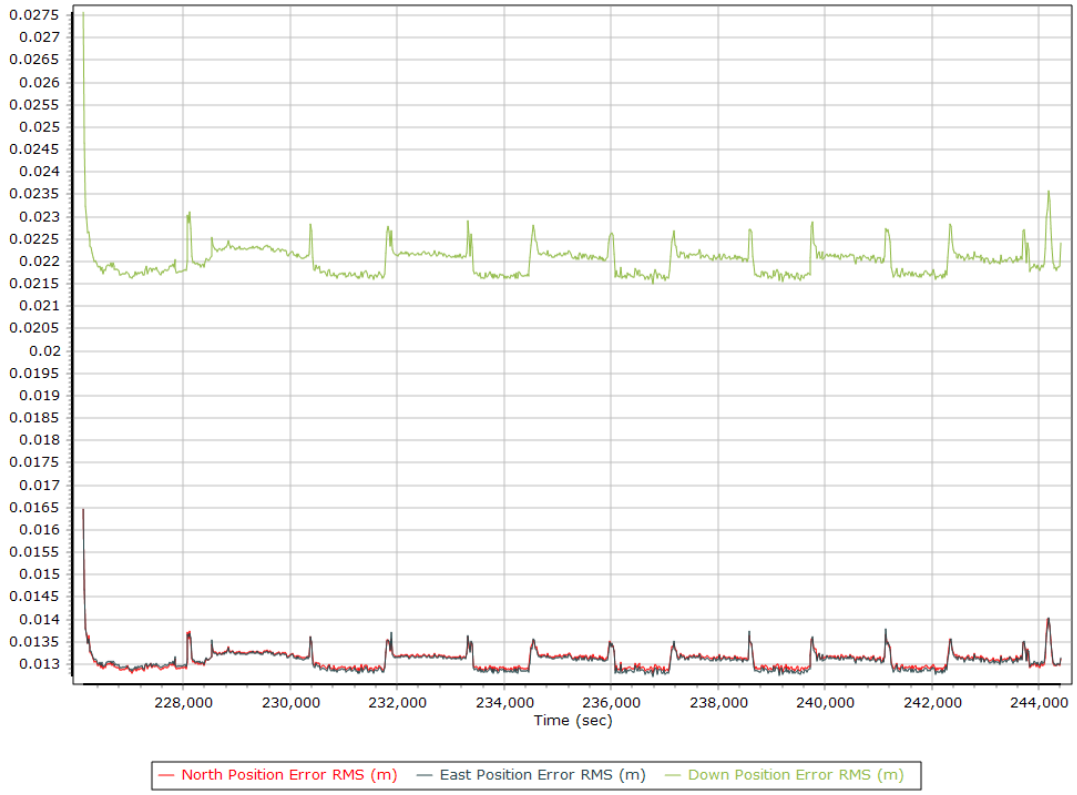


Z Gyro Bias (deg/h)

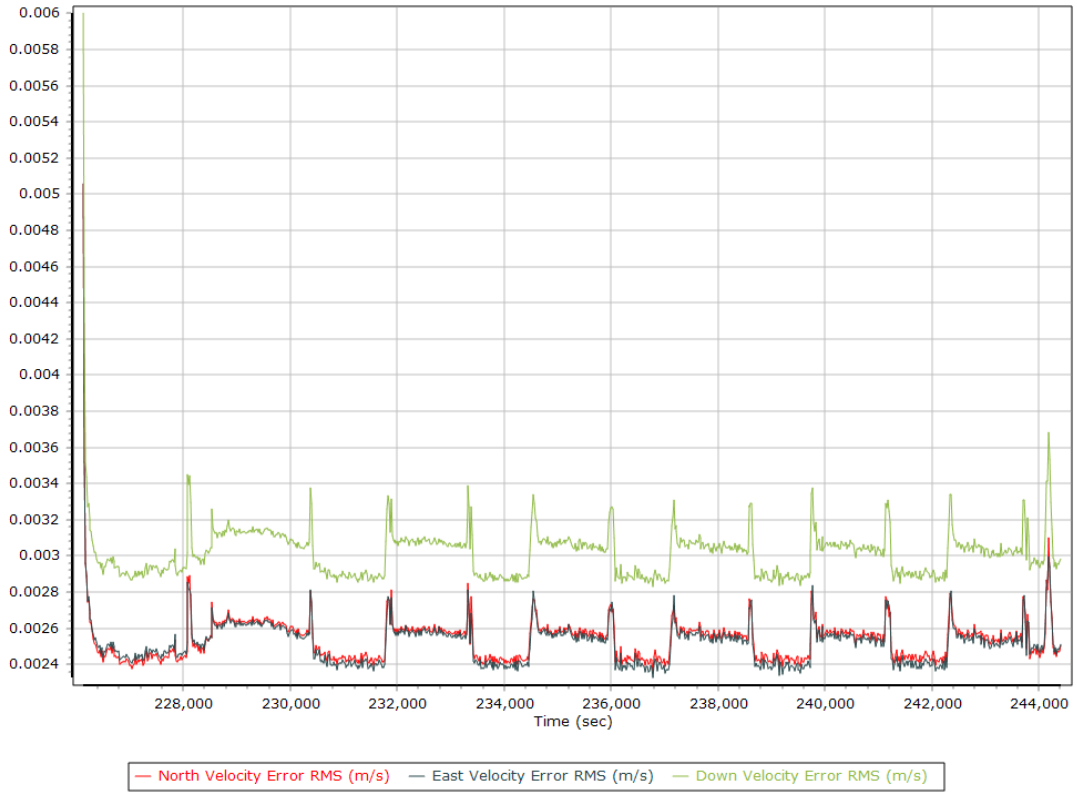


Smoothed Performance Metrics

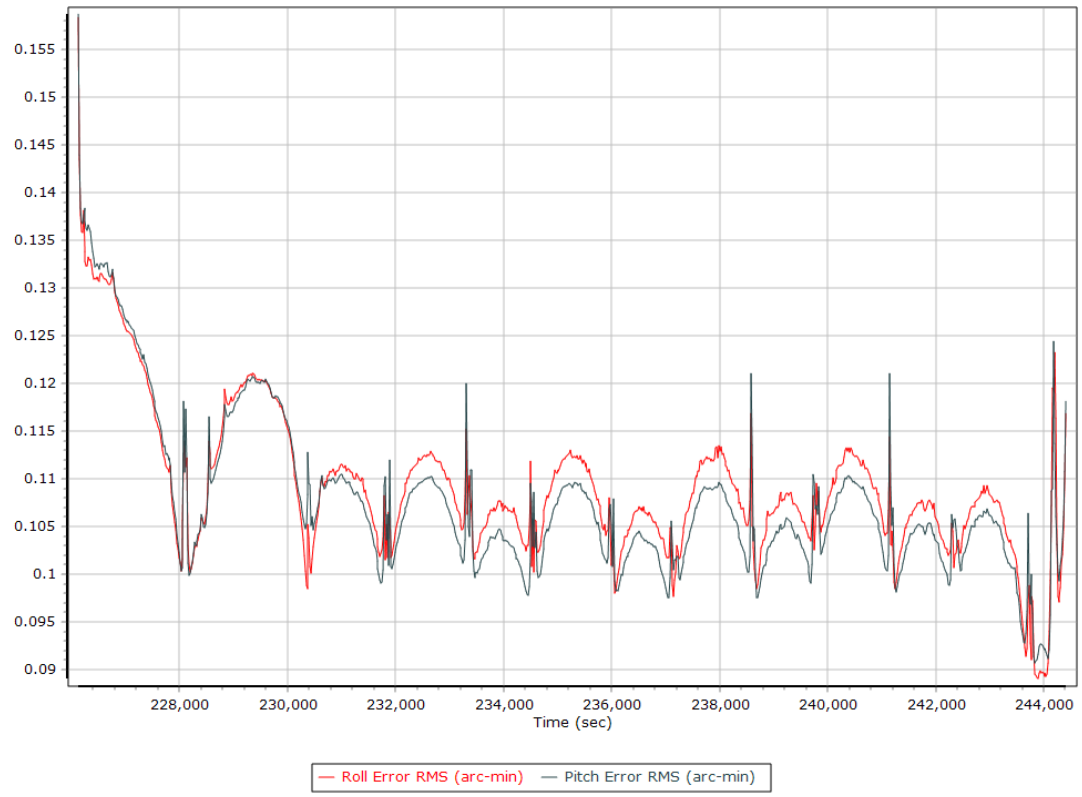
Position Error RMS (m)



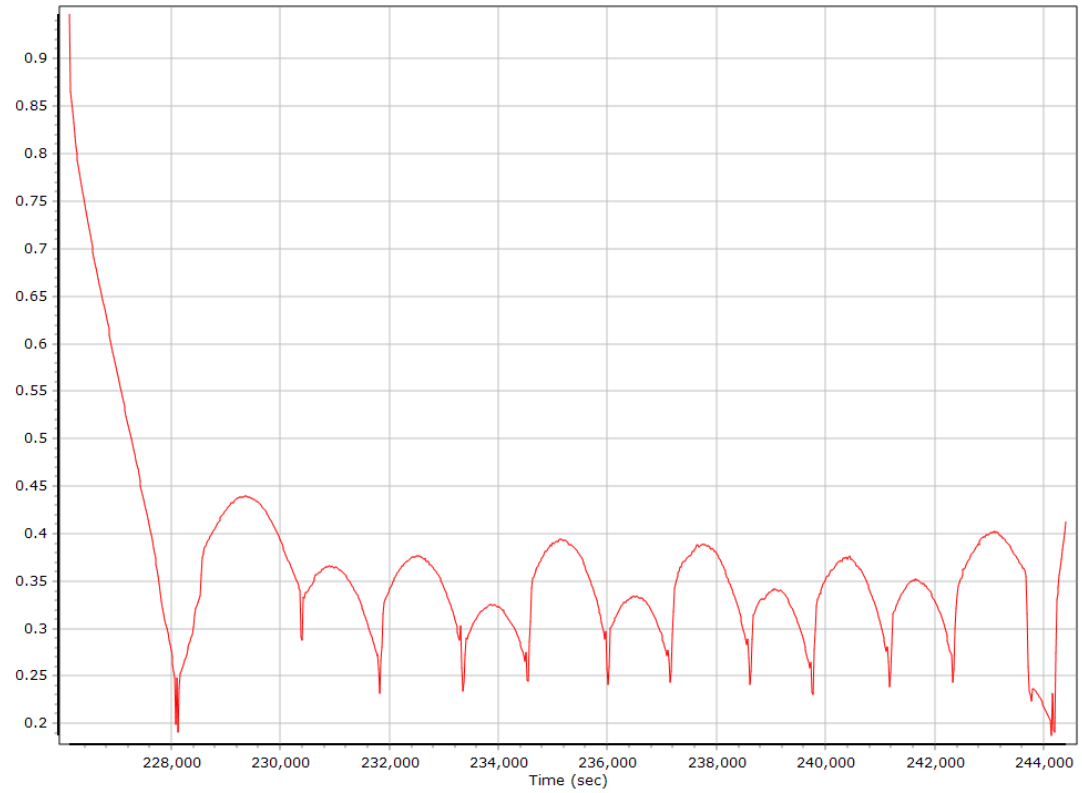
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

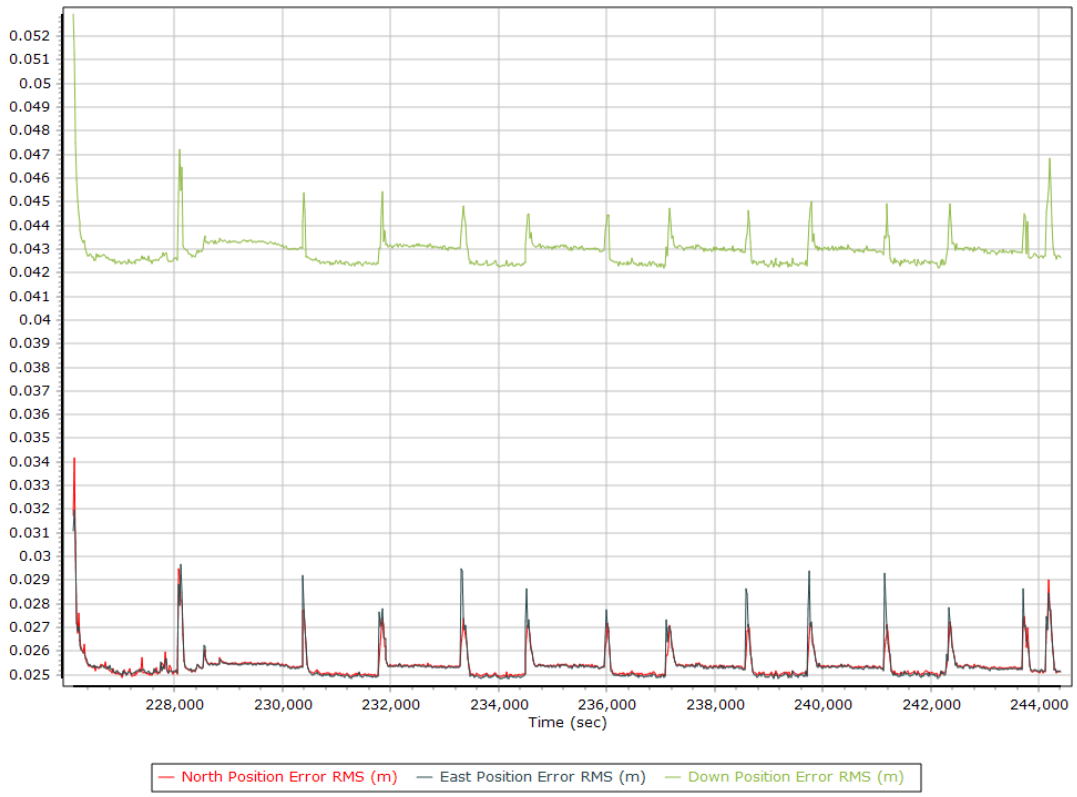


Heading Error RMS (arc-min)

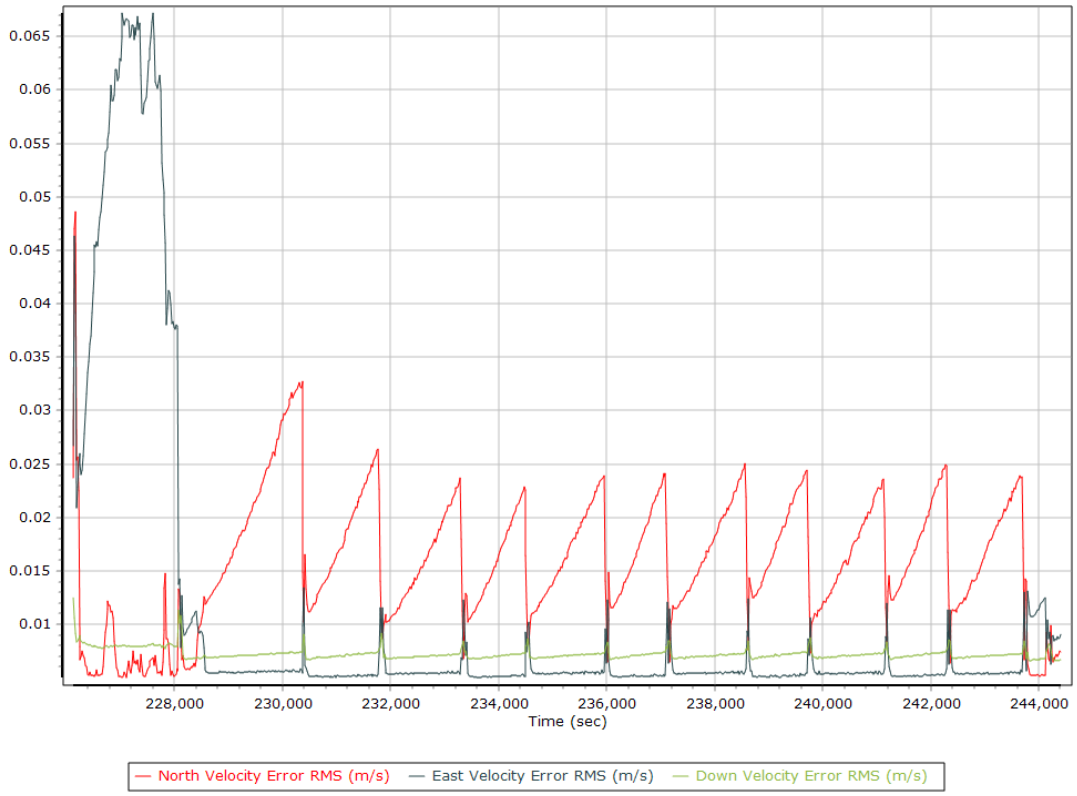


Forward Processed Performance Metrics

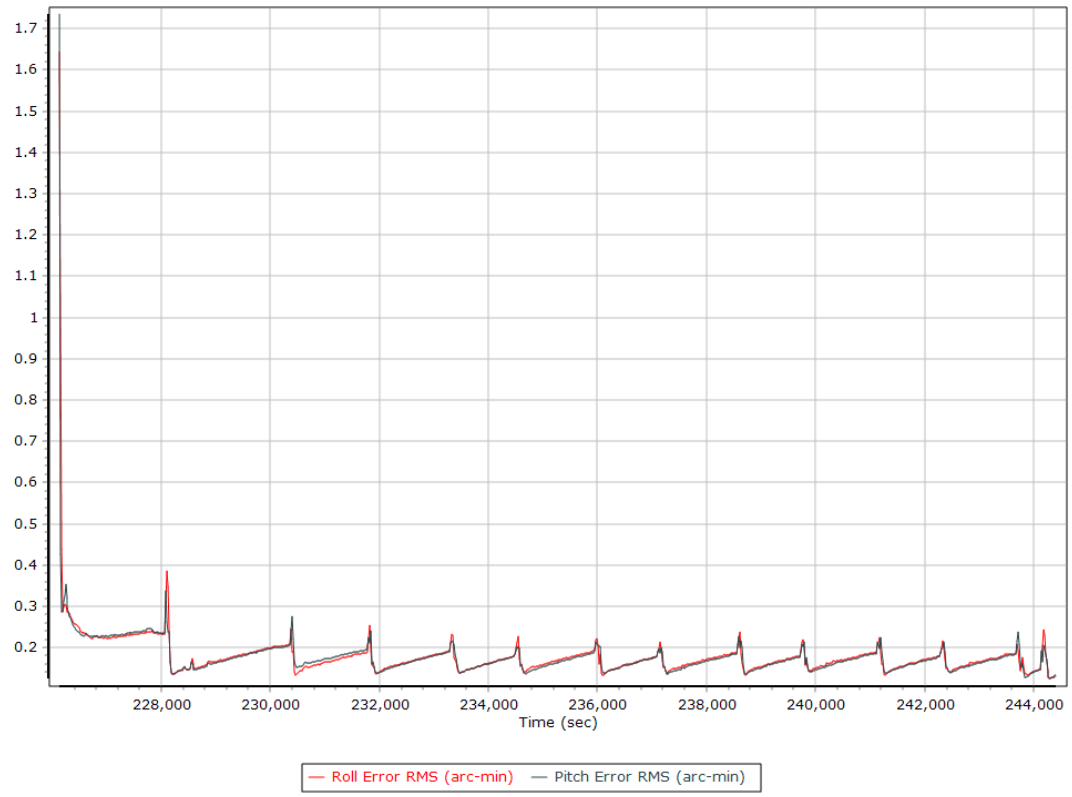
Position Error RMS (m)



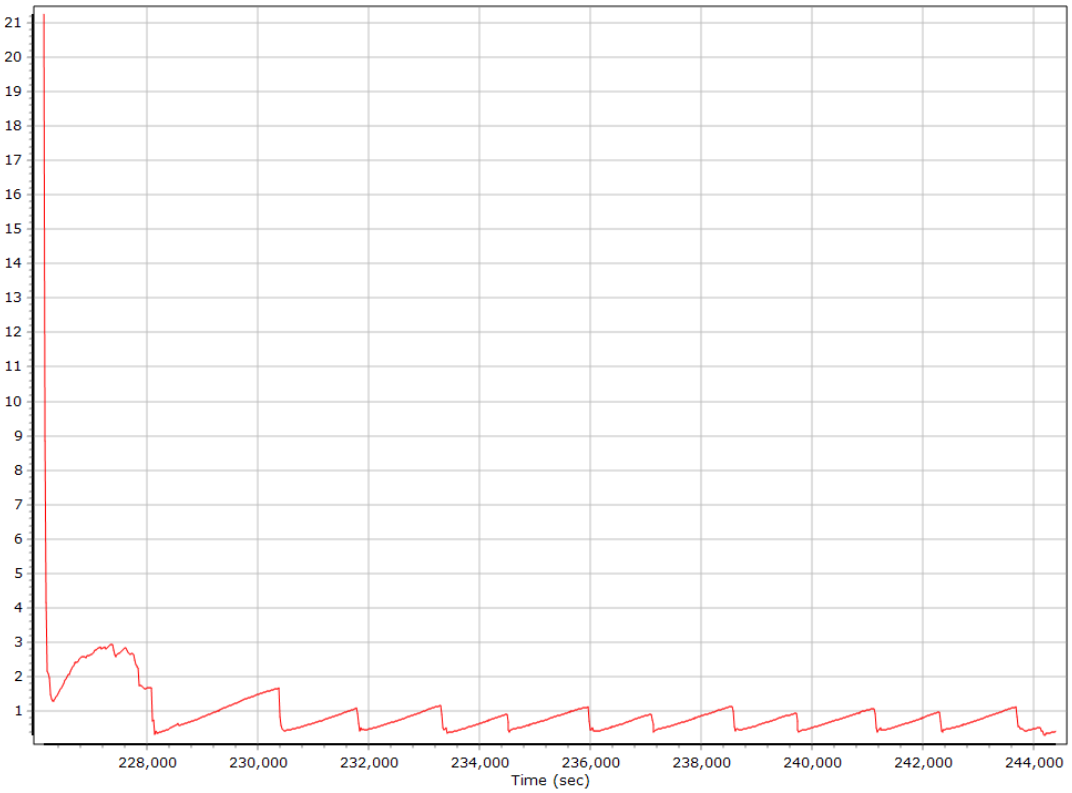
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

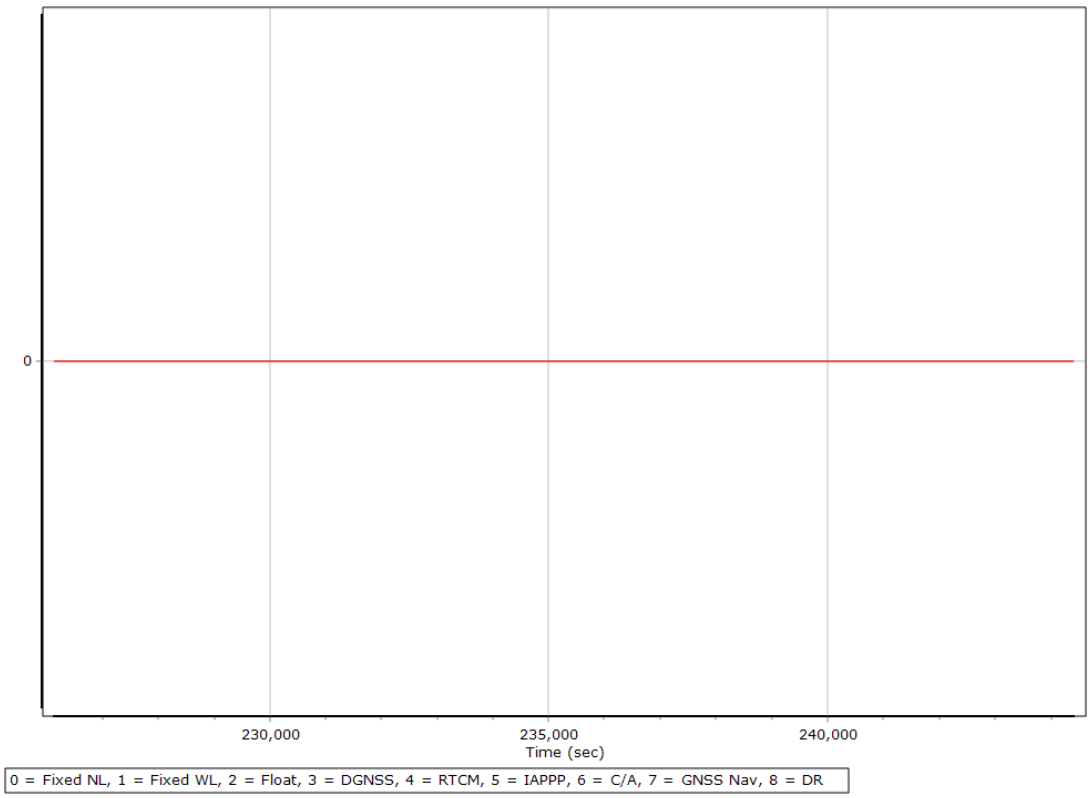


Heading Error RMS (arc-min)

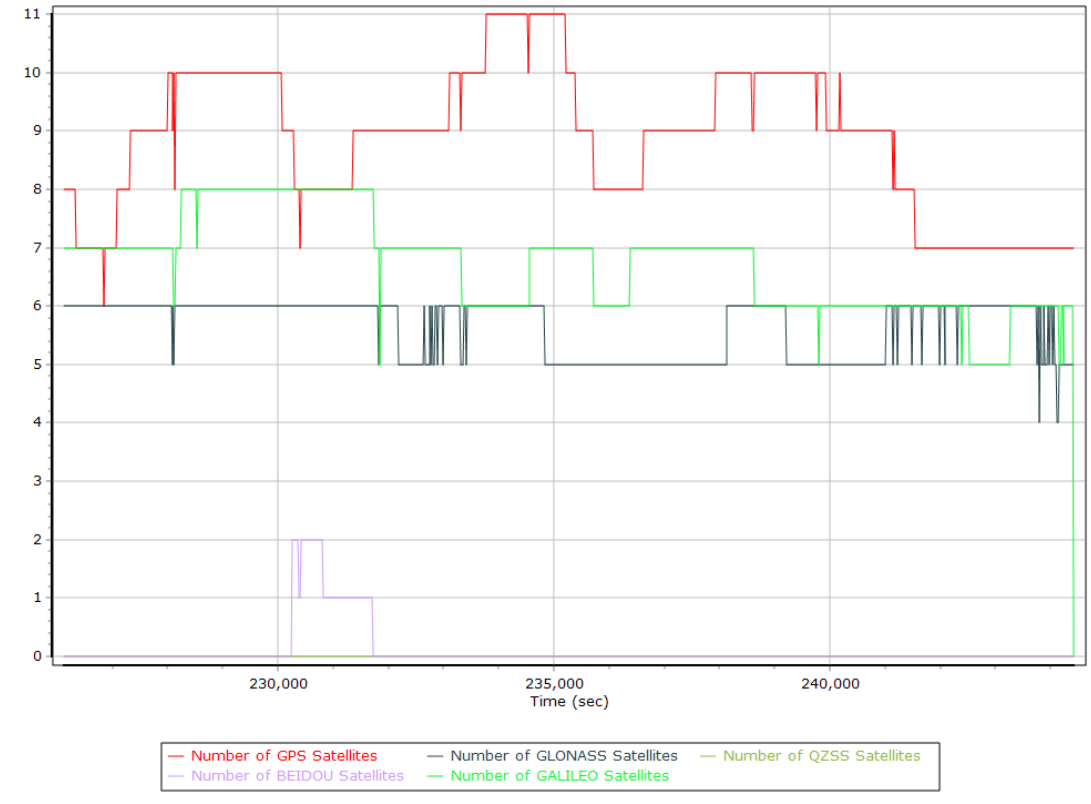


Forward Processed Solution Status

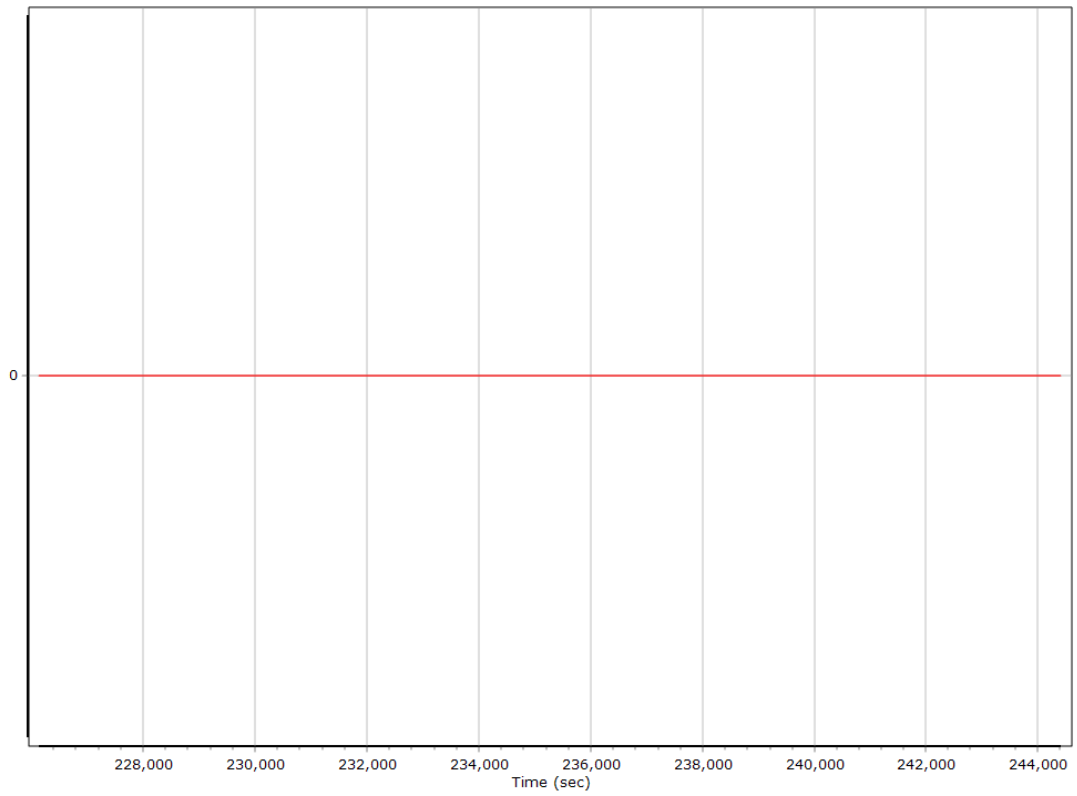
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12272020A_4040
Processing date	2022-01-05 15:17:47
Mission date	2020-12-27 16:20:11
Mission duration	05:40:46.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201227_161952_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3620.20g	GLONASS Broadcast Ephemeris
Ephm3620.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12272020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201227_161952_INS-GPS_1.raw		
Last raw data file	201227_161952_INS-GPS_1.raw		
Start GPS week	2138		
Start time	58792.684 (12/27/2020 4:19:52 PM)		
End time	79236.304 (12/27/2020 10:00:36 PM)		
Start of fine alignment	58876.303 (12/27/2020 4:21:16 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

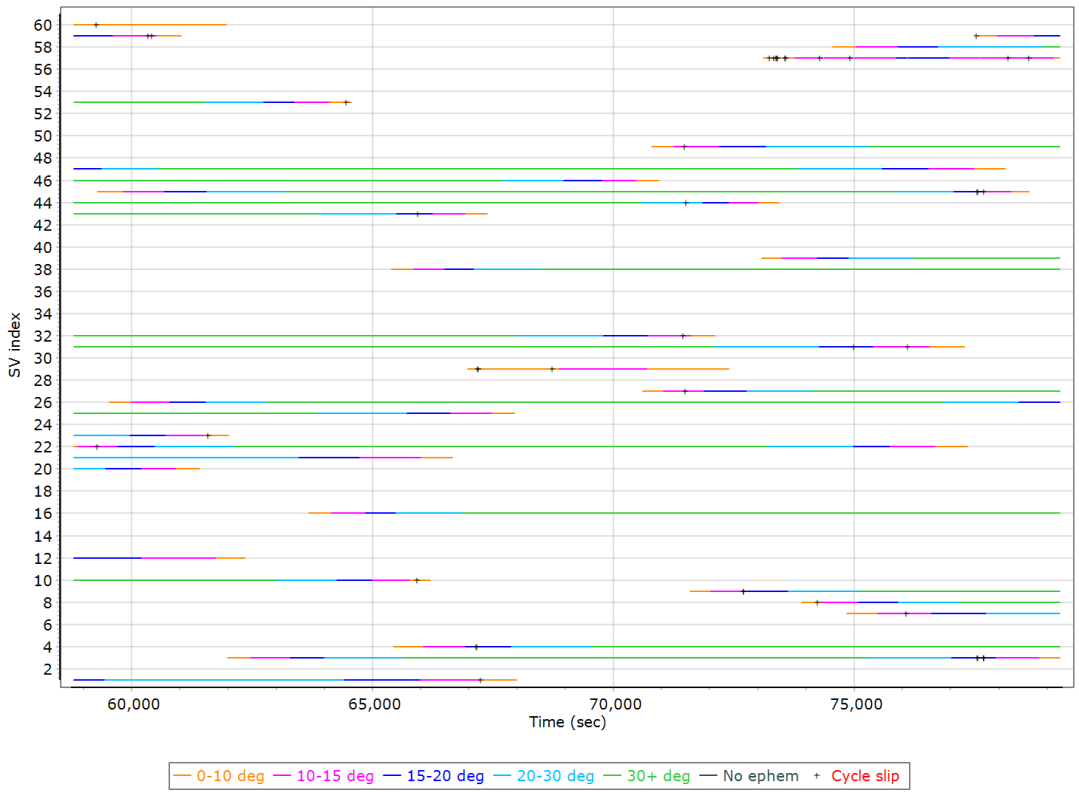
Rover Data QC

Raw IMU Import QC Summary

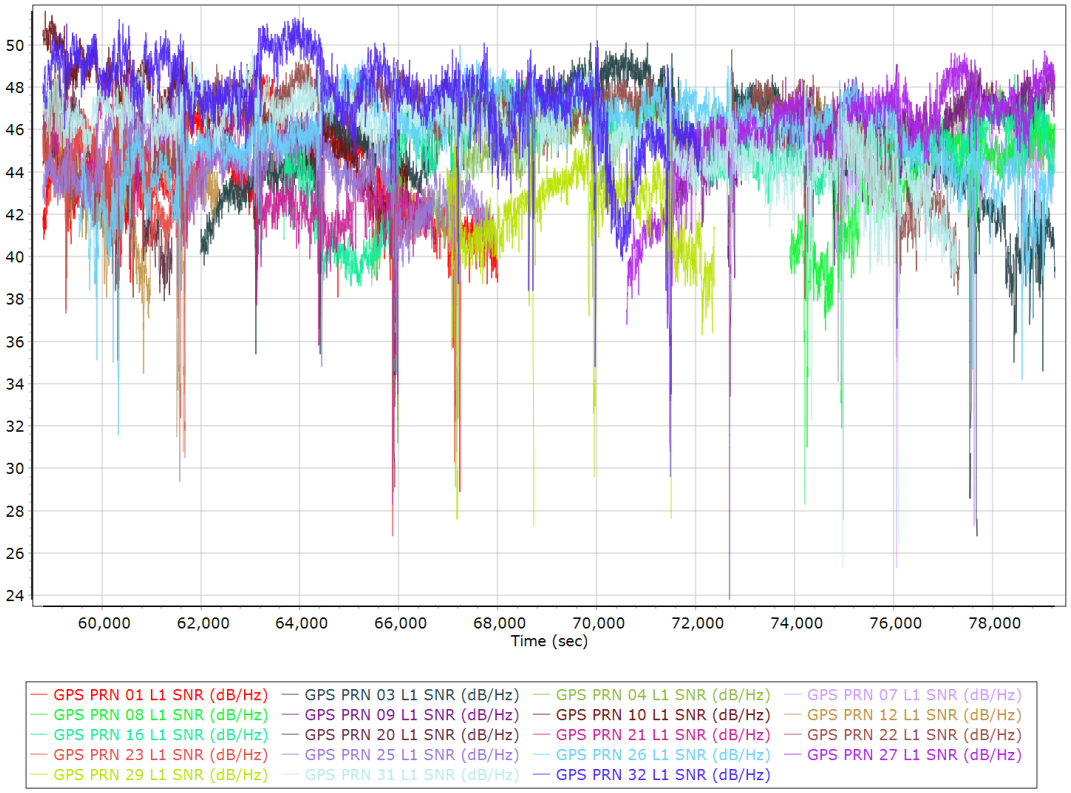
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12272020A_4040.log
IMU Records Processed	4088761
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

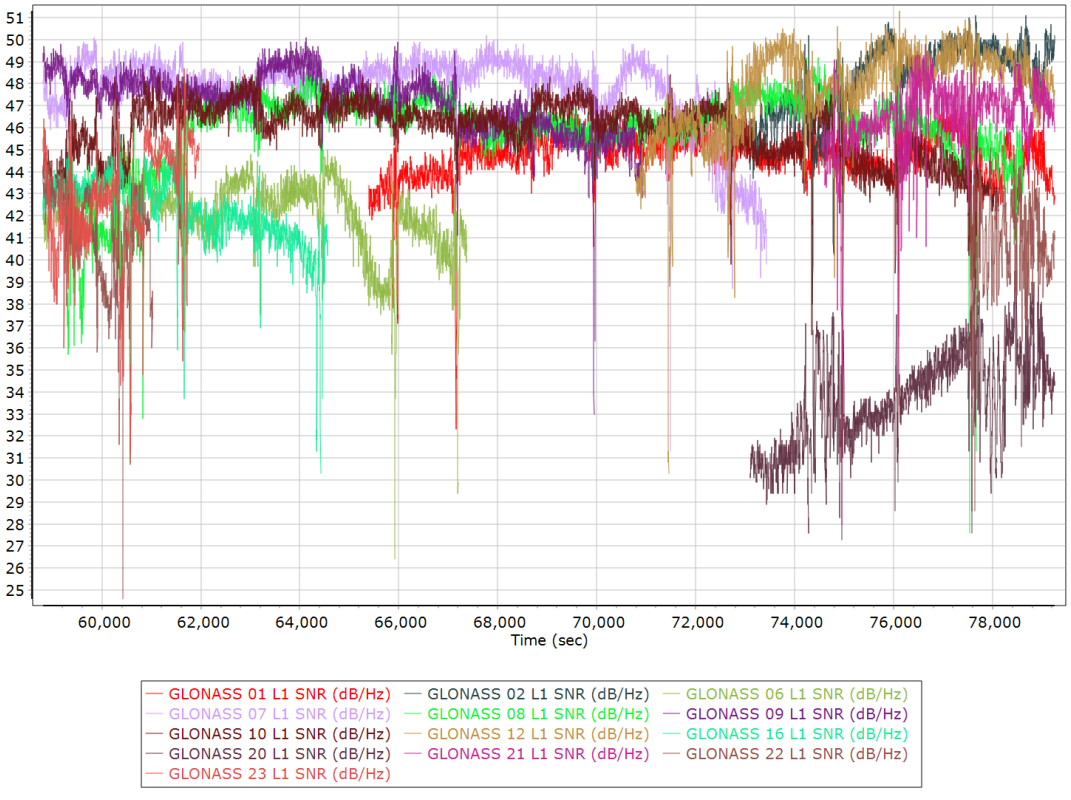
GPS/GLONASS L1 Satellite Lock/Elevation



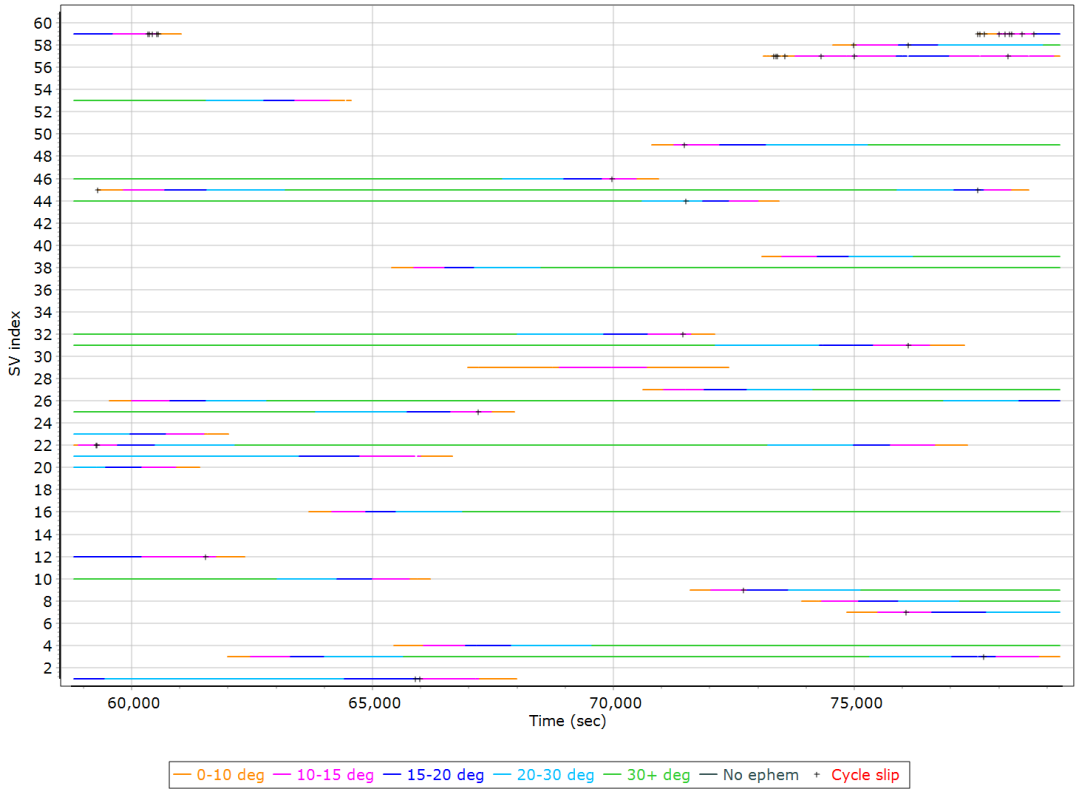
GPS L1 SNR



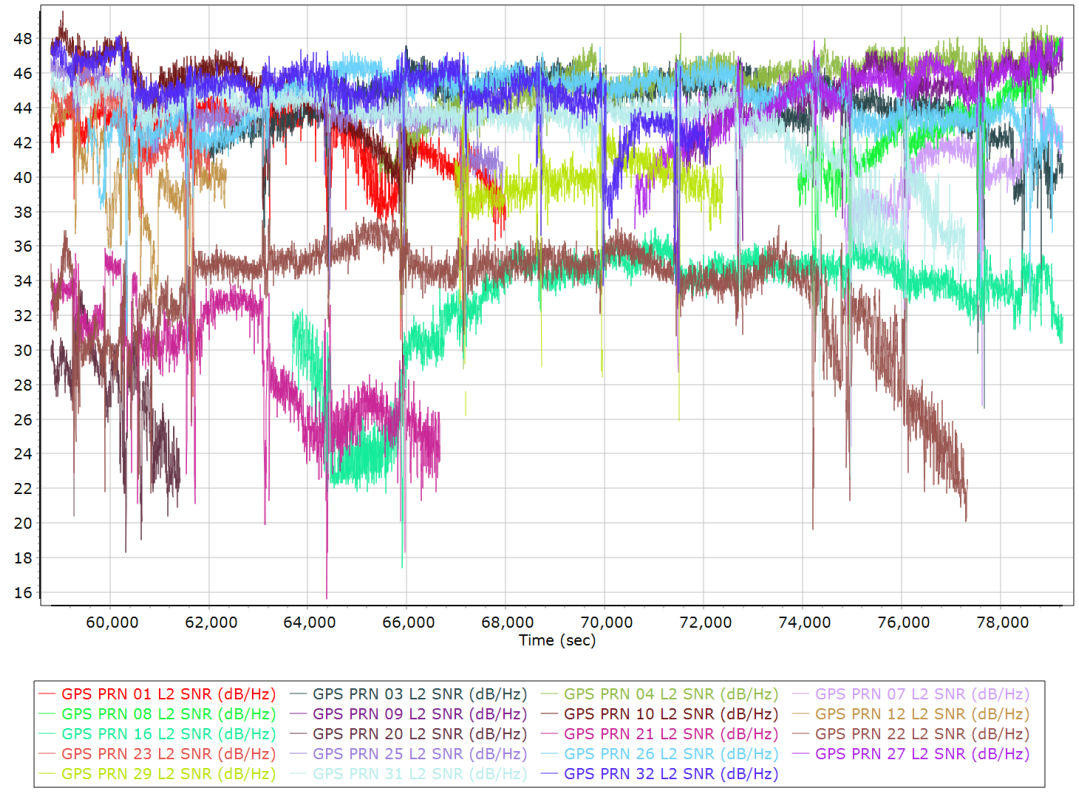
GLONASS L1 SNR



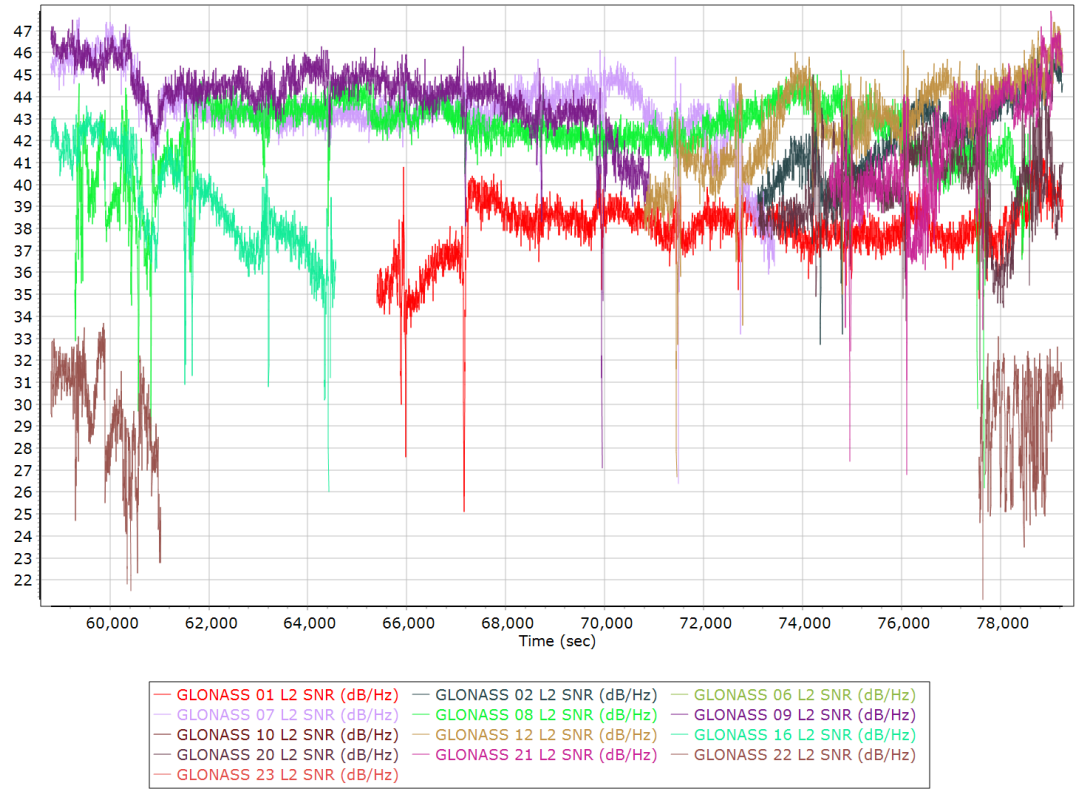
GPS/GLONASS L2 Satellite Lock/Elevation



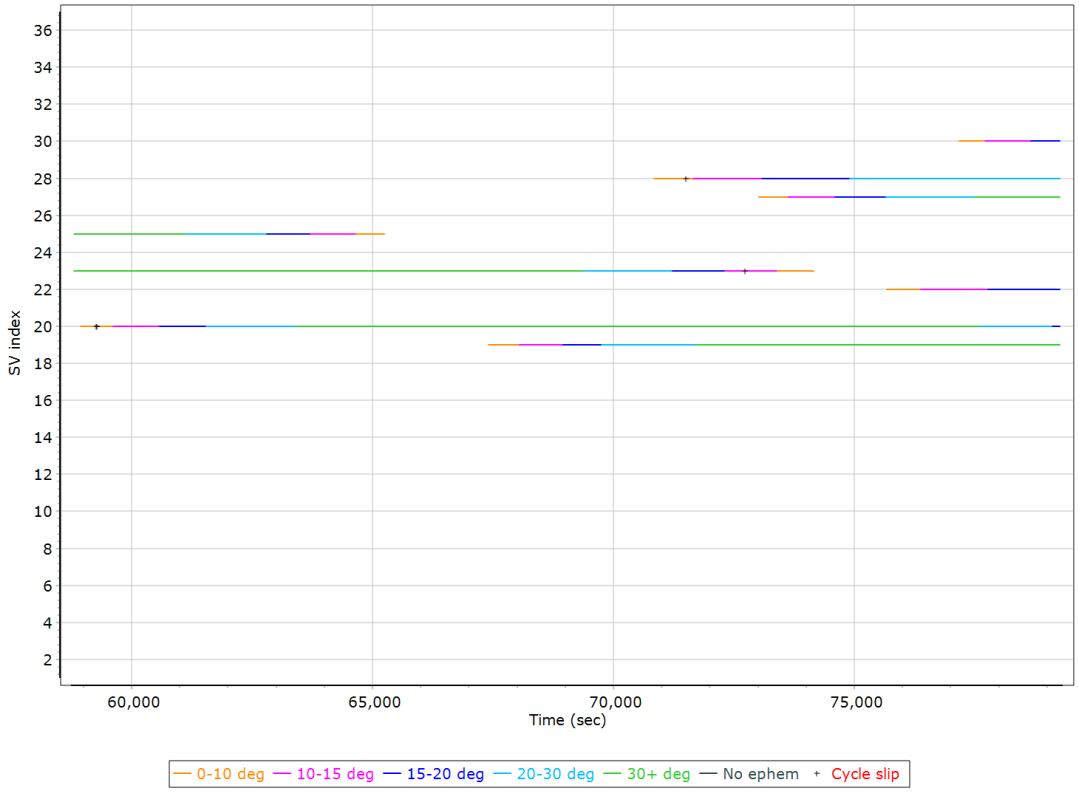
GPS L2 SNR



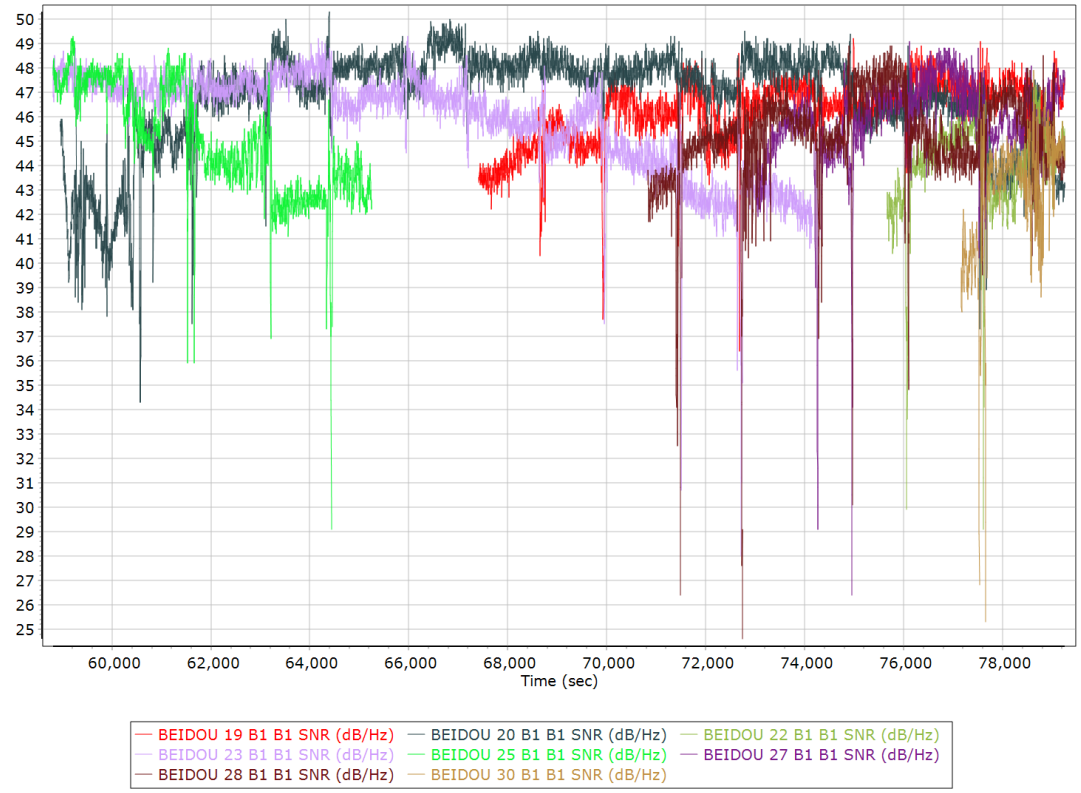
GLONASS L2 SNR



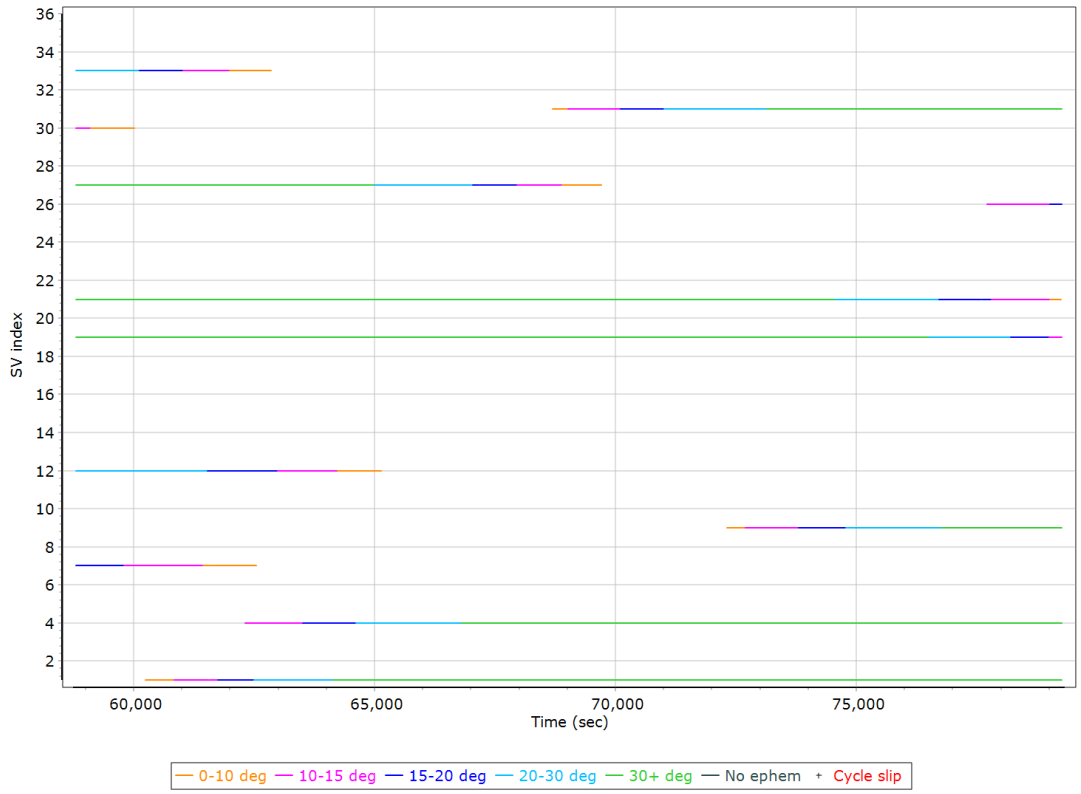
BEIDOU Satellite Lock/Elevation



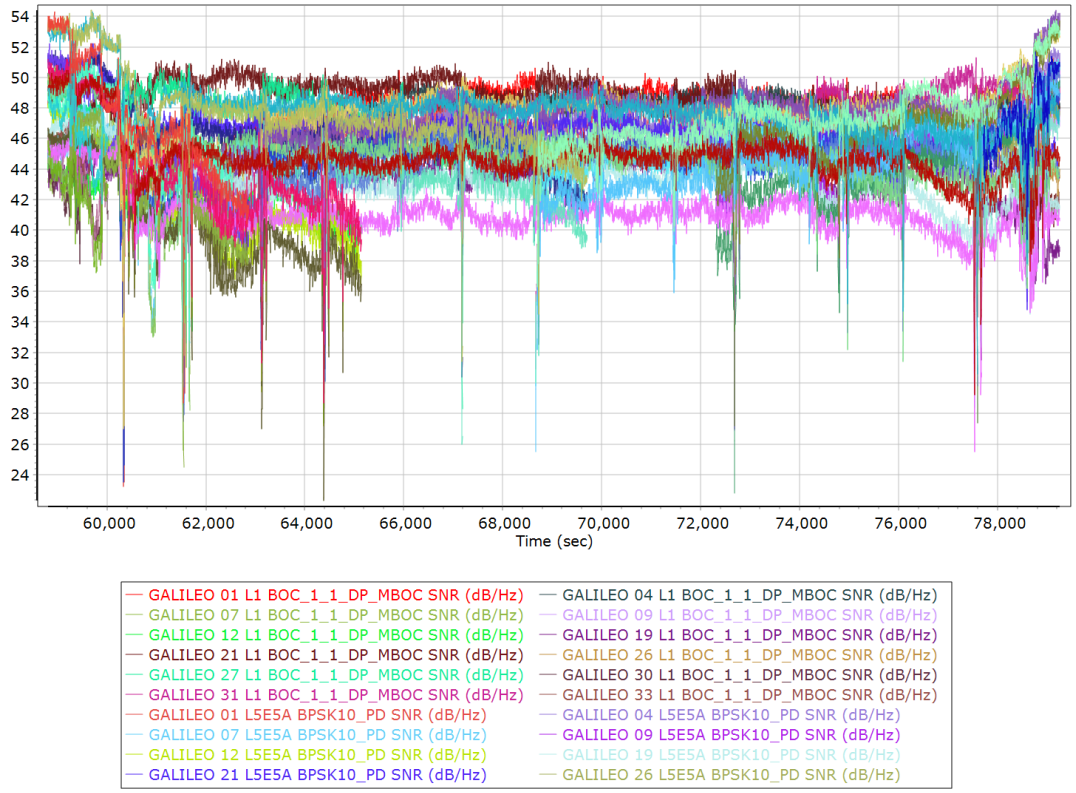
BEIDOU SNR



GALILEO Satellite Lock/Elevation

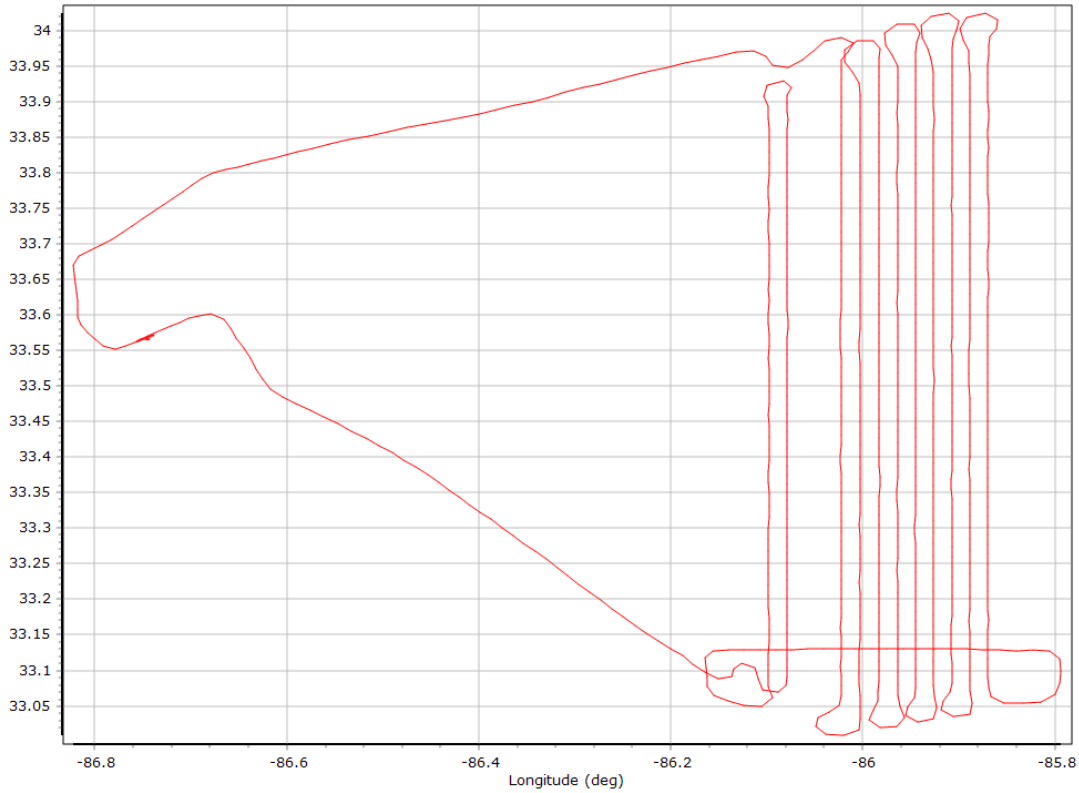


GALILEO SNR

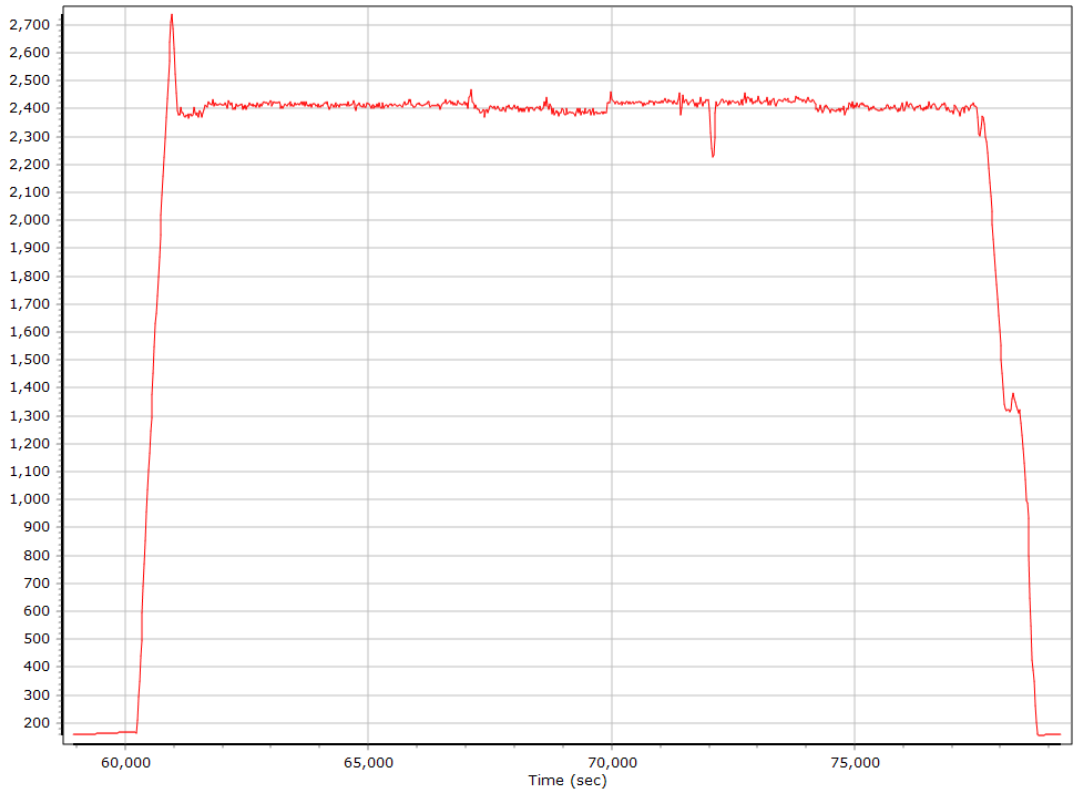

54
52
50
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46
44
42
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38
36
34
32
30
28
26
24
60,000
62,000
64,000
66,000
68,000
70,000
72,000
74,000
76,000
78,000
Time (sec)
GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 31 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 33 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 01 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 09 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 12 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 19 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 21 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

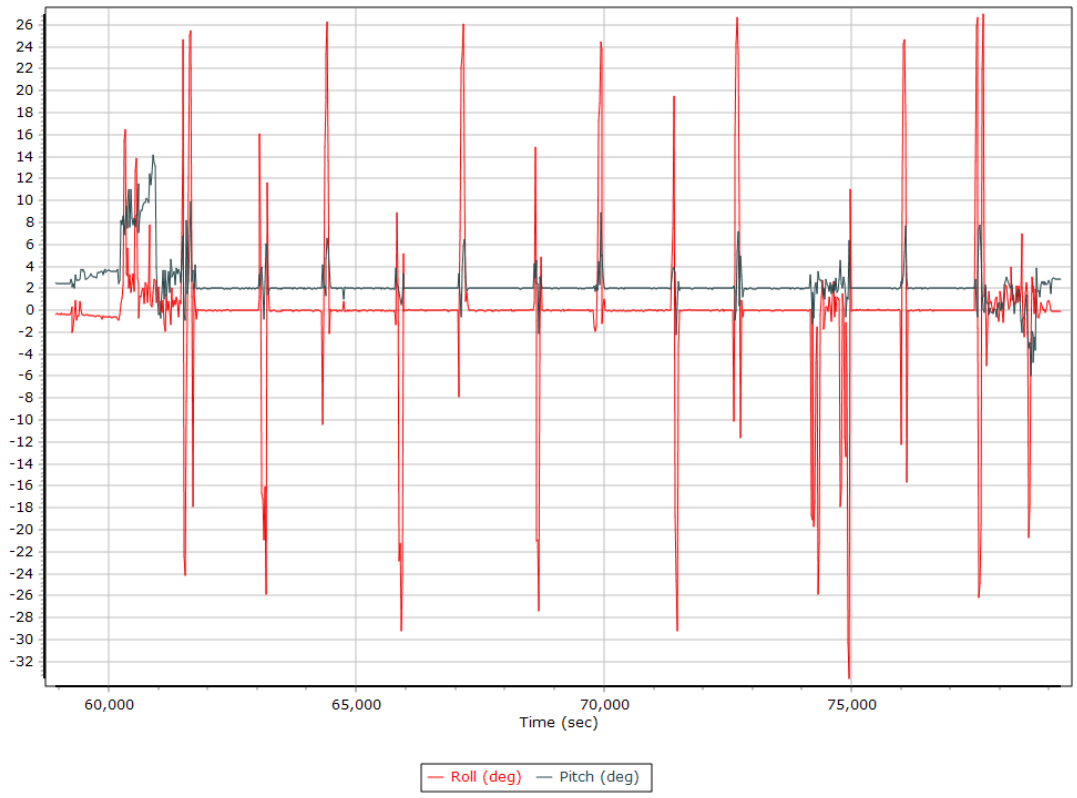
Top View



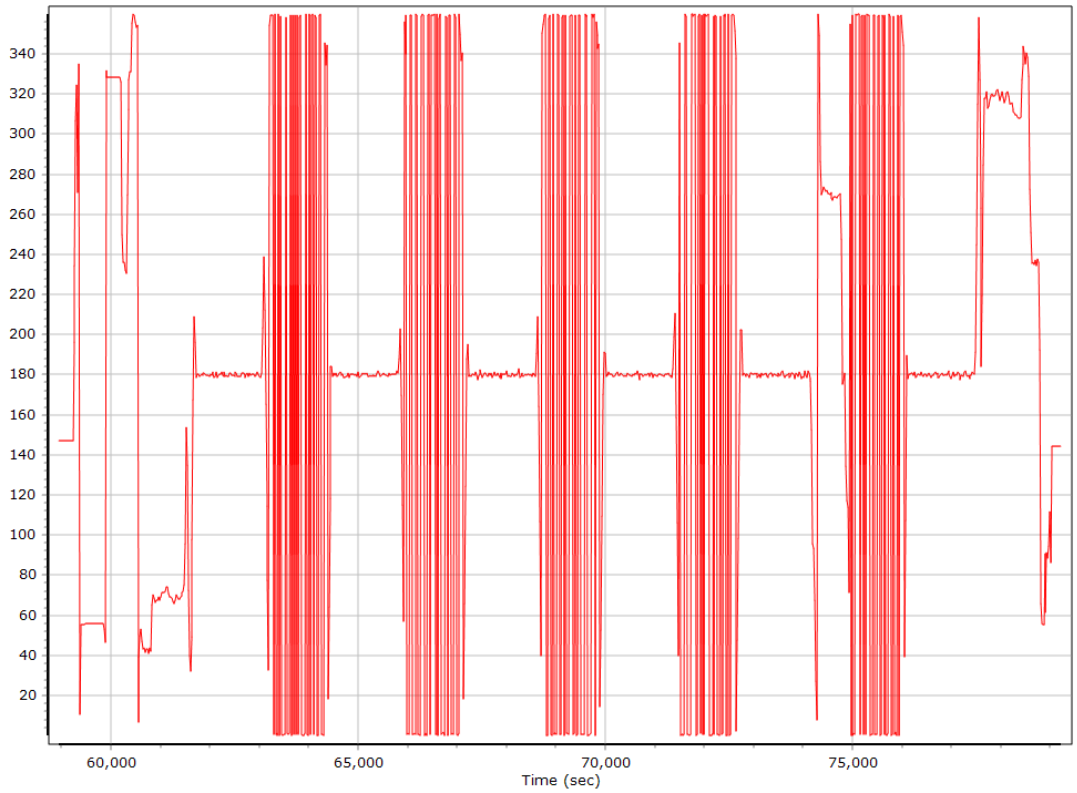
Altitude



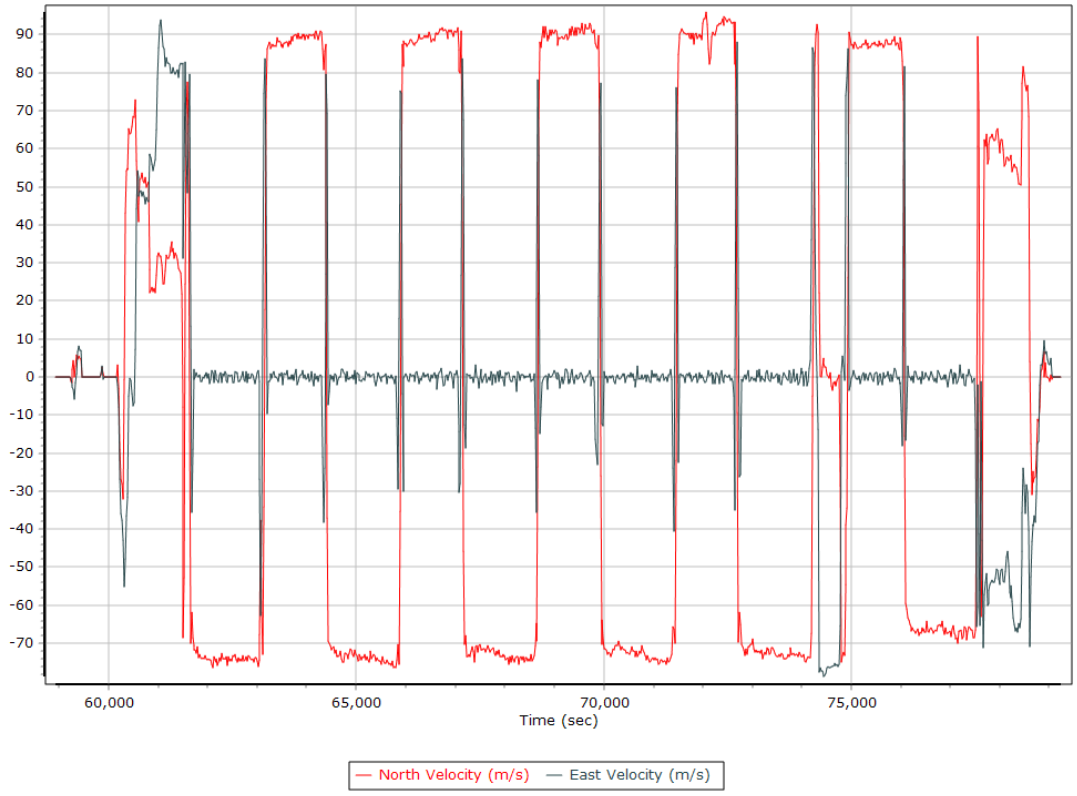
Roll/Pitch



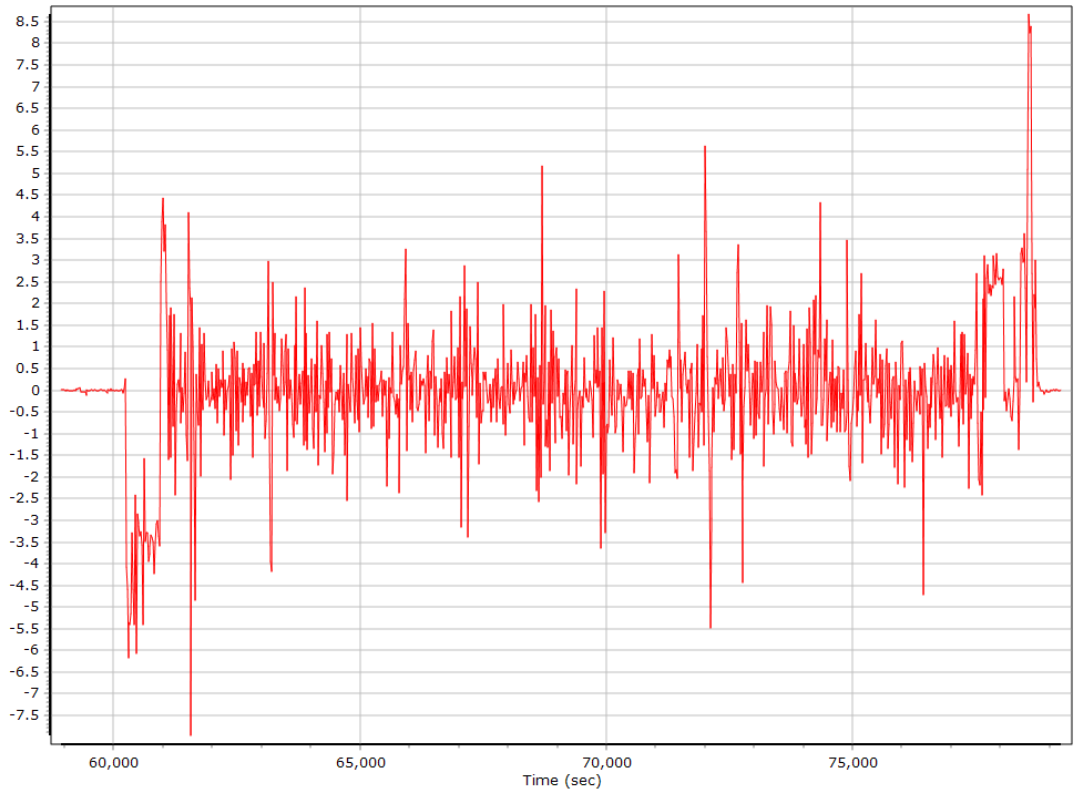
Heading



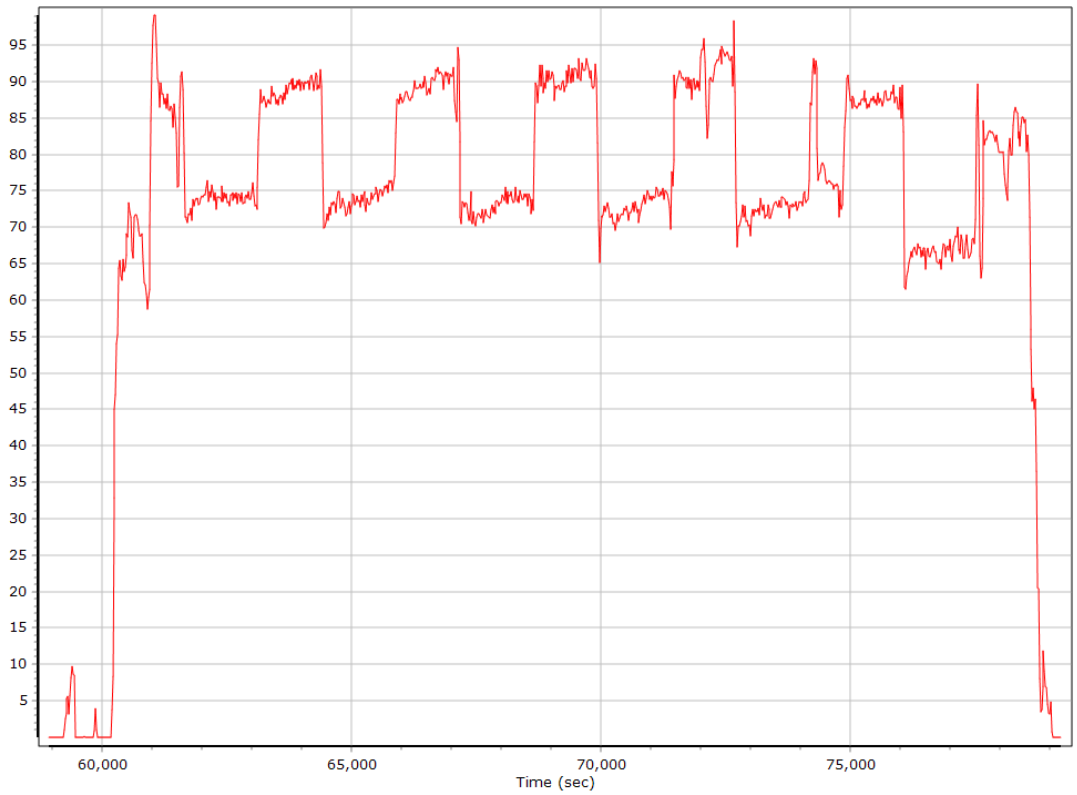
North/East Velocity



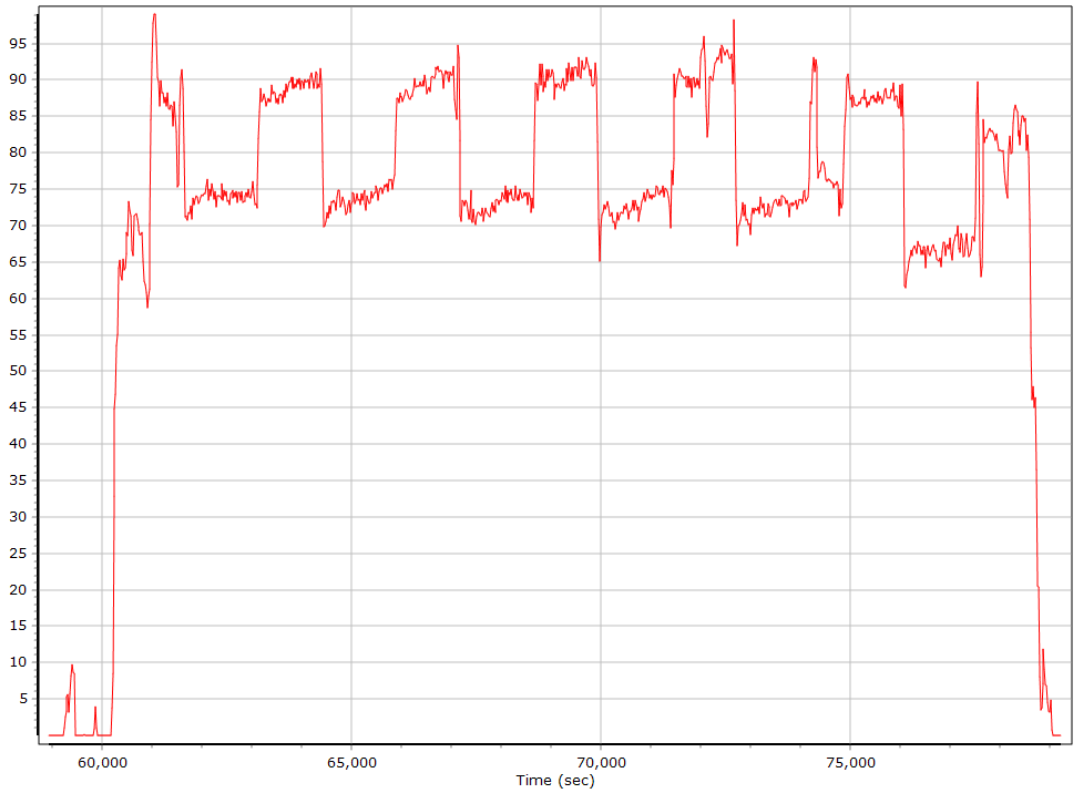
Down Velocity



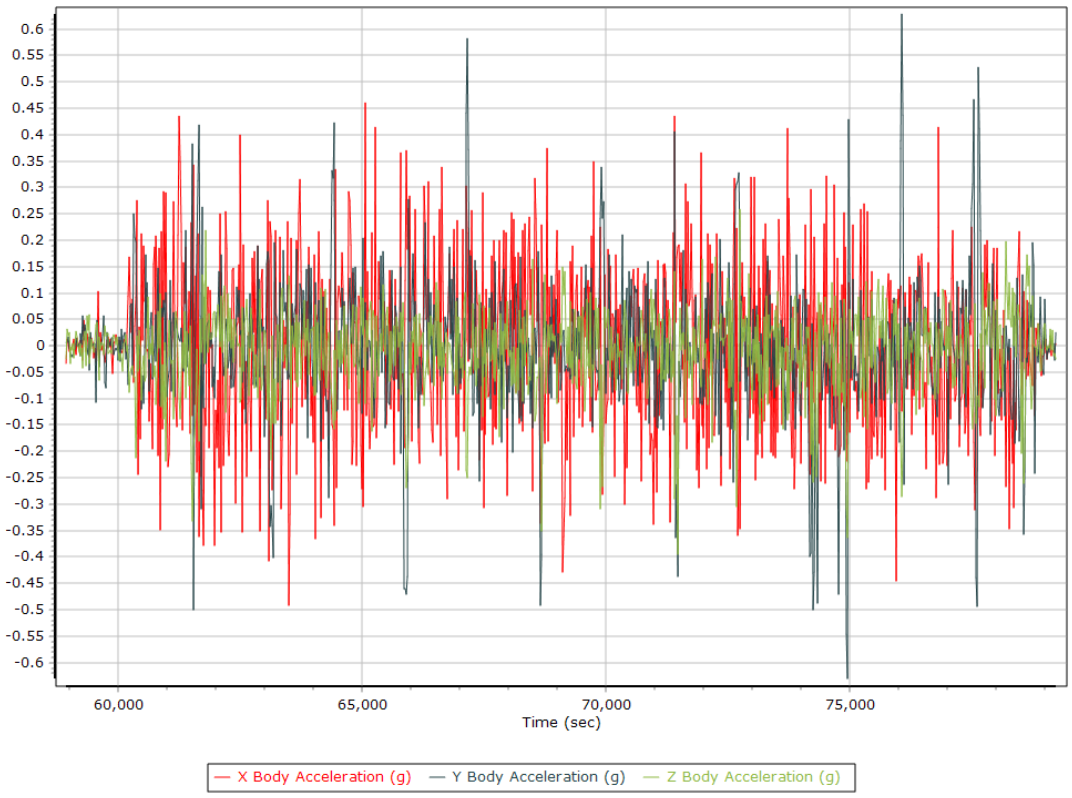
Total Speed



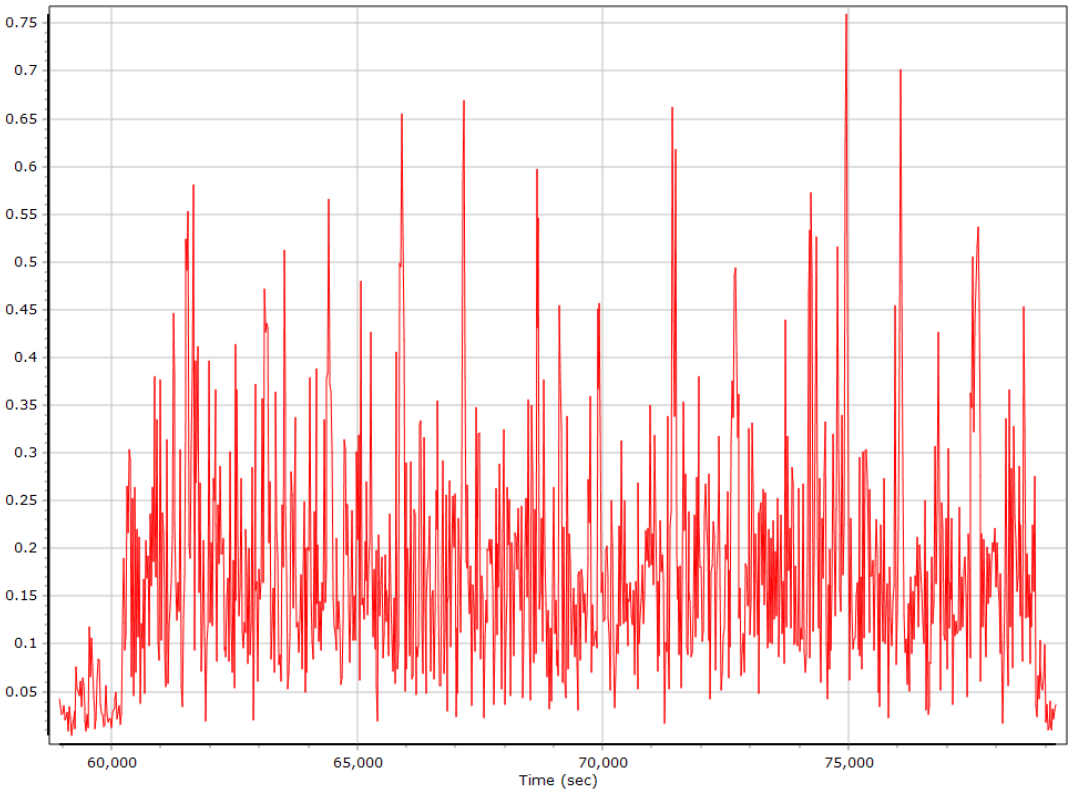
Ground Speed



Body Acceleration



Total Body Acceleration

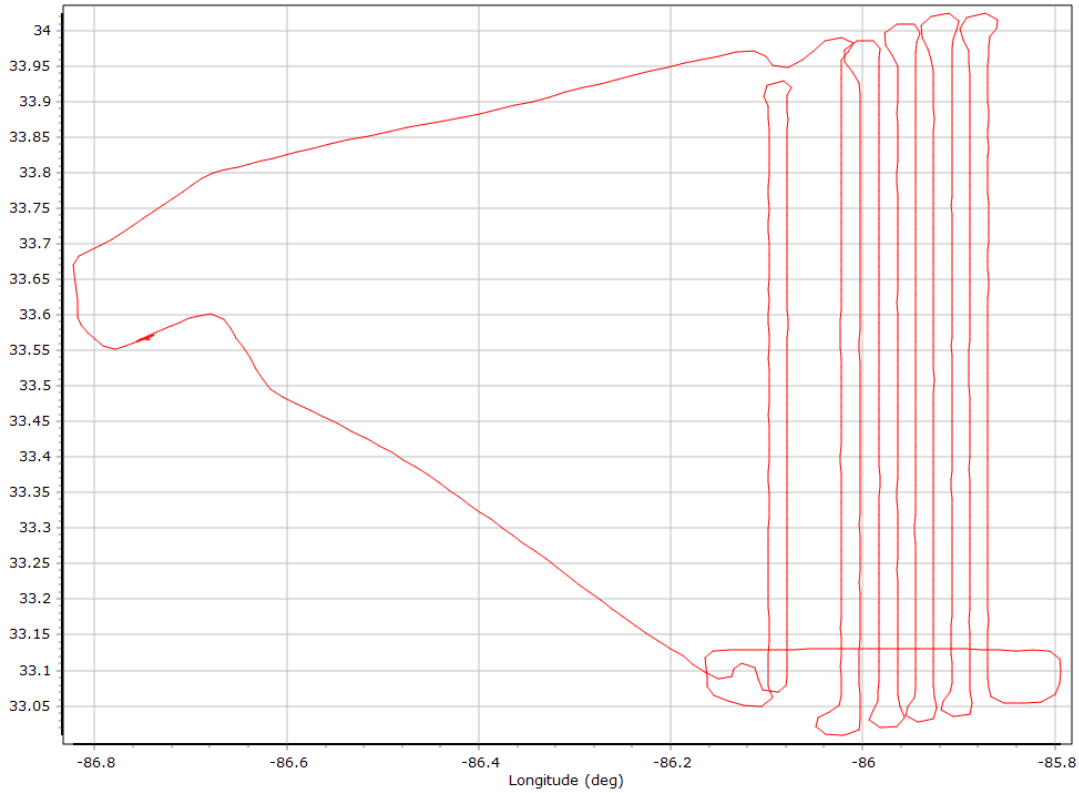


Body Angular Rate

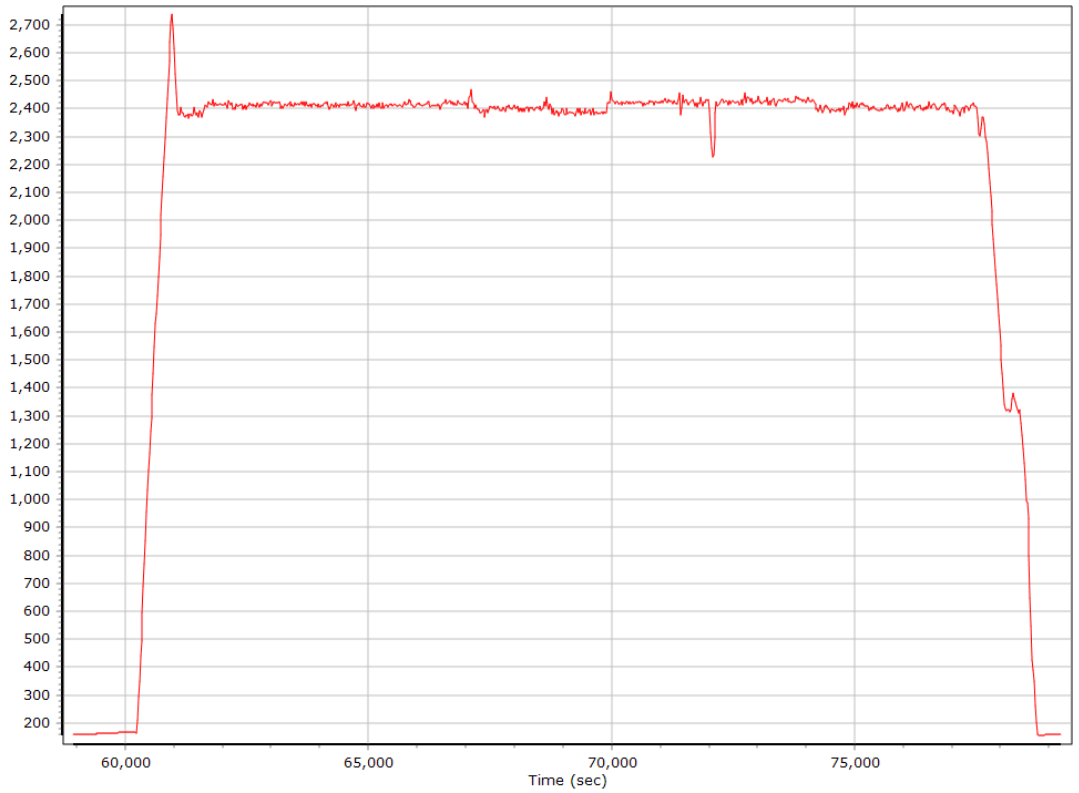


Forward Processed Trajectory Information

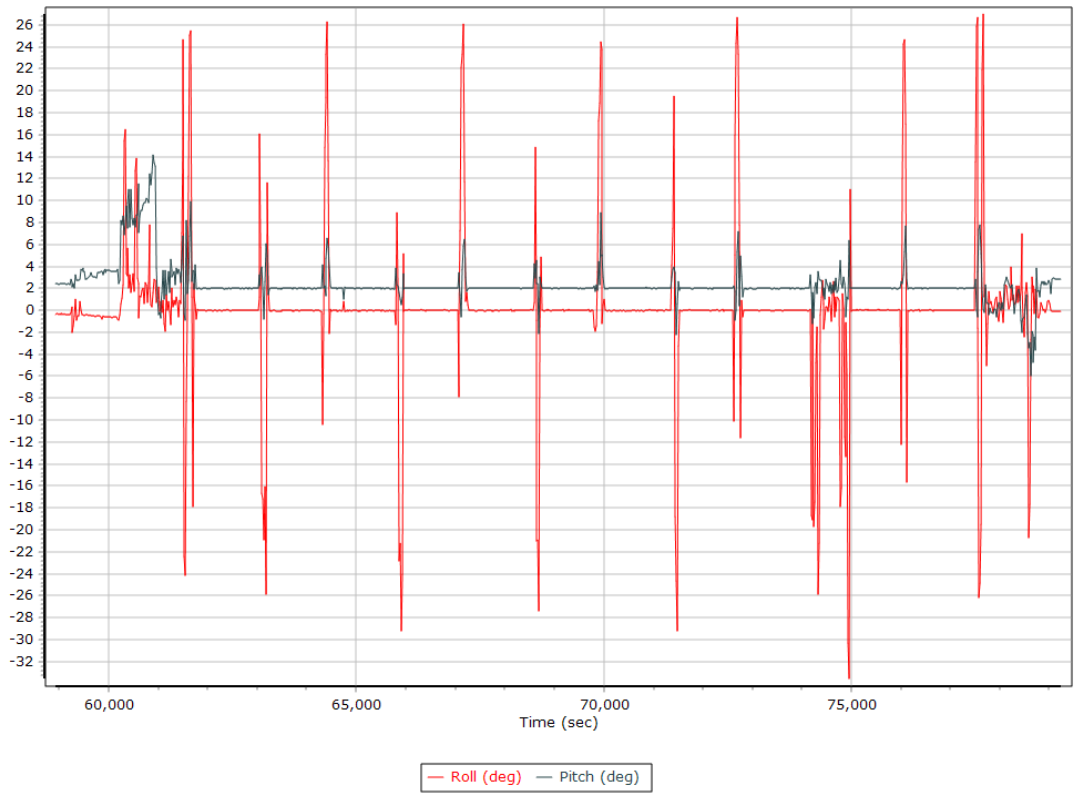
Top View



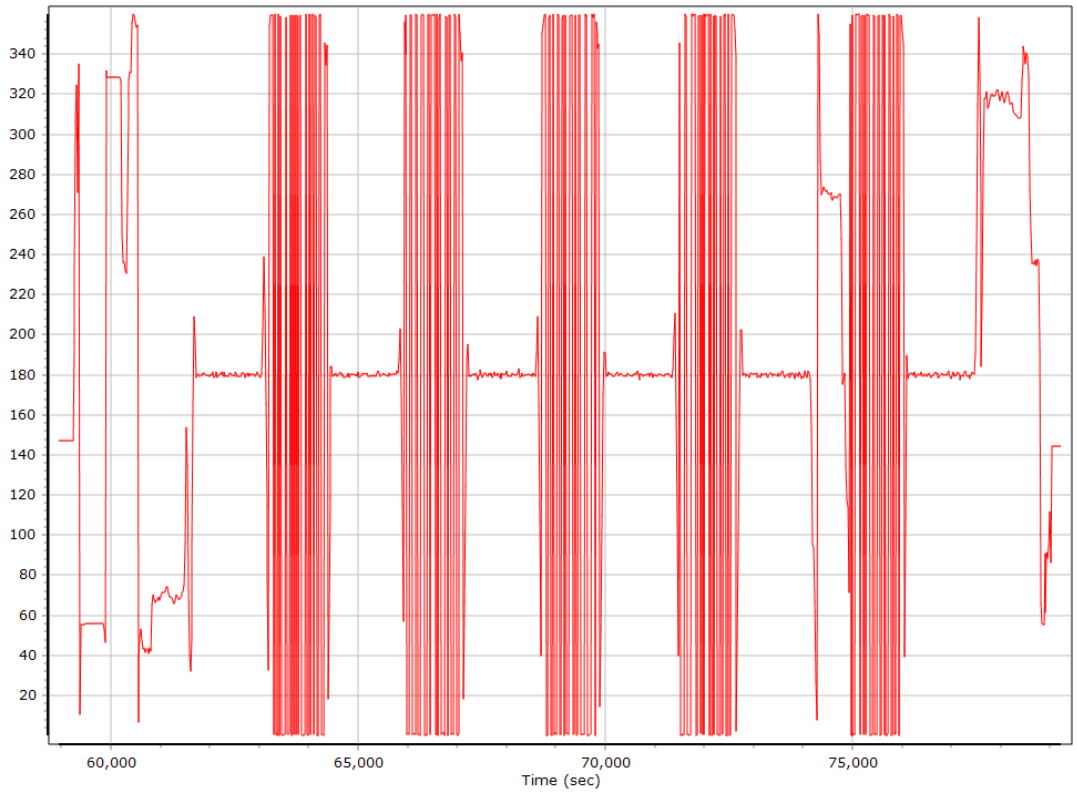
Altitude



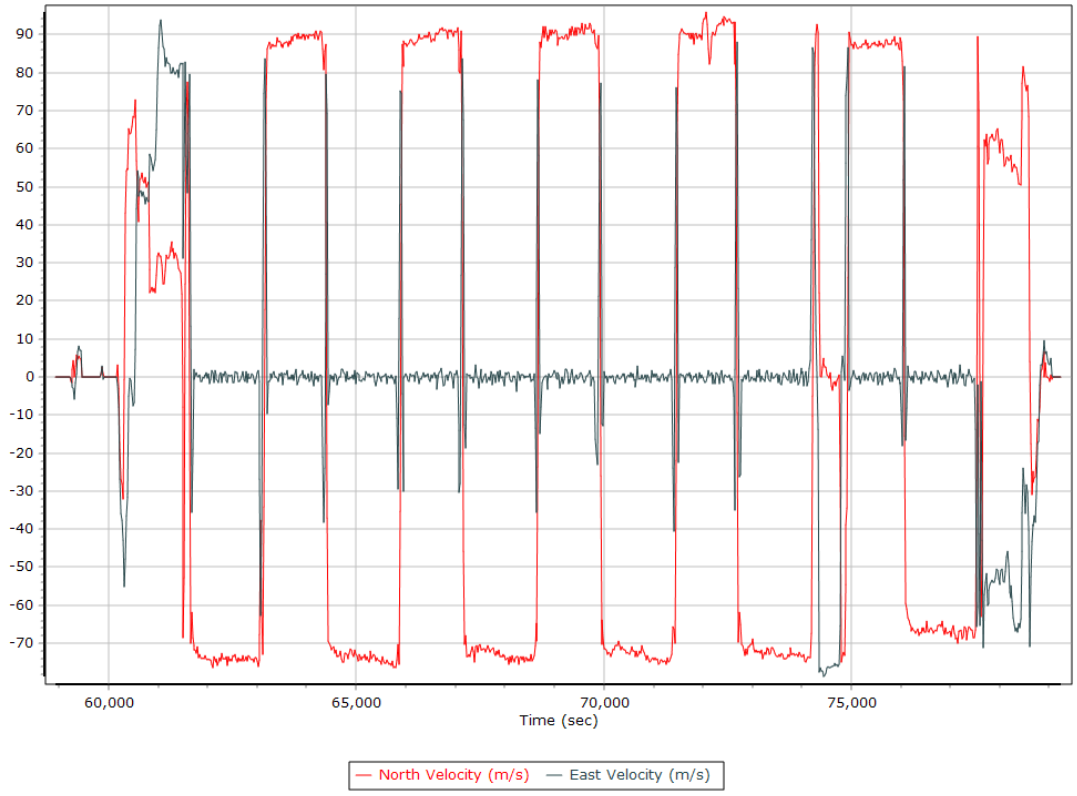
Roll/Pitch



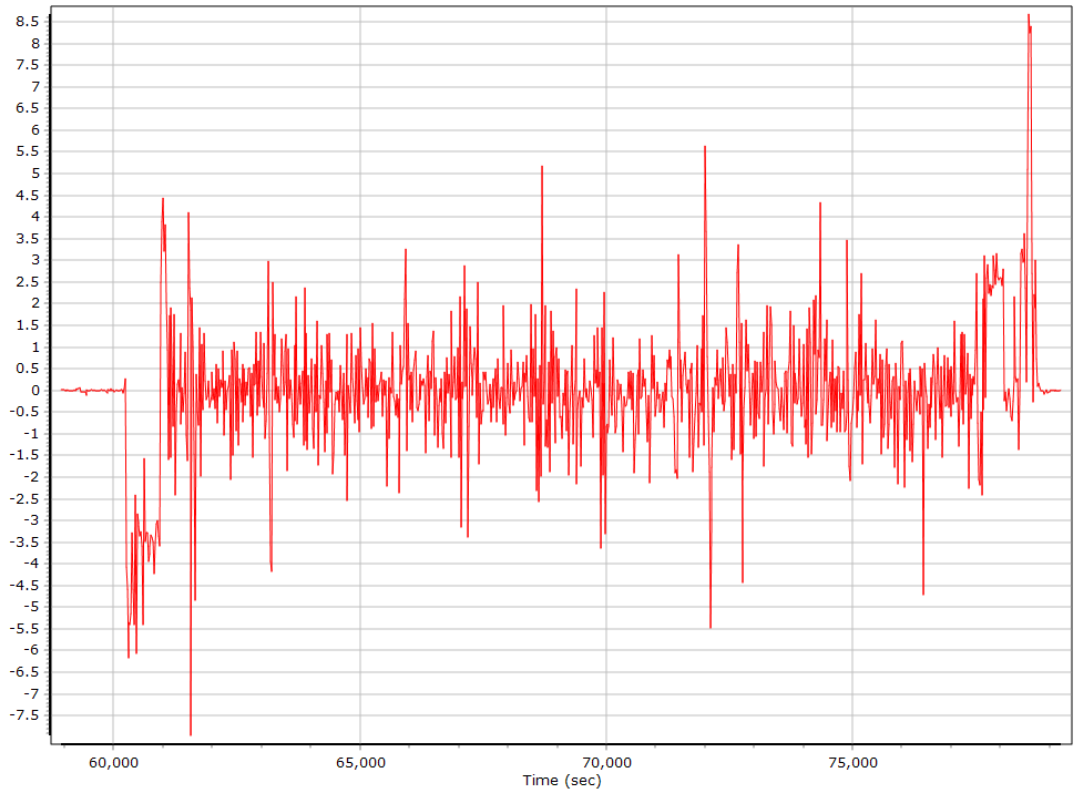
Heading



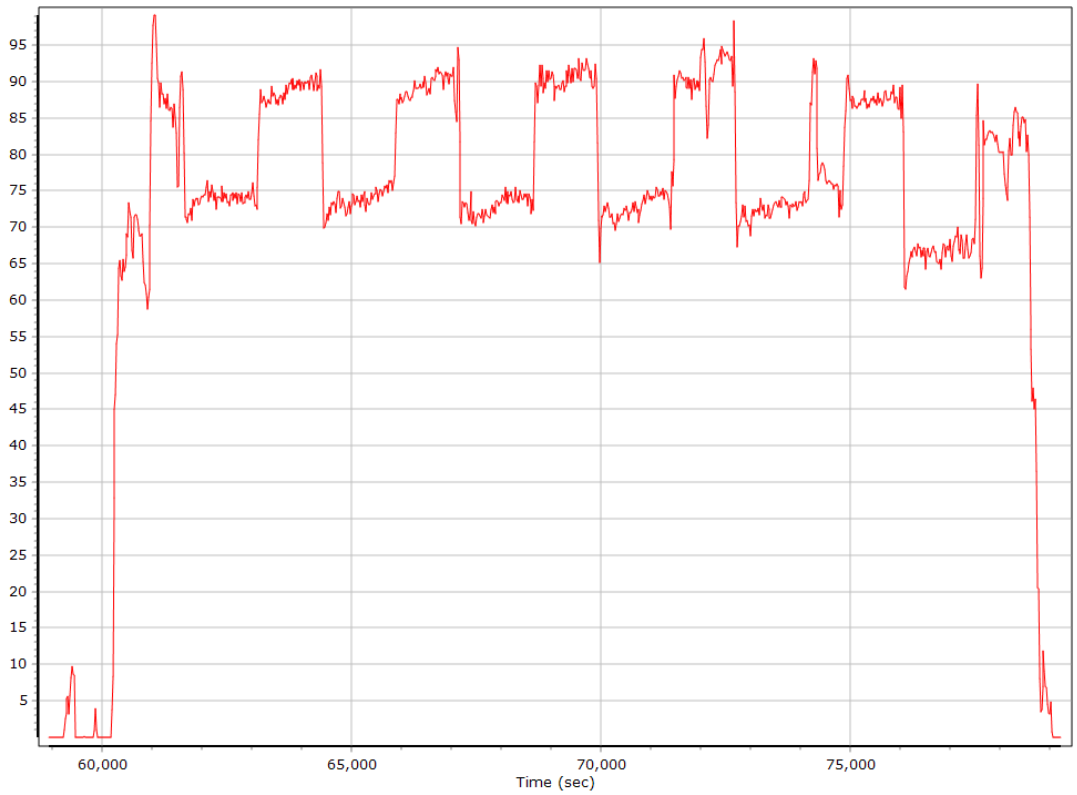
North/East Velocity



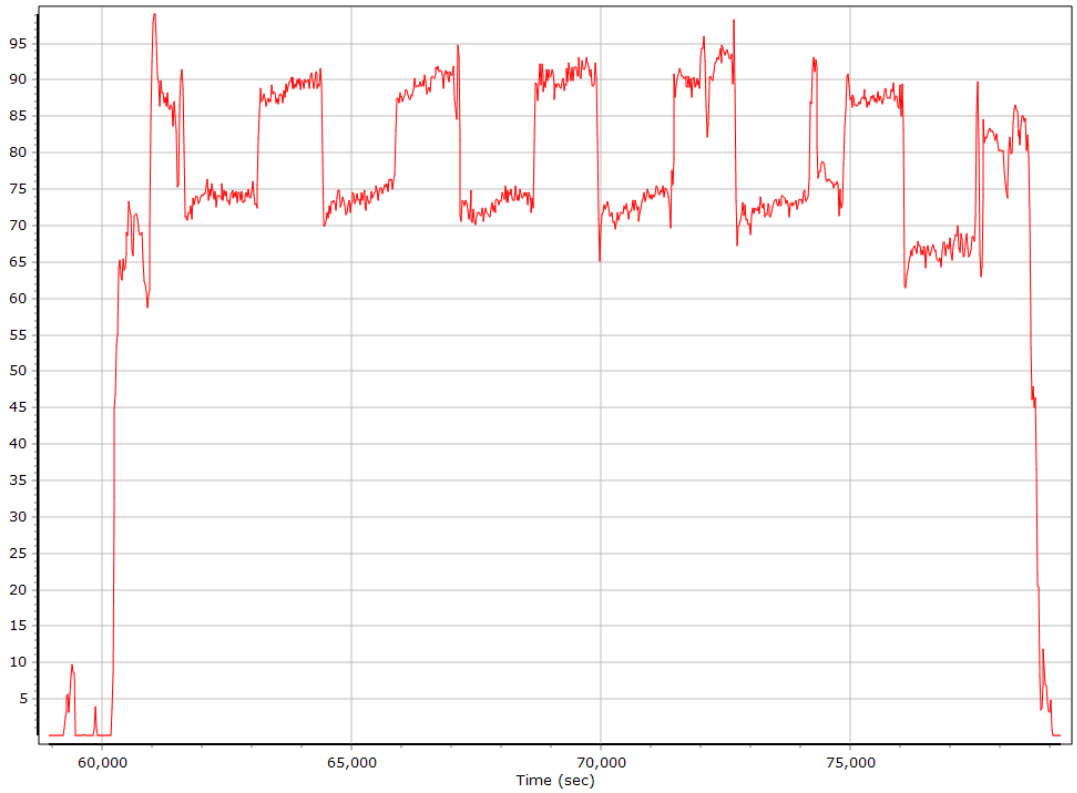
Down Velocity



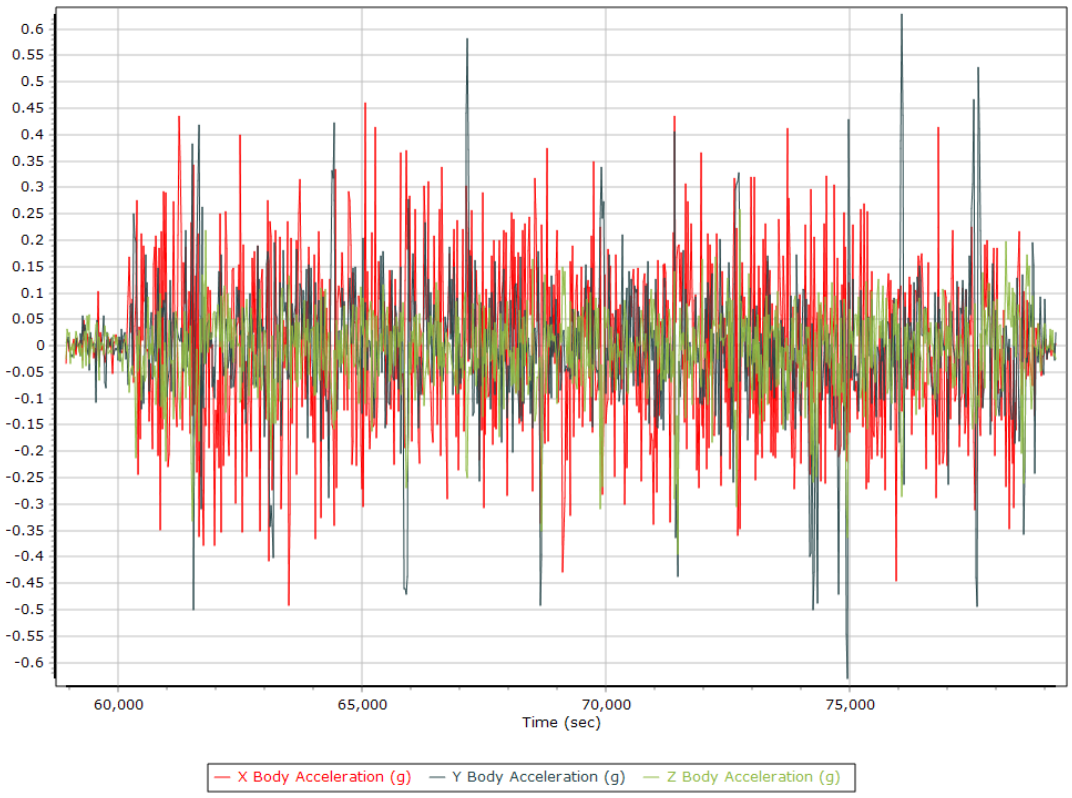
Total Speed



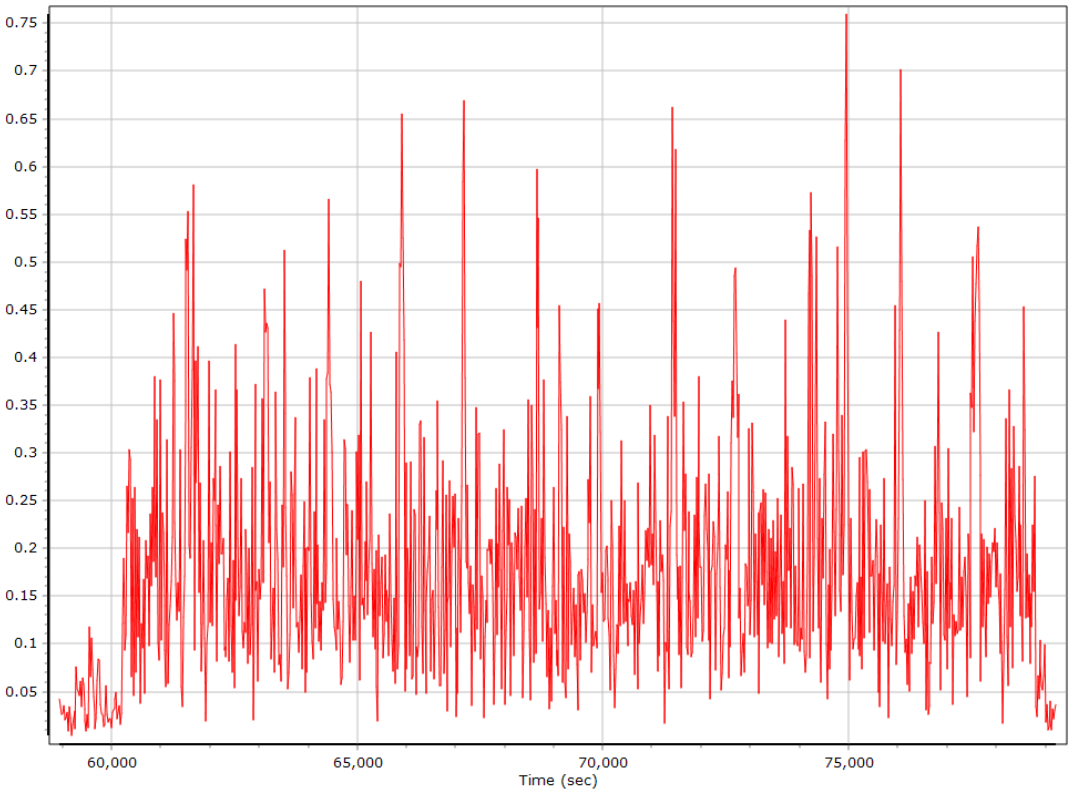
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

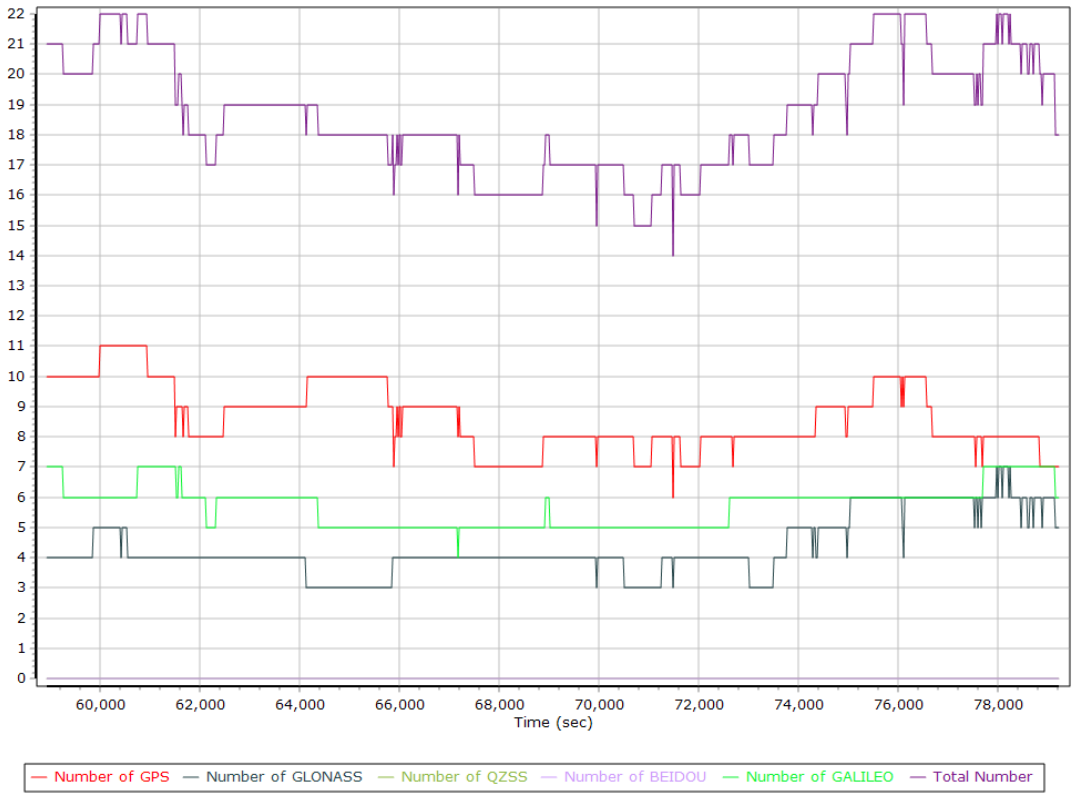


GNSS QC

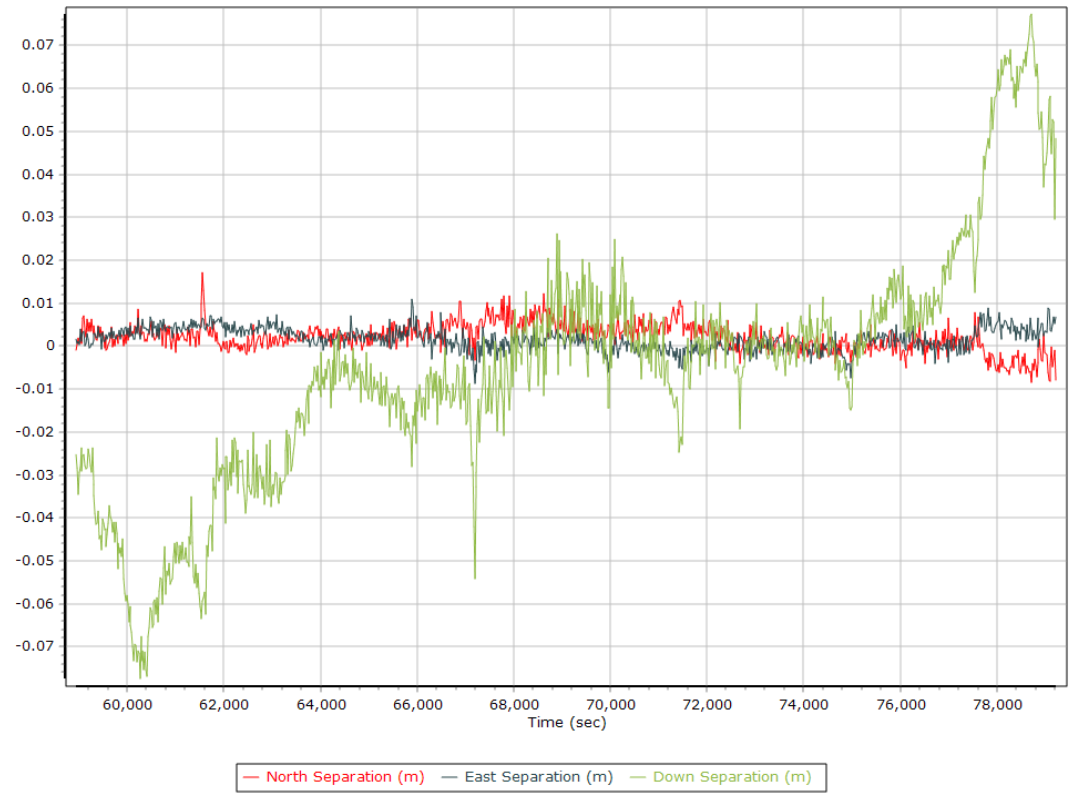
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	6	11	9
Number of GLONASS SV	2	7	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	4	7	6
Total number of SV	14	22	19
PDOP	1.03	1.68	1.25
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	20418.00	0.00	0.00
Percentage	100.00	0.00	0.00

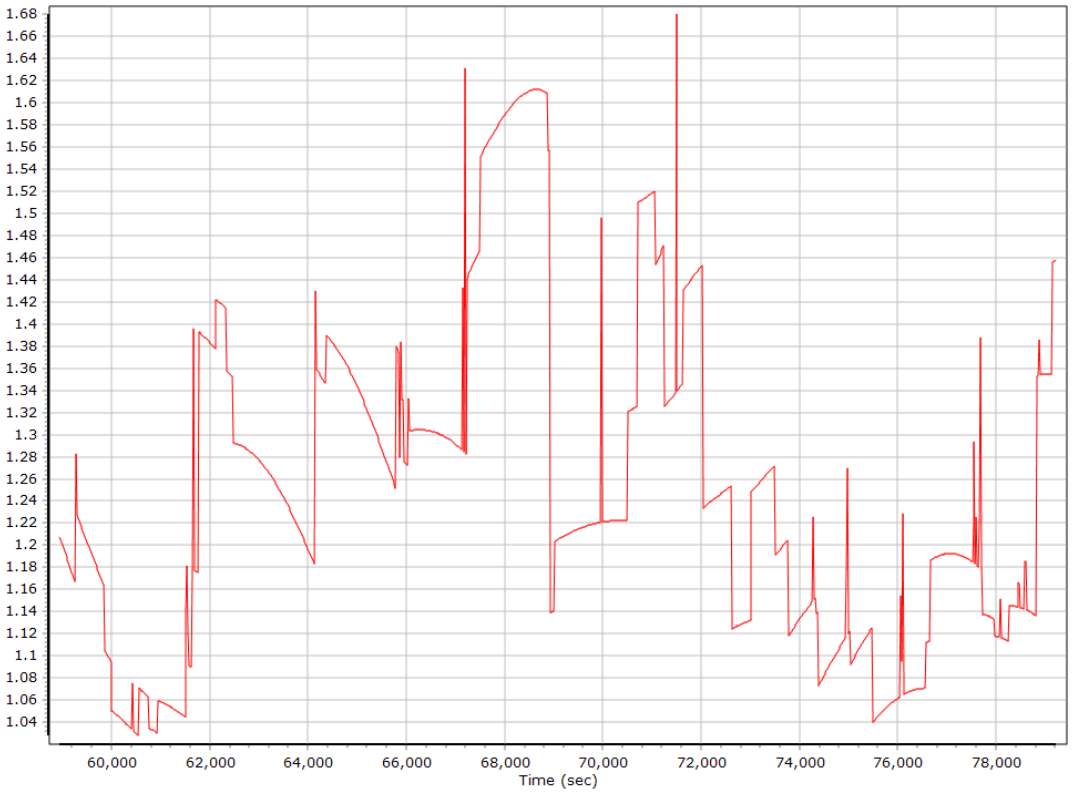
Num SVs in solution



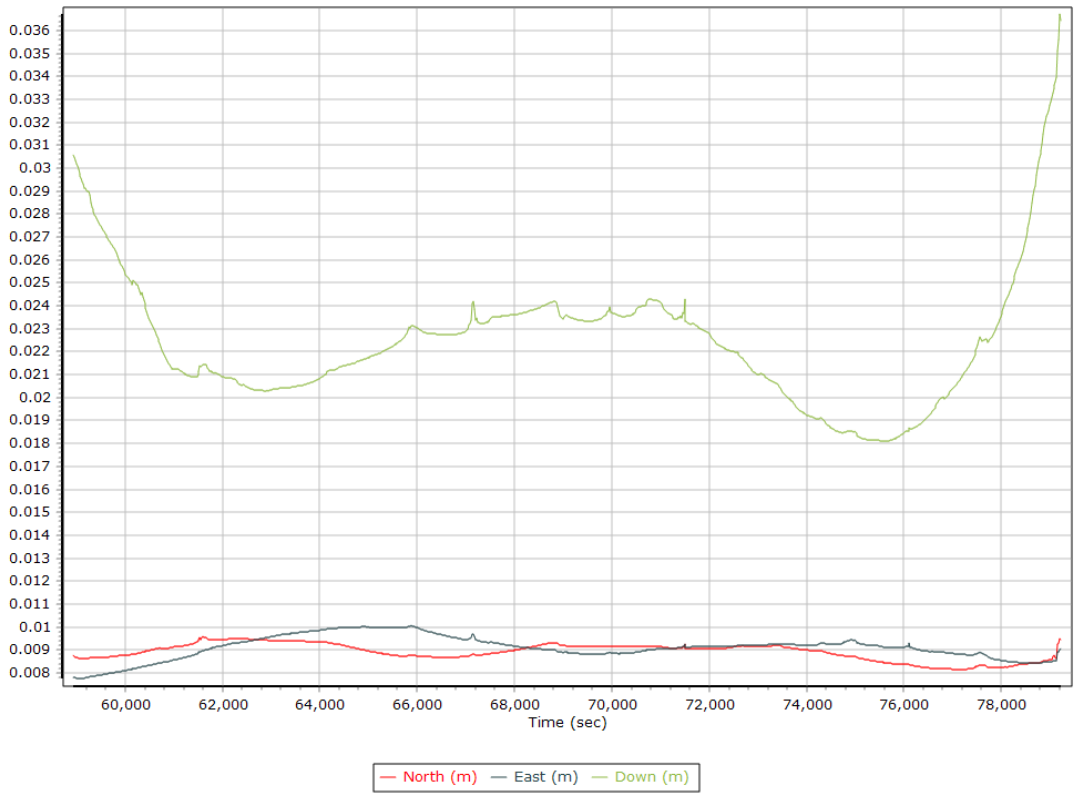
Forward/Reverse Separation



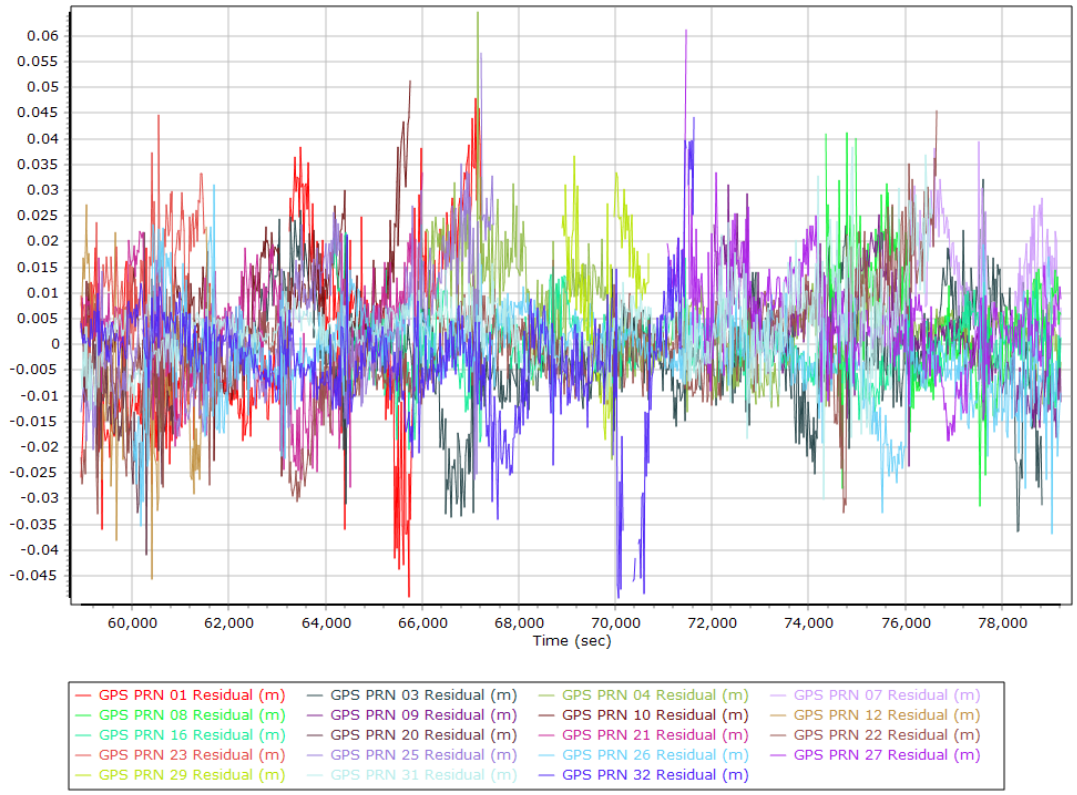
PDOP



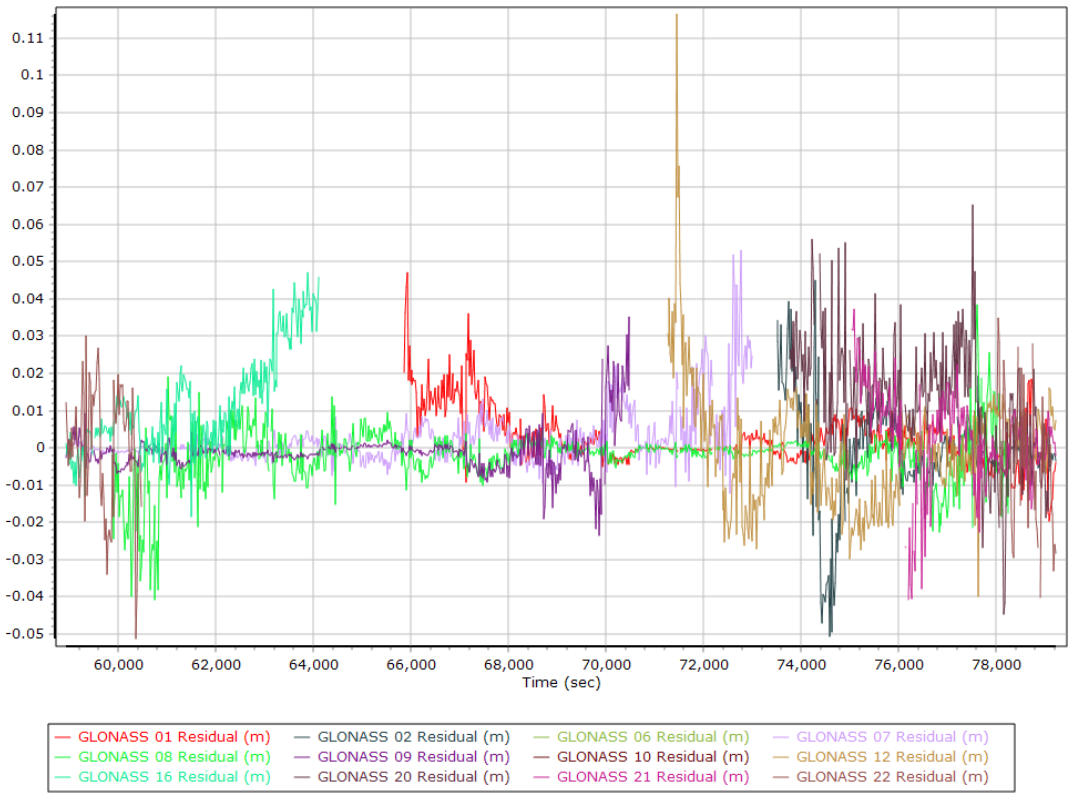
Estimated Position Accuracy



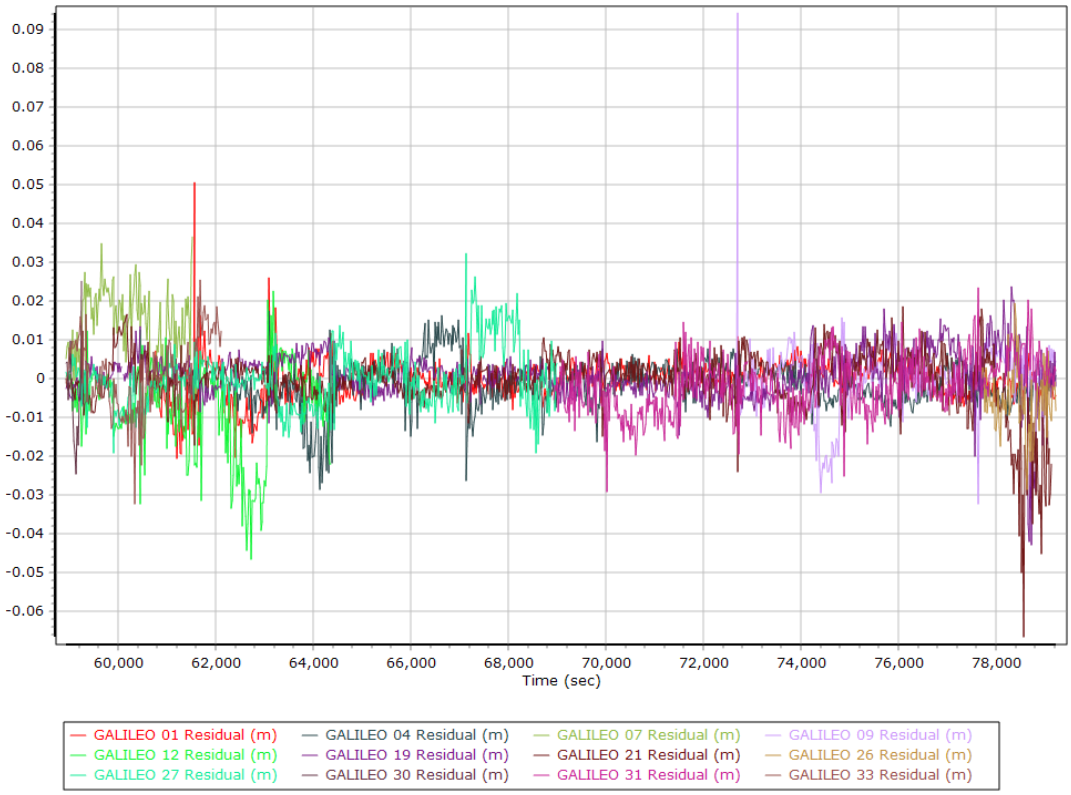
GPS Residuals



GLONASS Residuals



GALILEO Residuals



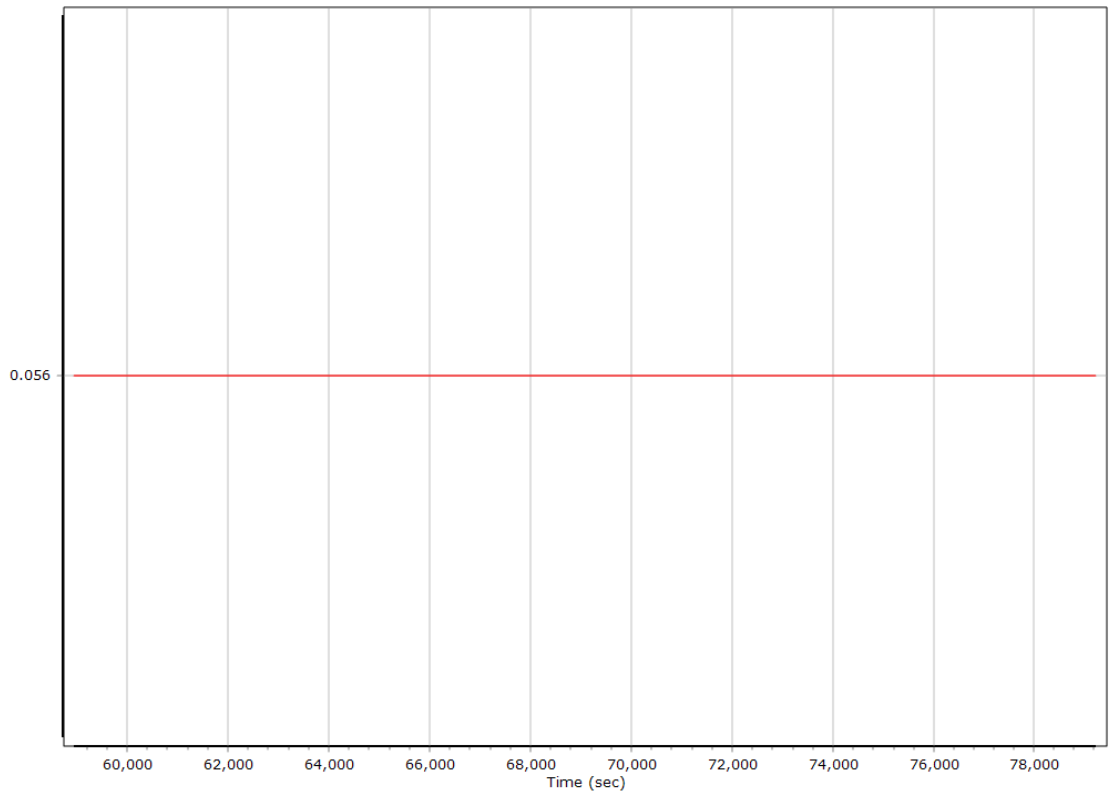
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	58793.000 (12/27/2020 4:19:53 PM)		
Processing end time	79239.000 (12/27/2020 10:00:39 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

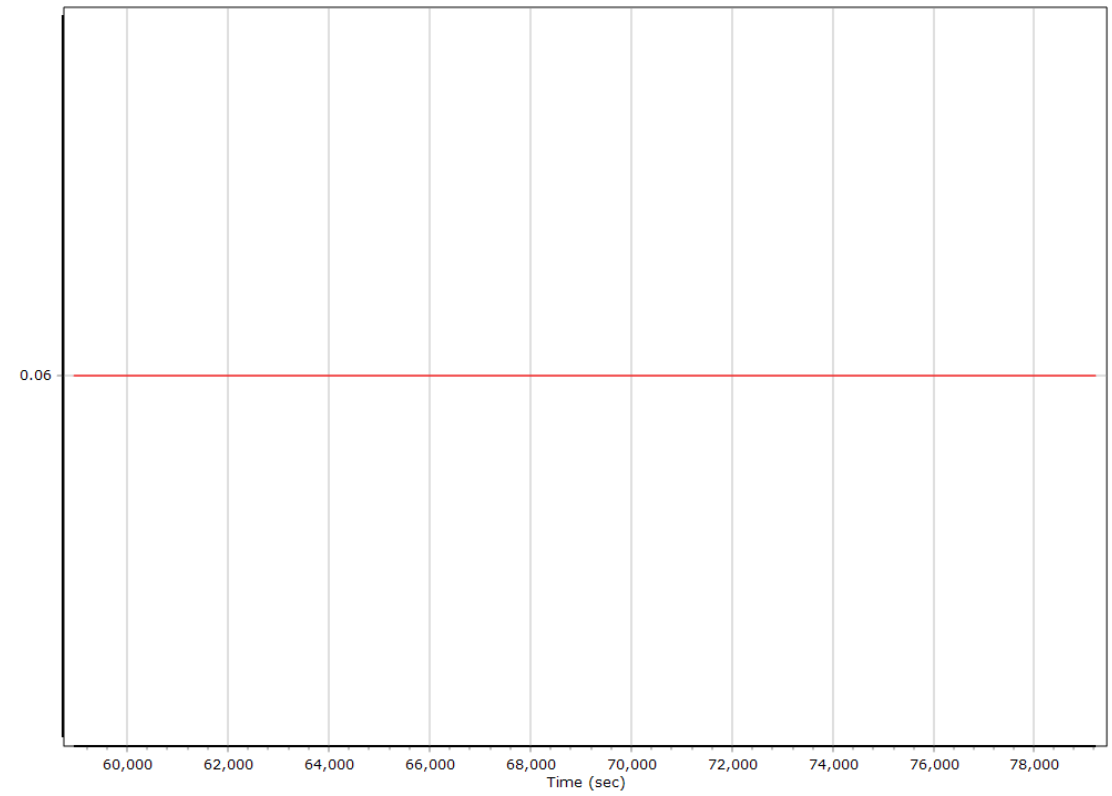
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

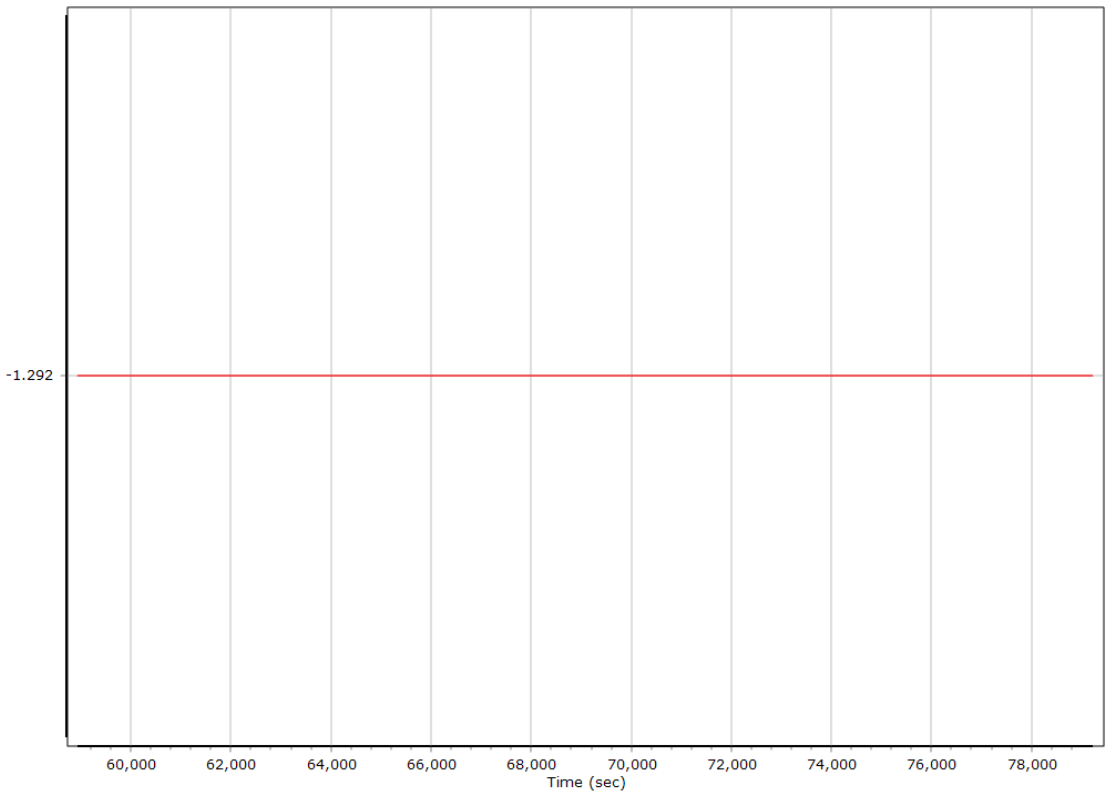
X Reference-Primary GNSS Lever Arm (m)



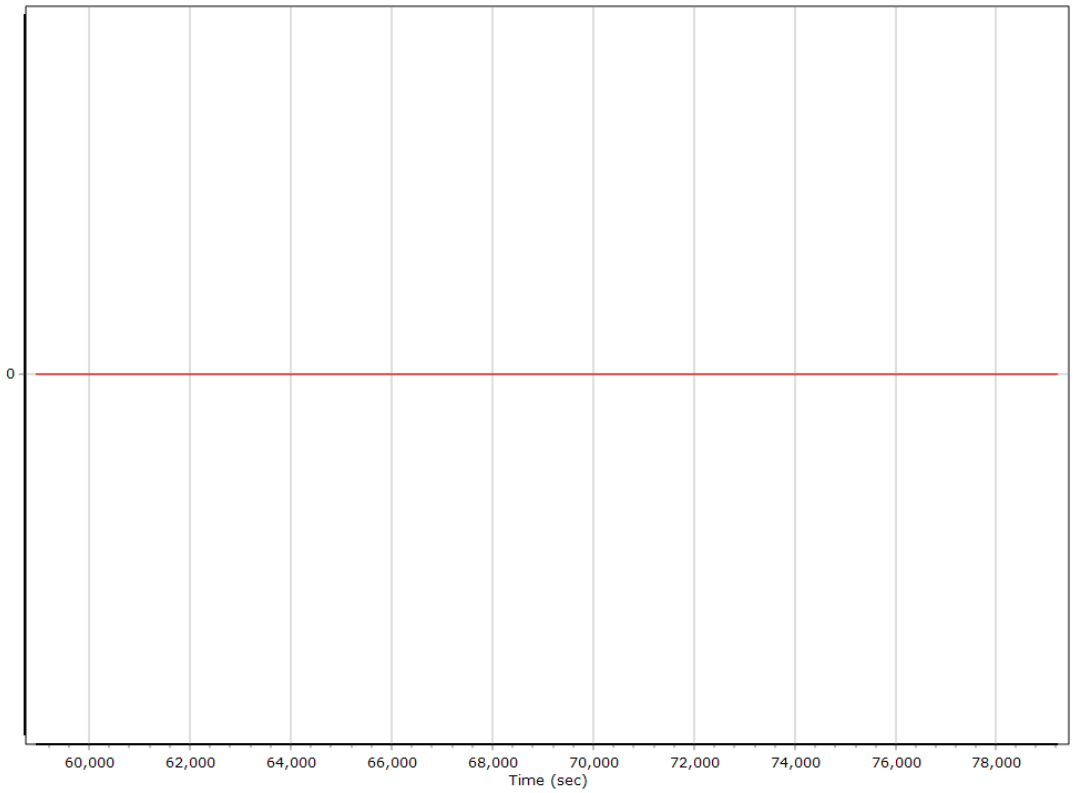
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



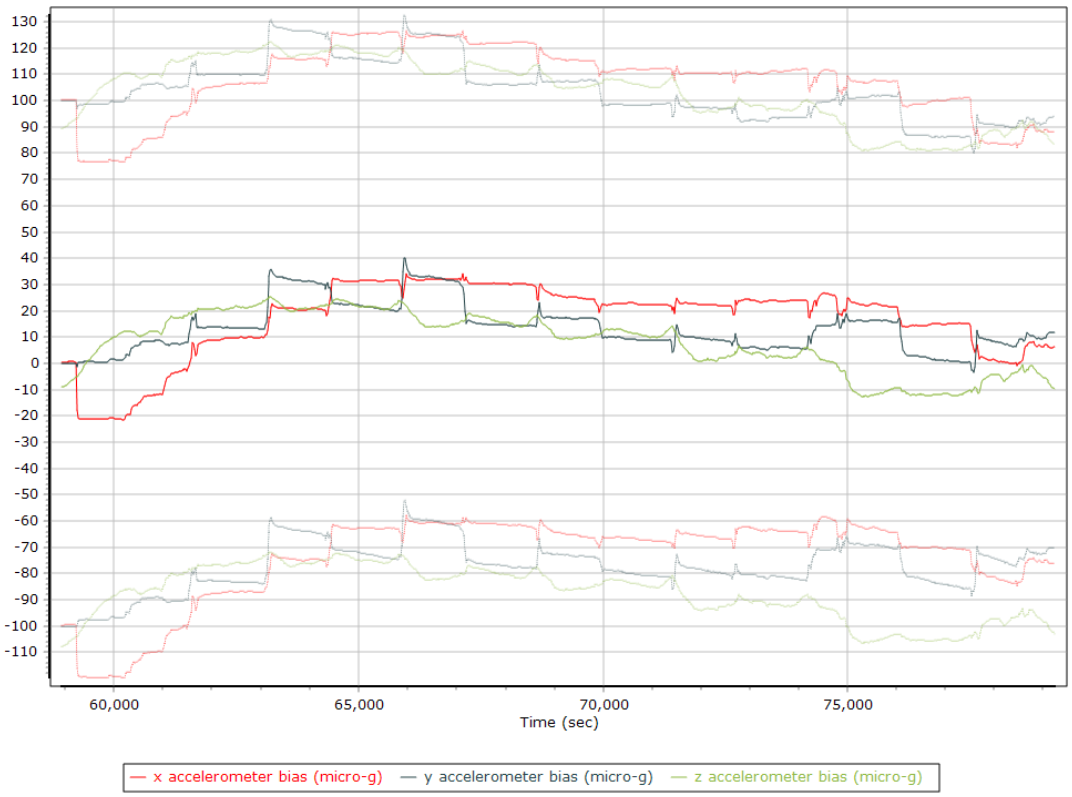
Reference-Primary GNSS Lever Arm Figure of Merit



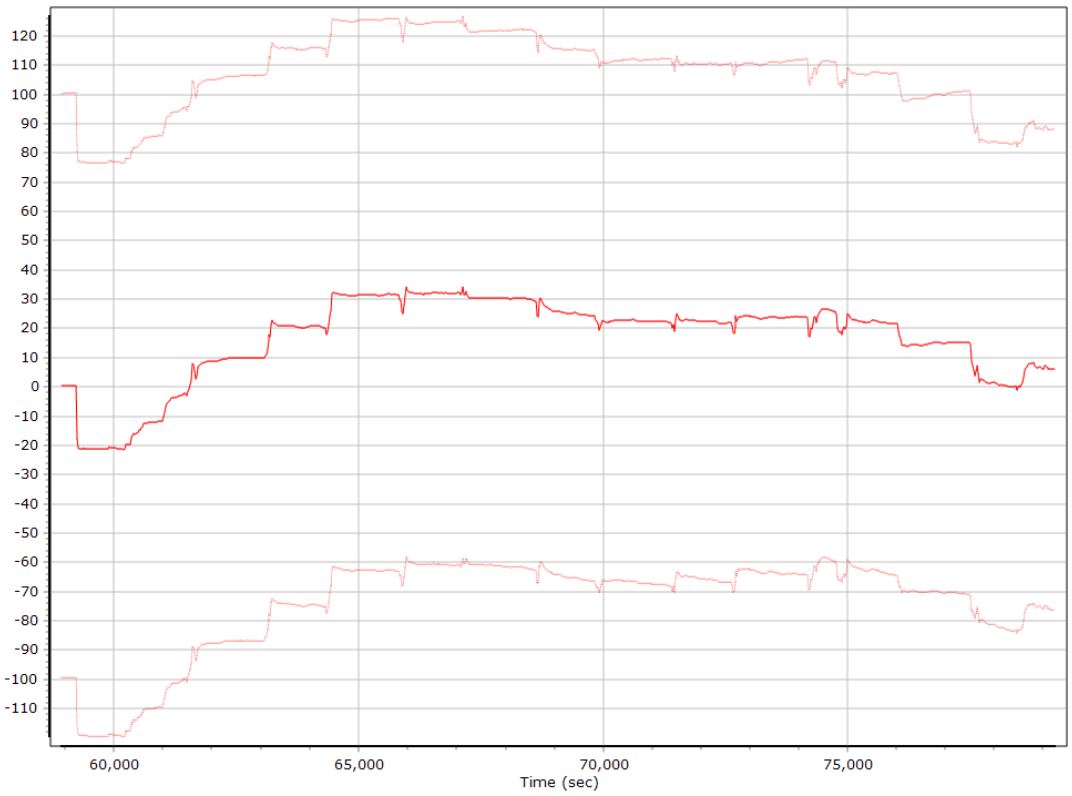
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

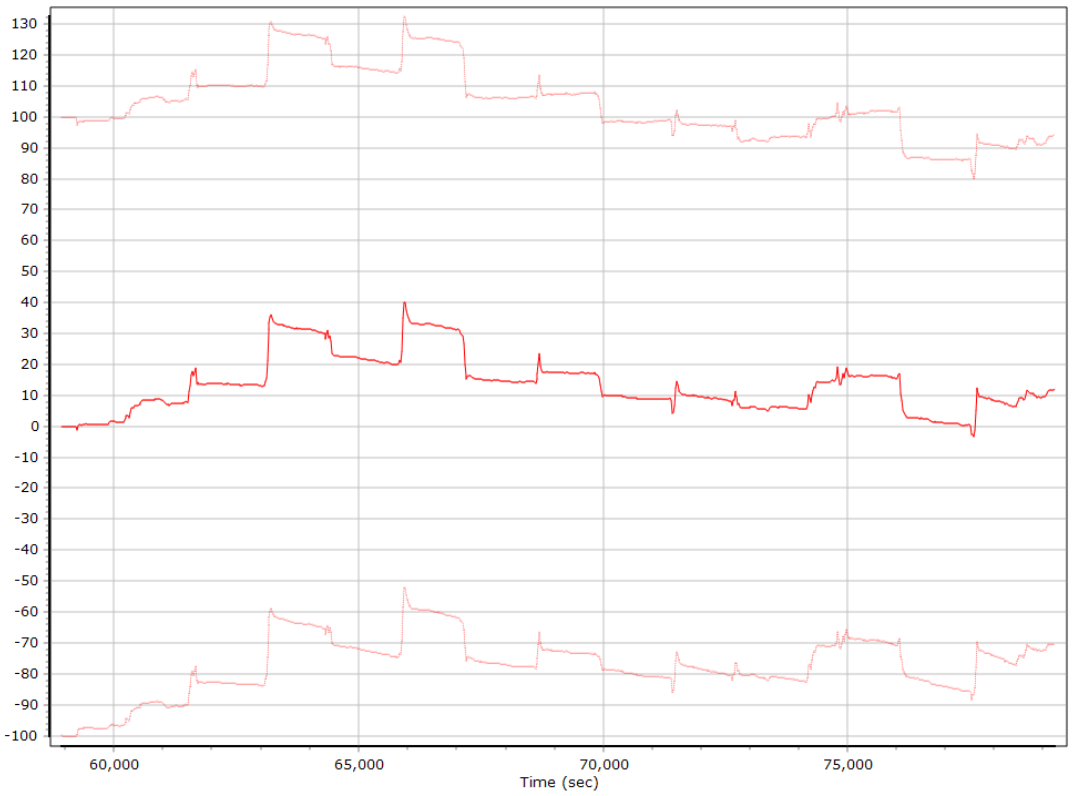
Accelerometer Bias (micro-g)



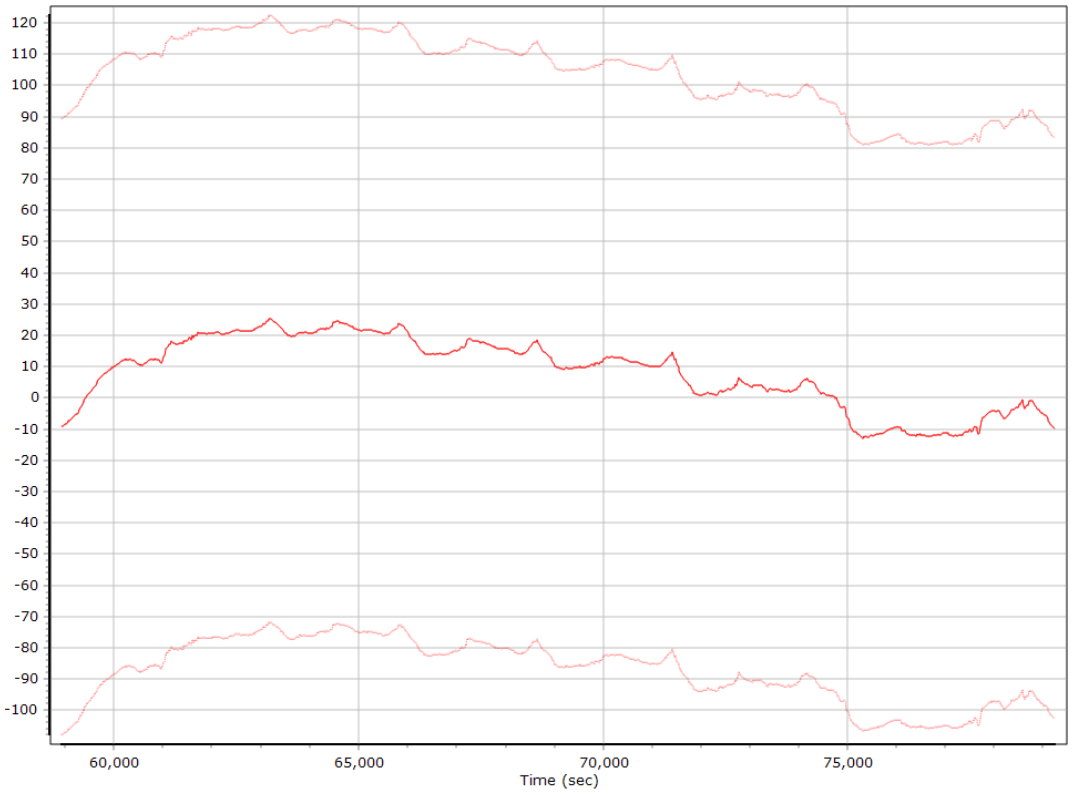
X Accelerometer Bias (micro-g)



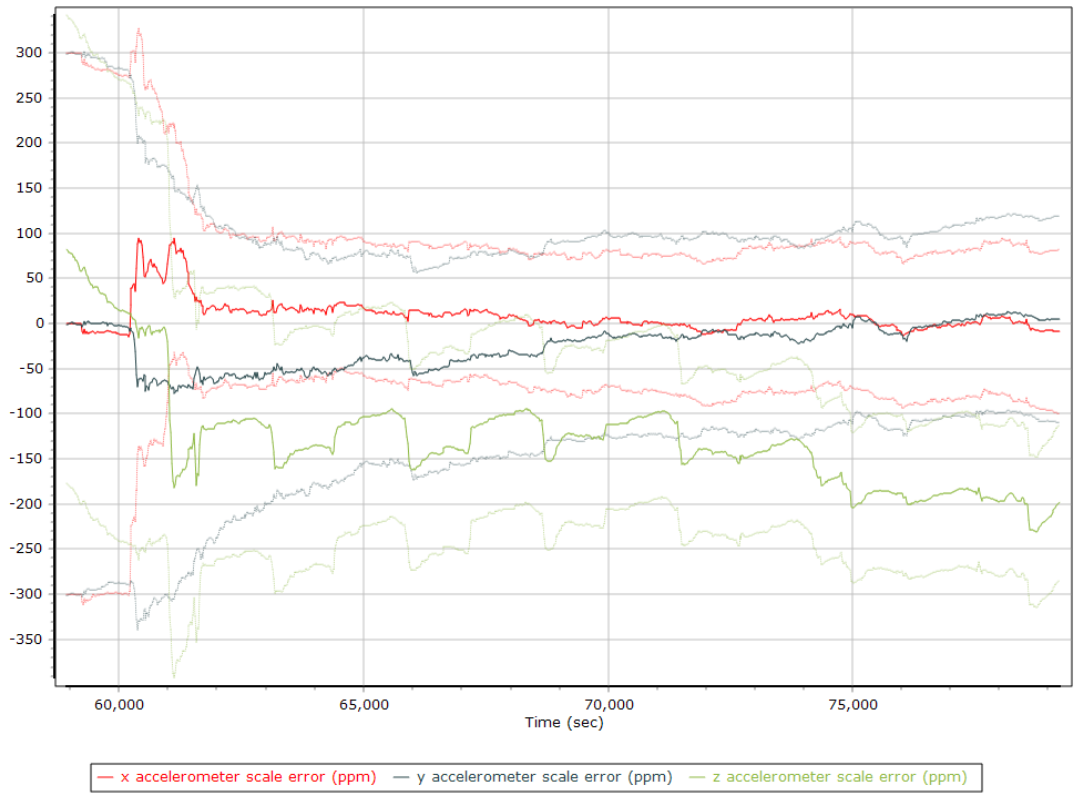
Y Accelerometer Bias (micro-g)



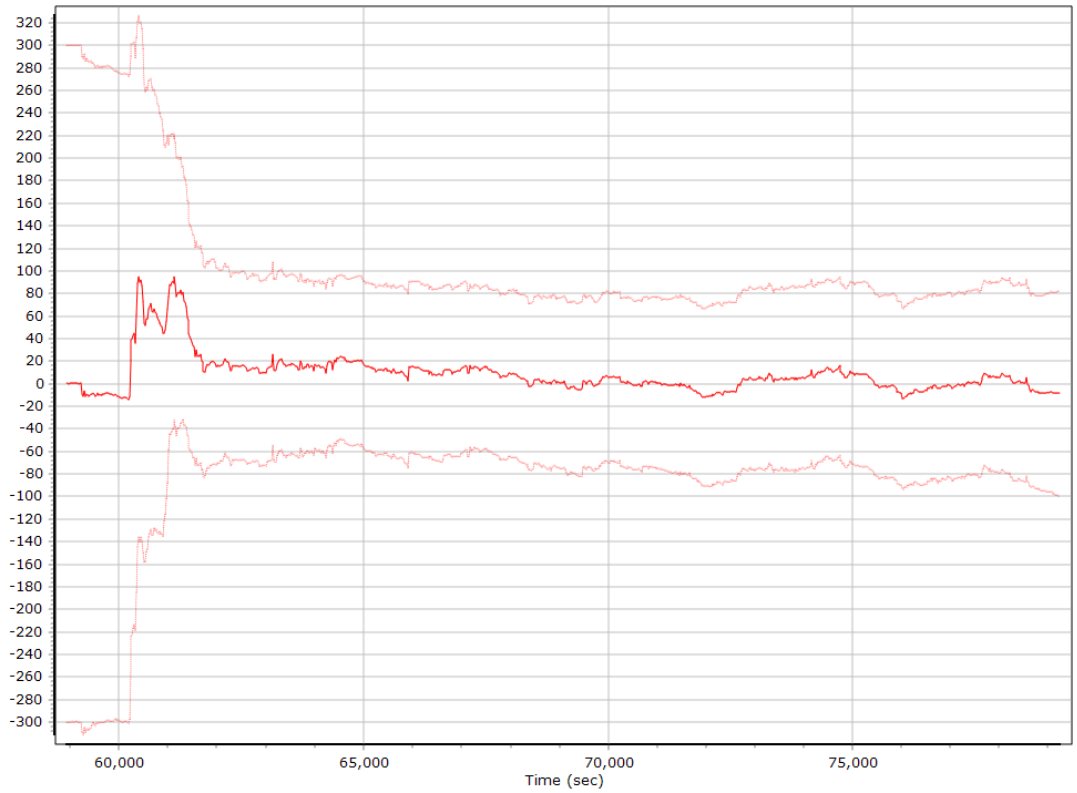
Z Accelerometer Bias (micro-g)



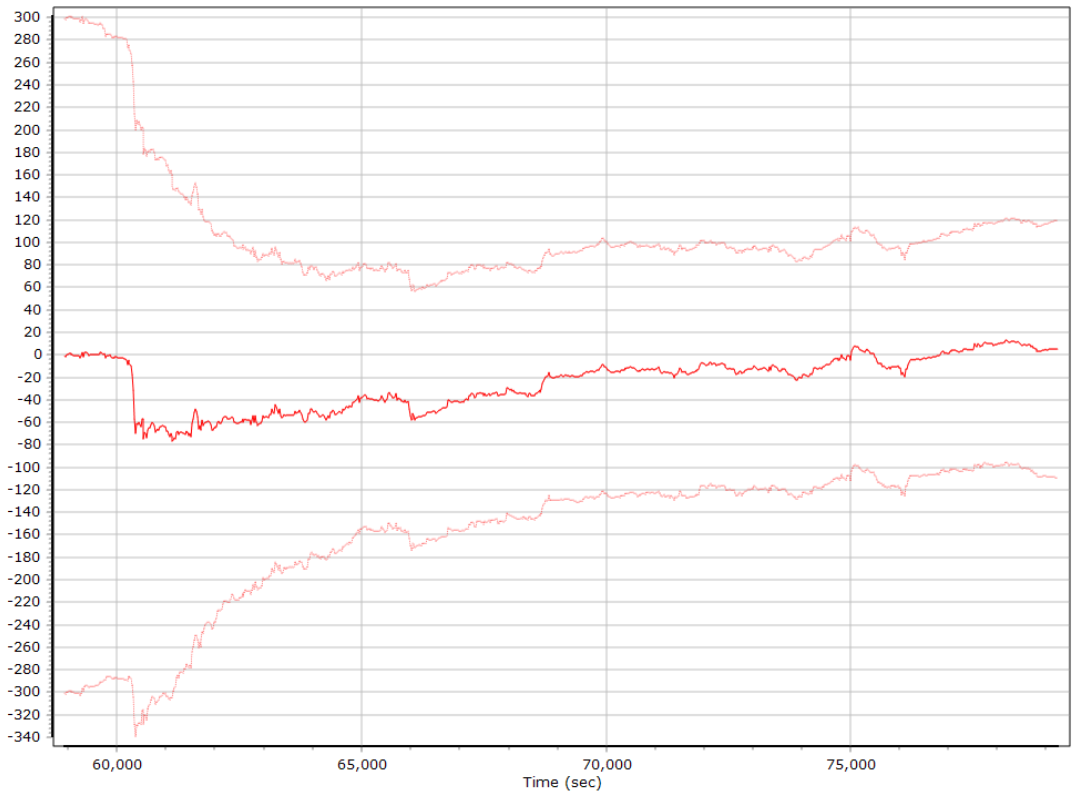
Accelerometer Scale Error (ppm)



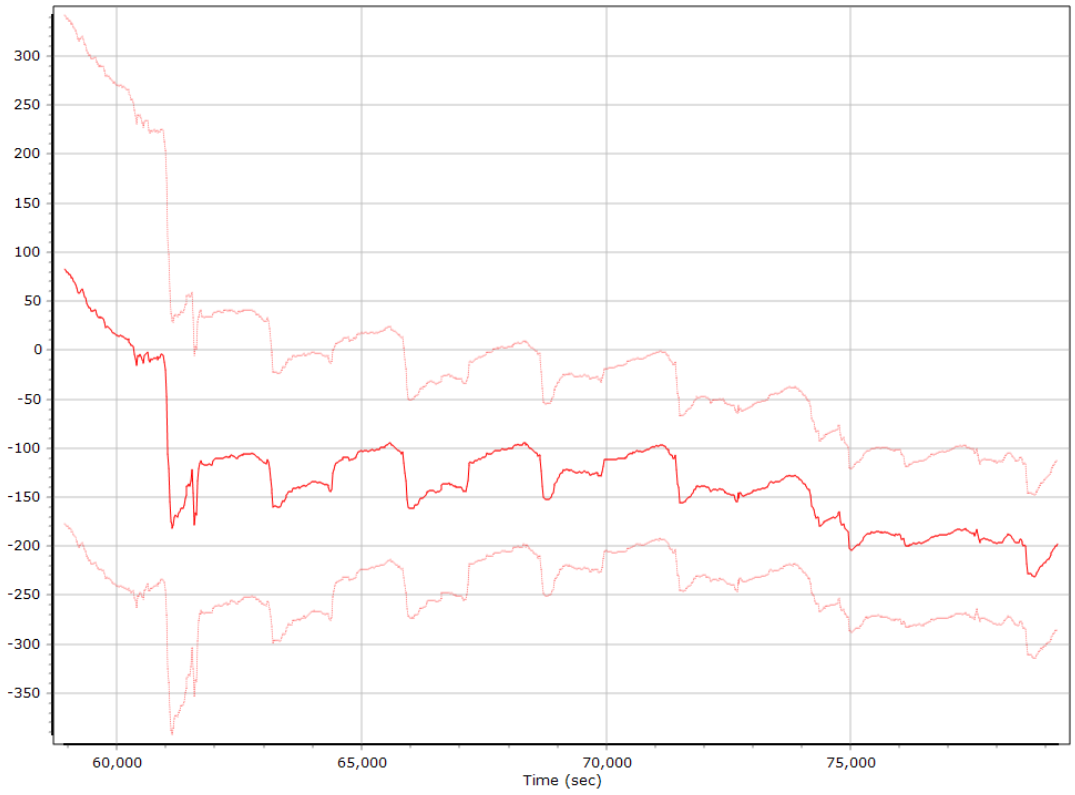
X Accelerometer Scale Error (ppm)



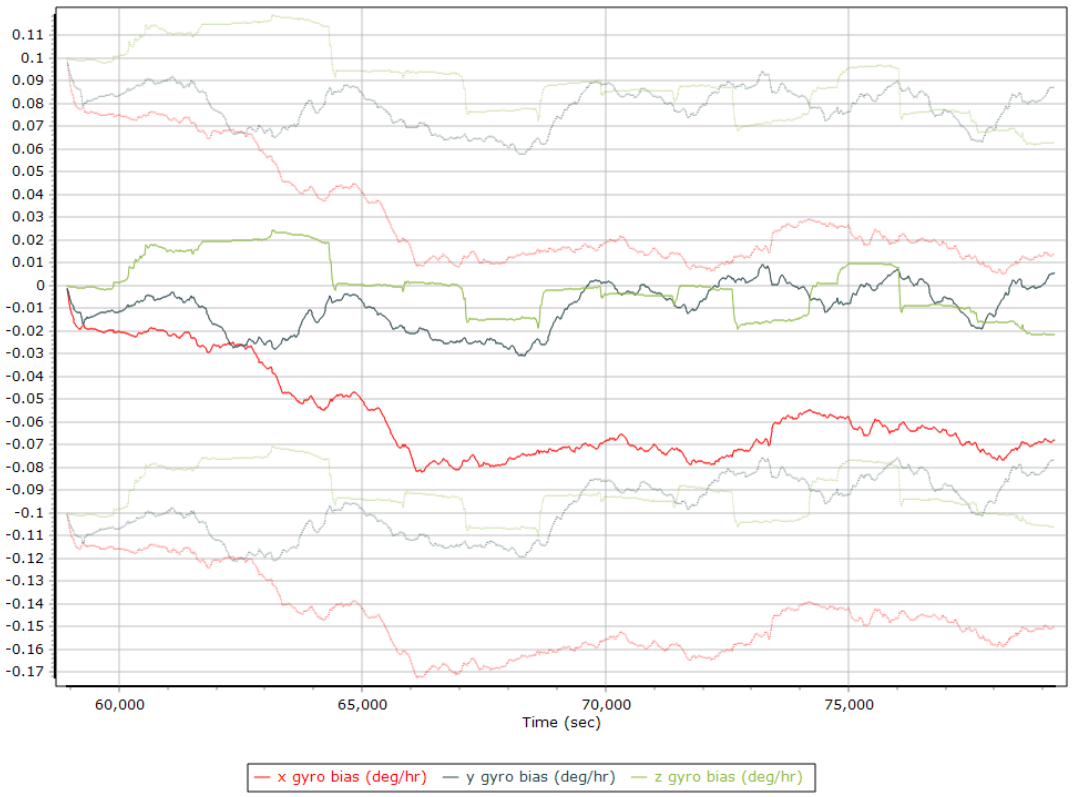
Y Accelerometer Scale Error (ppm)



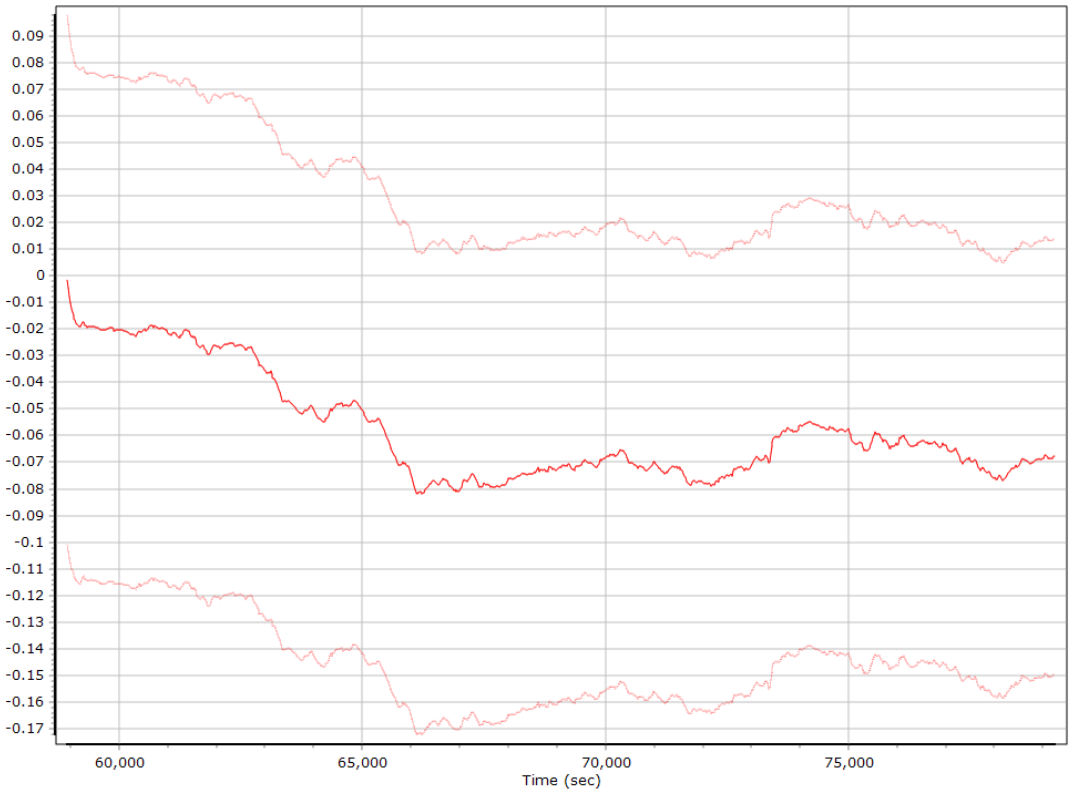
Z Accelerometer Scale Error (ppm)



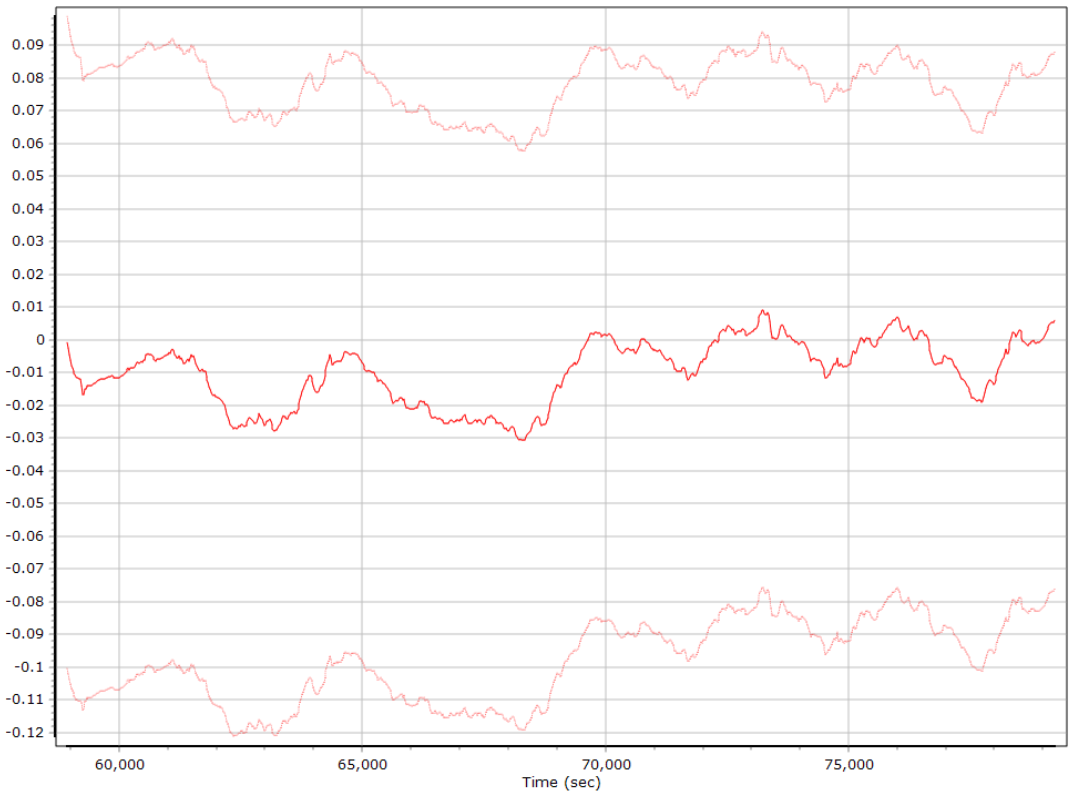
Gyro Bias (deg/h)



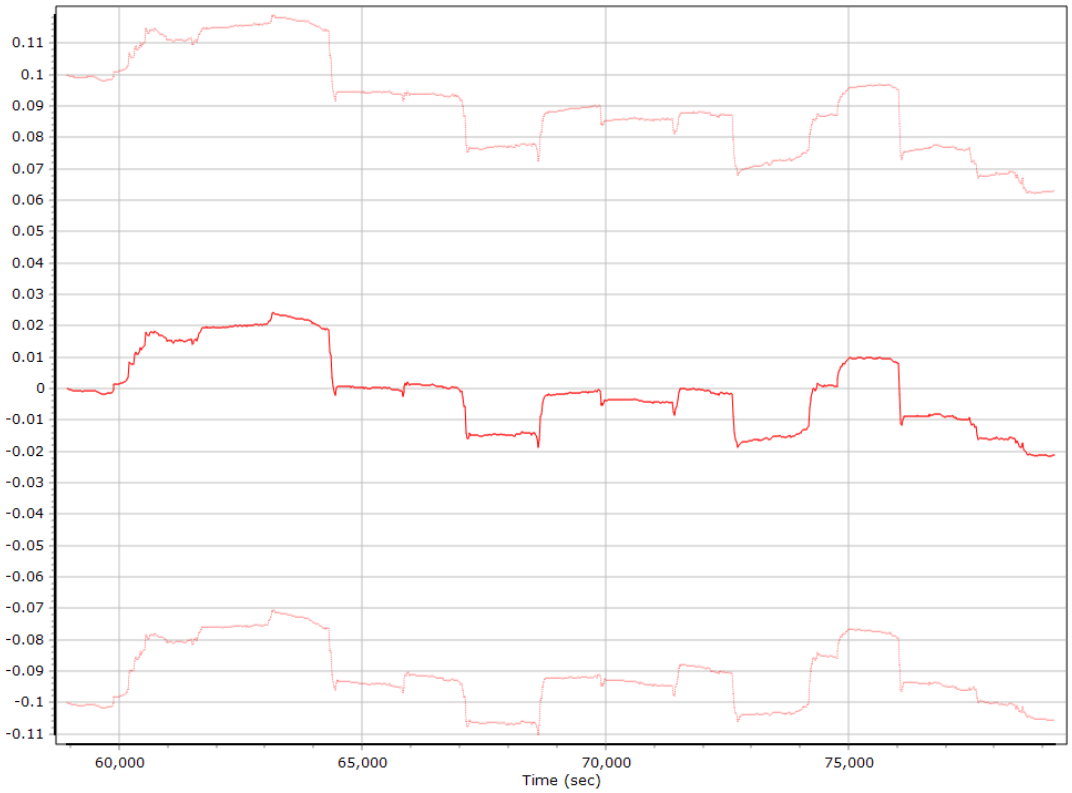
X Gyro Bias (deg/h)



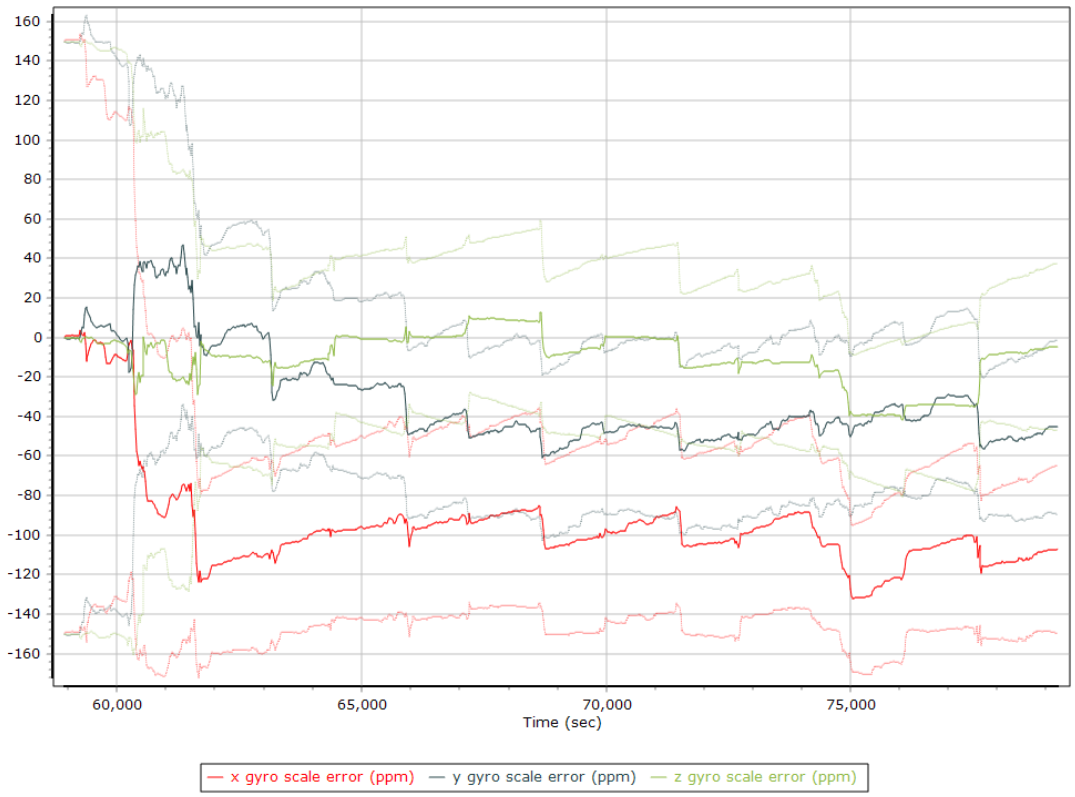
Y Gyro Bias (deg/h)



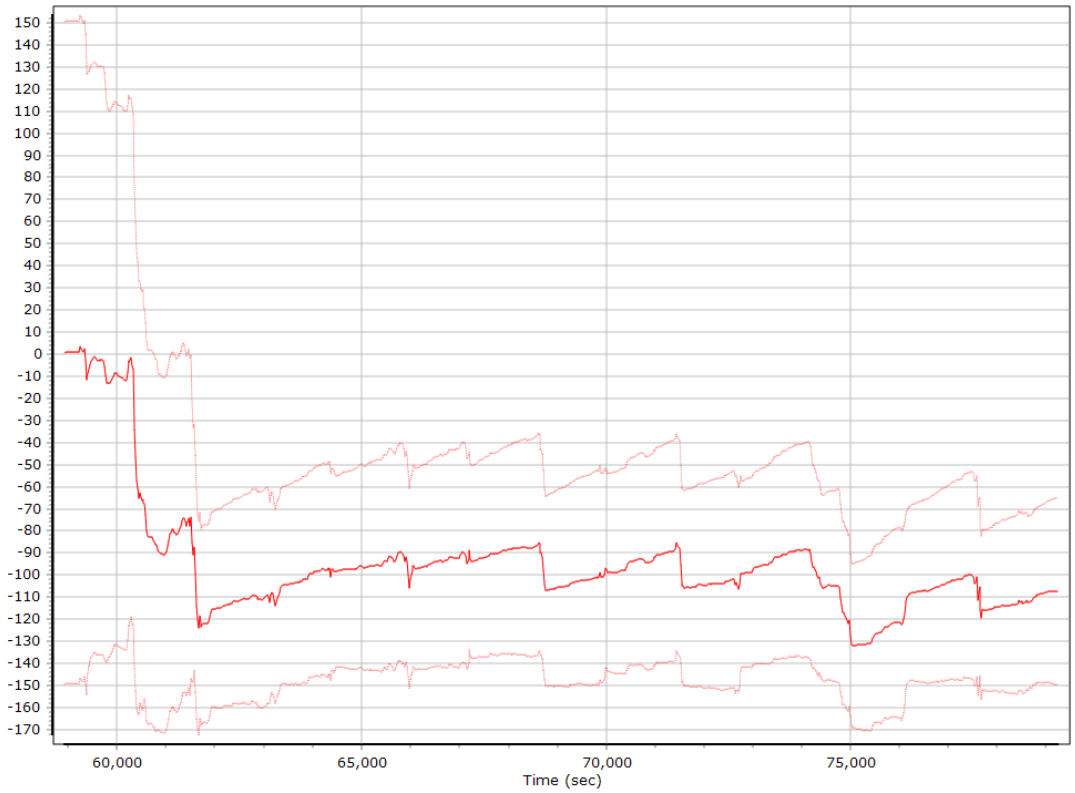
Z Gyro Bias (deg/h)



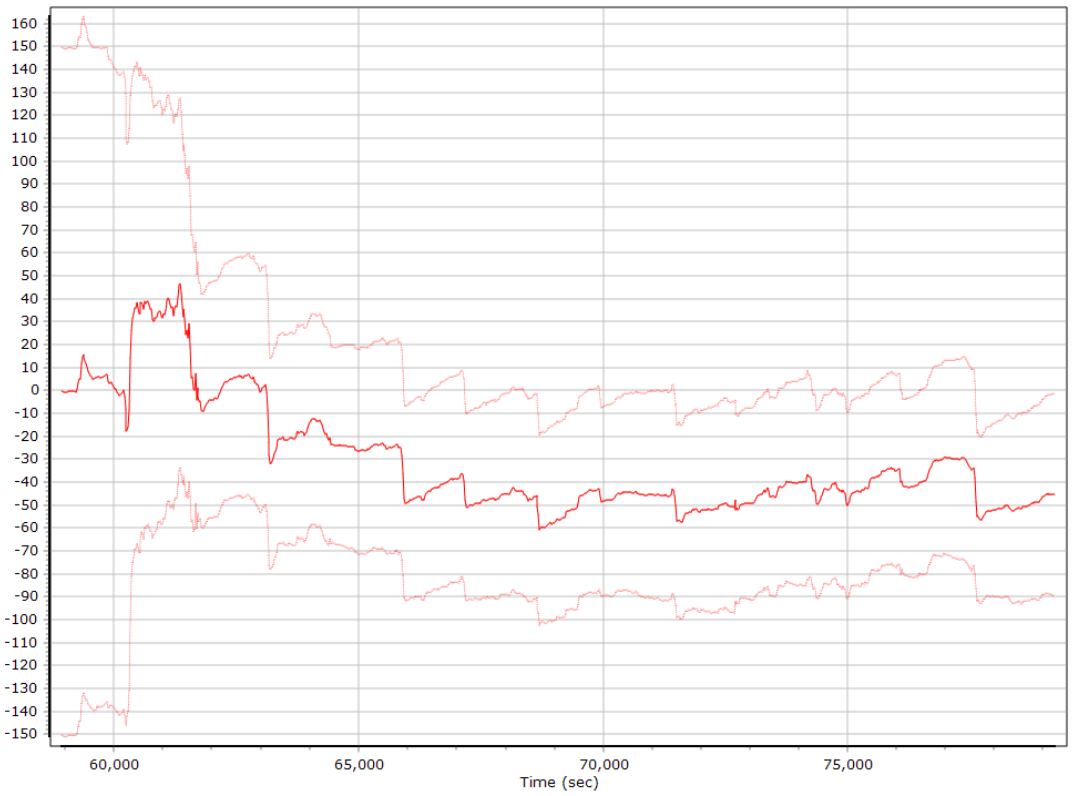
Gyro Scale Error (ppm)



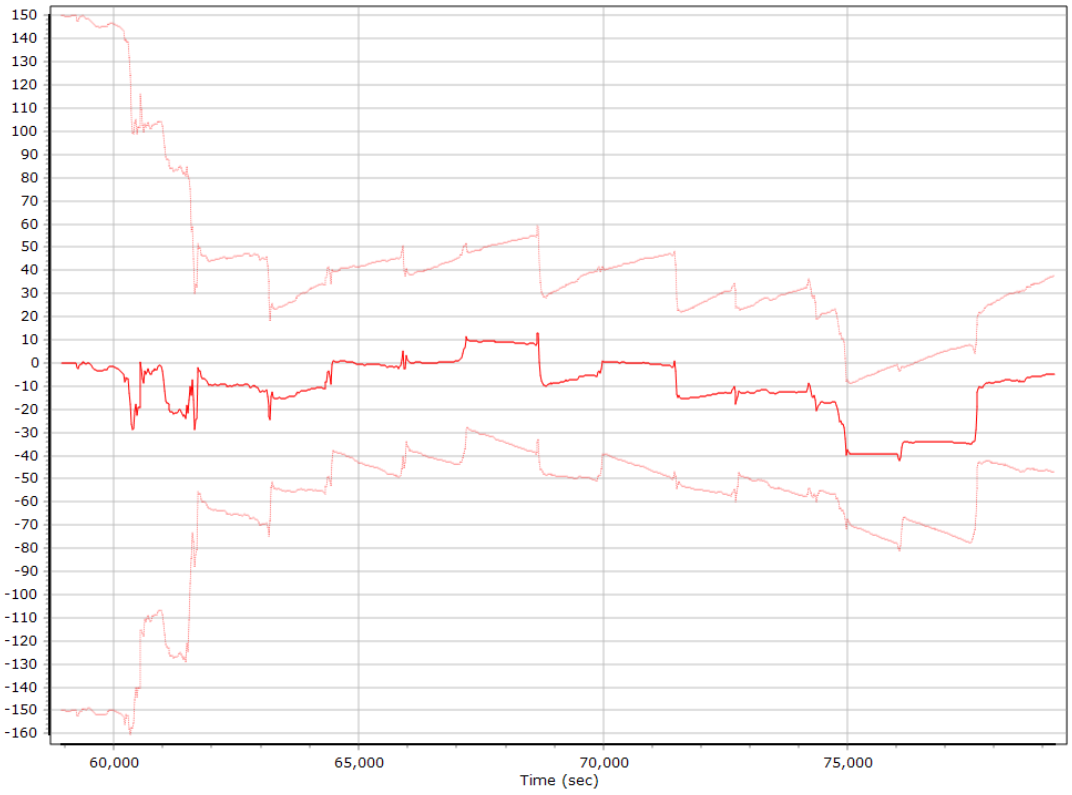
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

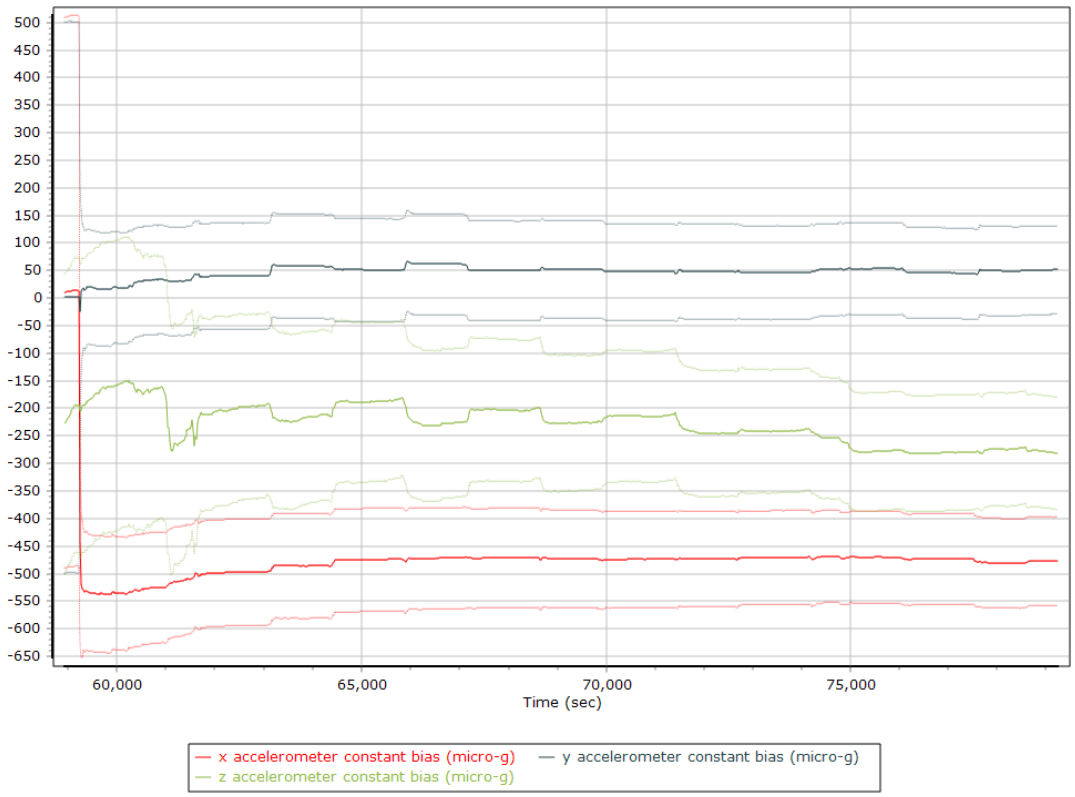


Z Gyro Scale Error (ppm)

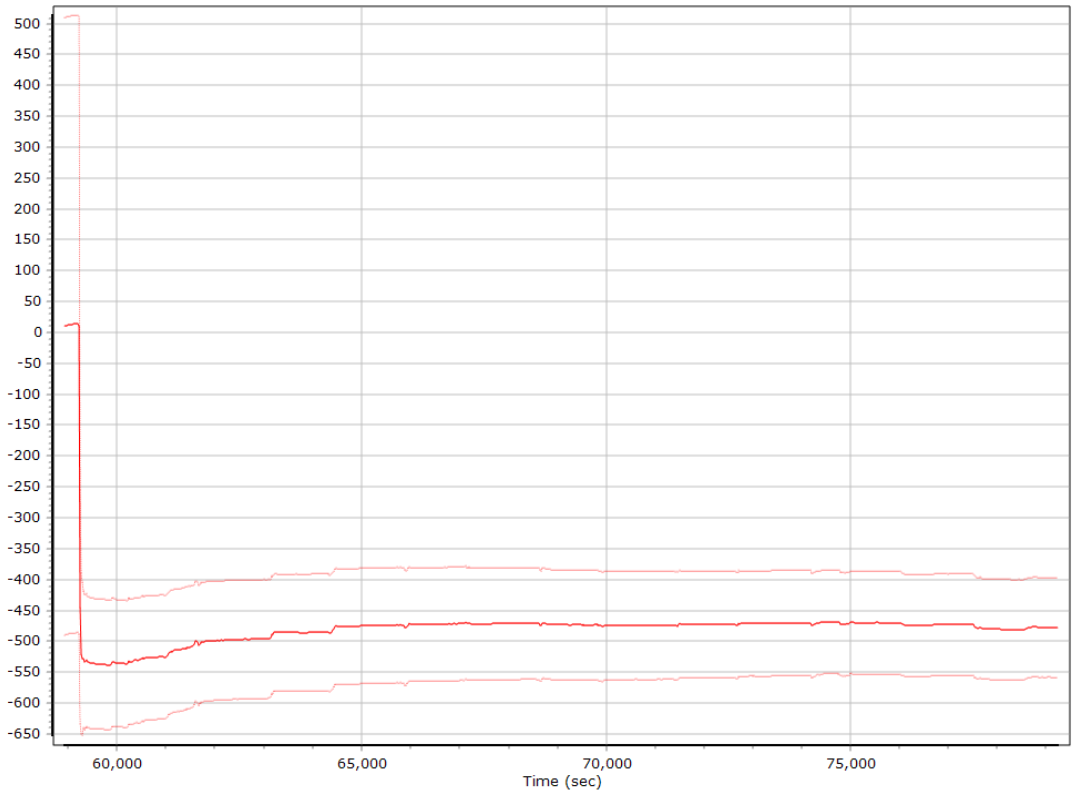


Forward Processed Estimated Constant Errors, Reference Frame

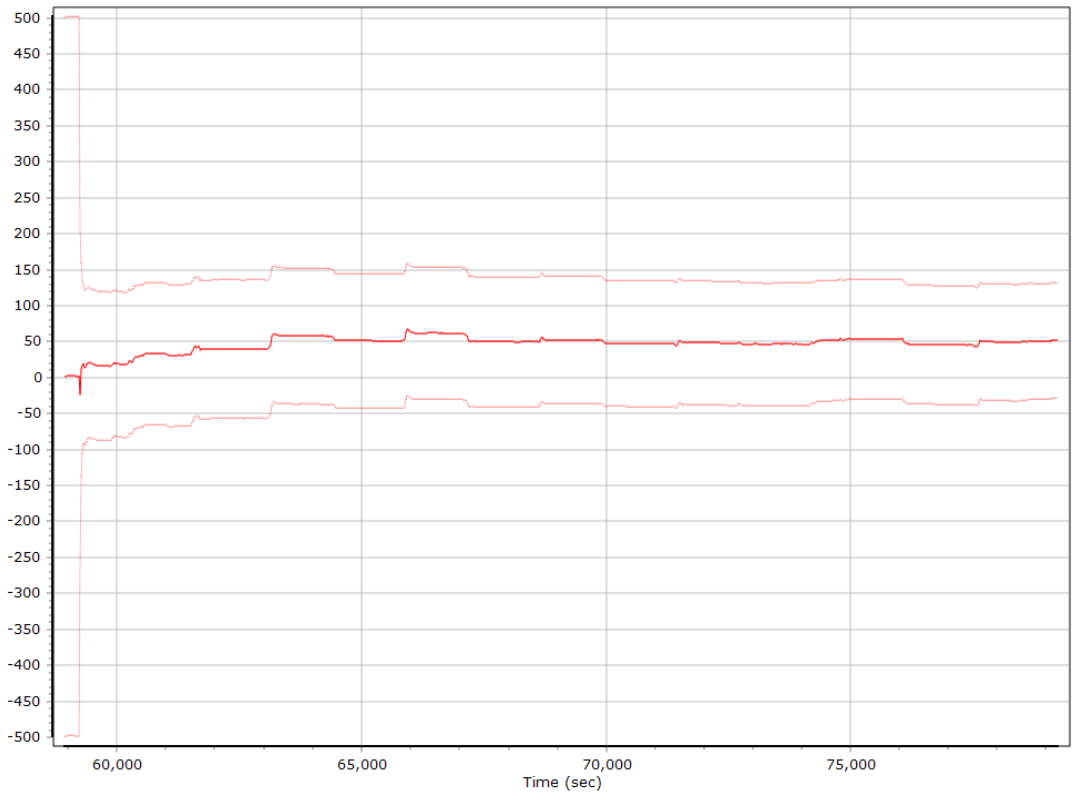
Accelerometer Bias (micro-g)



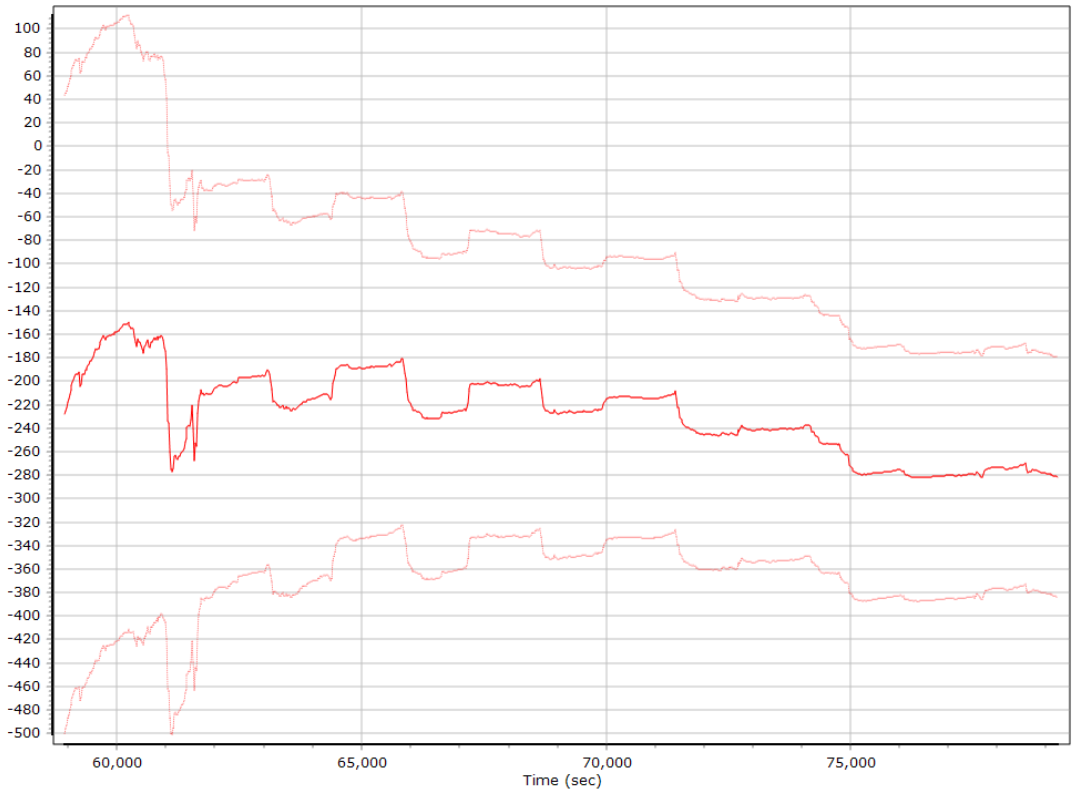
X Accelerometer Bias (micro-g)



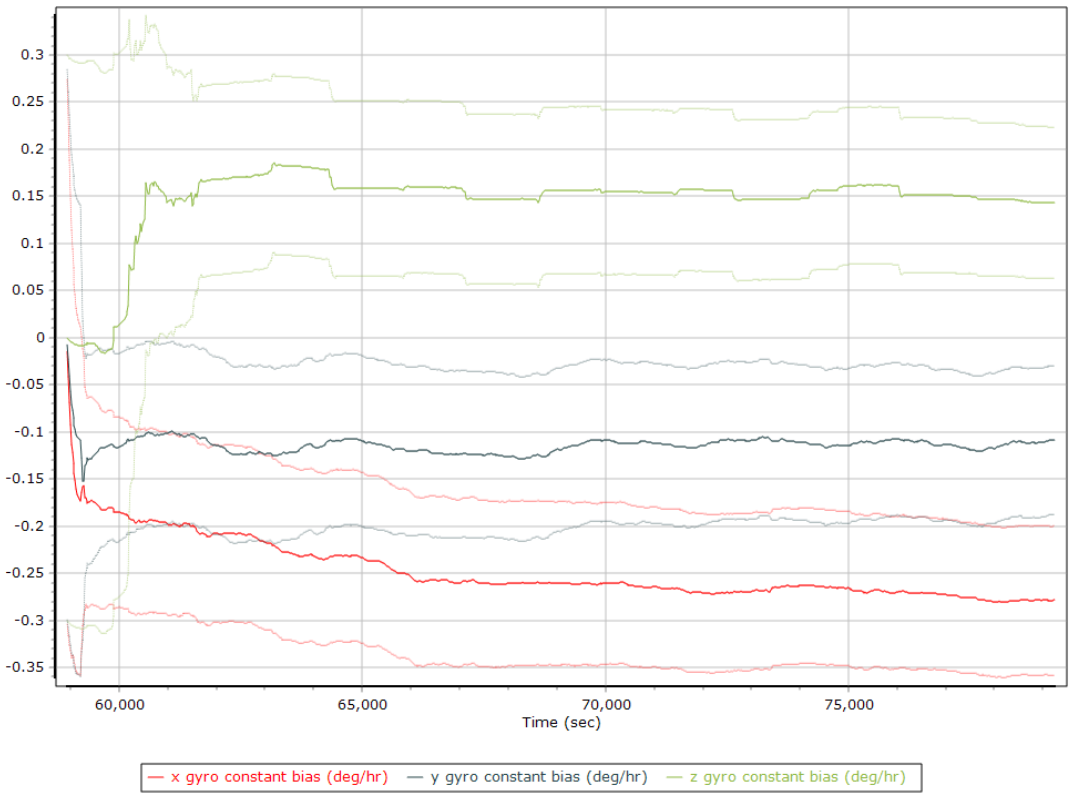
Y Accelerometer Bias (micro-g)



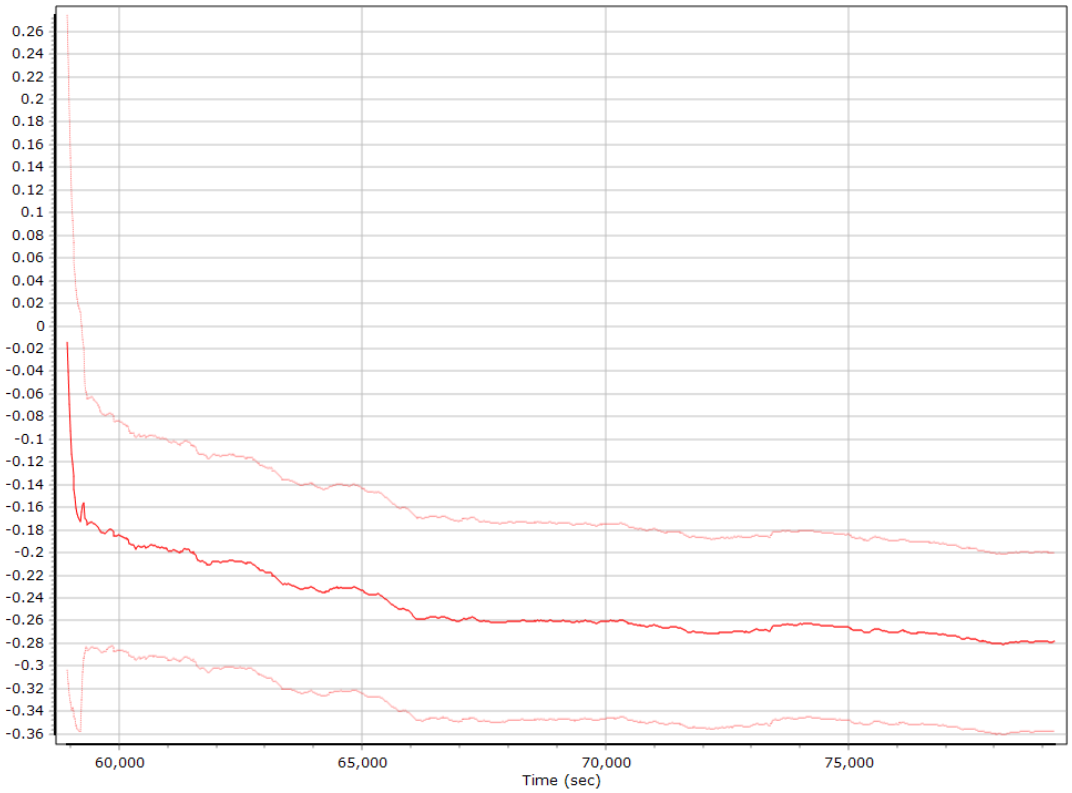
Z Accelerometer Bias (micro-g)



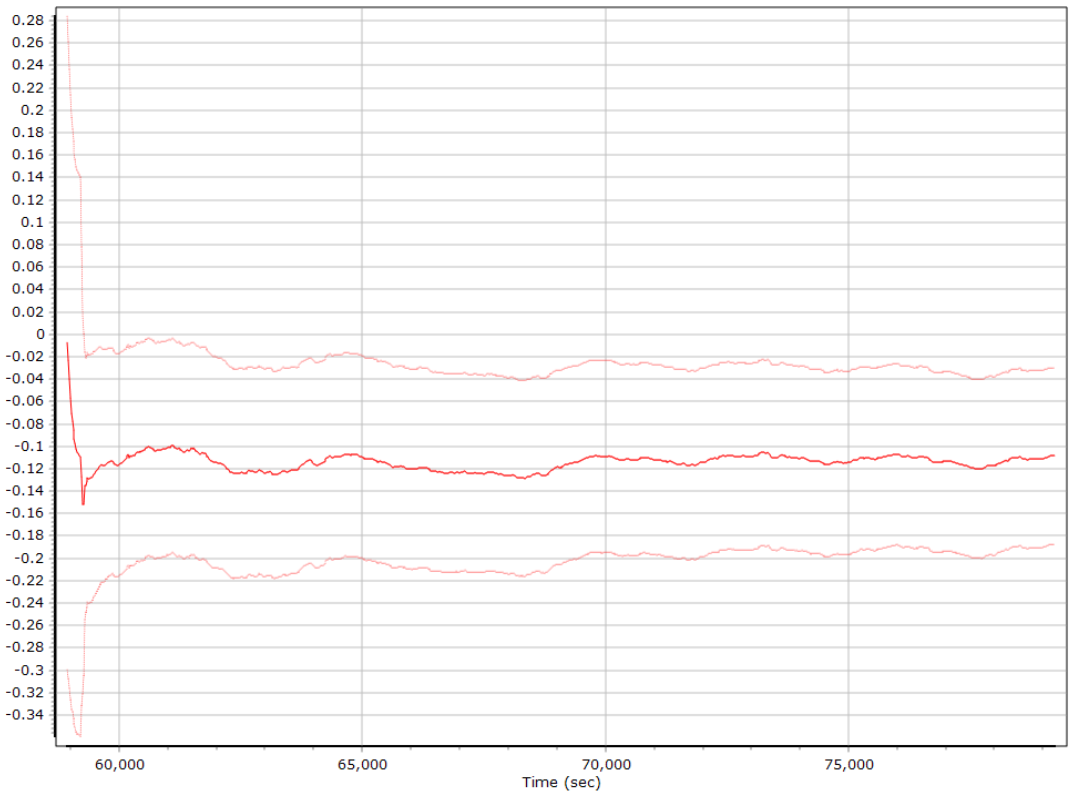
Gyro Bias (deg/h)



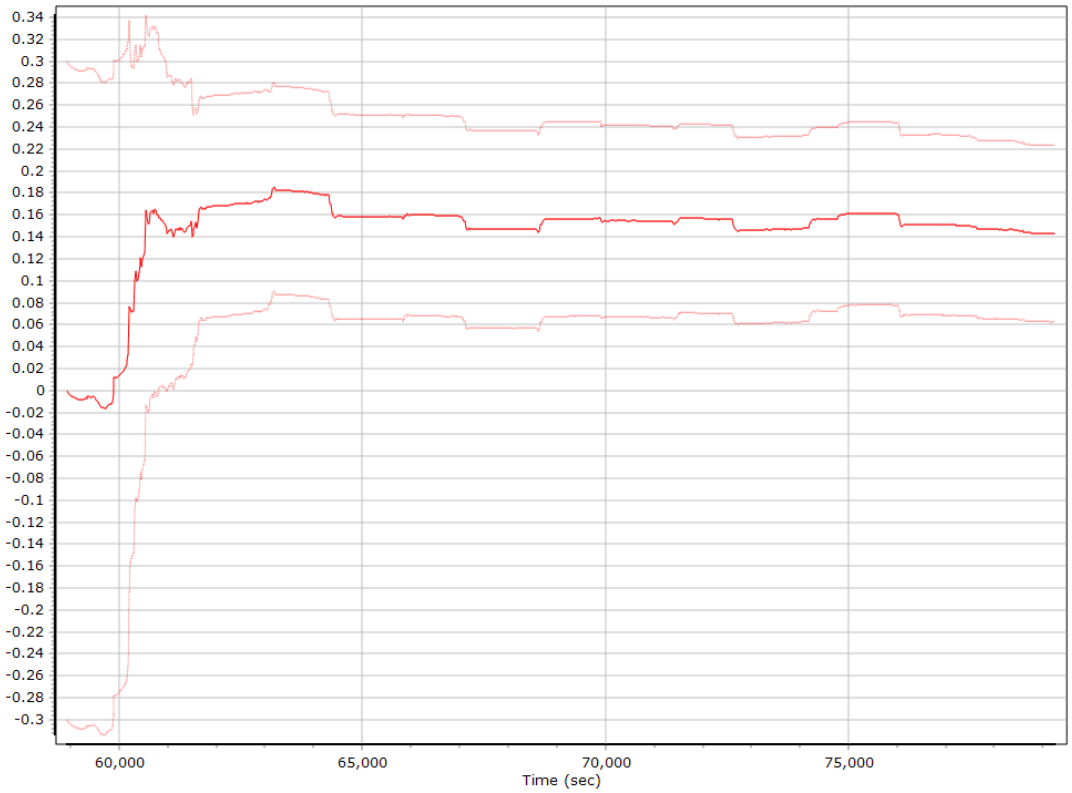
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)

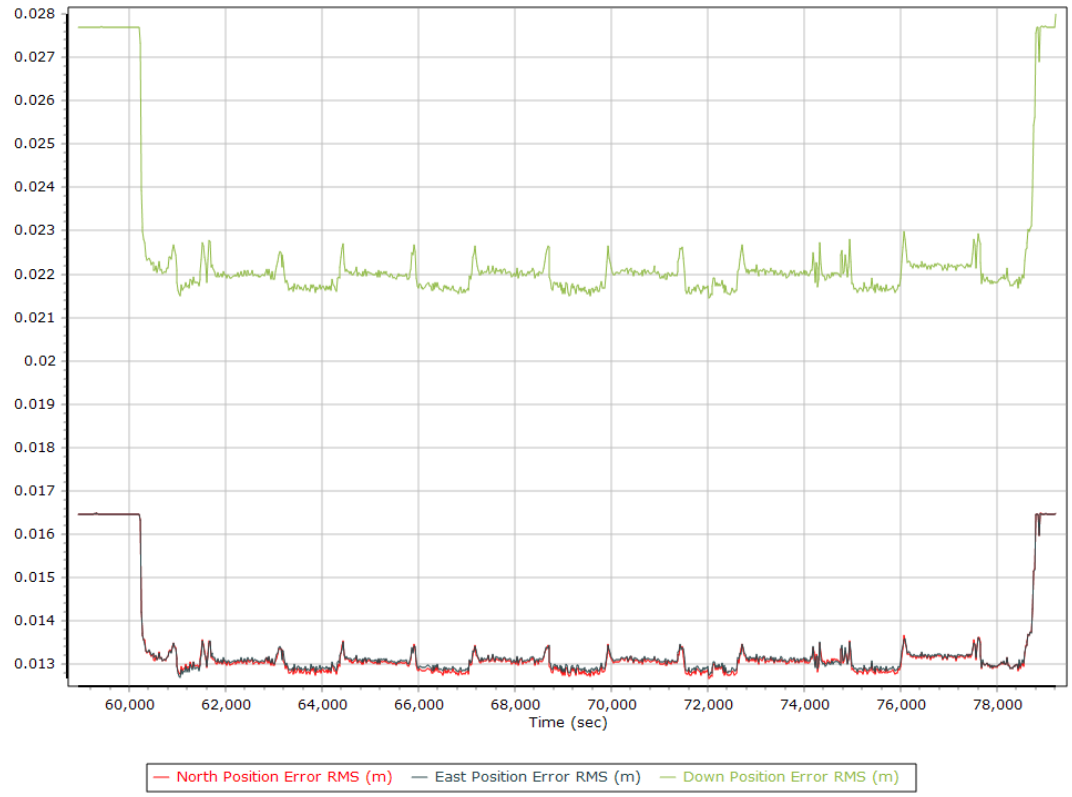


Z Gyro Bias (deg/h)

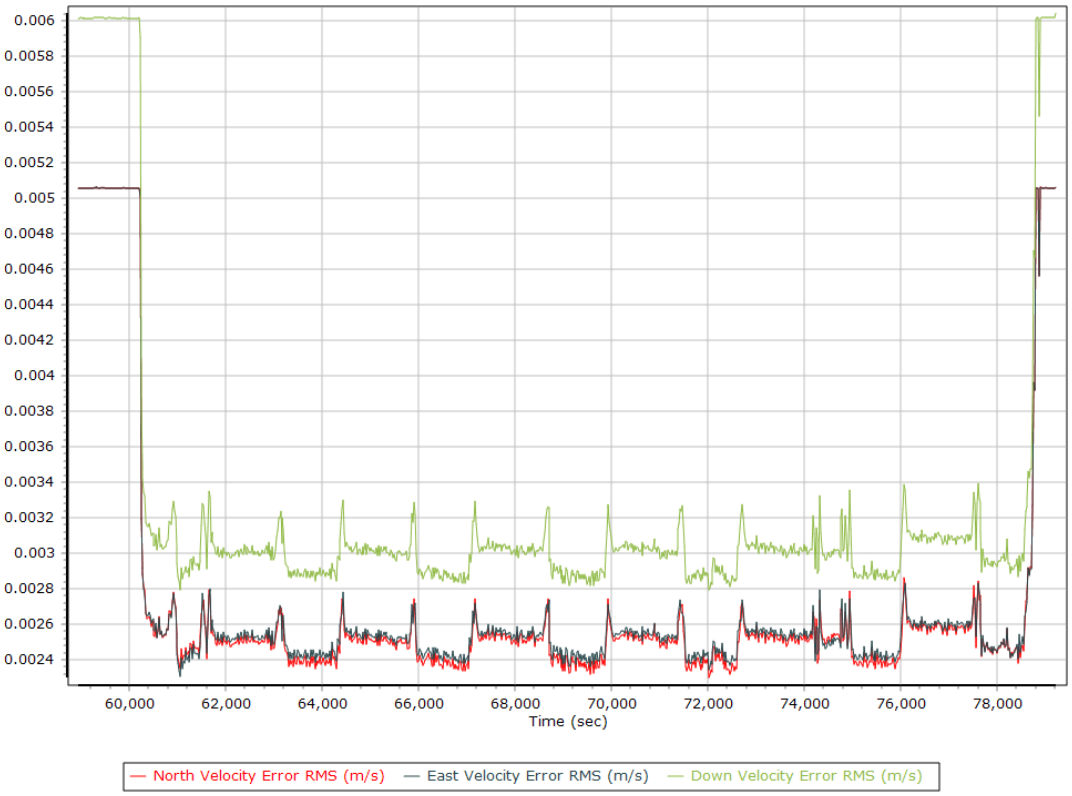


Smoothed Performance Metrics

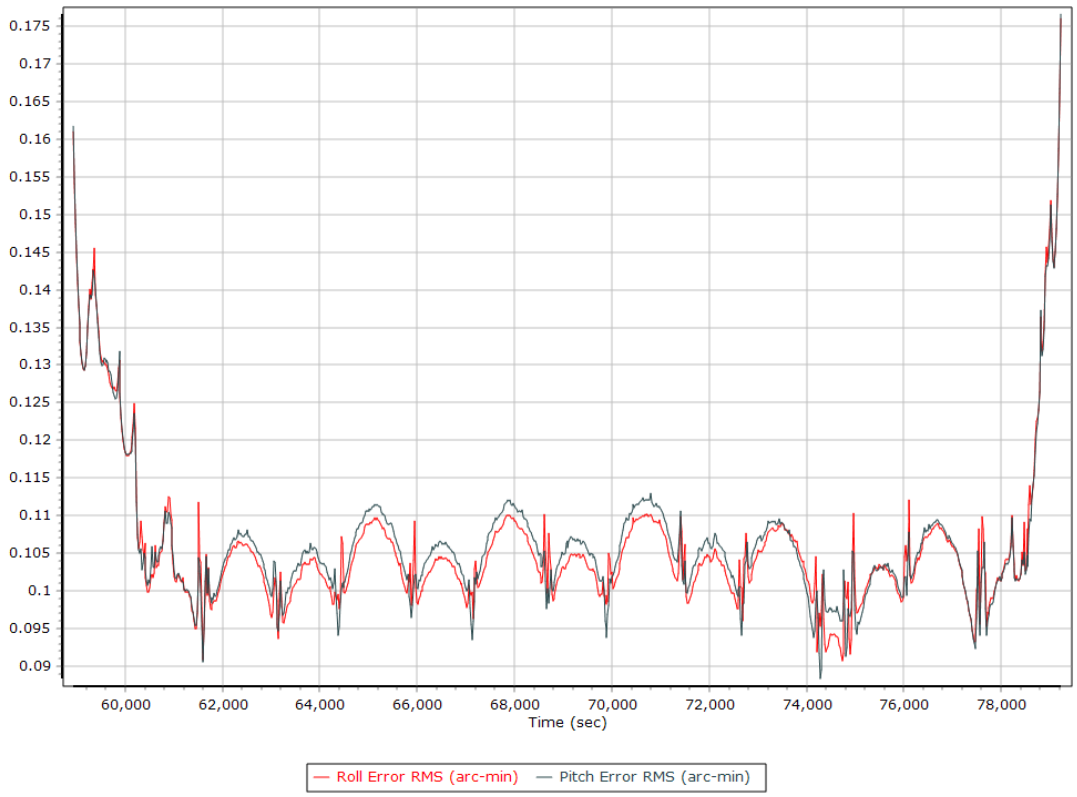
Position Error RMS (m)



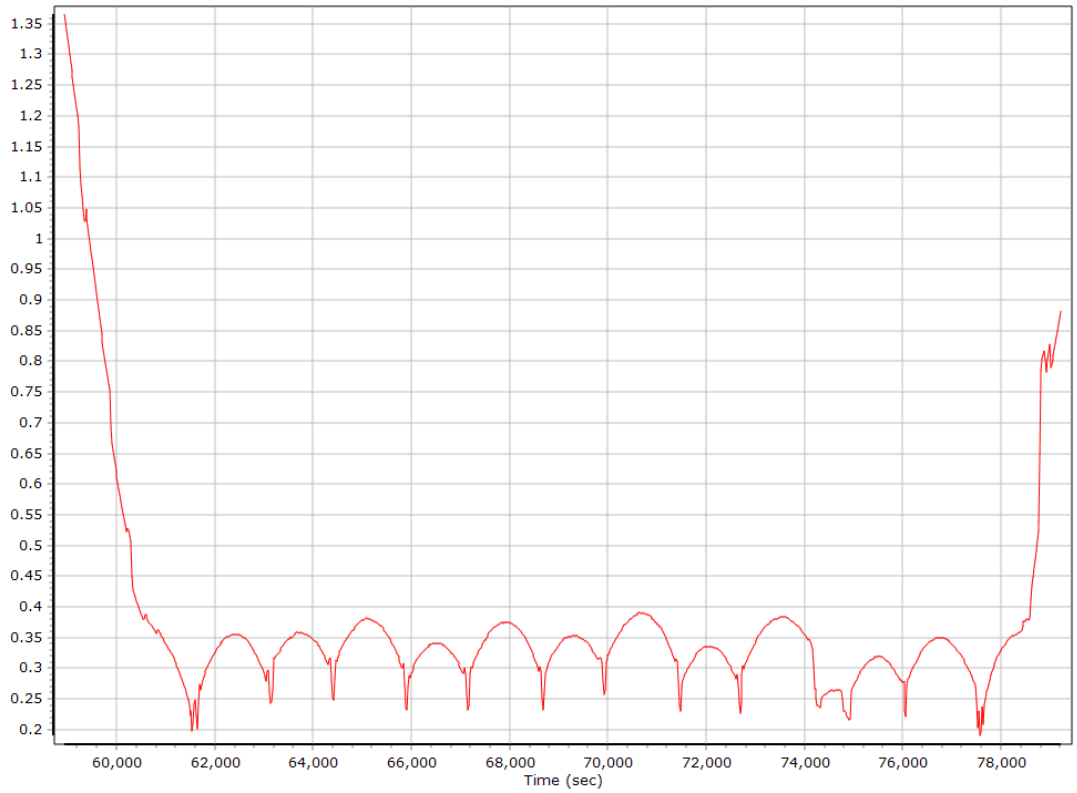
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)



Heading Error RMS (arc-min)

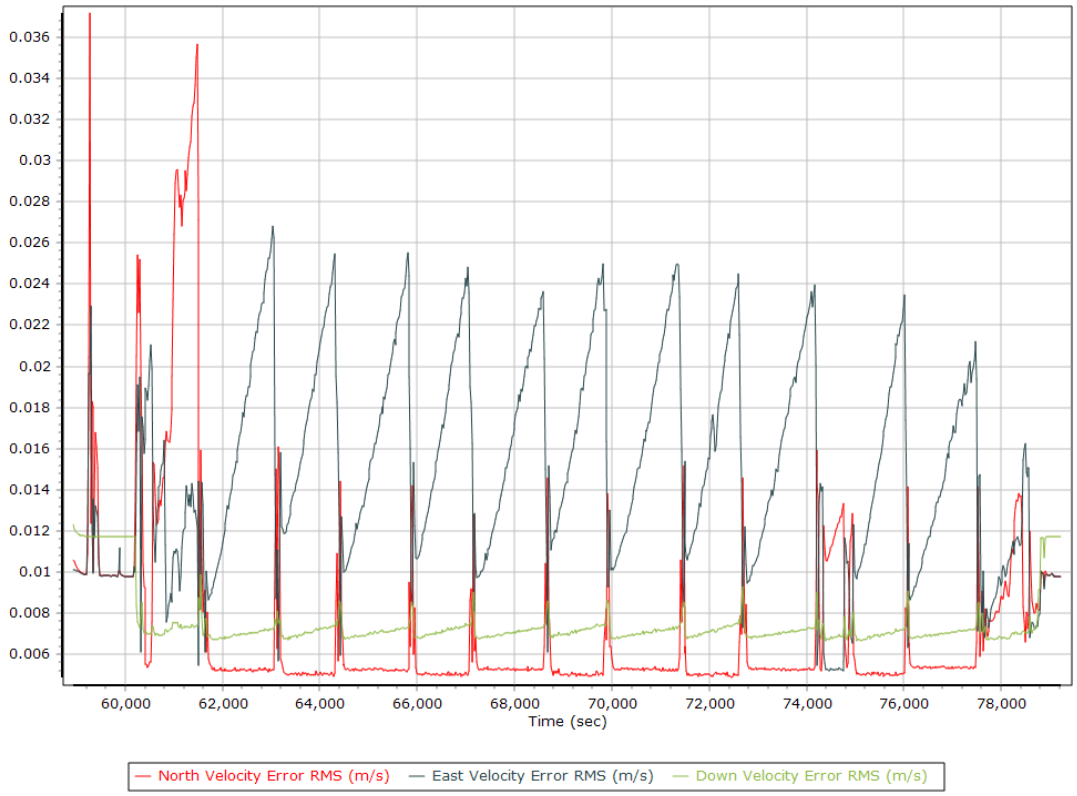


Forward Processed Performance Metrics

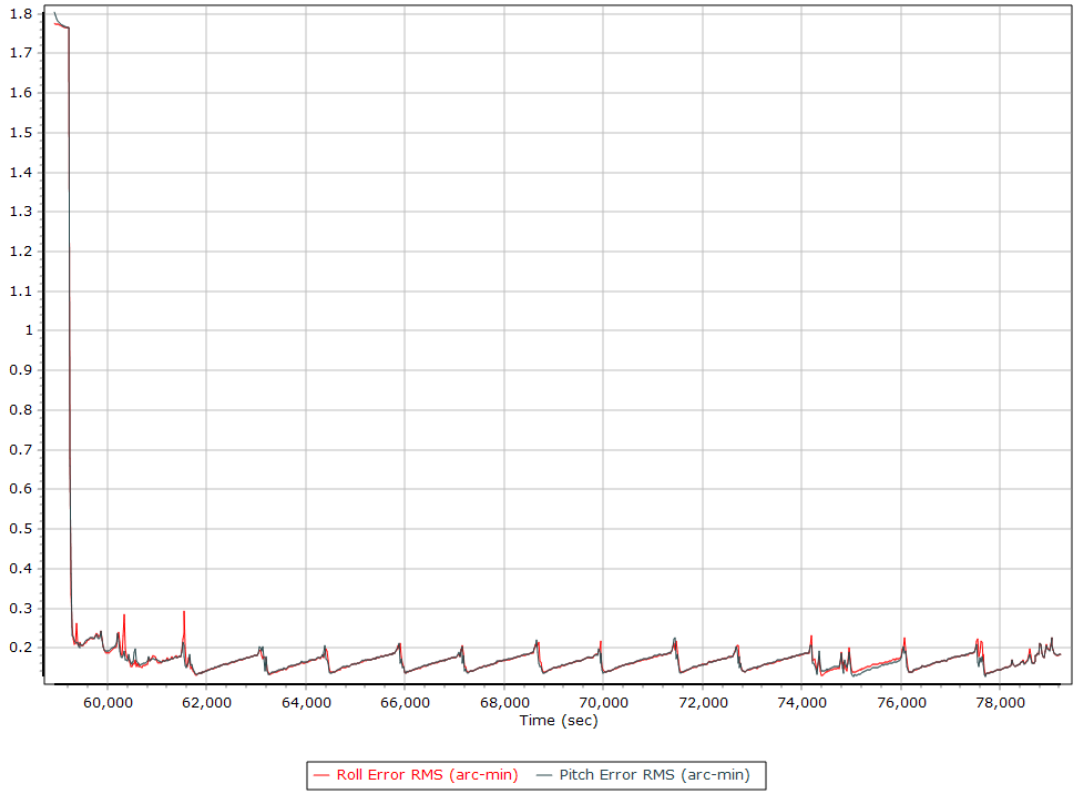
Position Error RMS (m)



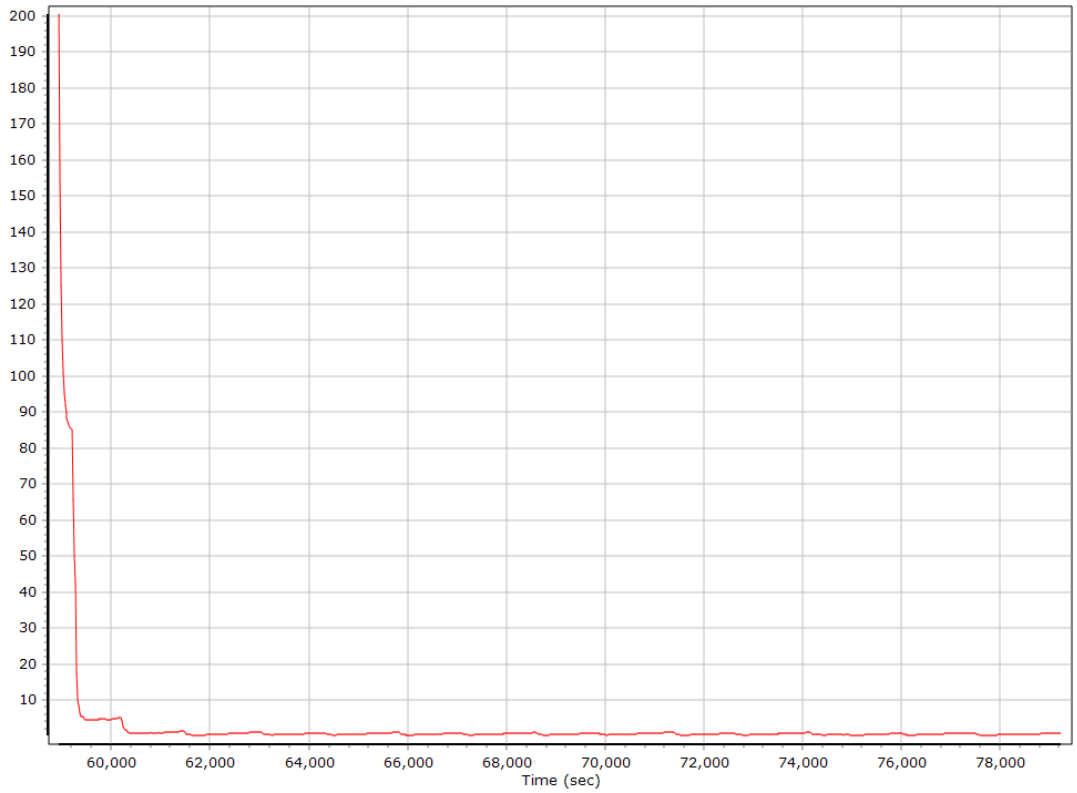
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

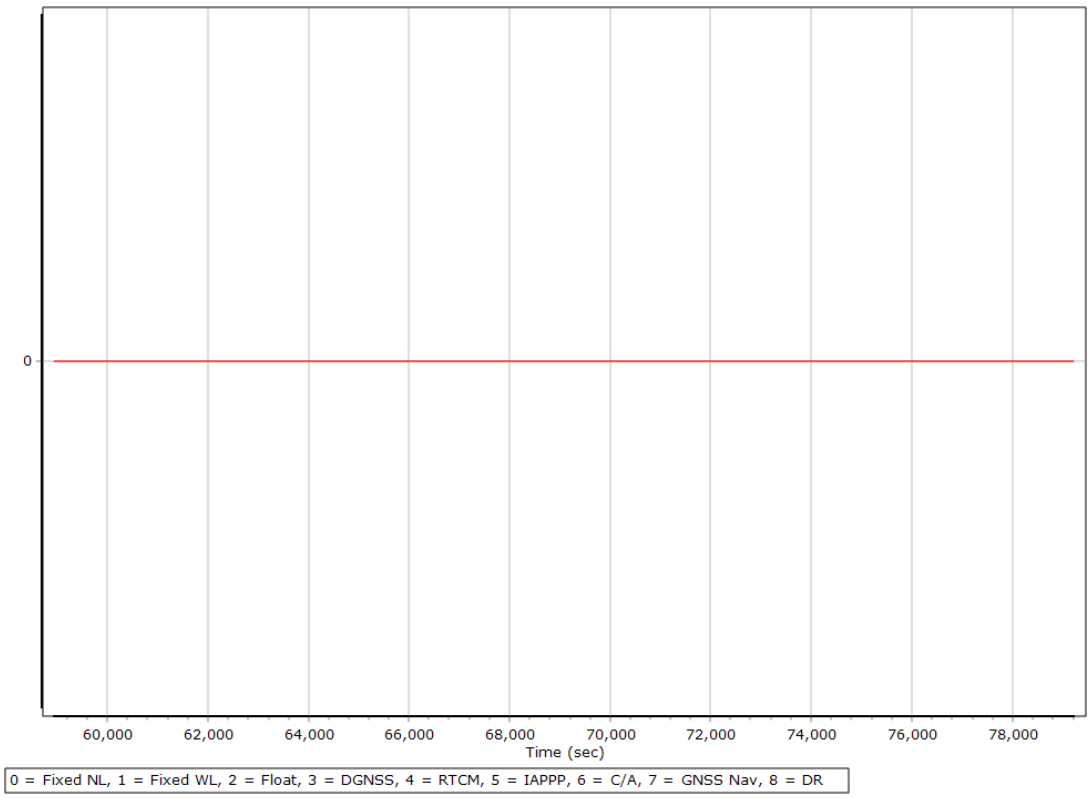


Heading Error RMS (arc-min)

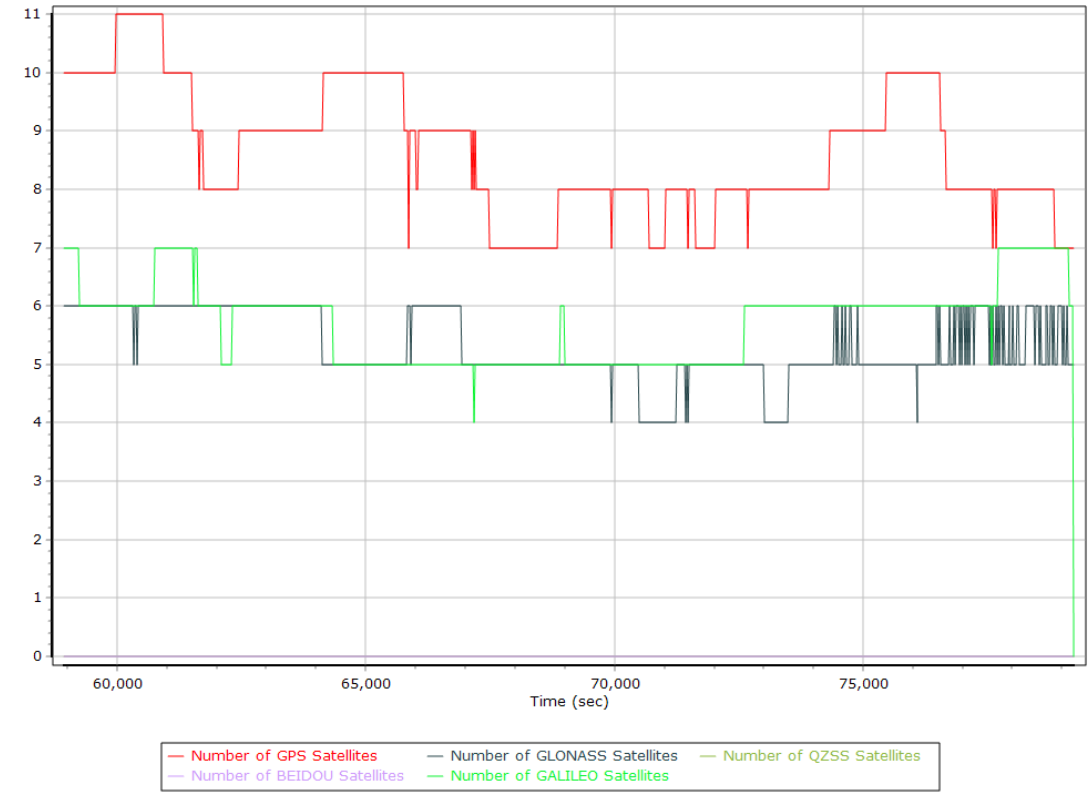


Forward Processed Solution Status

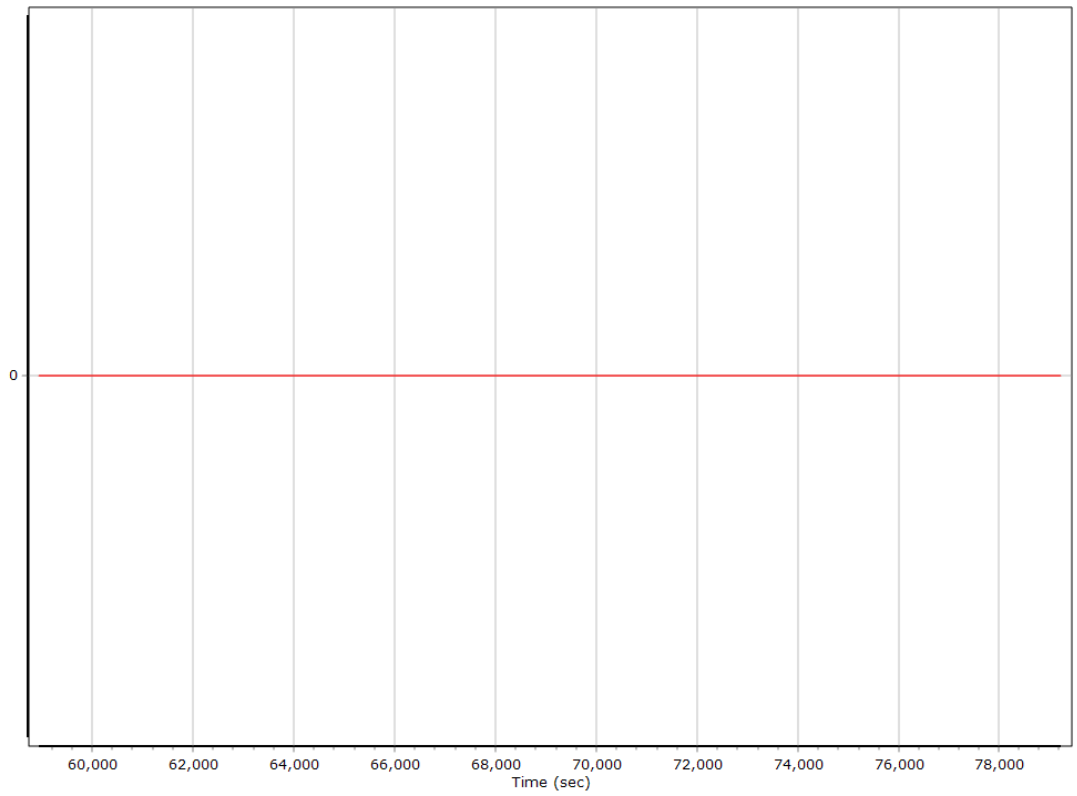
Processing Mode



Number of Satellites



Baseline Length



General Information

Mission Information

Project name	12282020A_4040
Processing date	2022-01-05 15:19:59
Mission date	2020-12-28 15:11:36
Mission duration	02:39:13.000
Processing mode	IN-Fusion PP-RTX

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N10451
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
201228_151117_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm3630.20g	GLONASS Broadcast Ephemeris
Ephm3630.20n	GPS Broadcast Ephemeris

Output Files

Filename	File type
sbet_12282020A_4040.out	SBET Trajectory File

Rover Data Summary

First raw data file	201228_151117_INS-GPS_1.raw		
Last raw data file	201228_151117_INS-GPS_1.raw		
Start GPS week	2138		
Start time	141077.733 (12/28/2020 3:11:17 PM)		
End time	150630.400 (12/28/2020 5:50:30 PM)		
Start of fine alignment	141382.389 (12/28/2020 3:16:22 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event Input	None		
Correction data	None		
IMU Installation Lever Arms & Mounting Angles			
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

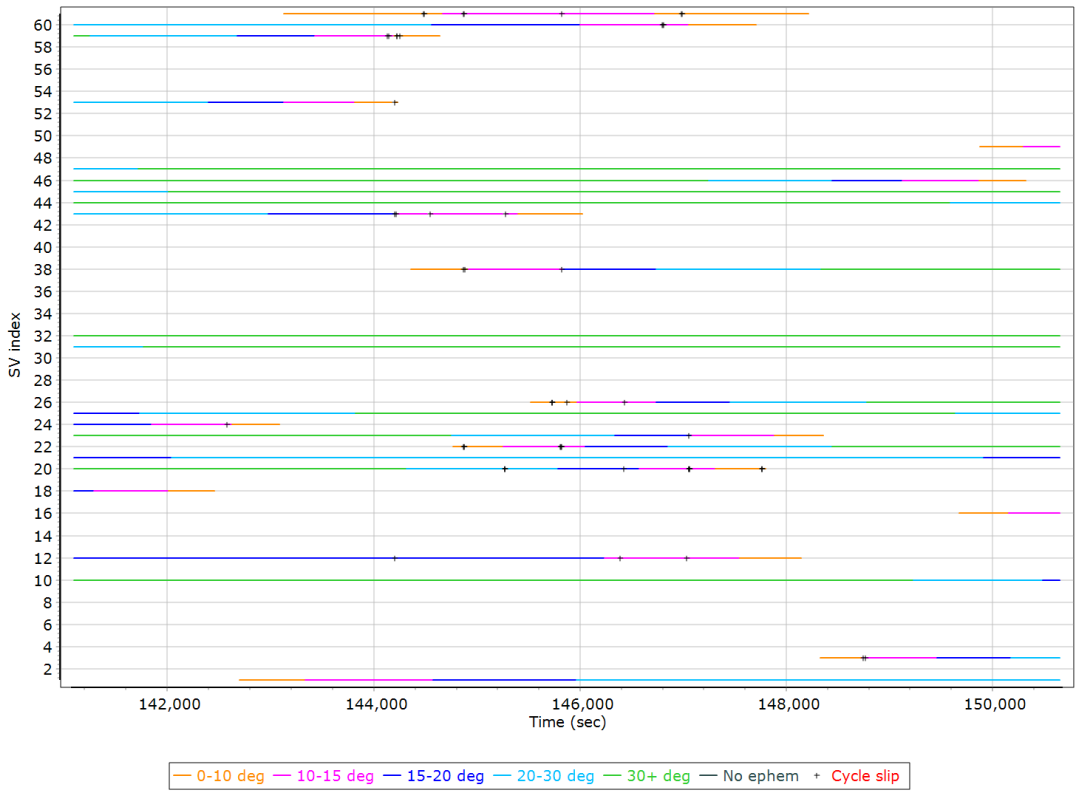
Rover Data QC

Raw IMU Import QC Summary

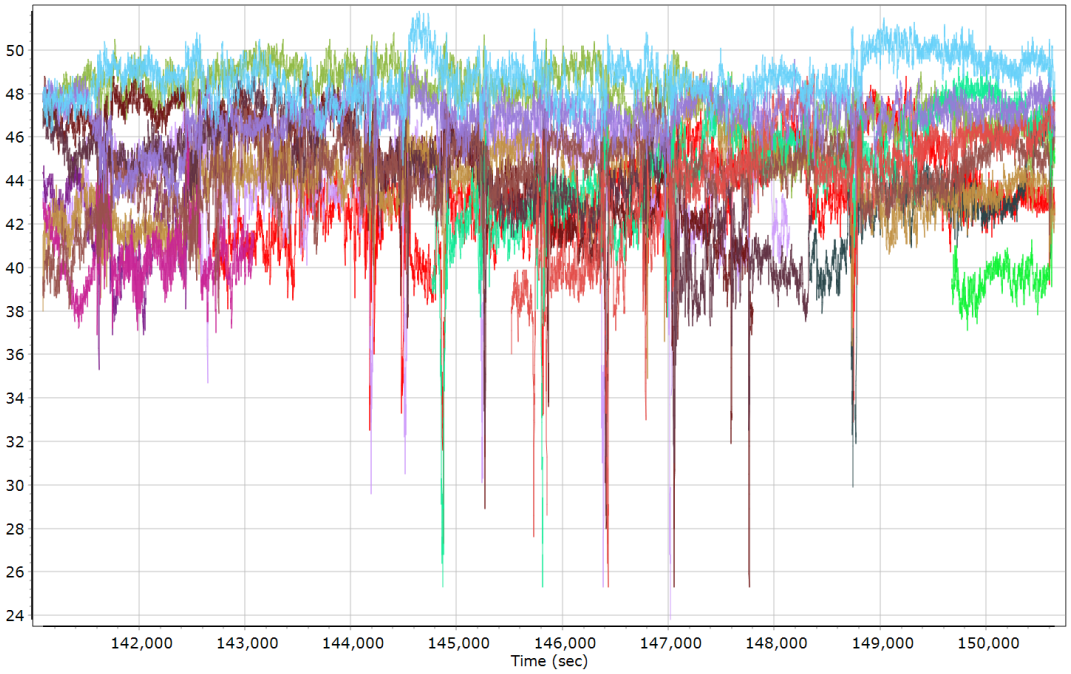
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_12282020A_4040.log
IMU Records Processed	1910405
Termination Status	Normal
IMU Anomalies	0

Primary Observables & Satellite Data

GPS/GLONASS L1 Satellite Lock/Elevation

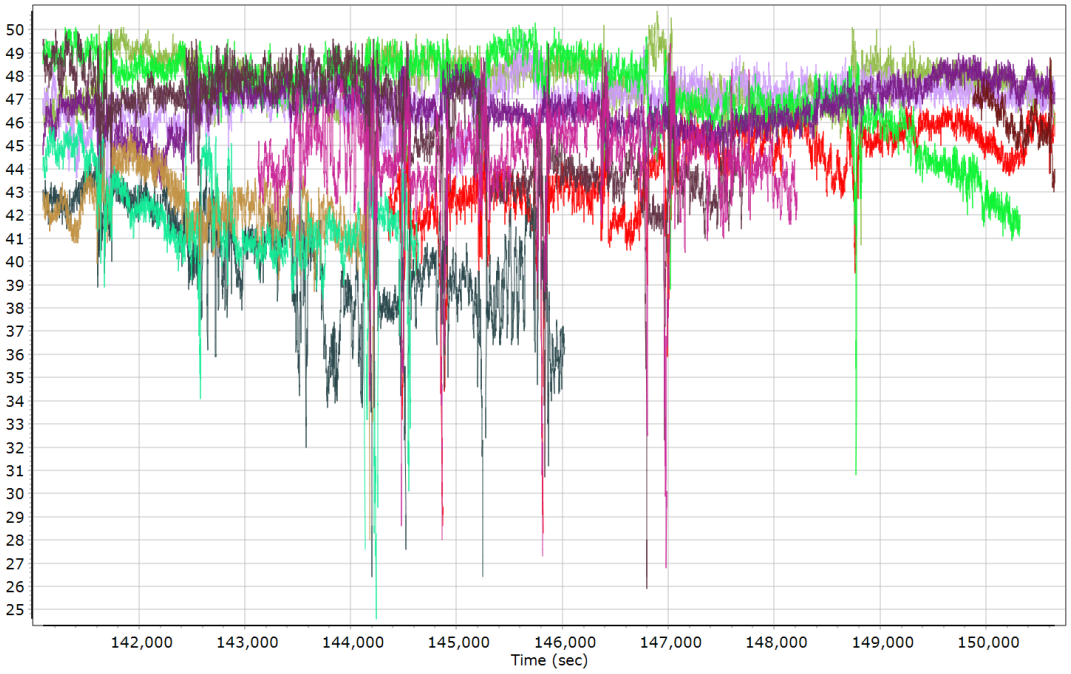


GPS L1 SNR



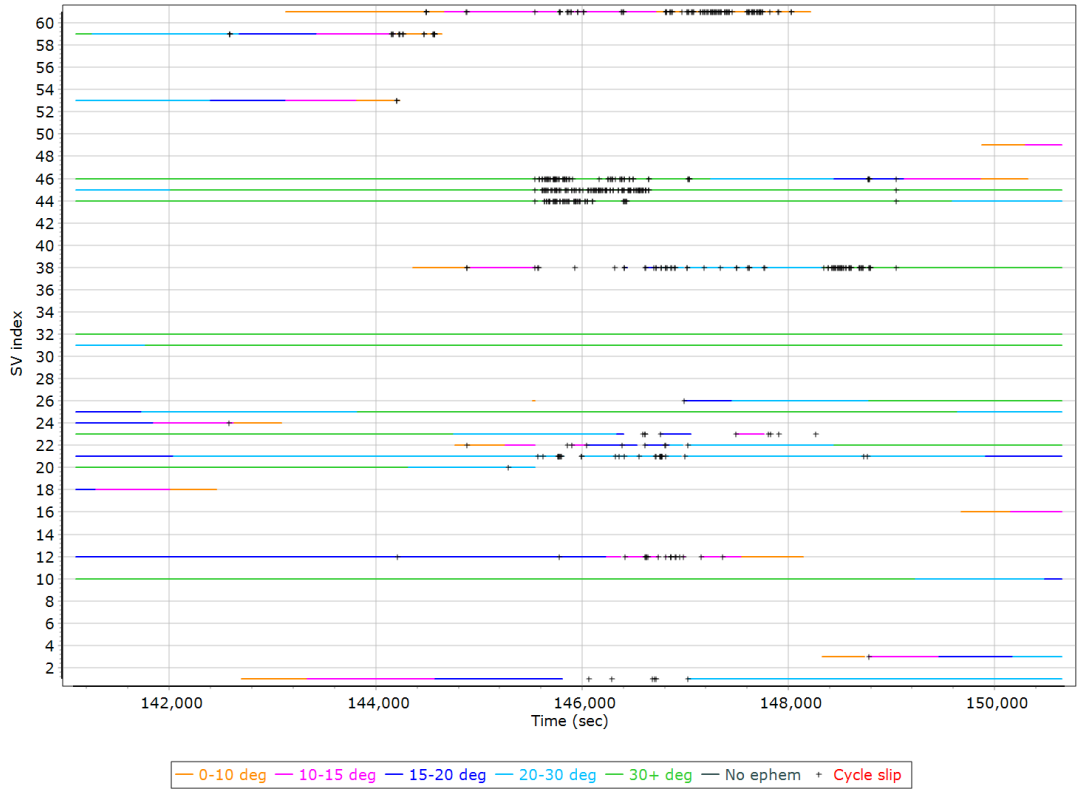
GPS PRN 01 L1 SNR (dB/Hz) GPS PRN 03 L1 SNR (dB/Hz) GPS PRN 10 L1 SNR (dB/Hz) GPS PRN 12 L1 SNR (dB/Hz)
GPS PRN 16 L1 SNR (dB/Hz) GPS PRN 18 L1 SNR (dB/Hz) GPS PRN 20 L1 SNR (dB/Hz) GPS PRN 21 L1 SNR (dB/Hz)
GPS PRN 22 L1 SNR (dB/Hz) GPS PRN 23 L1 SNR (dB/Hz) GPS PRN 24 L1 SNR (dB/Hz) GPS PRN 25 L1 SNR (dB/Hz)
GPS PRN 26 L1 SNR (dB/Hz) GPS PRN 31 L1 SNR (dB/Hz) GPS PRN 32 L1 SNR (dB/Hz)

GLONASS L1 SNR

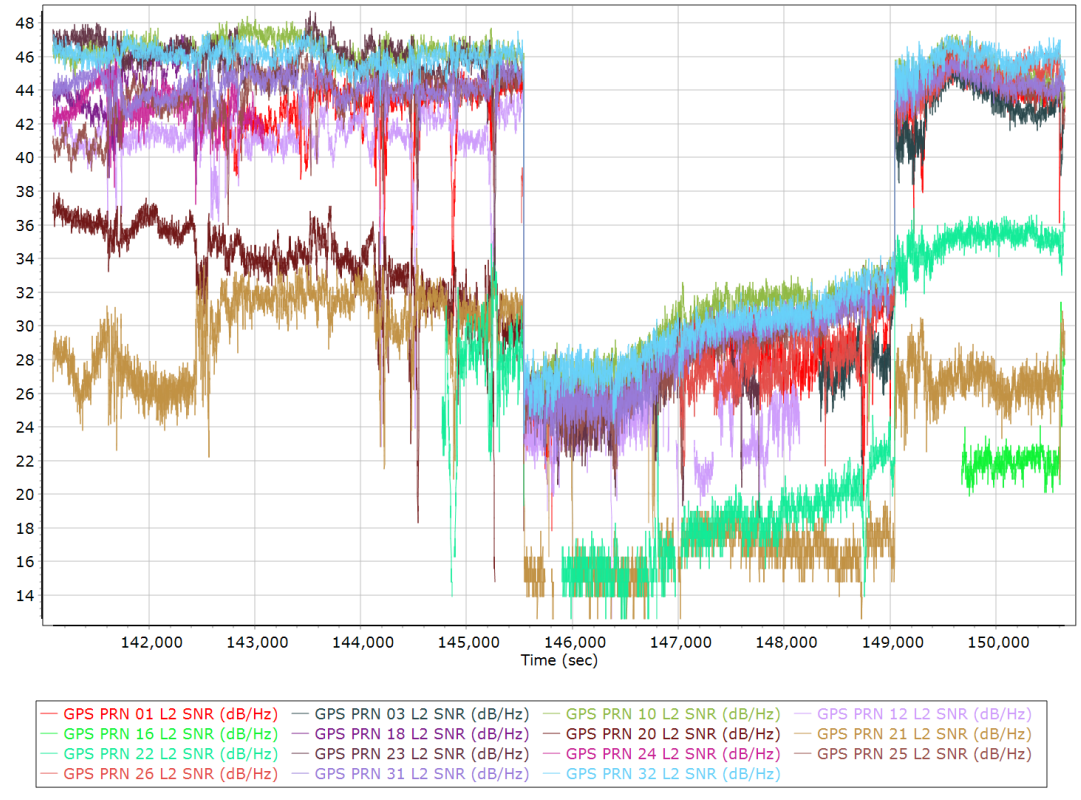


GLONASS 01 L1 SNR (dB/Hz) GLONASS 06 L1 SNR (dB/Hz) GLONASS 07 L1 SNR (dB/Hz)
GLONASS 08 L1 SNR (dB/Hz) GLONASS 09 L1 SNR (dB/Hz) GLONASS 10 L1 SNR (dB/Hz)
GLONASS 12 L1 SNR (dB/Hz) GLONASS 16 L1 SNR (dB/Hz) GLONASS 22 L1 SNR (dB/Hz)
GLONASS 23 L1 SNR (dB/Hz) GLONASS 24 L1 SNR (dB/Hz)

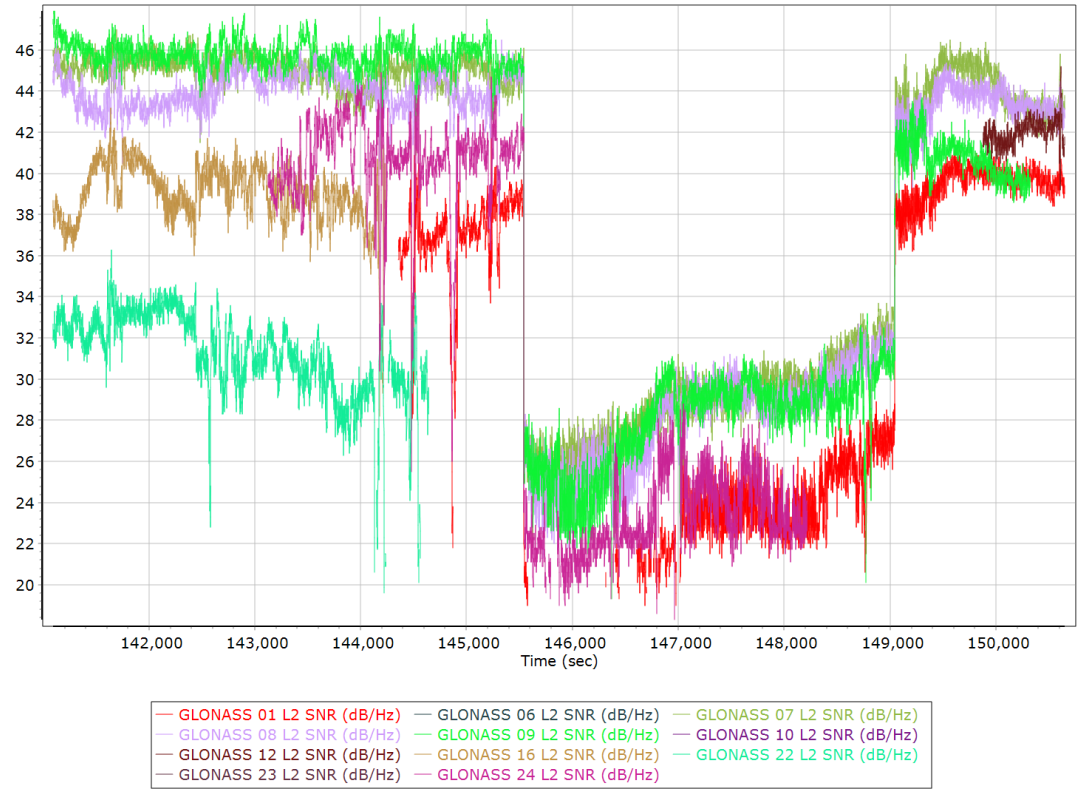
GPS/GLONASS L2 Satellite Lock/Elevation



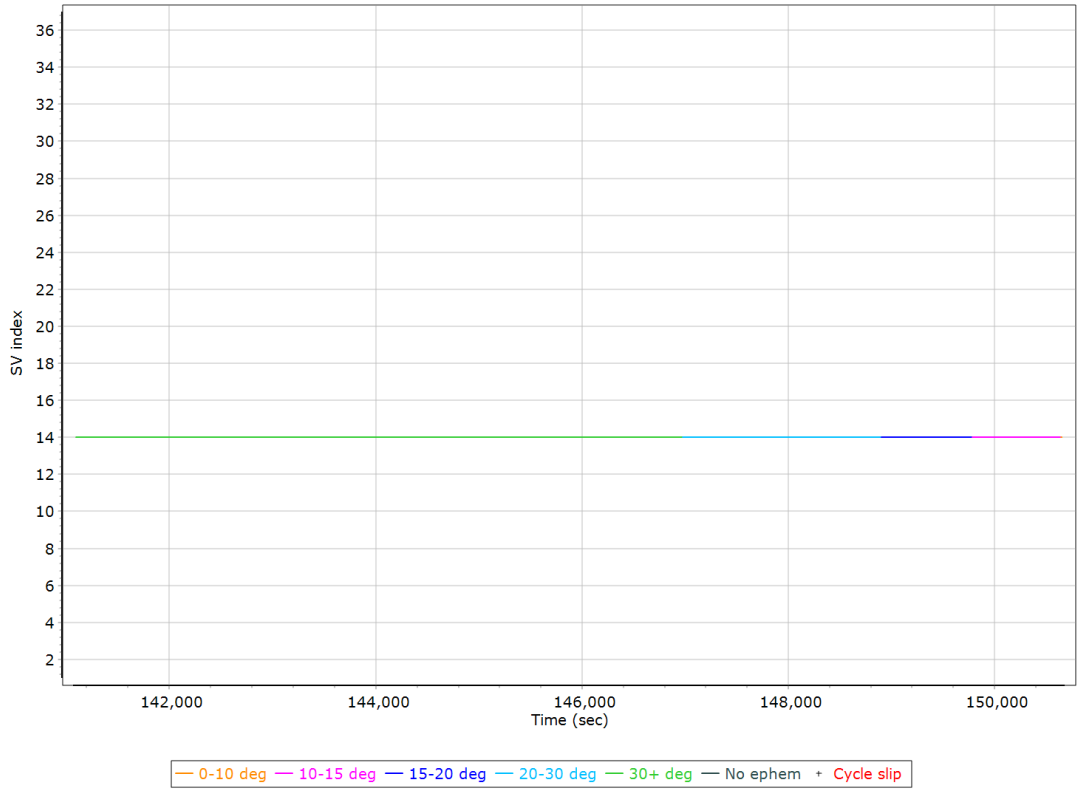
GPS L2 SNR



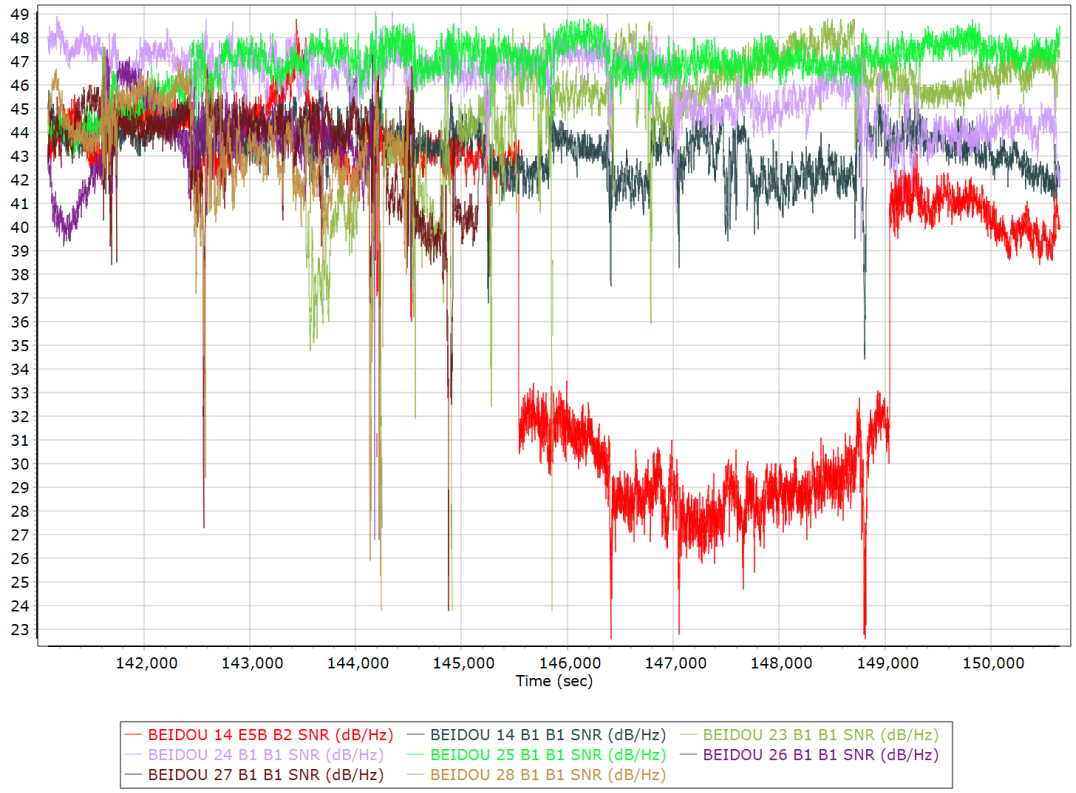
GLONASS L2 SNR



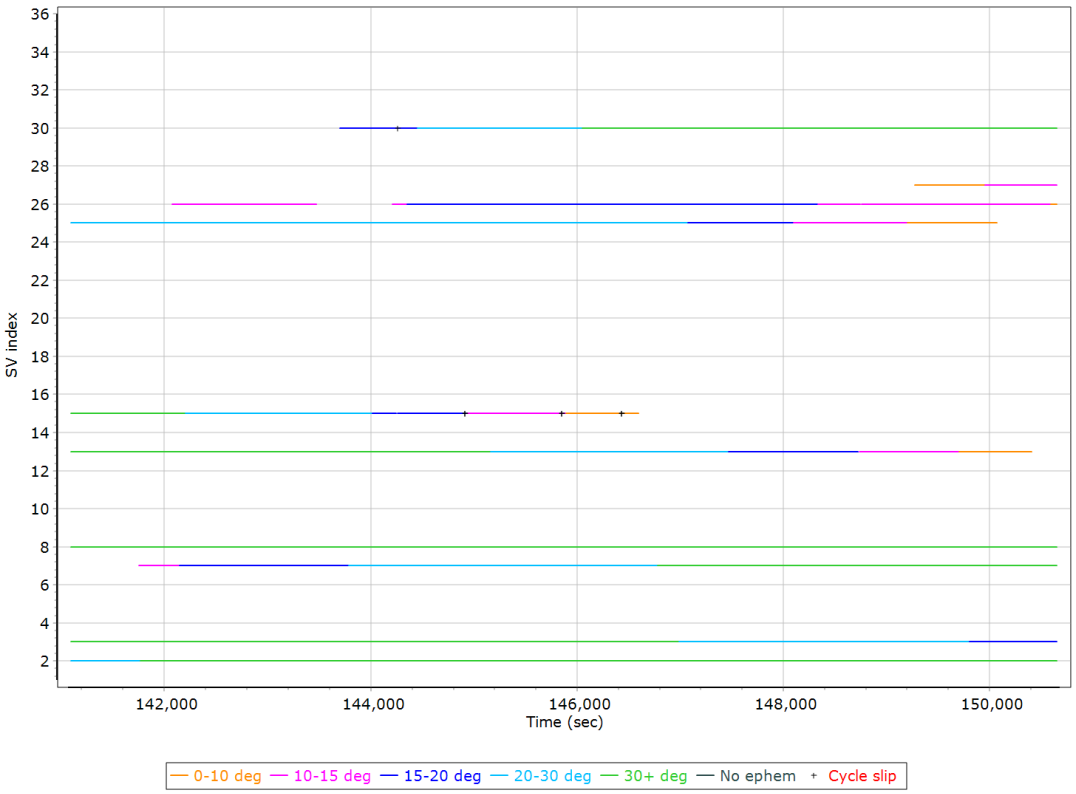
BEIDOU Satellite Lock/Elevation



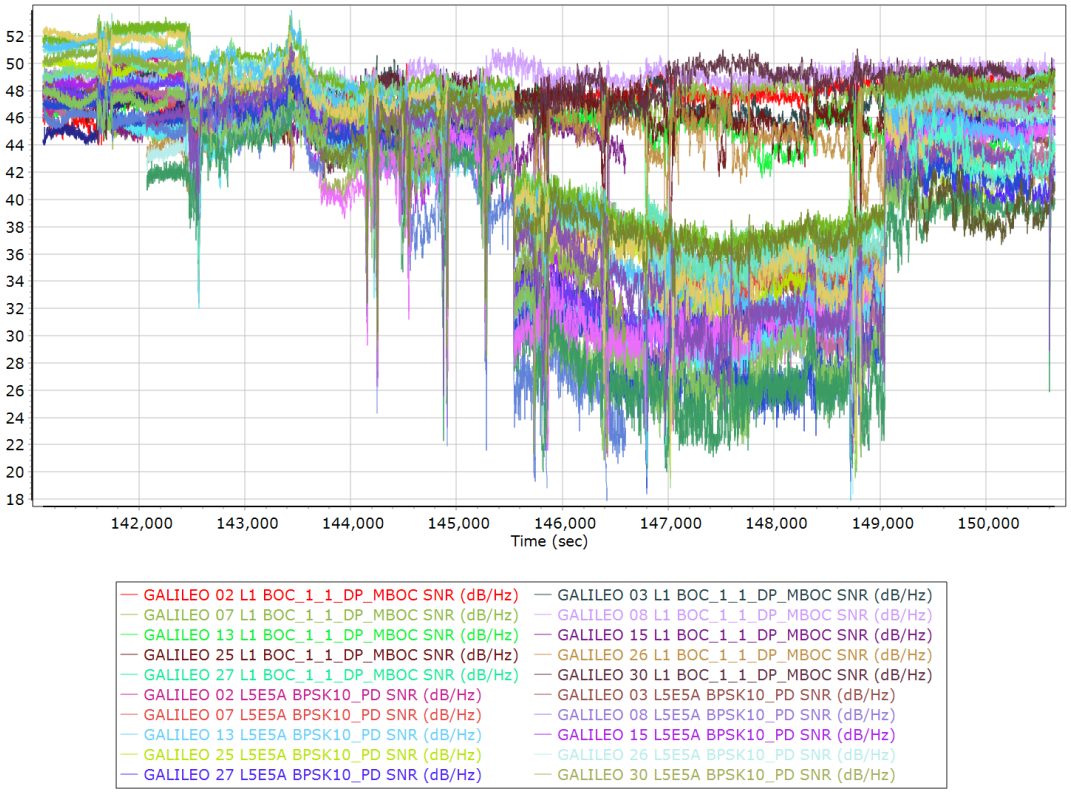
BEIDOU SNR



GALILEO Satellite Lock/Elevation

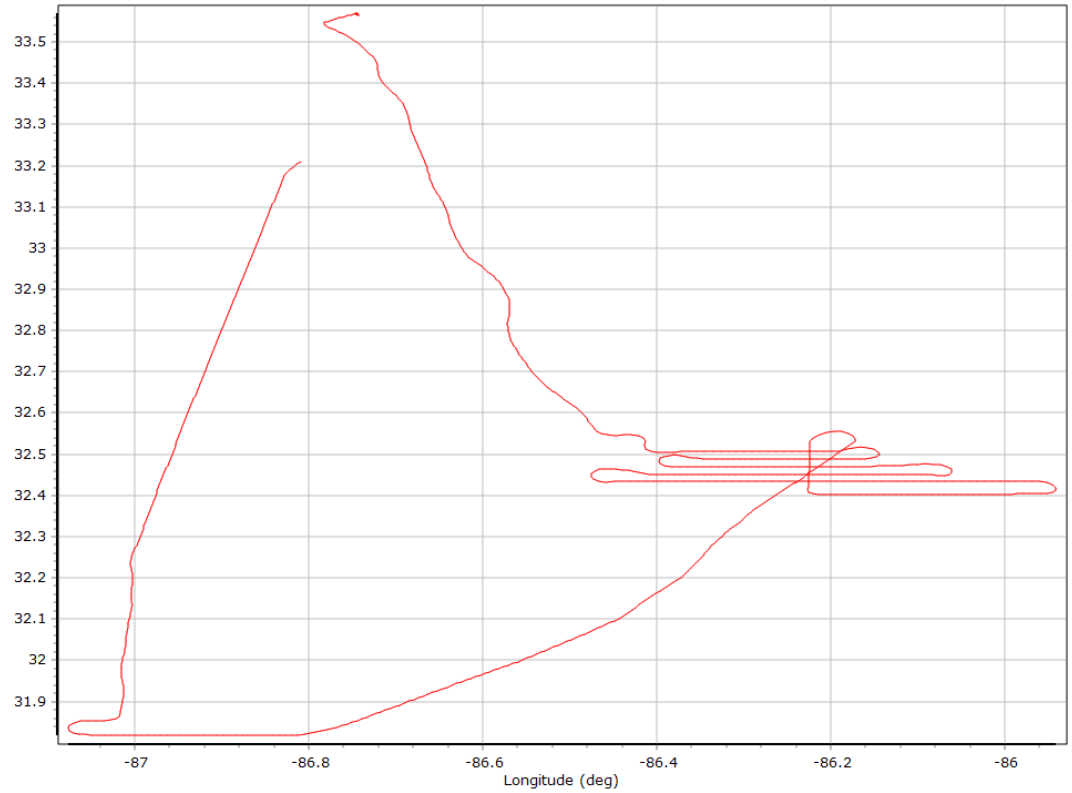


GALILEO SNR

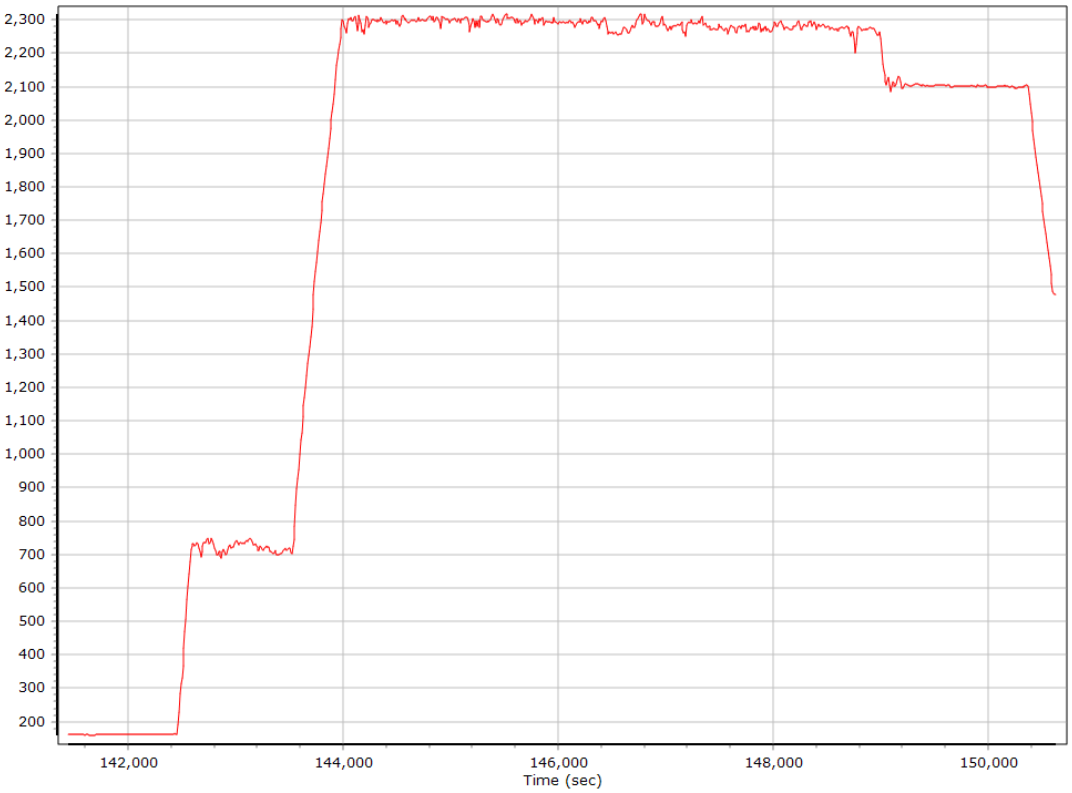

52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
142,000
143,000
144,000
145,000
146,000
147,000
148,000
149,000
150,000
Time (sec)
GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 07 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 13 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 15 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 25 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 26 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 27 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 30 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
GALILEO 02 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 03 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 08 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 25 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 26 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 27 L5E5A BPSK10_PD SNR (dB/Hz)
GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz)

Smoothed Trajectory Information

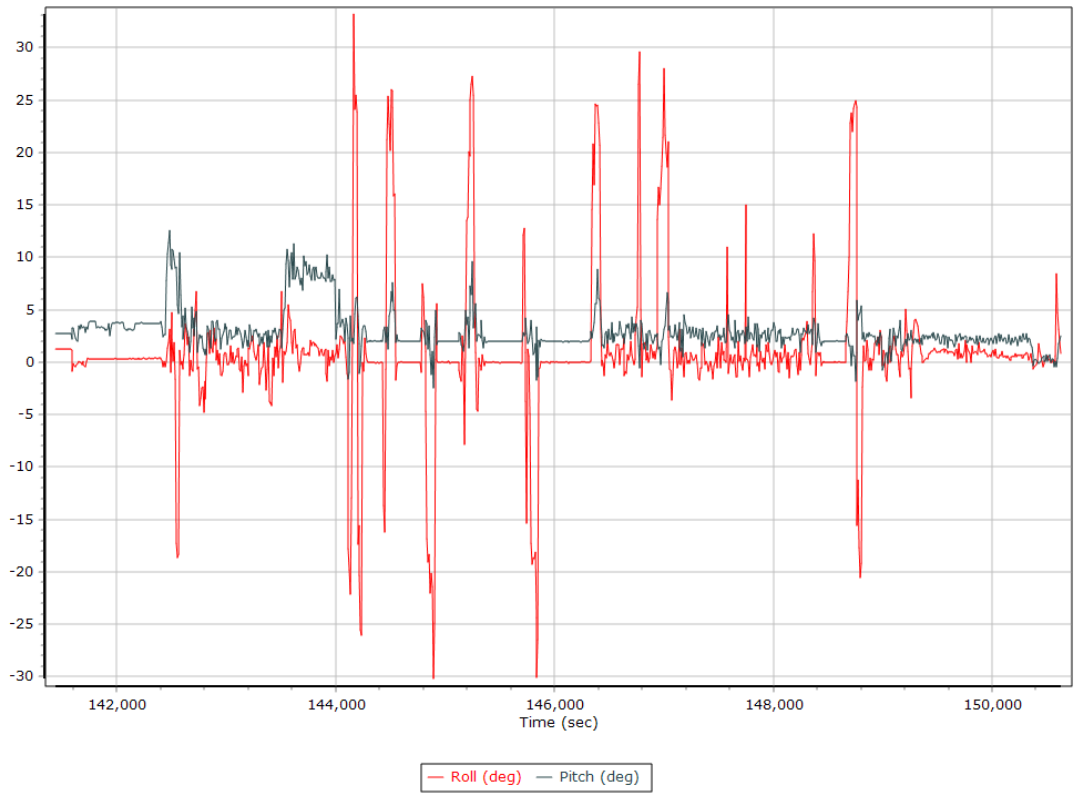
Top View



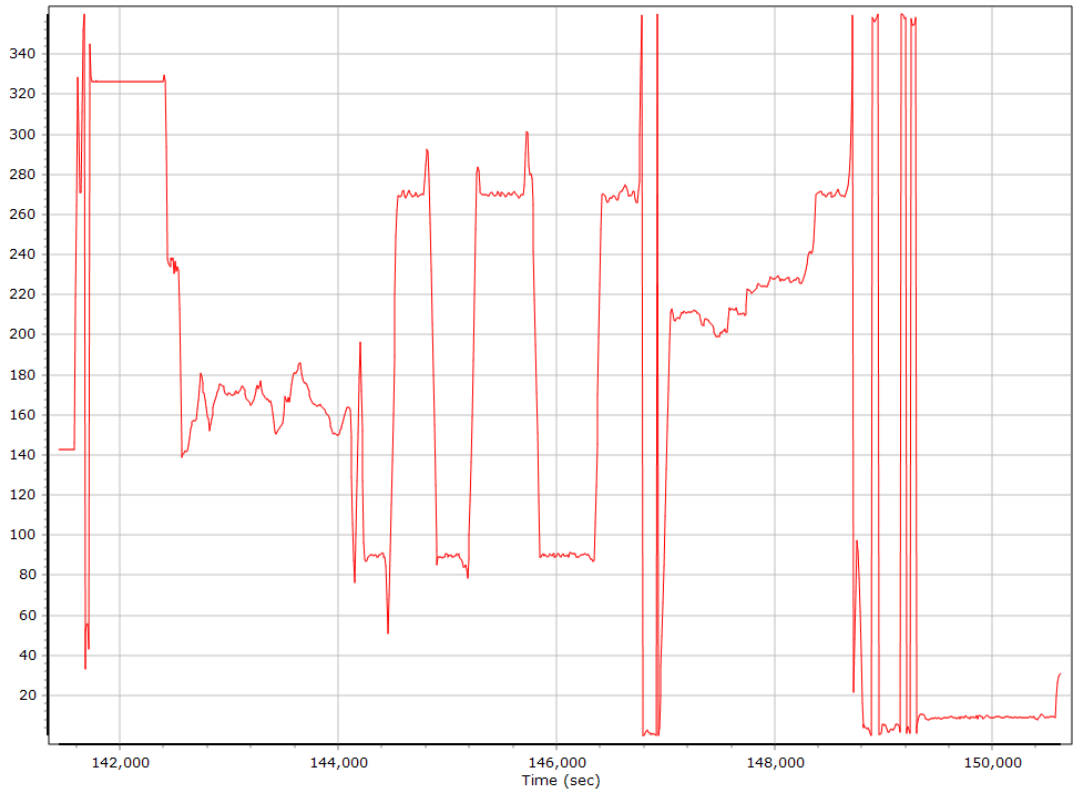
Altitude



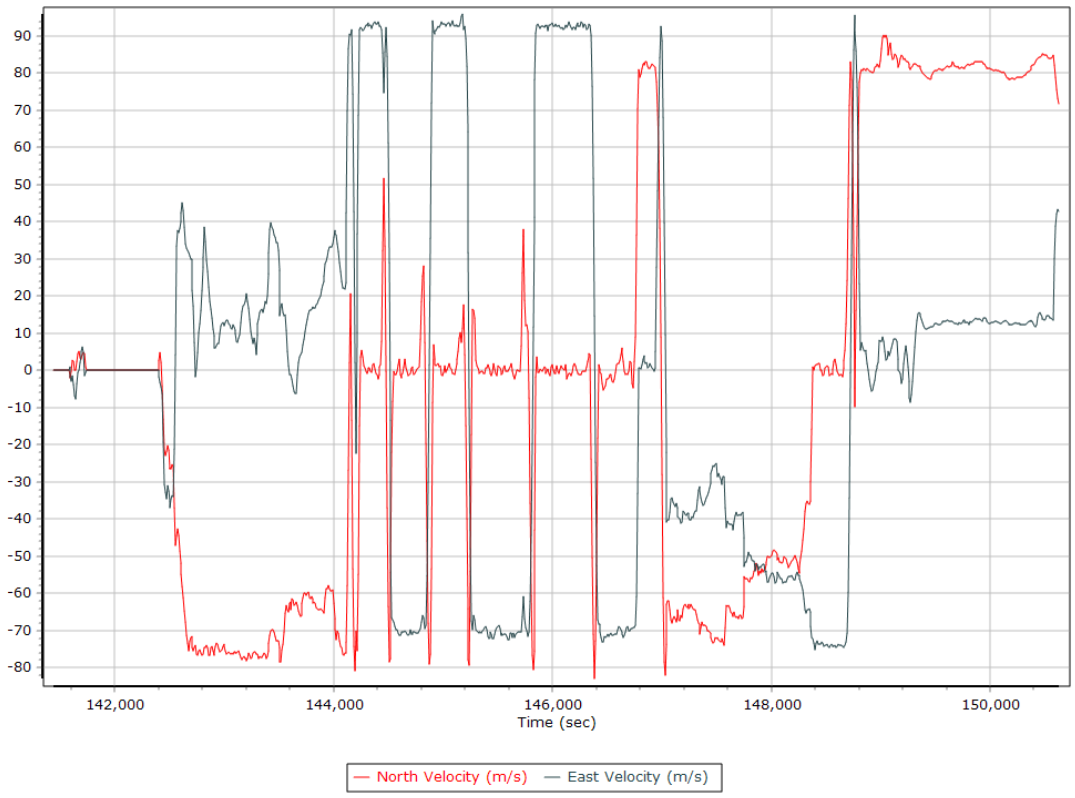
Roll/Pitch



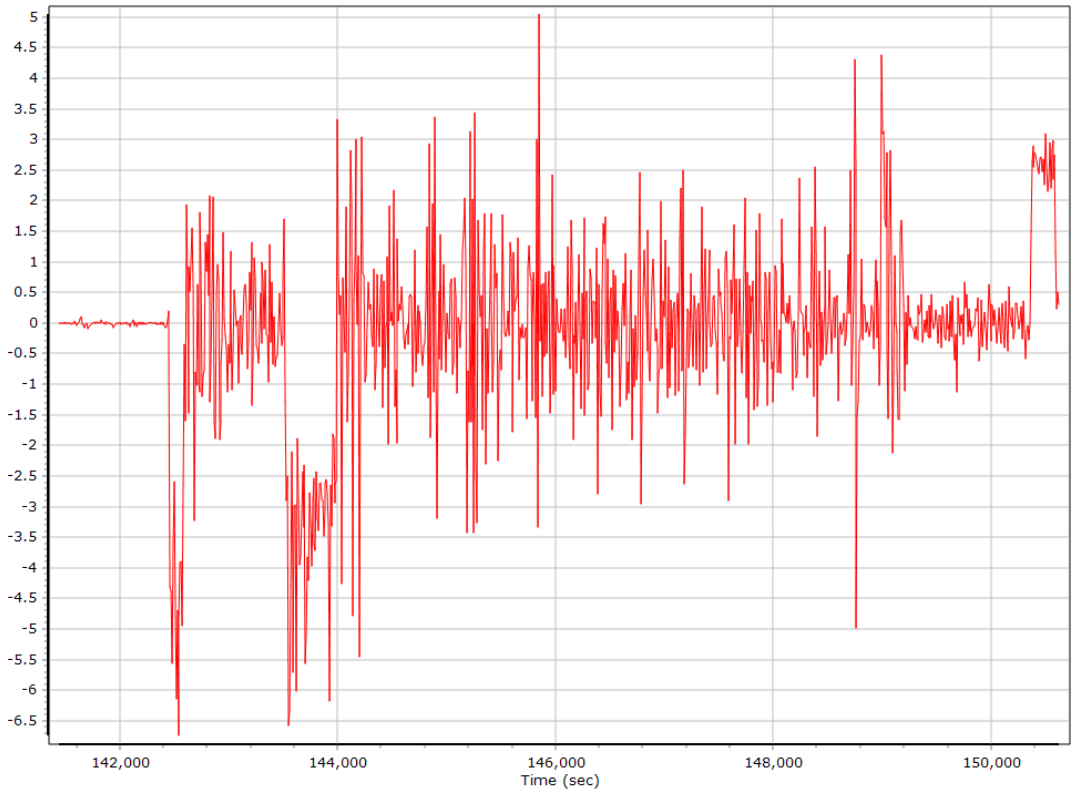
Heading



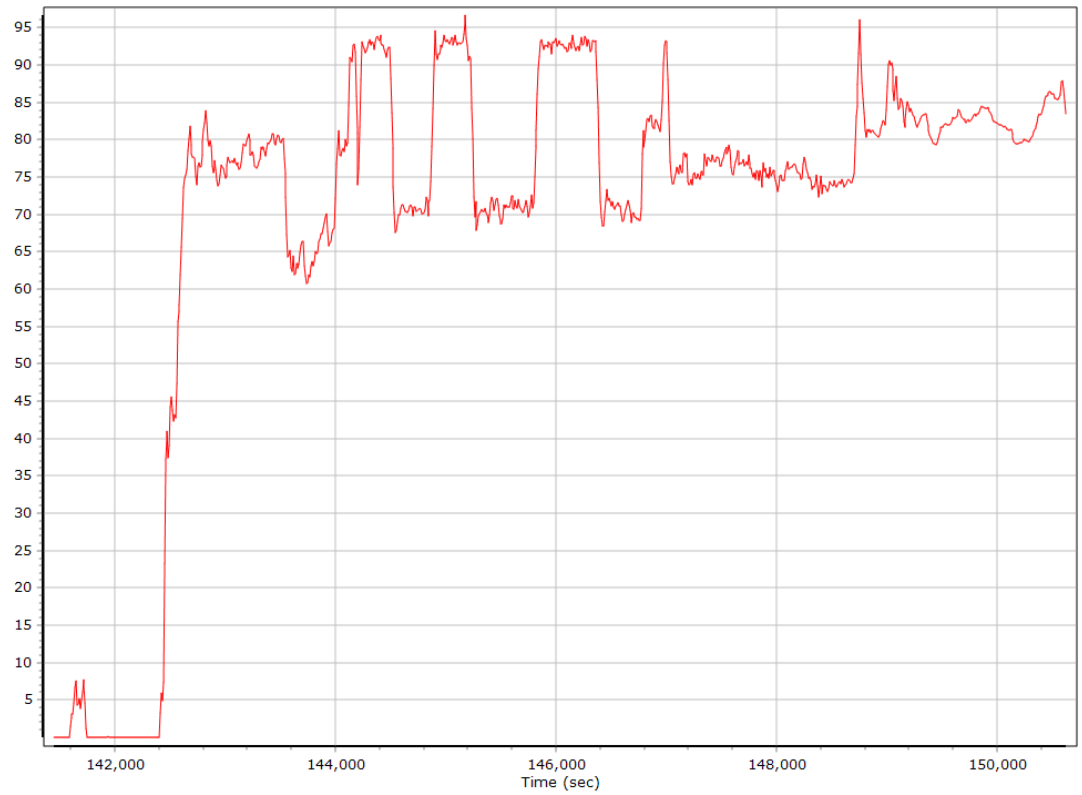
North/East Velocity



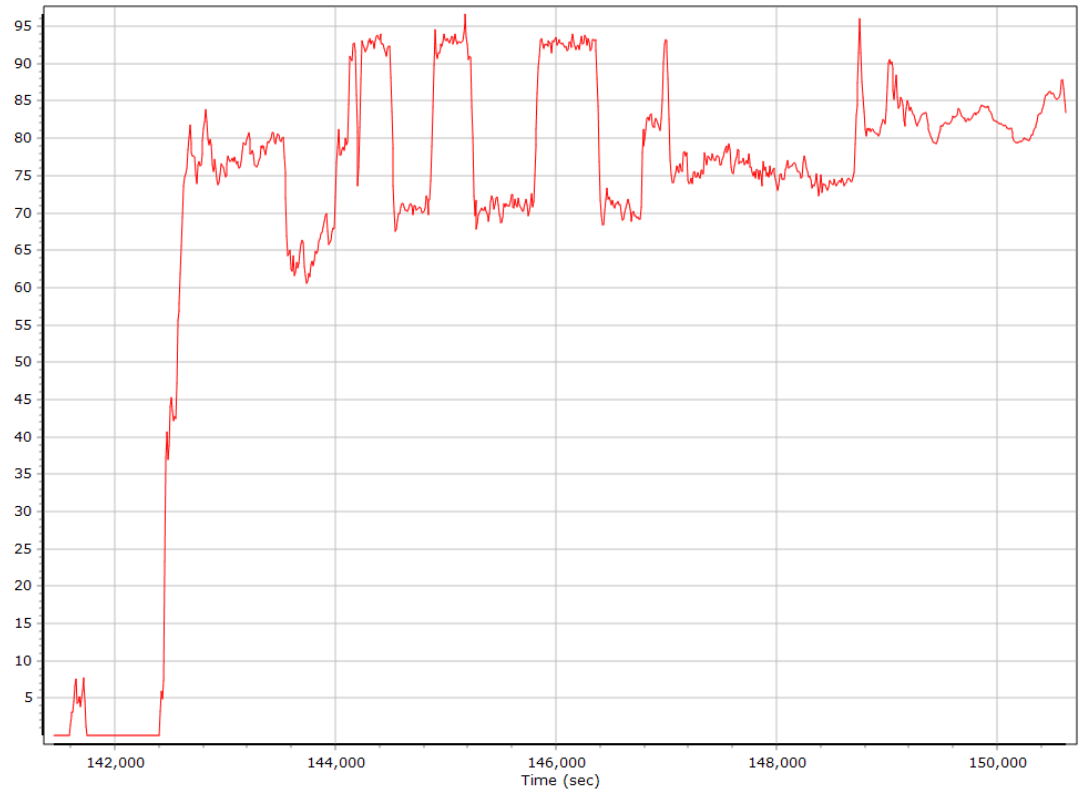
Down Velocity



Total Speed



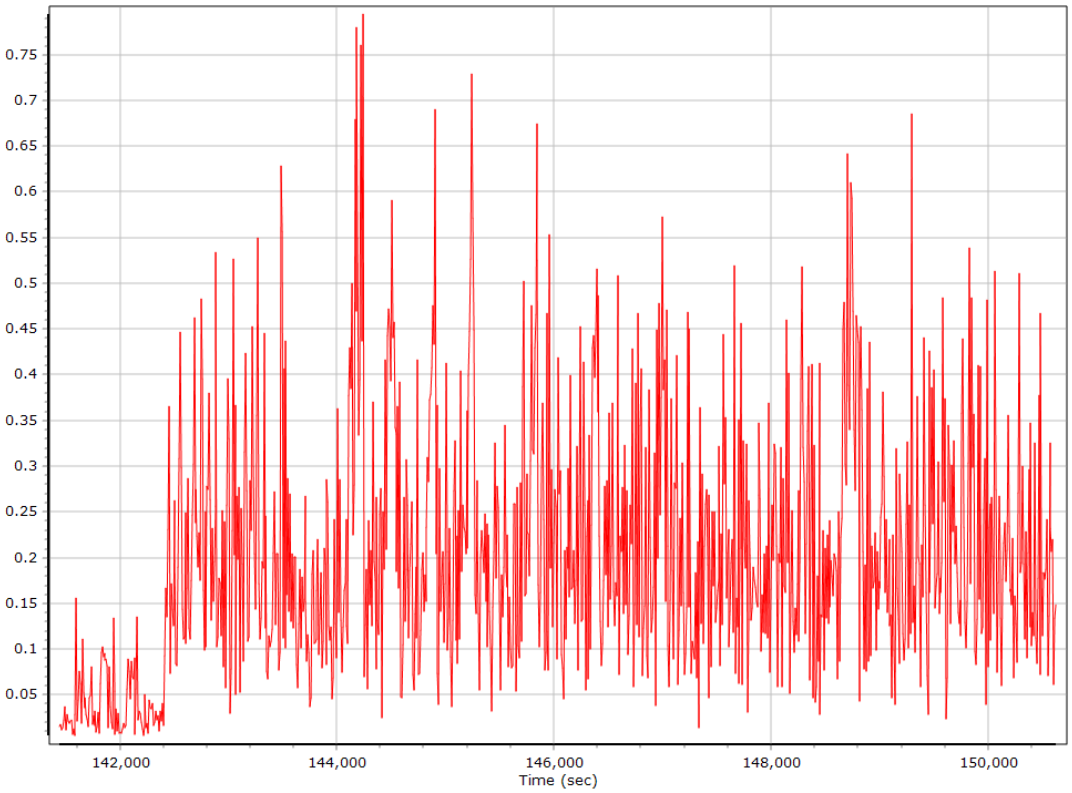
Ground Speed



Body Acceleration



Total Body Acceleration

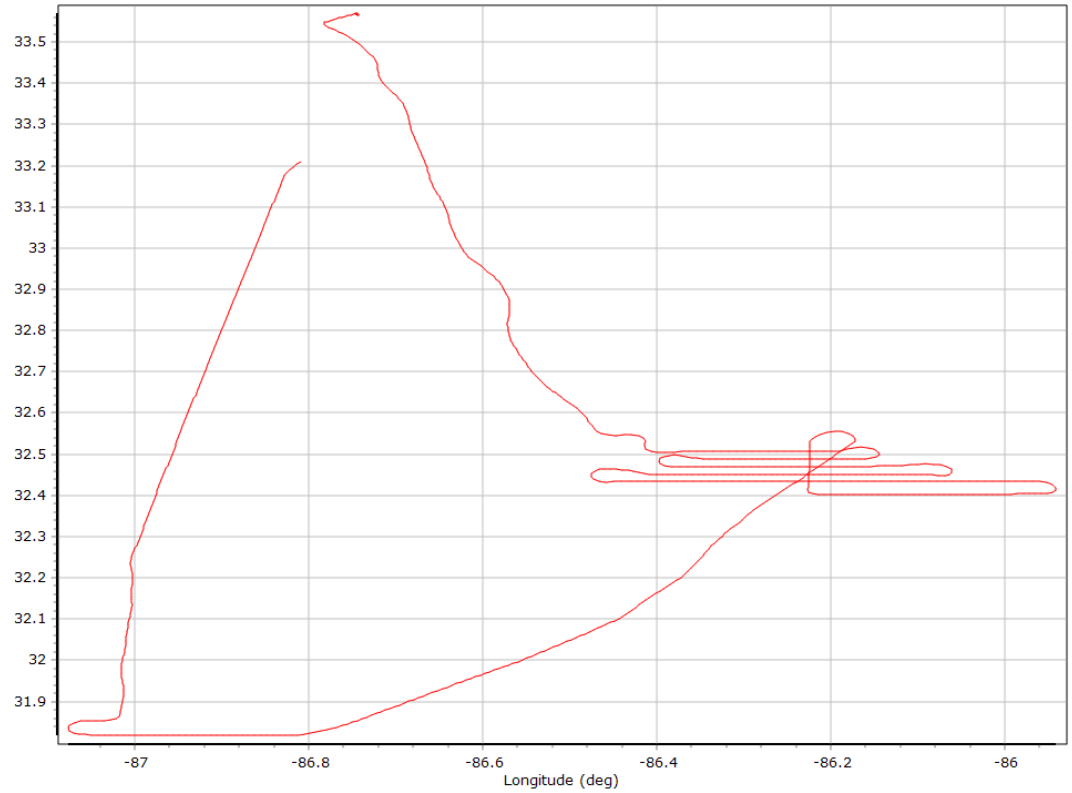


Body Angular Rate

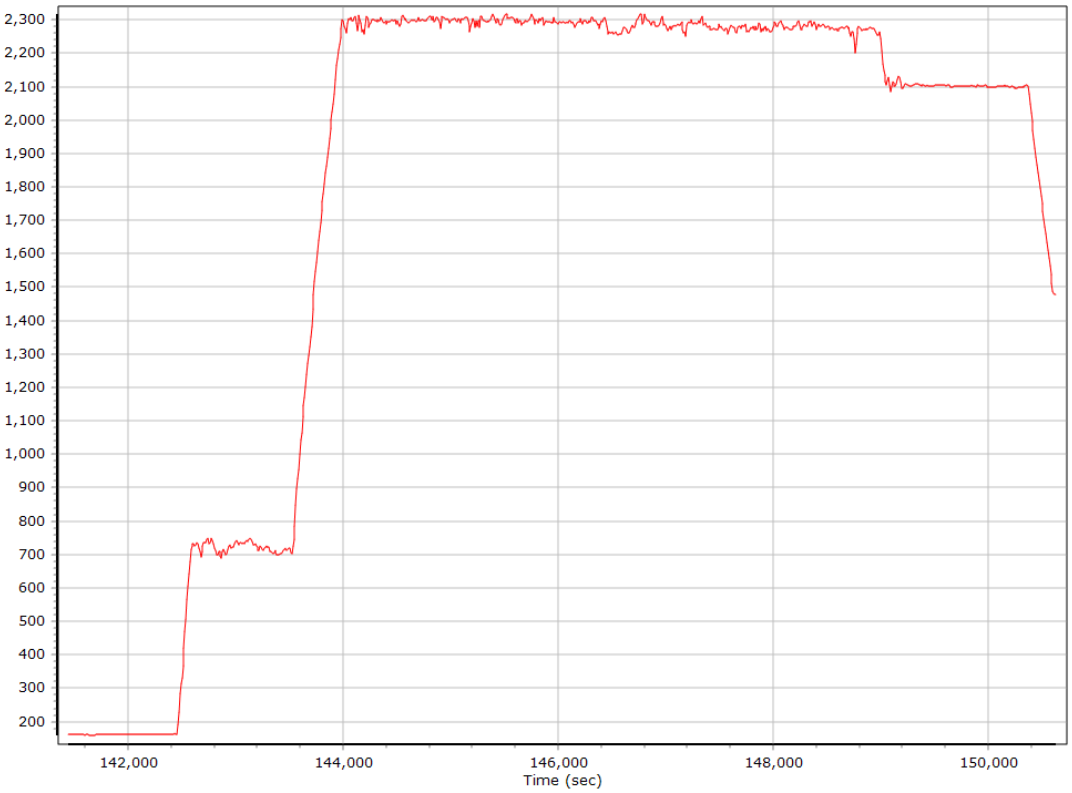


Forward Processed Trajectory Information

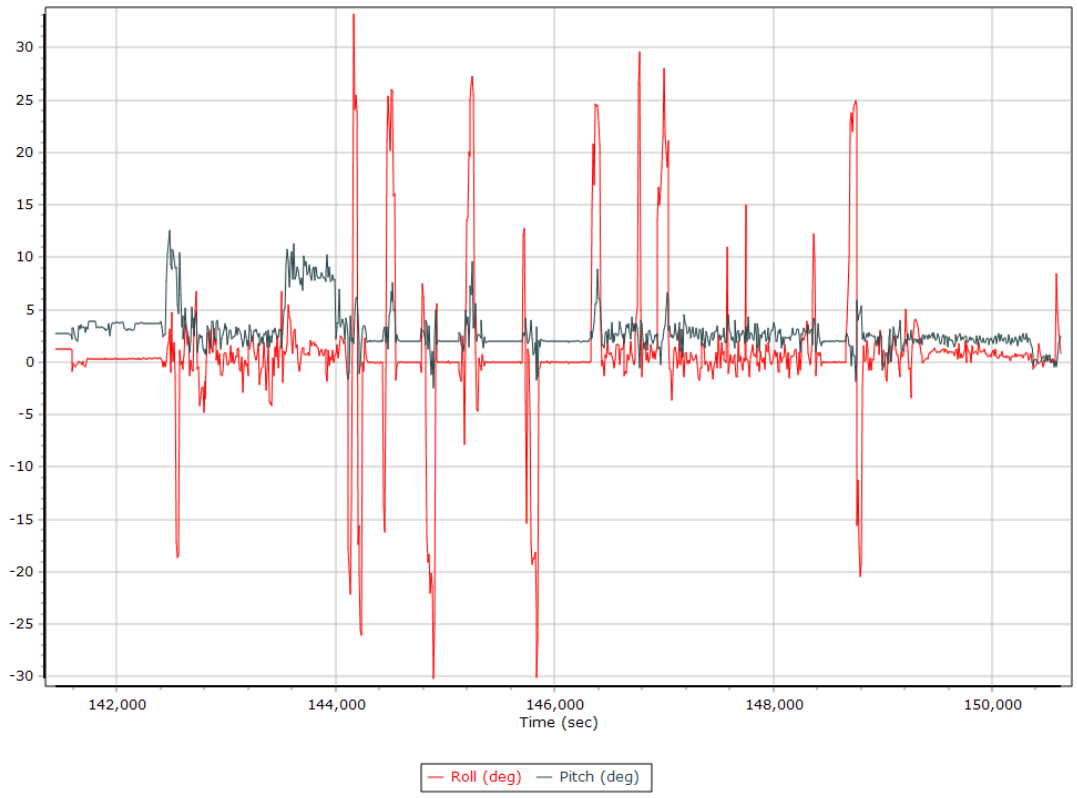
Top View



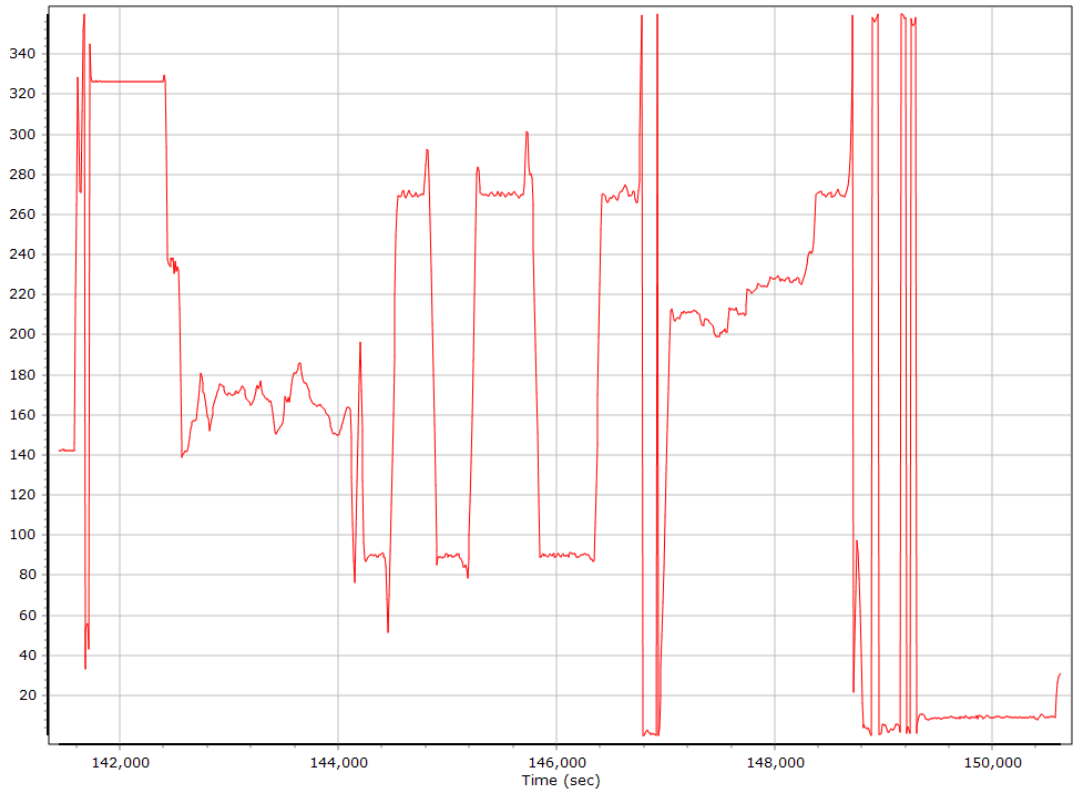
Altitude



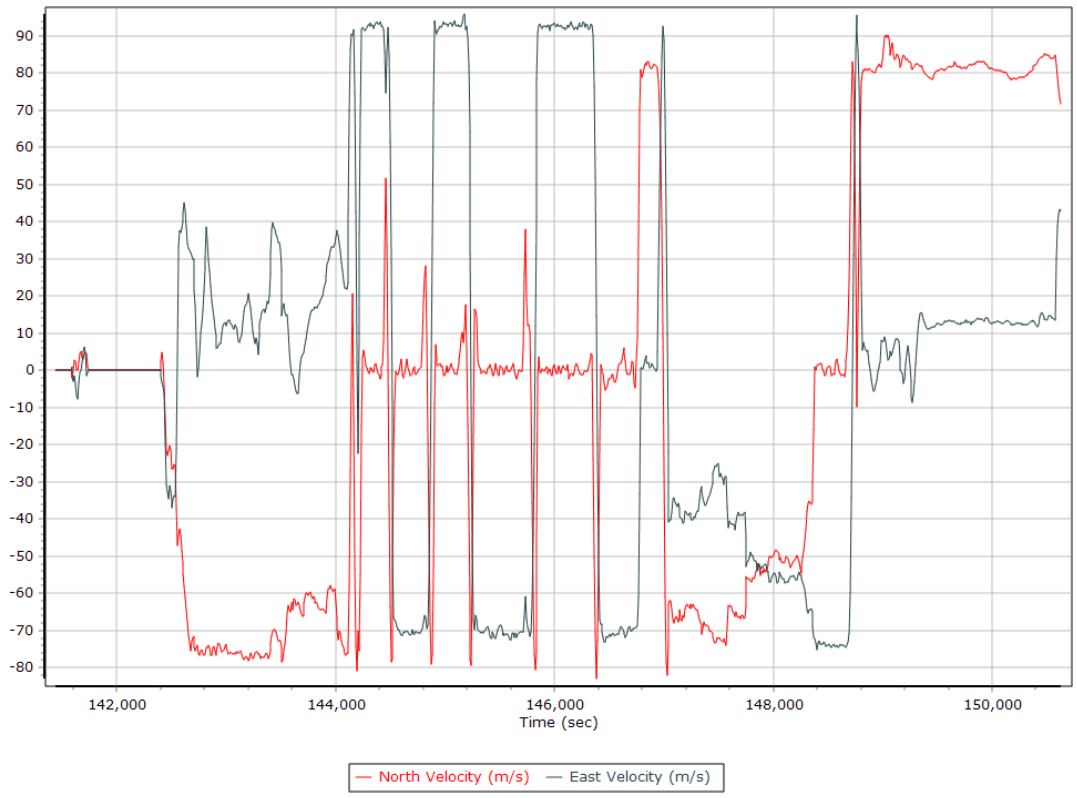
Roll/Pitch



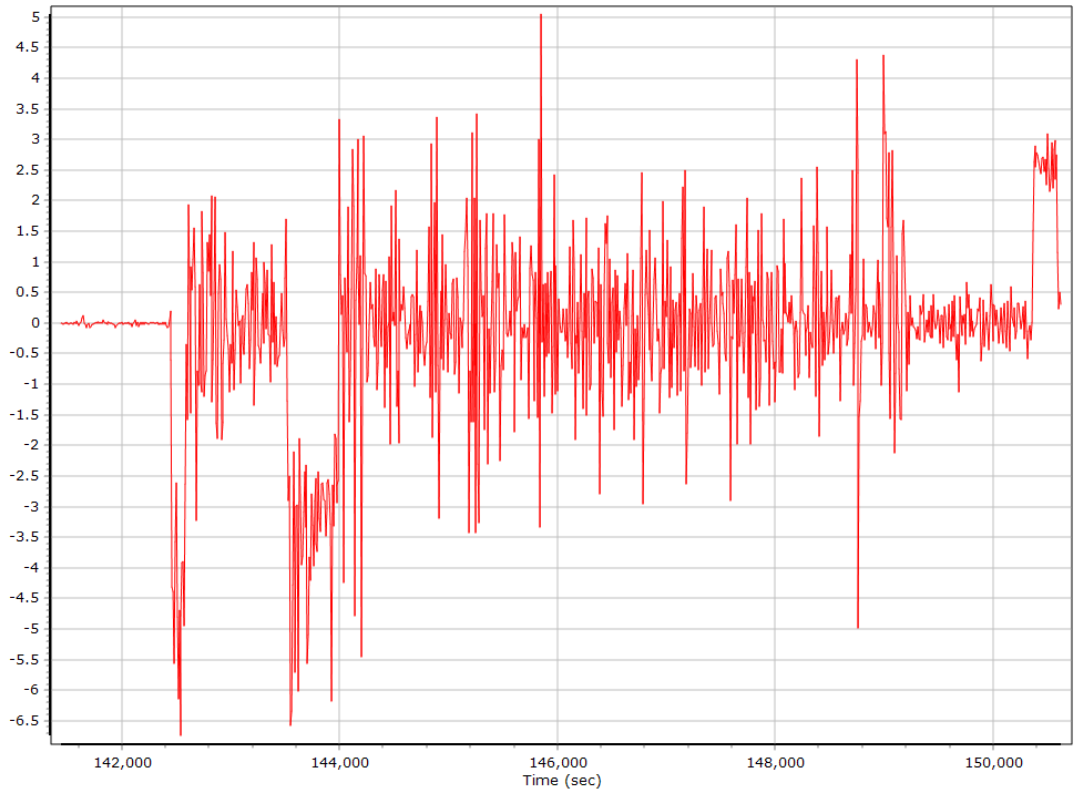
Heading



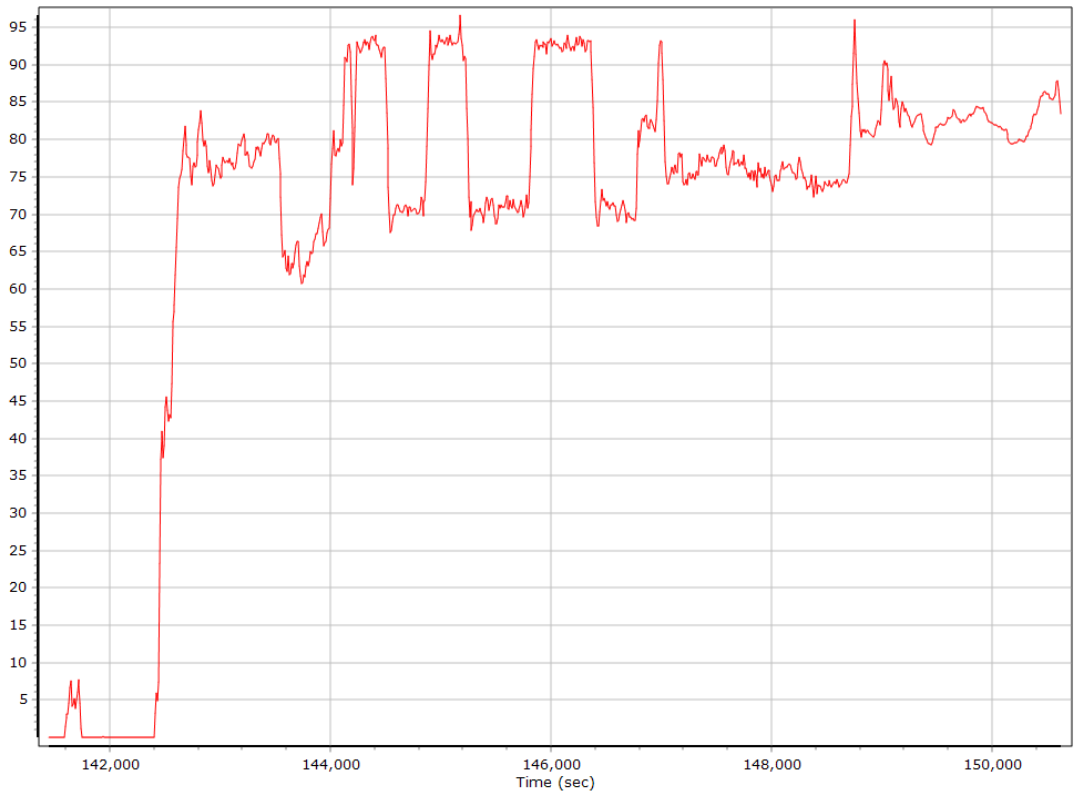
North/East Velocity



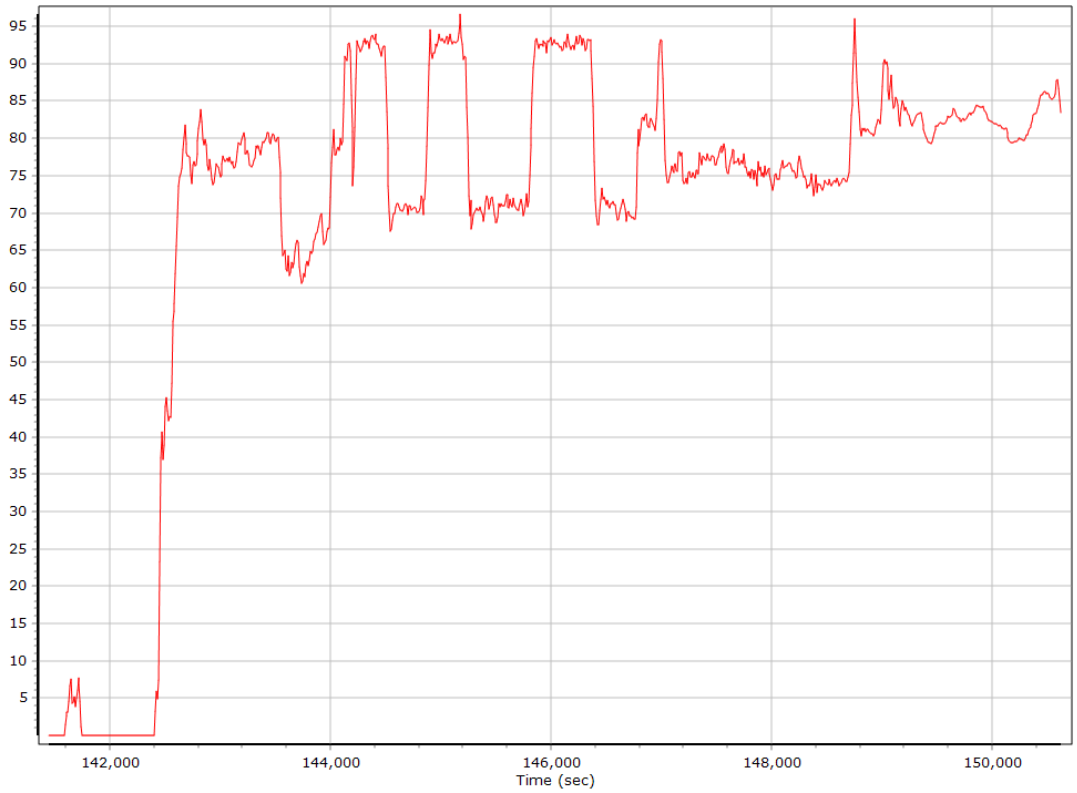
Down Velocity



Total Speed



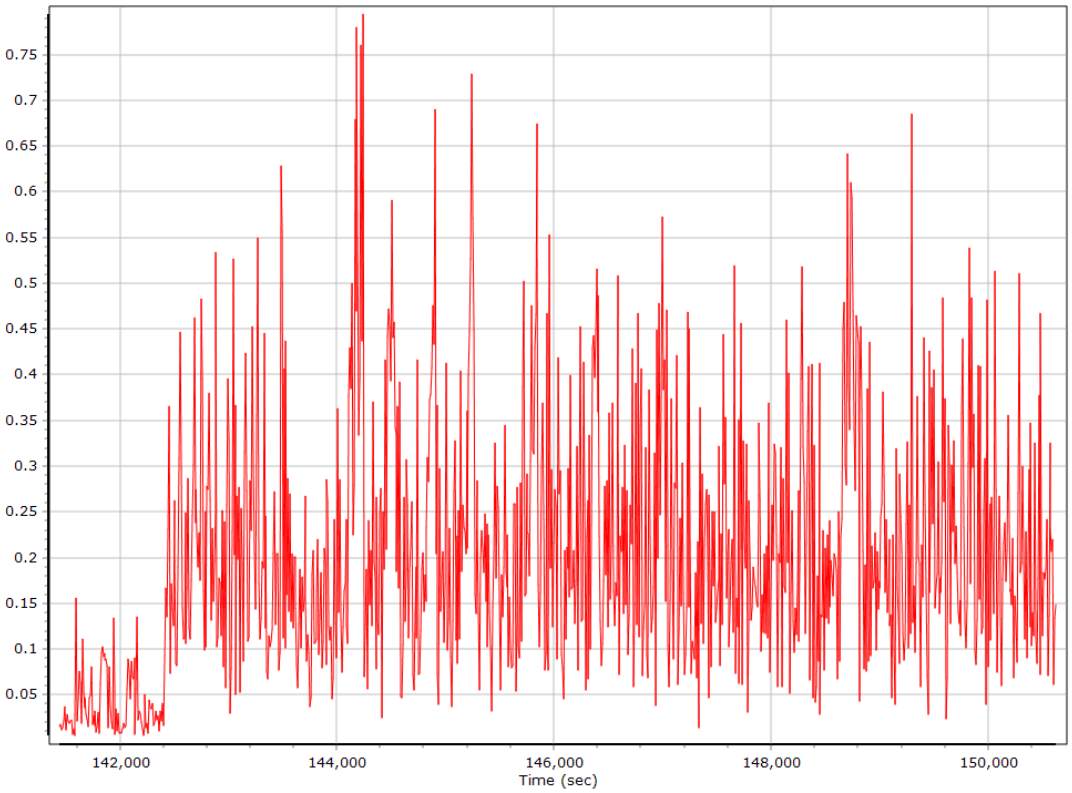
Ground Speed



Body Acceleration



Total Body Acceleration



Body Angular Rate

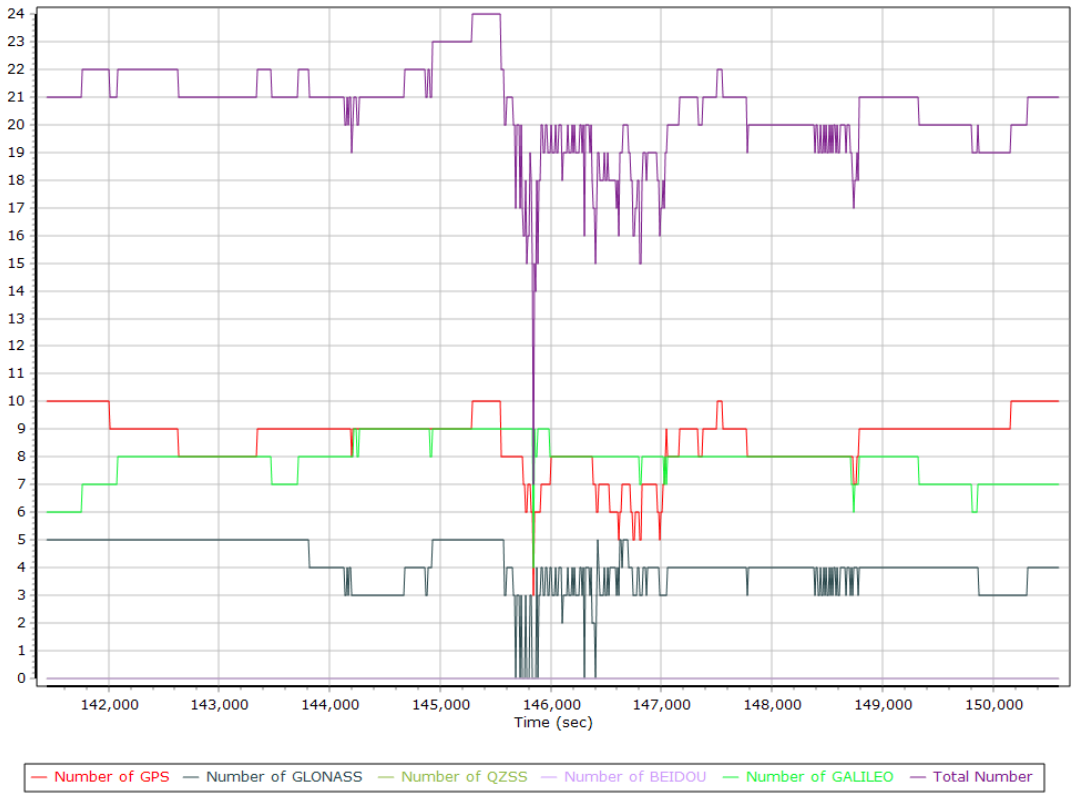


GNSS QC

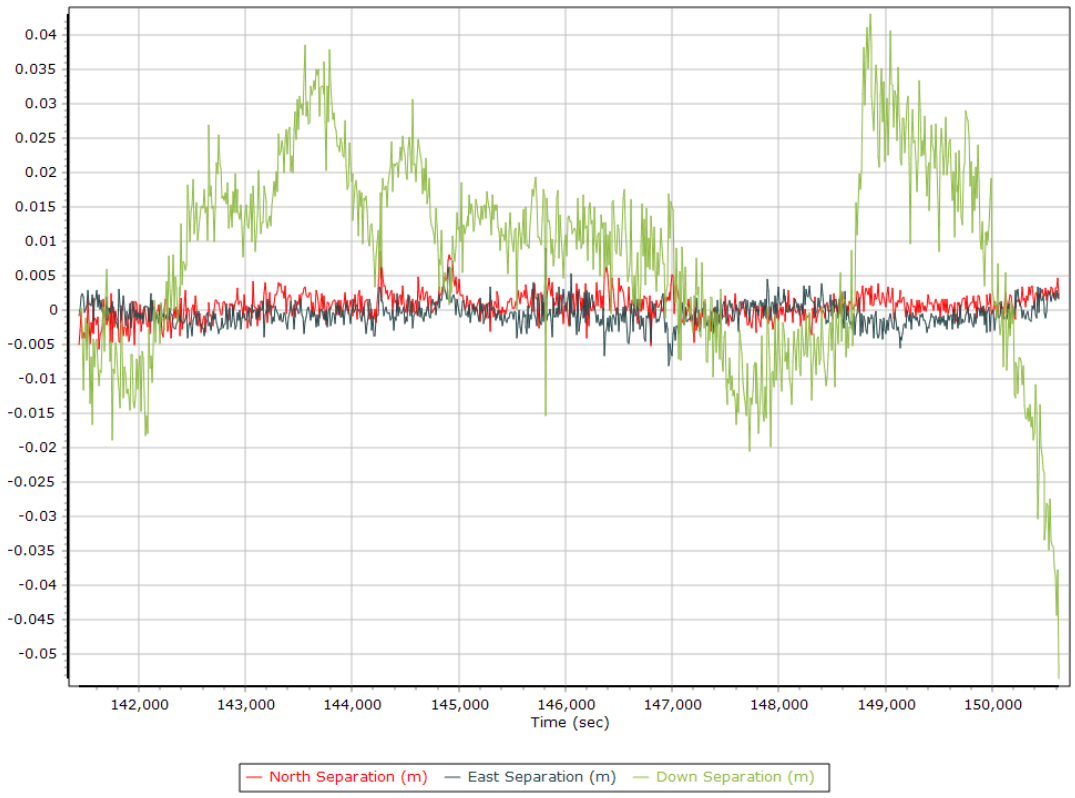
GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	0.00	0.00	
Number of GPS SV	3	10	9
Number of GLONASS SV	0	5	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	4	9	8
Total number of SV	7	24	21
PDOP	1.10	4.00	1.24
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	9495.00	0.00	0.00
Percentage	100.00	0.00	0.00

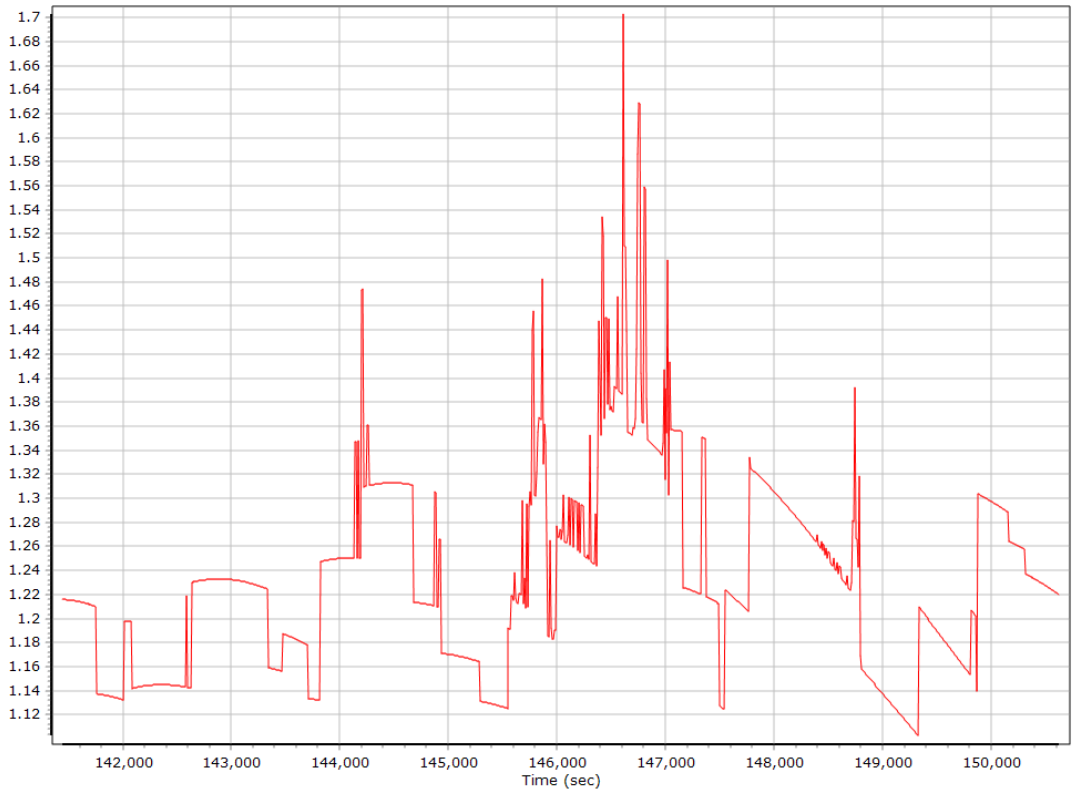
Num SVs in solution



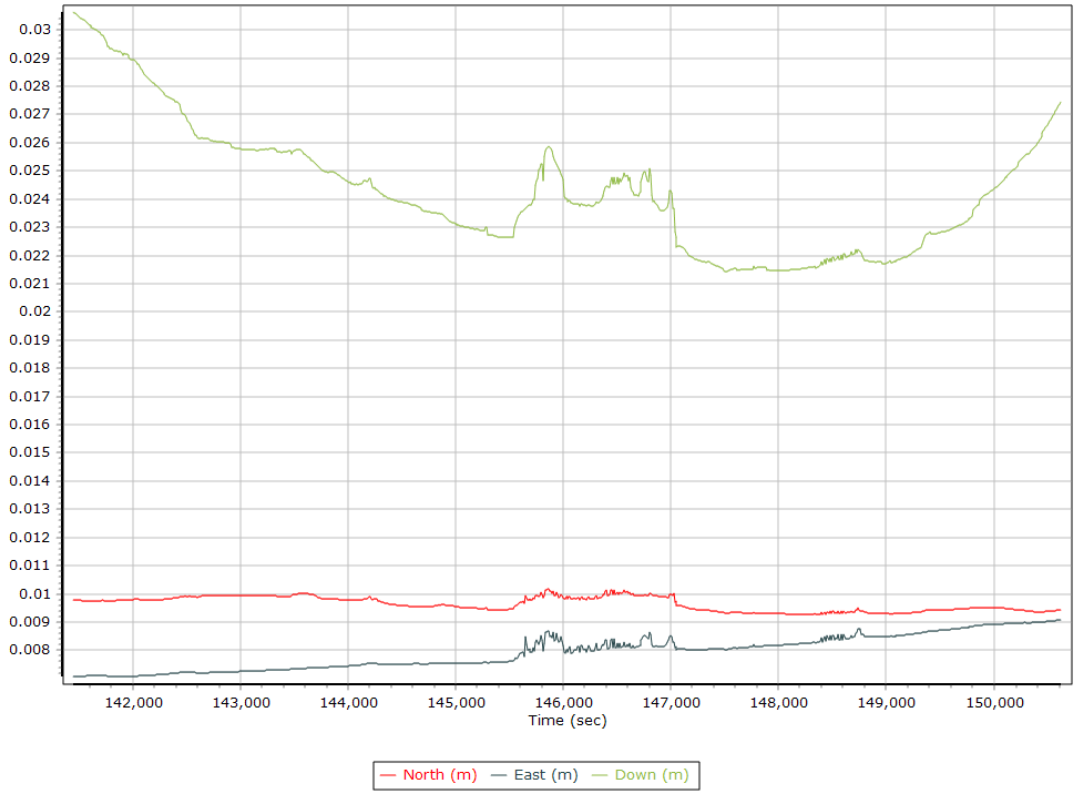
Forward/Reverse Separation



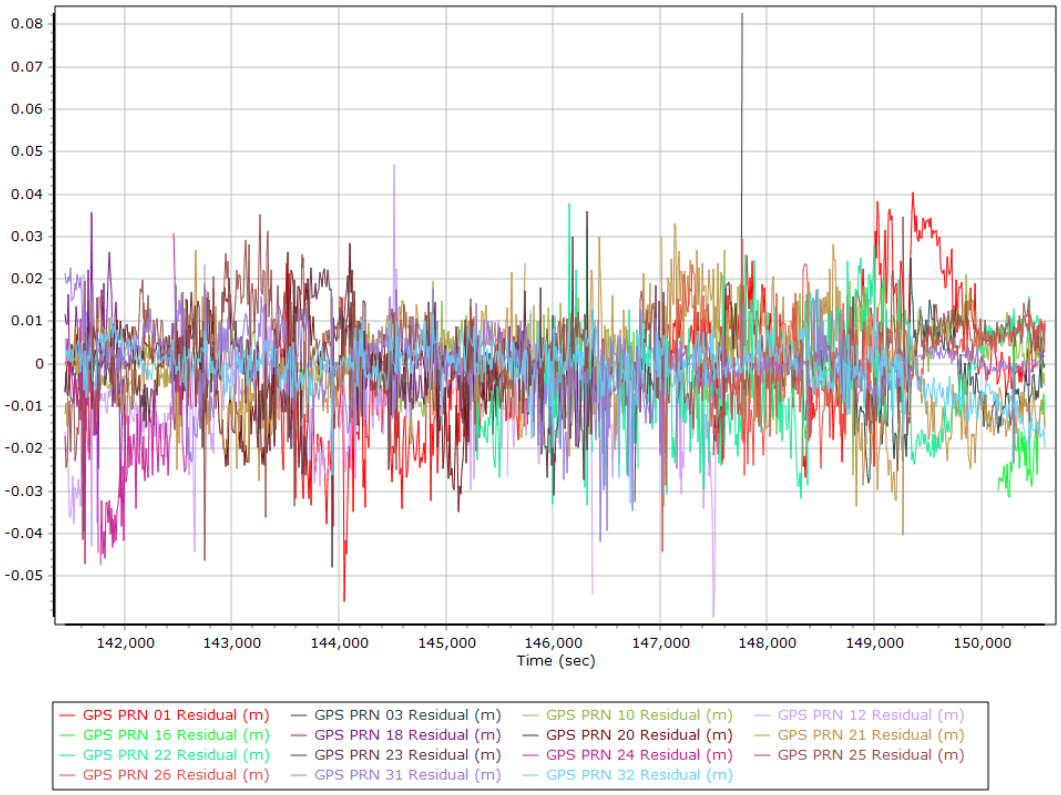
PDOP



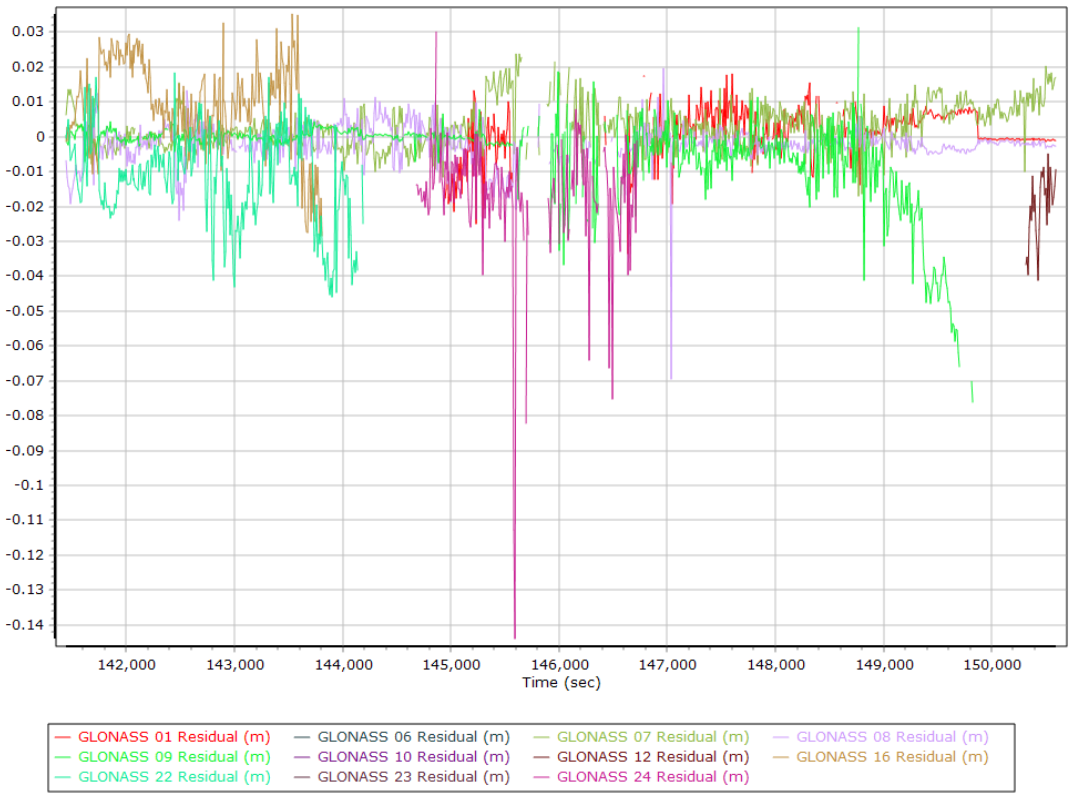
Estimated Position Accuracy



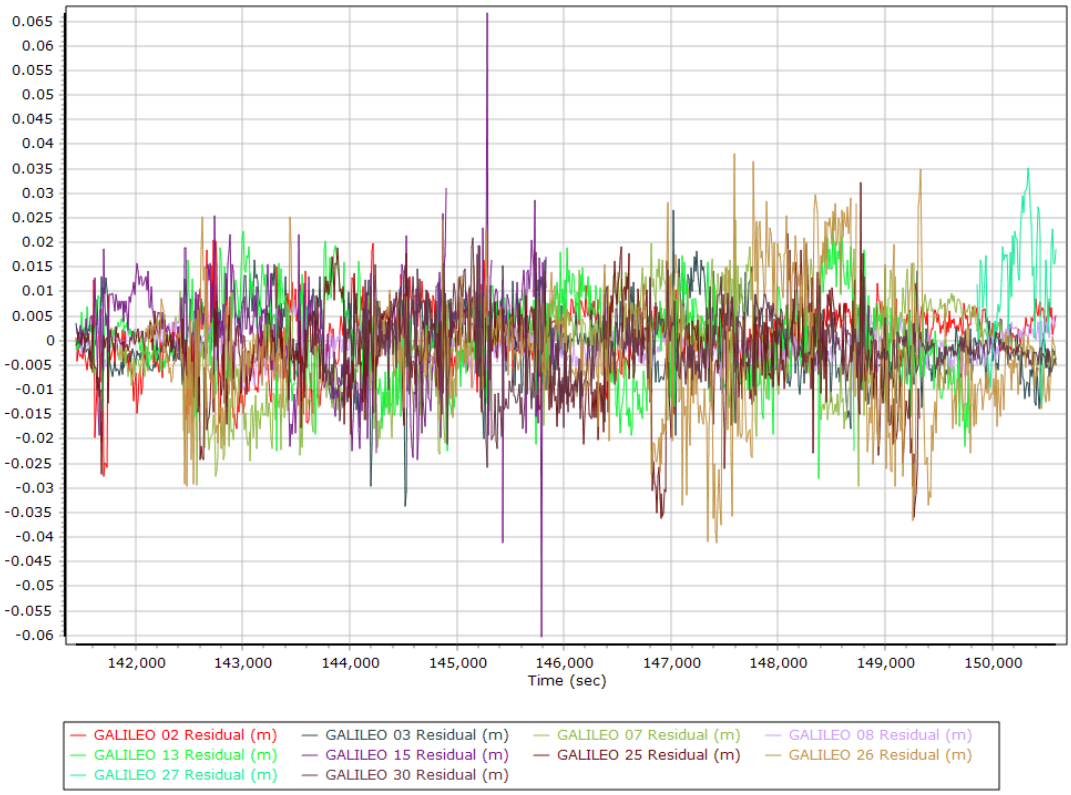
GPS Residuals



GLONASS Residuals



GALILEO Residuals



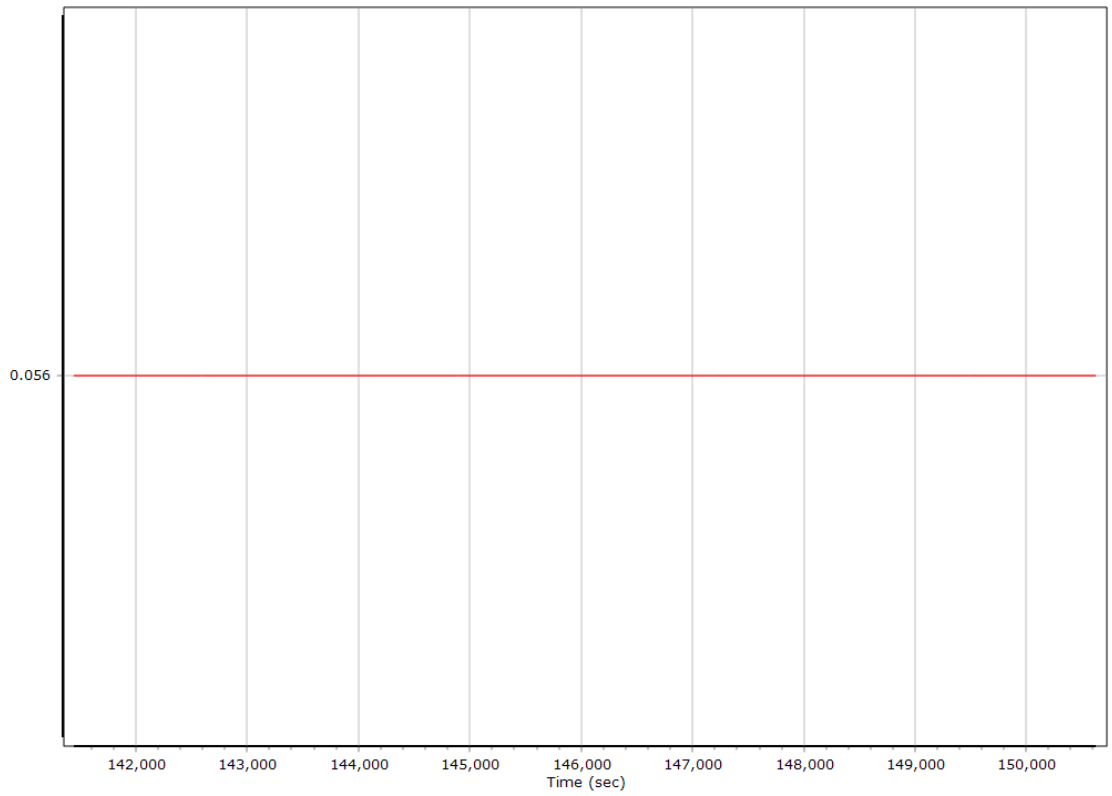
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion PP-RTX		
Stabilized mount	True		
Processing start time	141078.000 (12/28/2020 3:11:18 PM)		
Processing end time	150631.000 (12/28/2020 5:50:31 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Gimbal to IMU lever arm (m)	0.000	0.000	0.000
Gimbal to IMU mounting angles (deg)	0.000	0.000	0.000
Gimbal to Primary GNSS lever arm (m)	0.056	0.060	-1.292
Gimbal to Primary GNSS lever arm std dev (m)	0.030	0.030	0.030
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

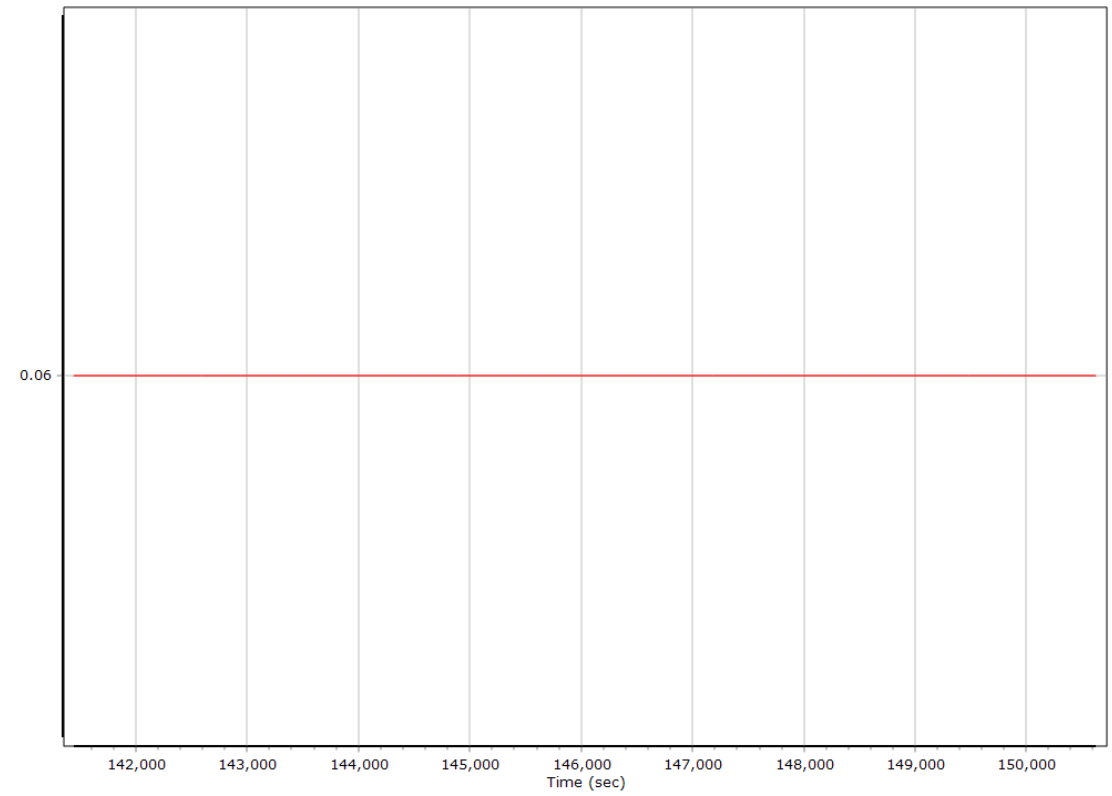
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

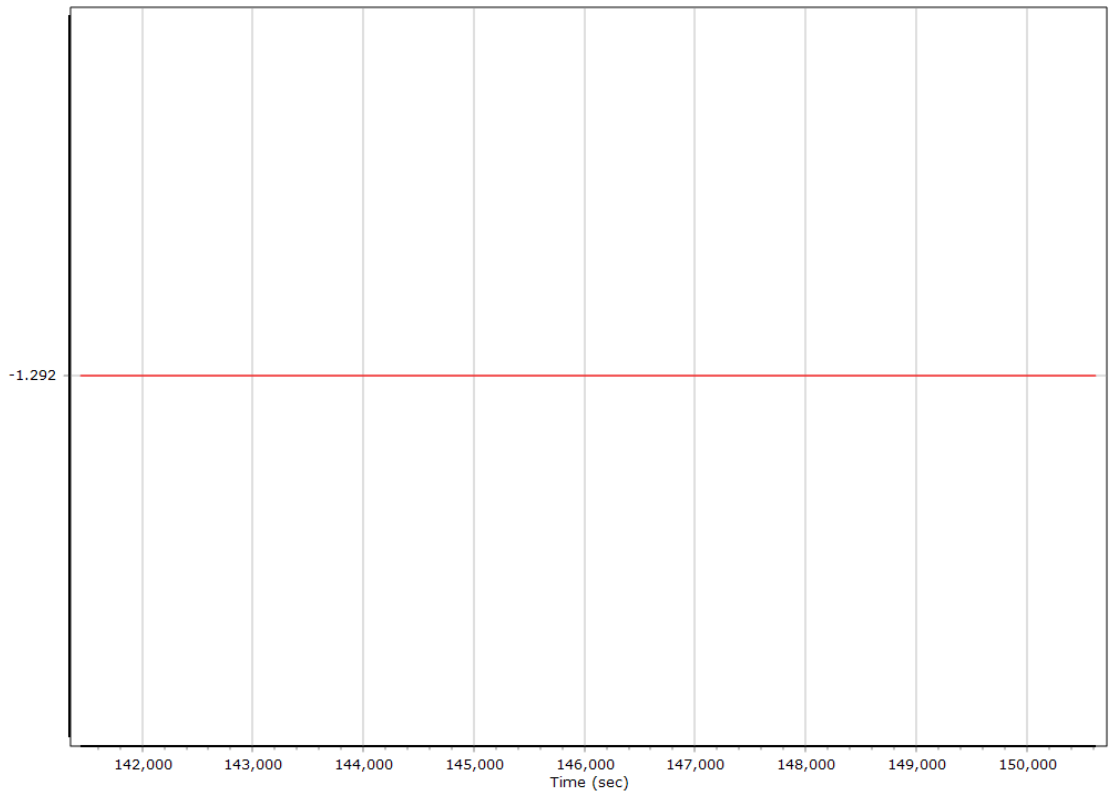
X Reference-Primary GNSS Lever Arm (m)



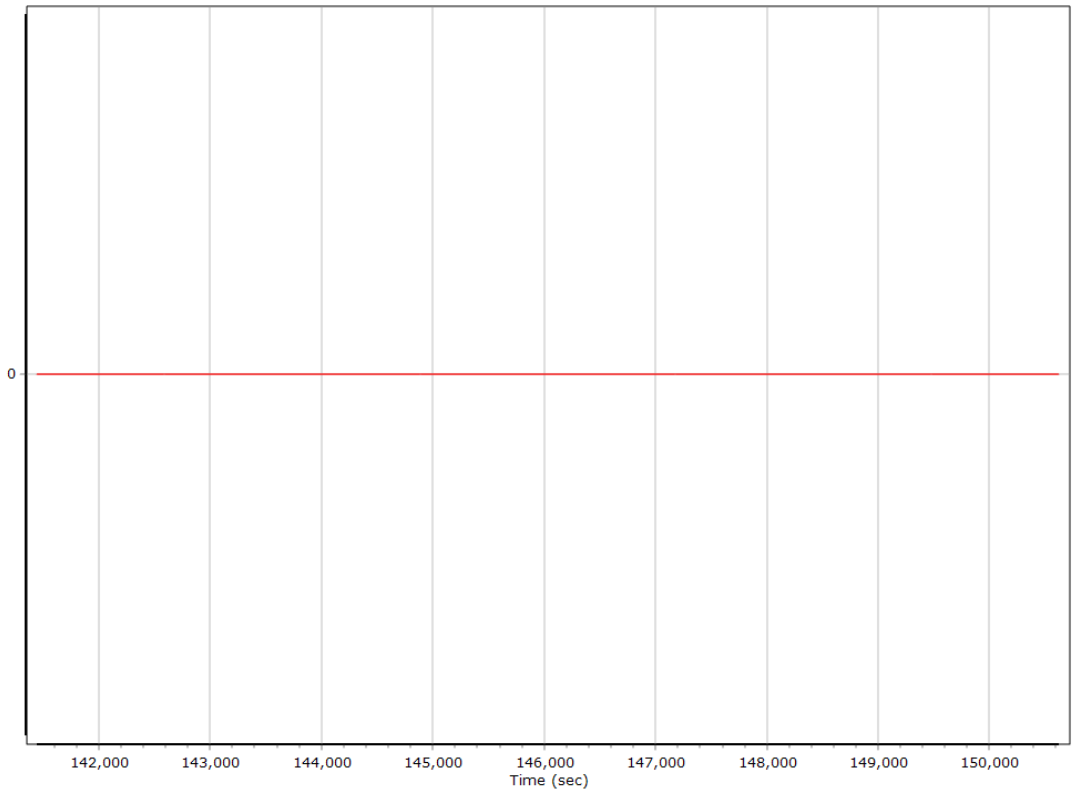
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



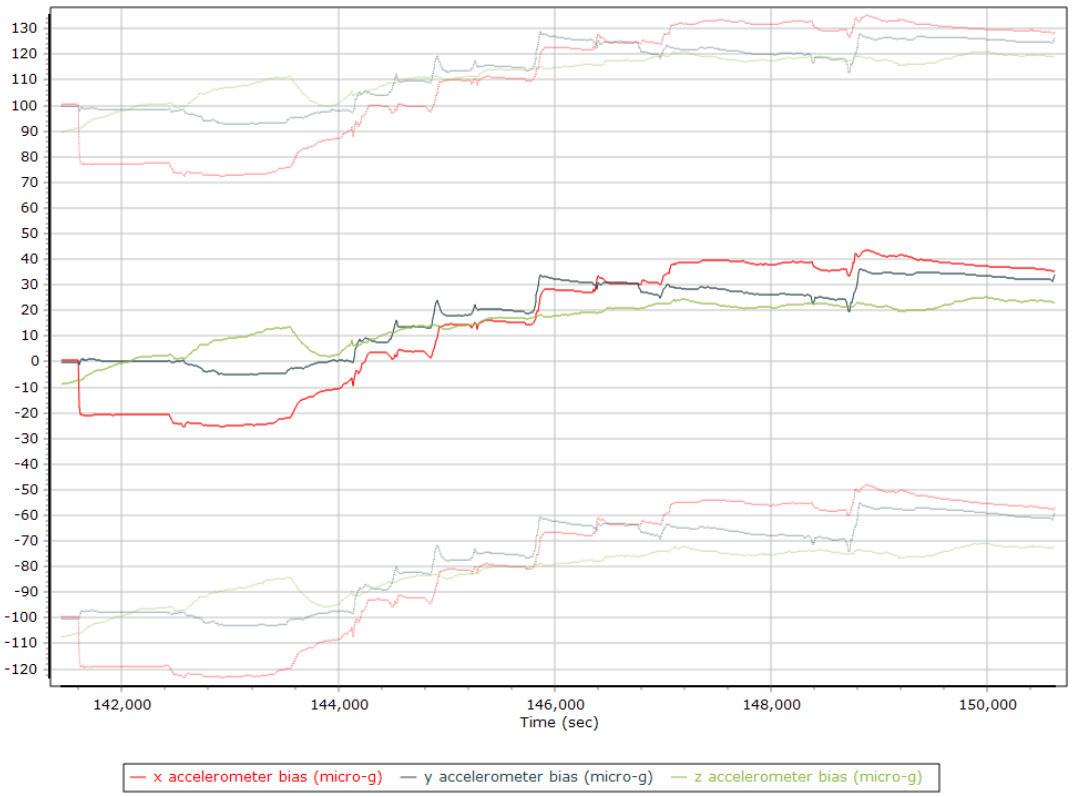
Reference-Primary GNSS Lever Arm Figure of Merit



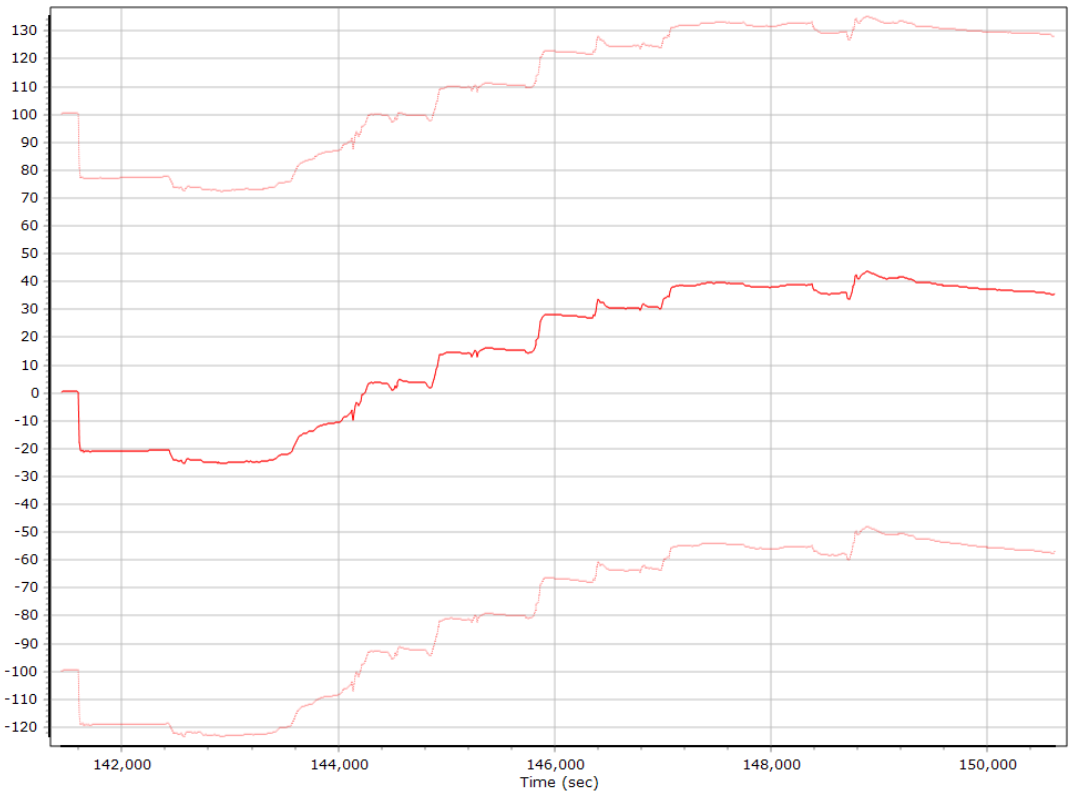
IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

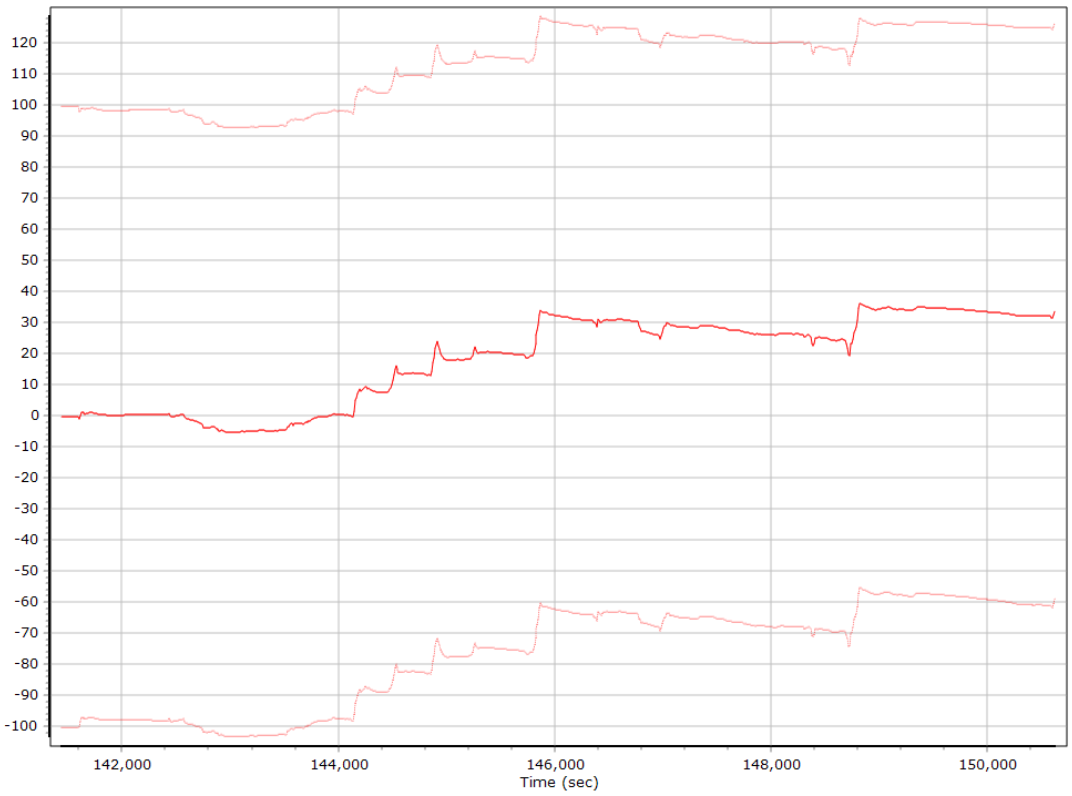
Accelerometer Bias (micro-g)



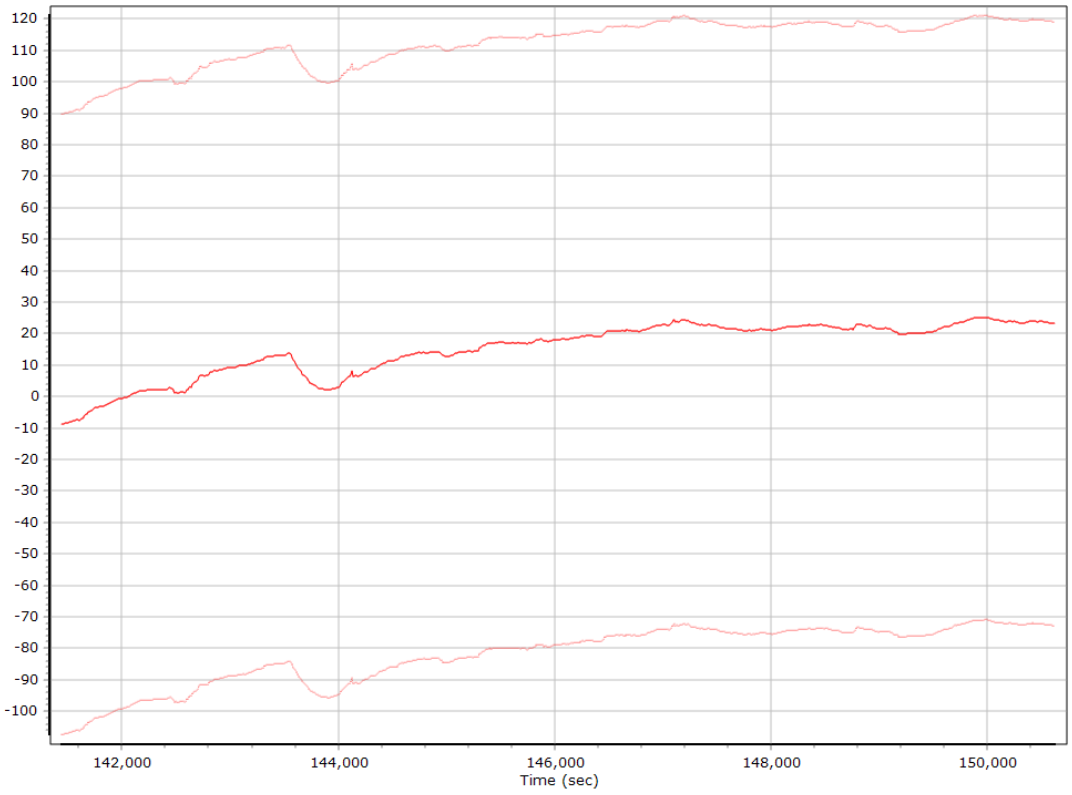
X Accelerometer Bias (micro-g)



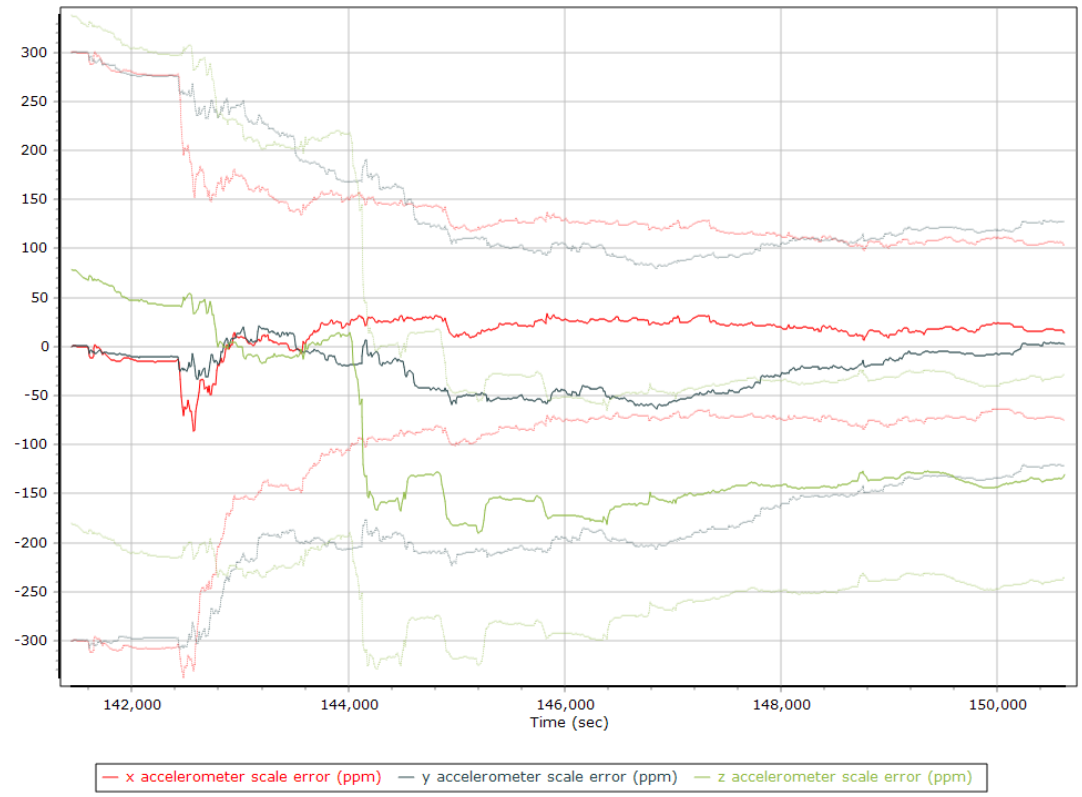
Y Accelerometer Bias (micro-g)



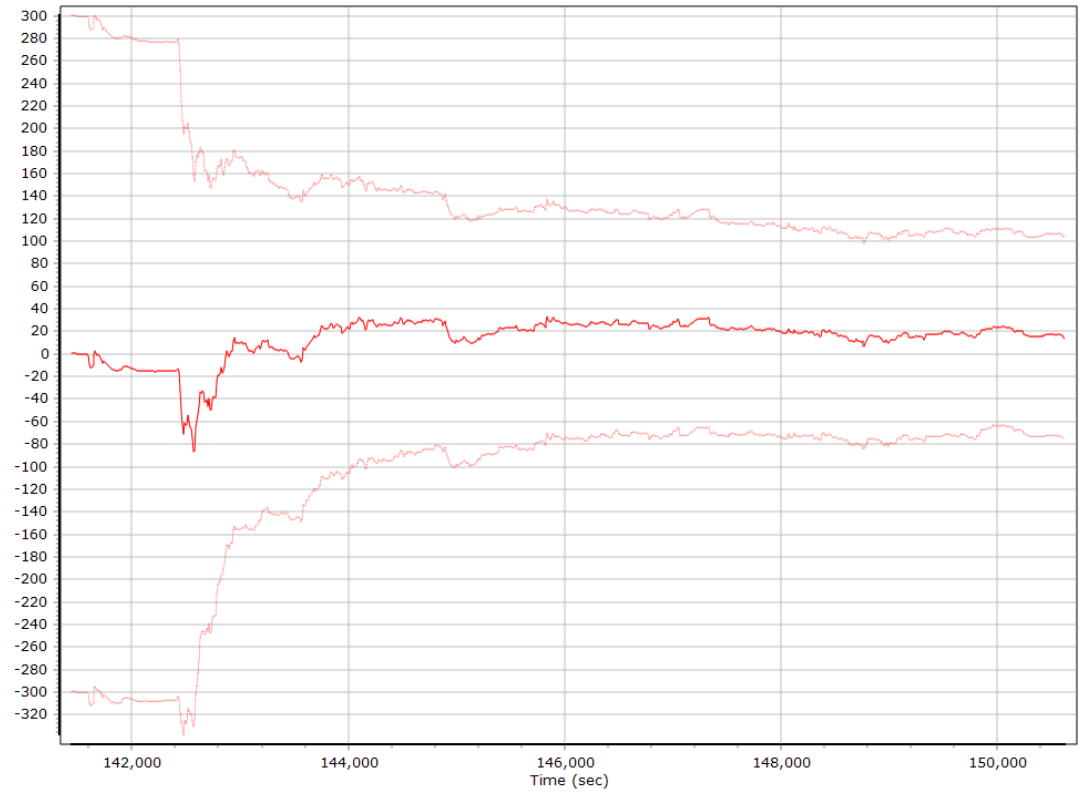
Z Accelerometer Bias (micro-g)



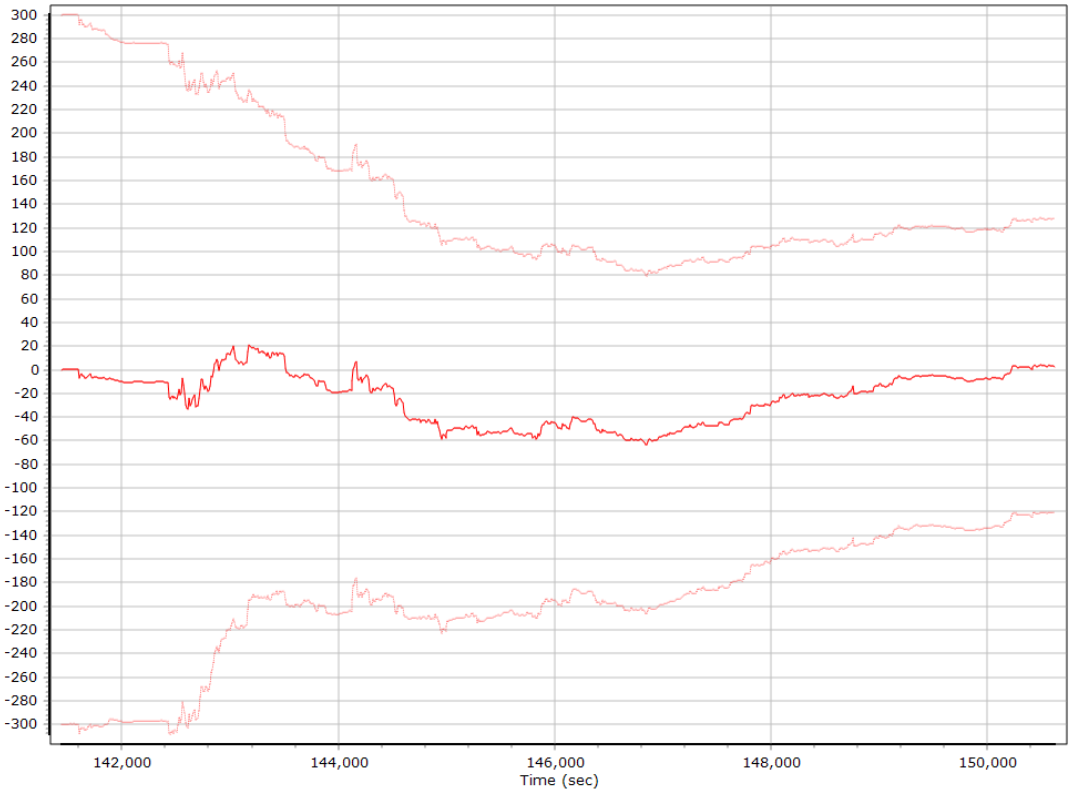
Accelerometer Scale Error (ppm)



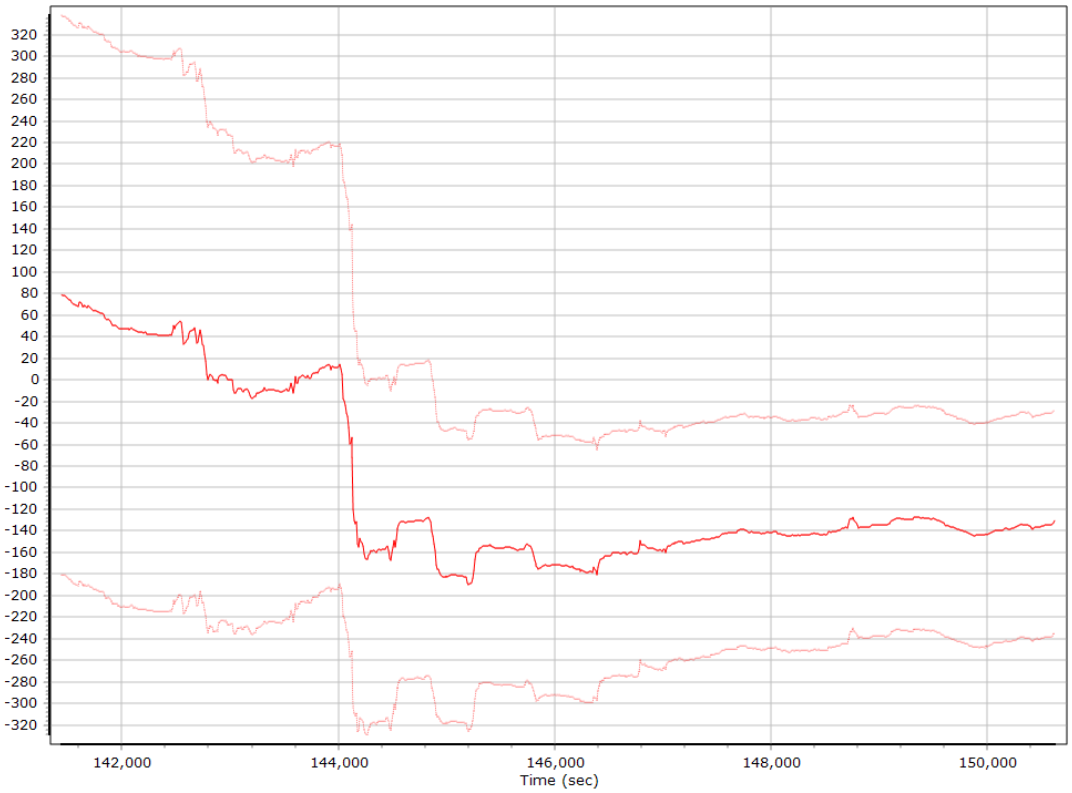
X Accelerometer Scale Error (ppm)



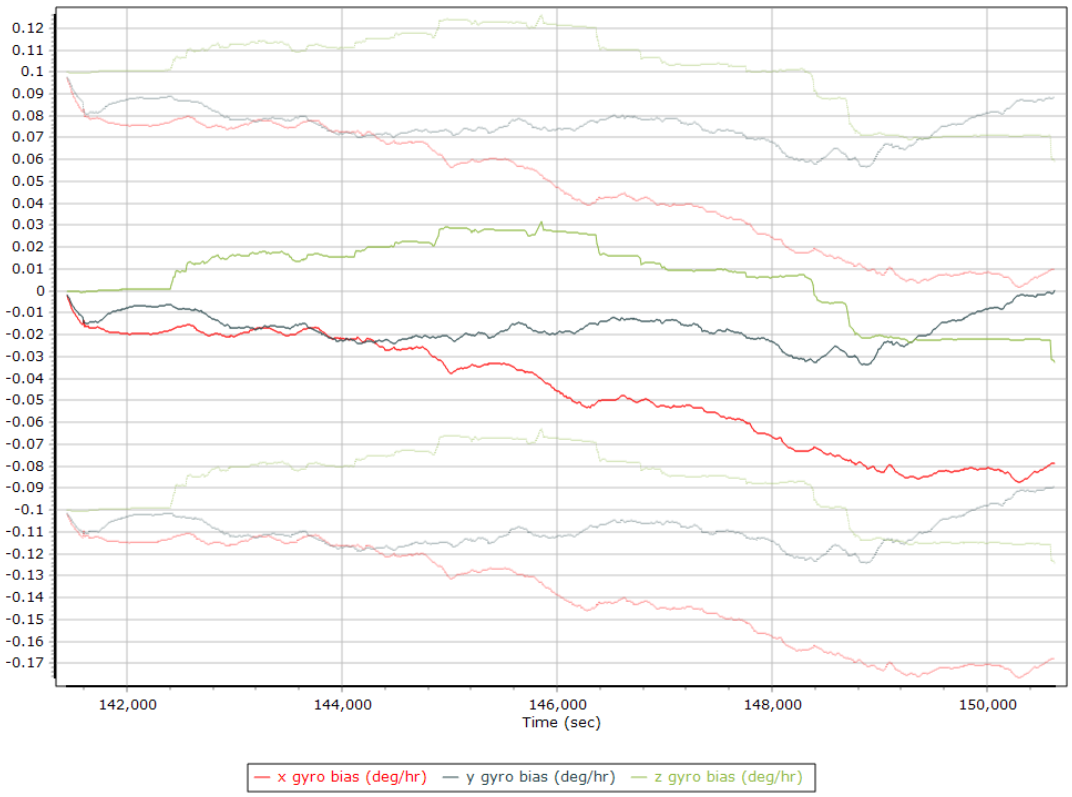
Y Accelerometer Scale Error (ppm)



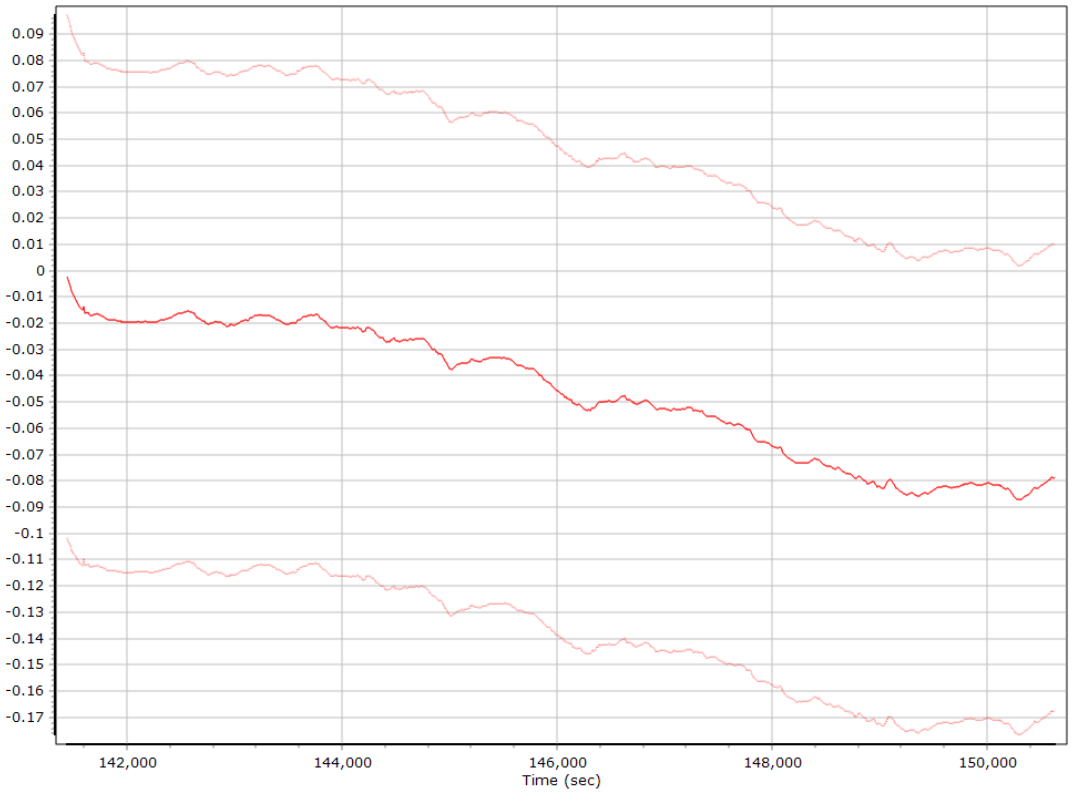
Z Accelerometer Scale Error (ppm)



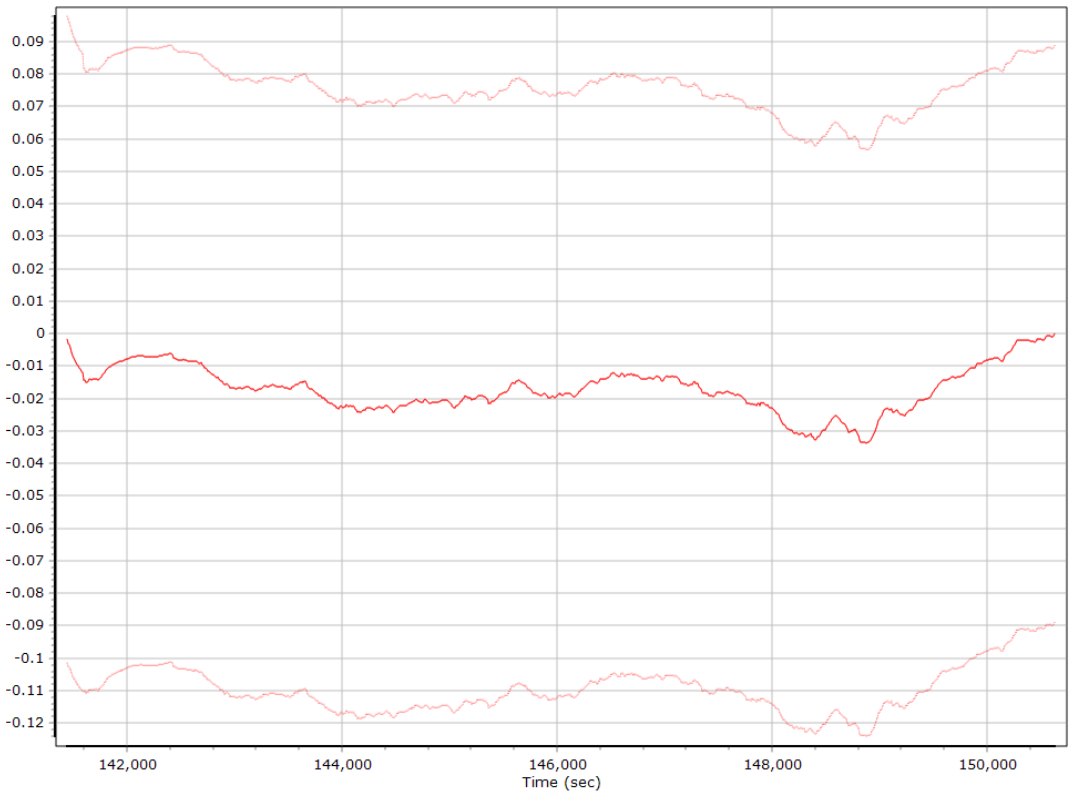
Gyro Bias (deg/h)



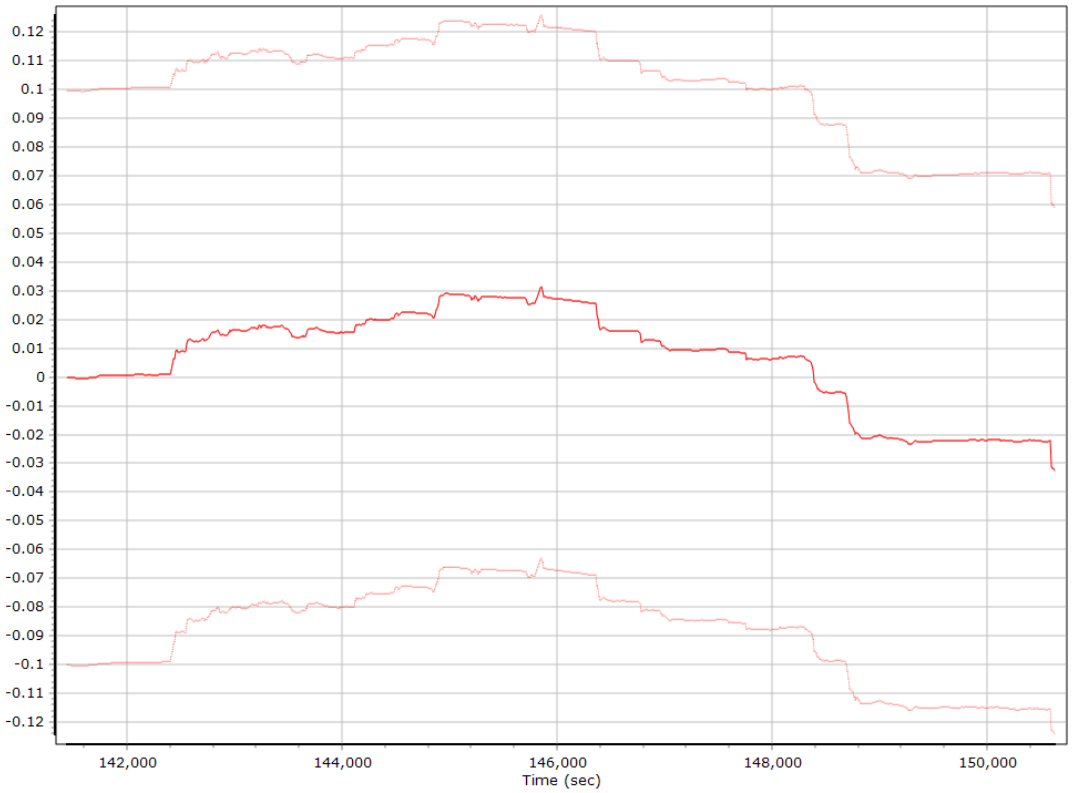
X Gyro Bias (deg/h)



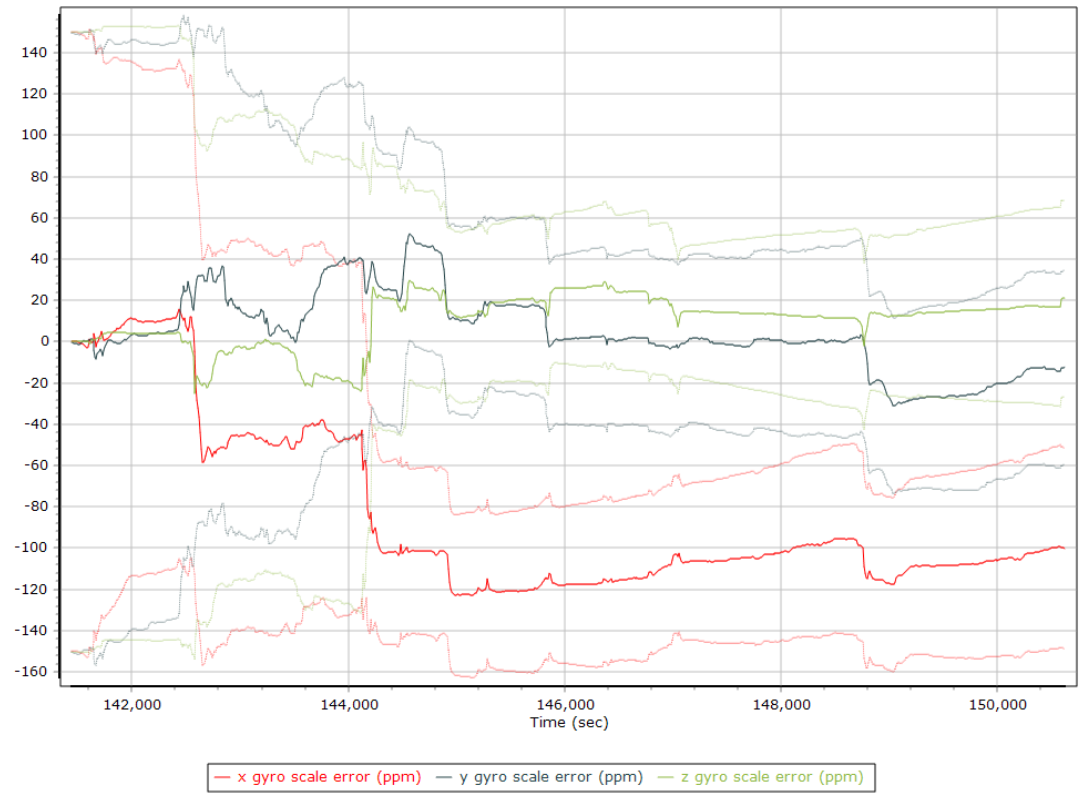
Y Gyro Bias (deg/h)



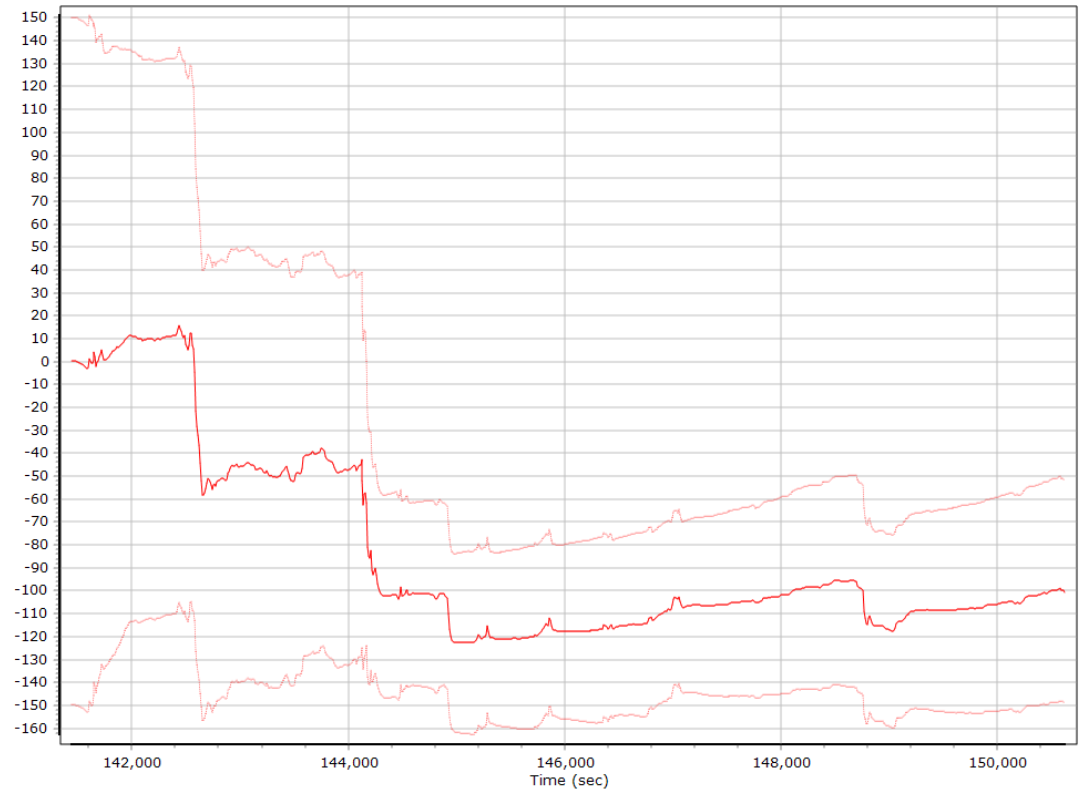
Z Gyro Bias (deg/h)



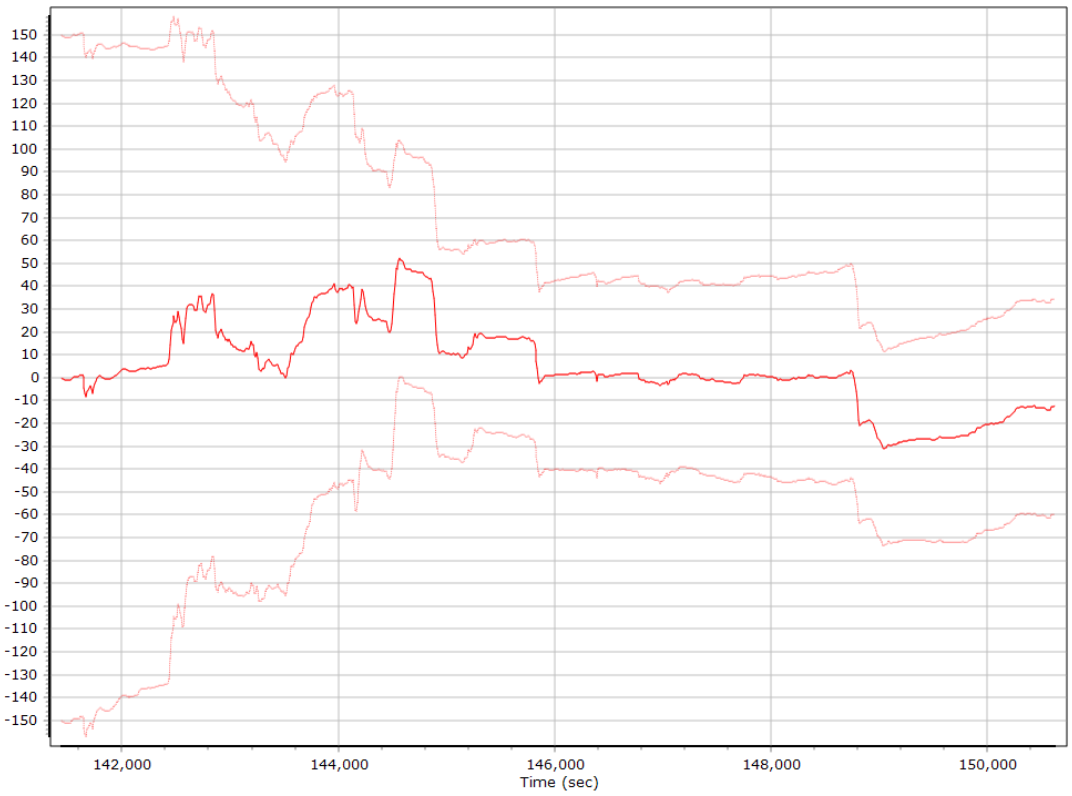
Gyro Scale Error (ppm)



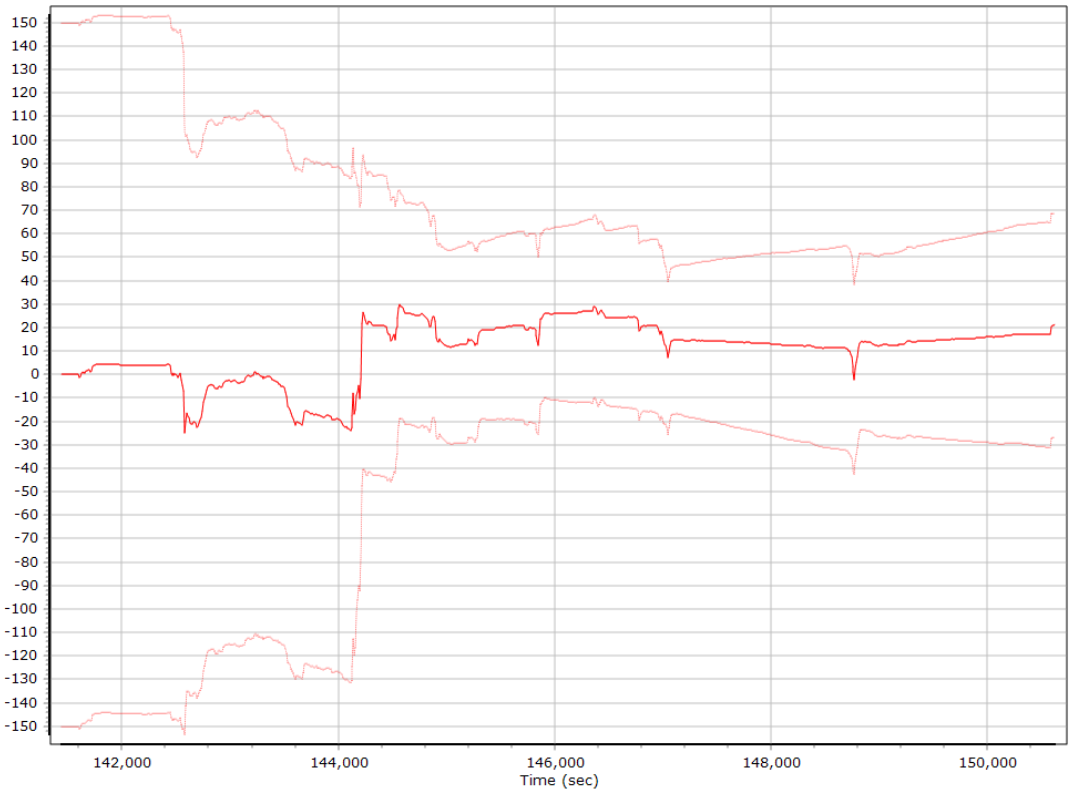
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

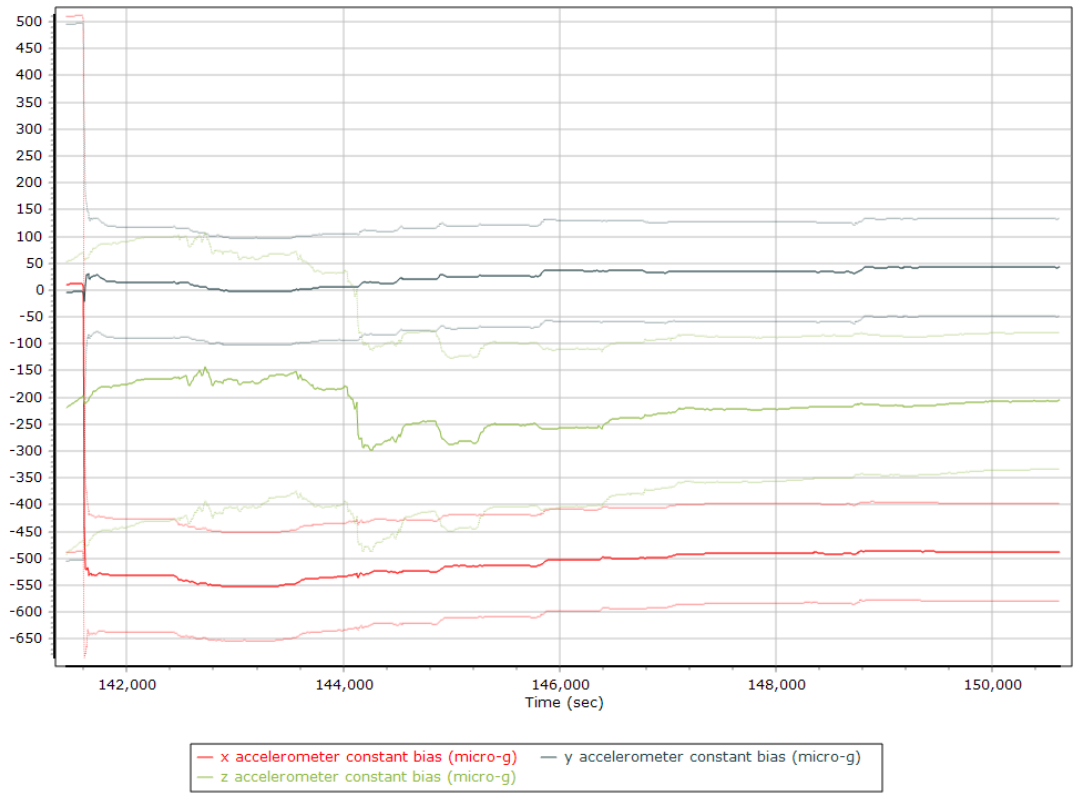


Z Gyro Scale Error (ppm)

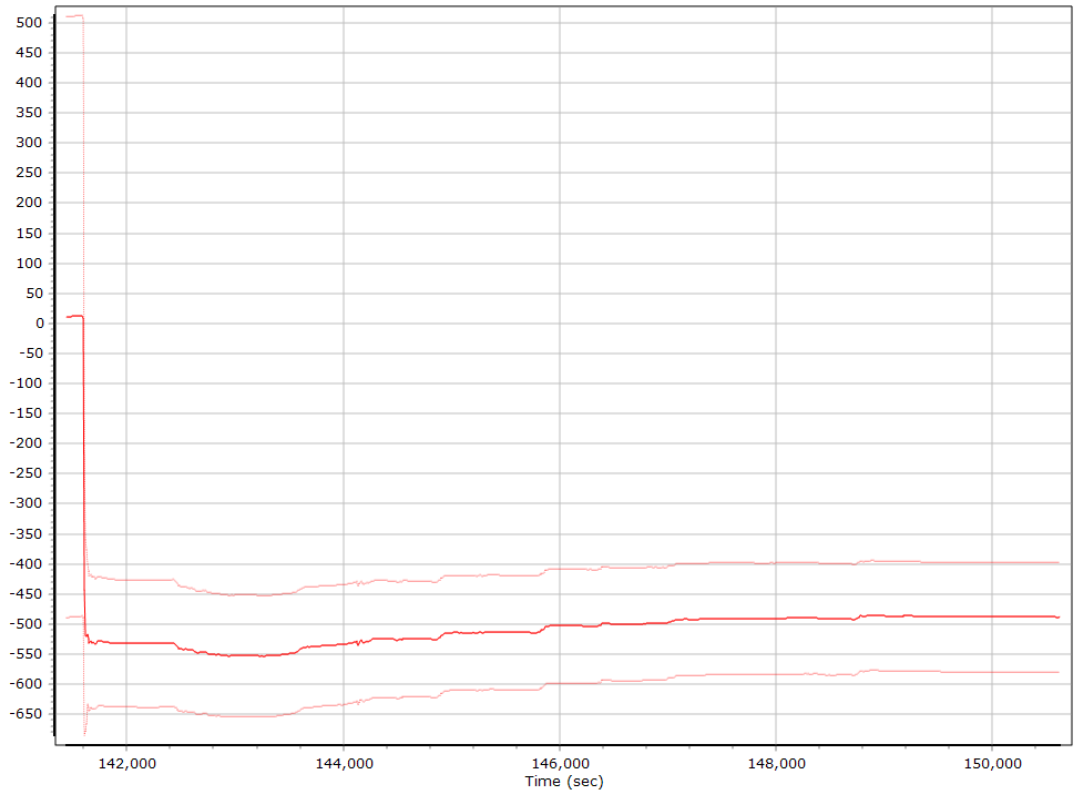


Forward Processed Estimated Constant Errors, Reference Frame

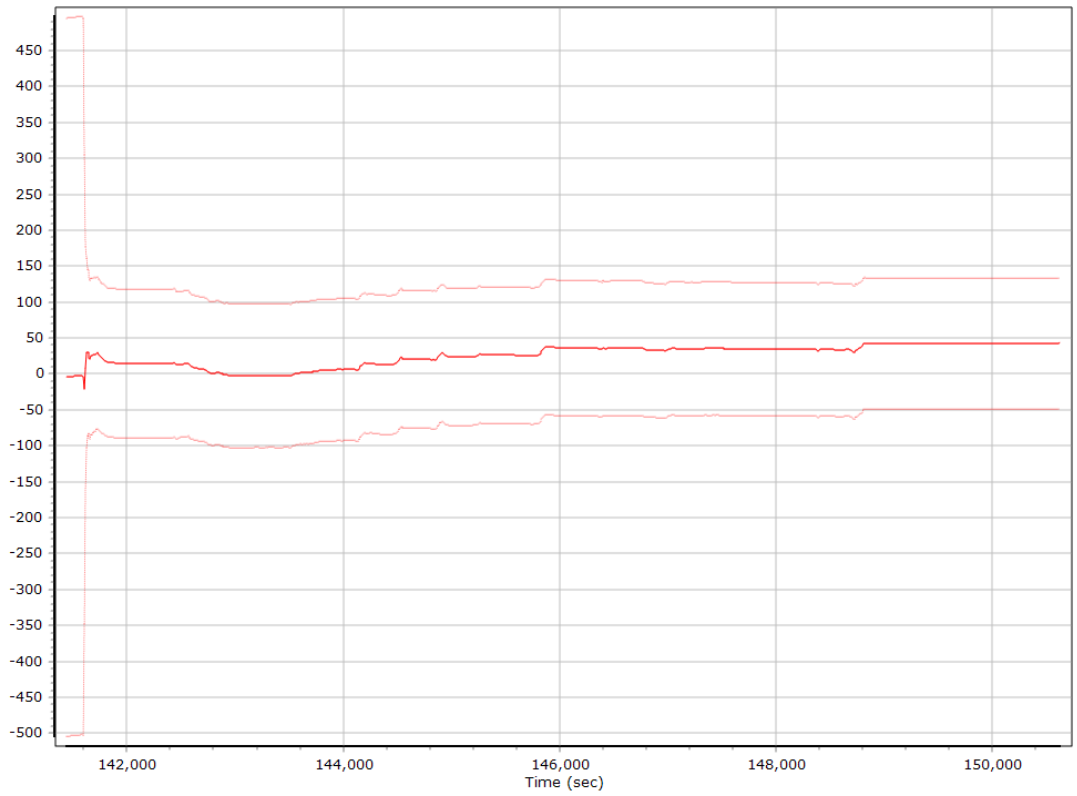
Accelerometer Bias (micro-g)



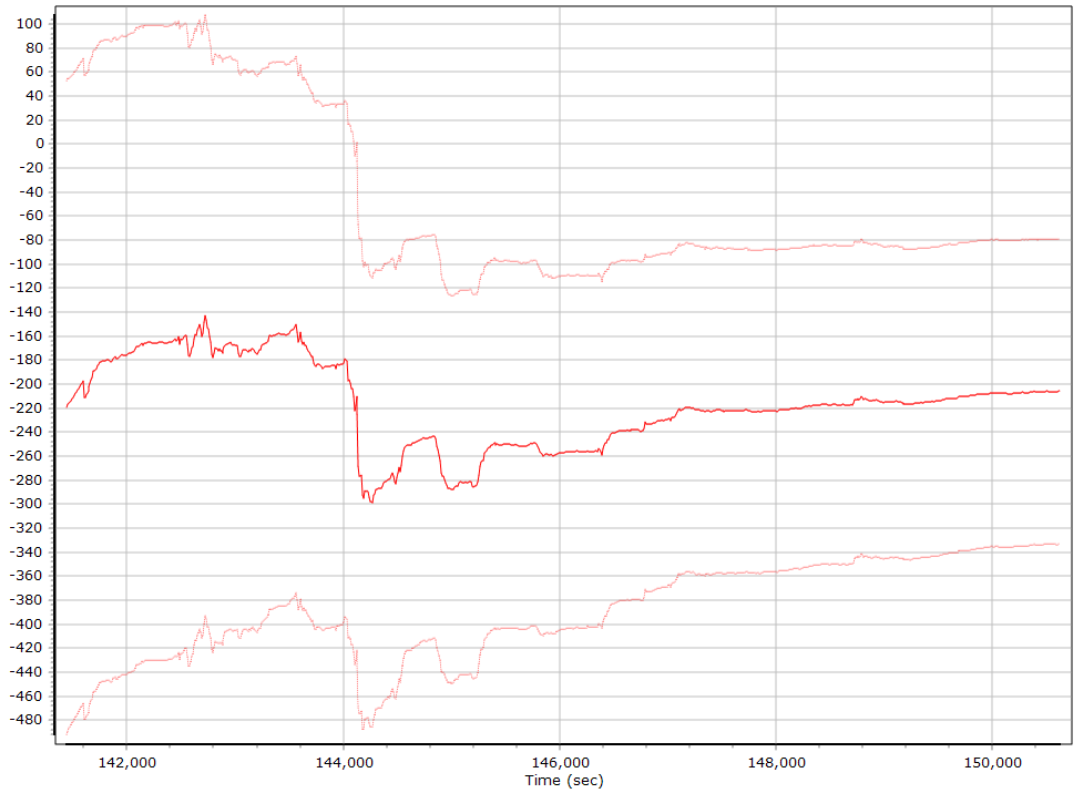
X Accelerometer Bias (micro-g)



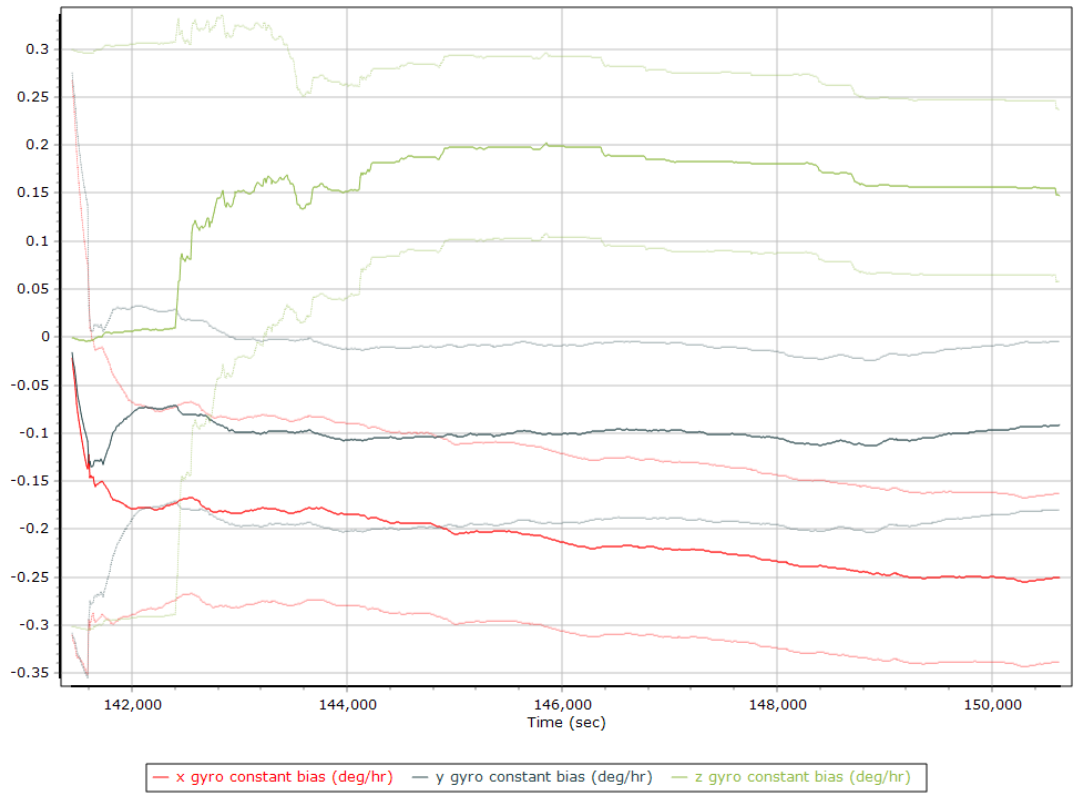
Y Accelerometer Bias (micro-g)



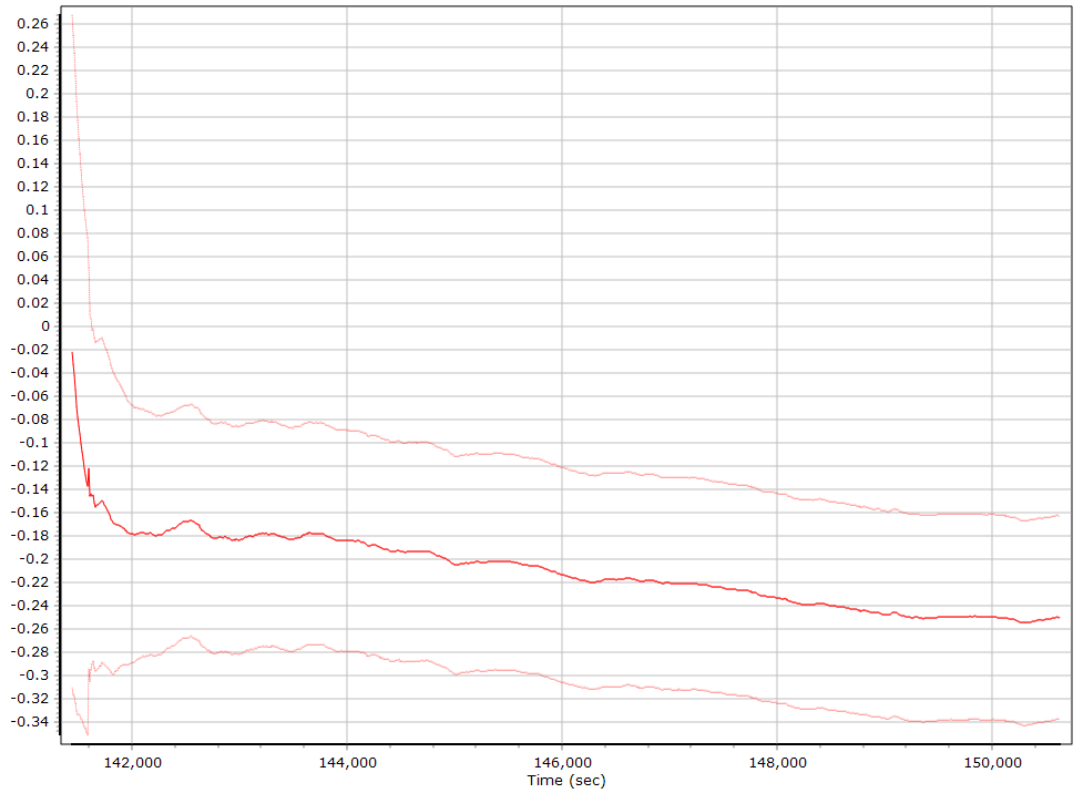
Z Accelerometer Bias (micro-g)



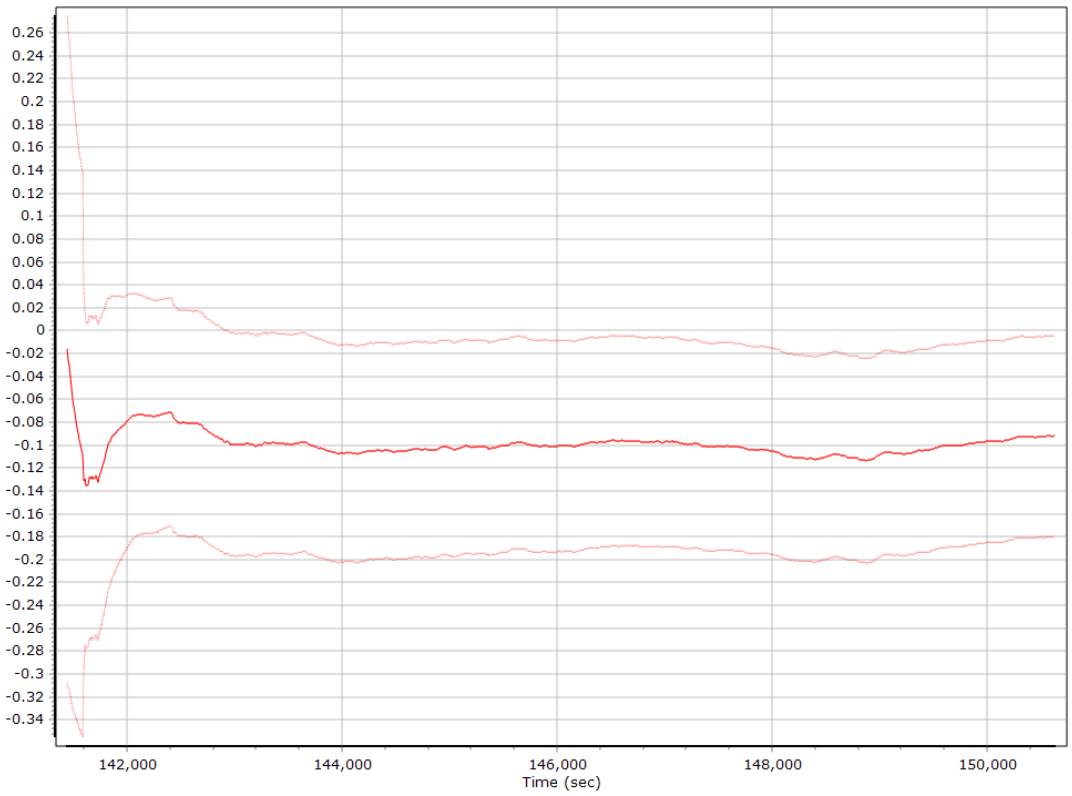
Gyro Bias (deg/h)



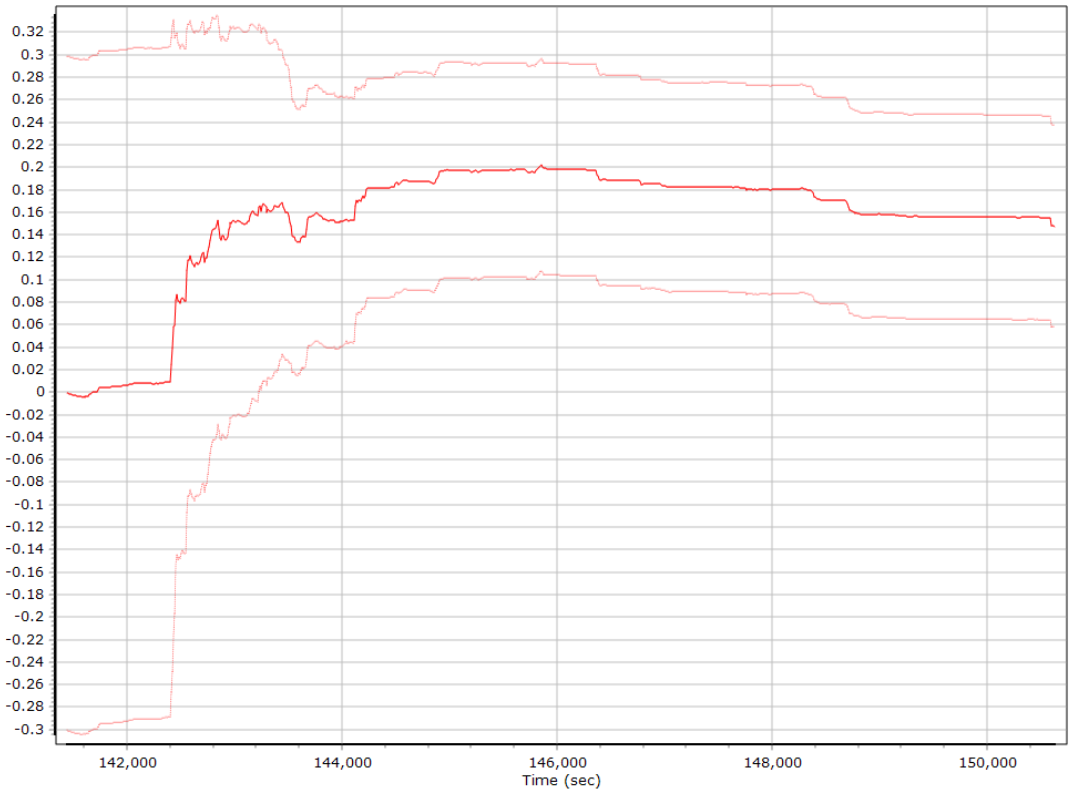
X Gyro Bias (deg/h)



Y Gyro Bias (deg/h)



Z Gyro Bias (deg/h)

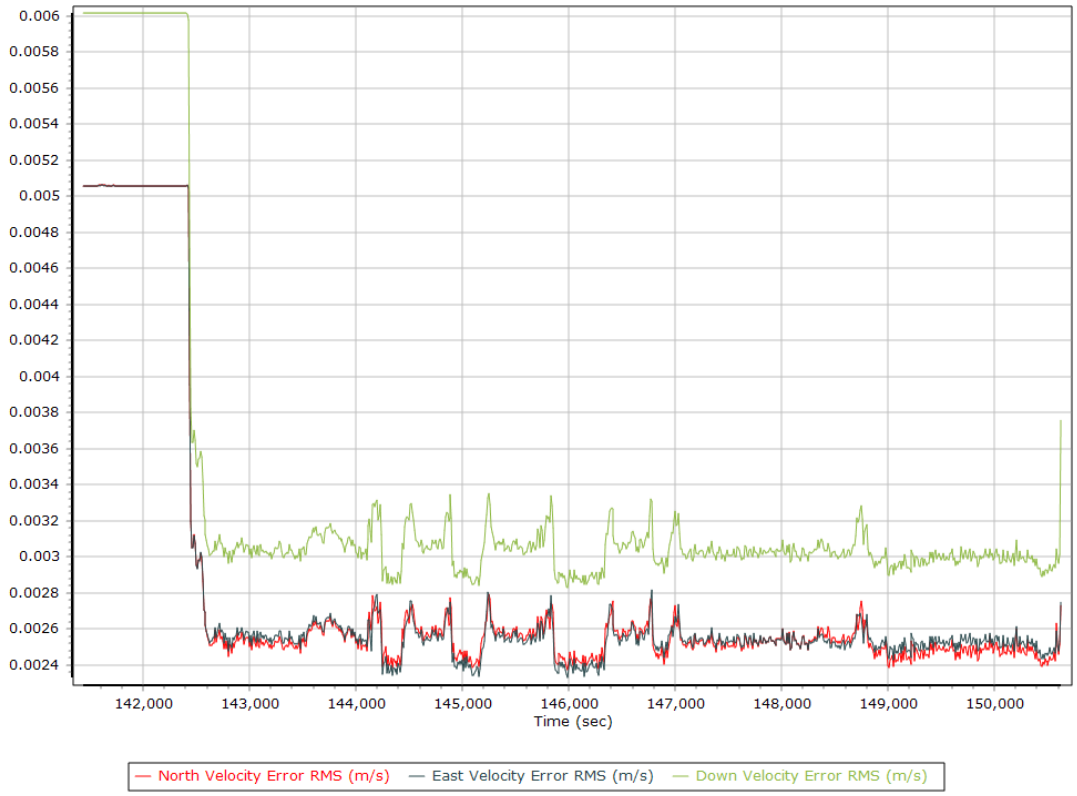


Smoothed Performance Metrics

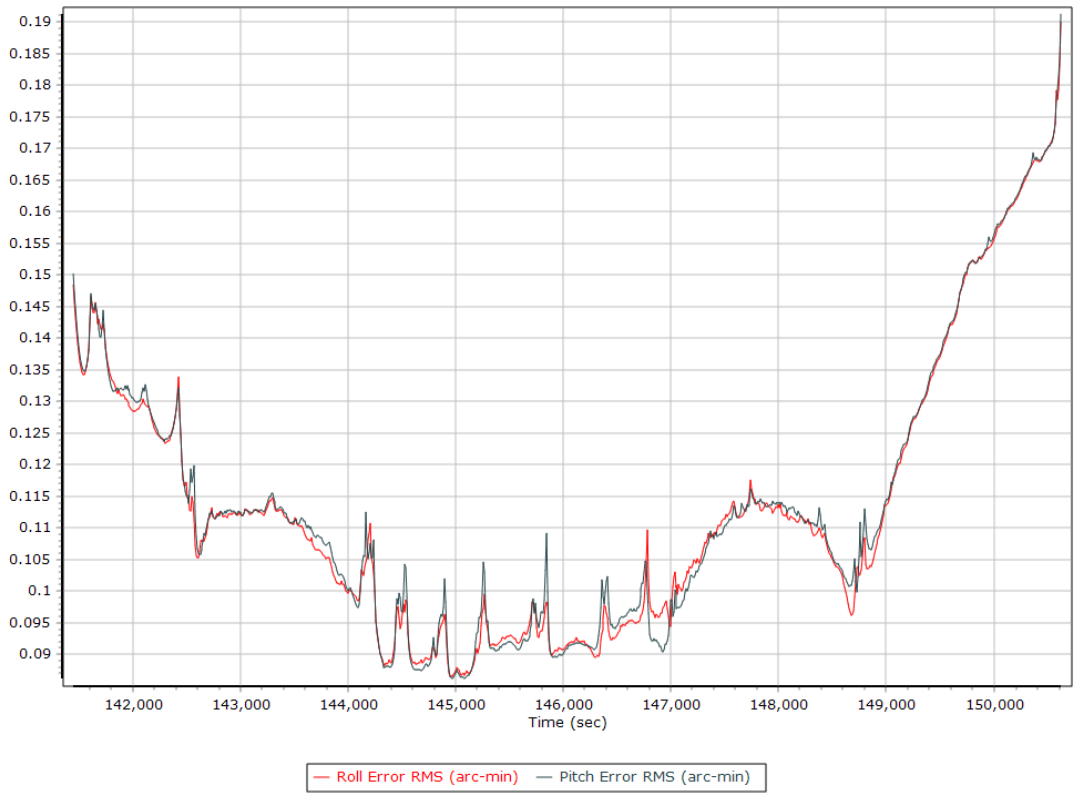
Position Error RMS (m)



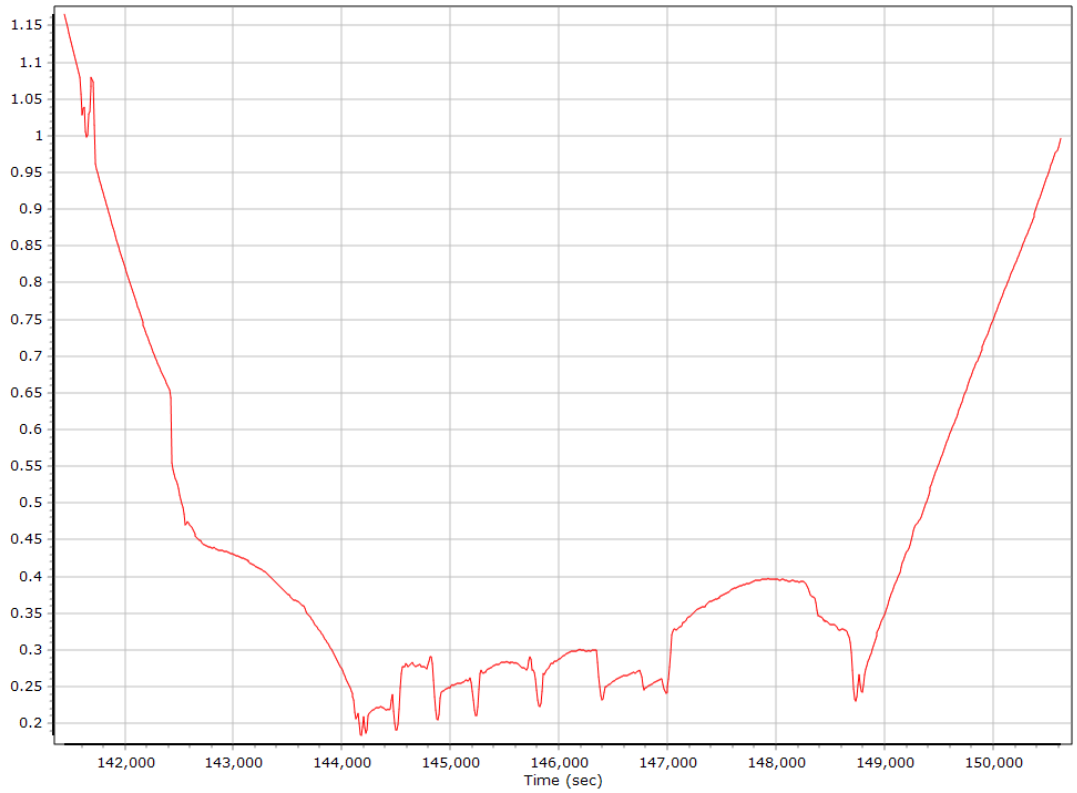
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)



Heading Error RMS (arc-min)

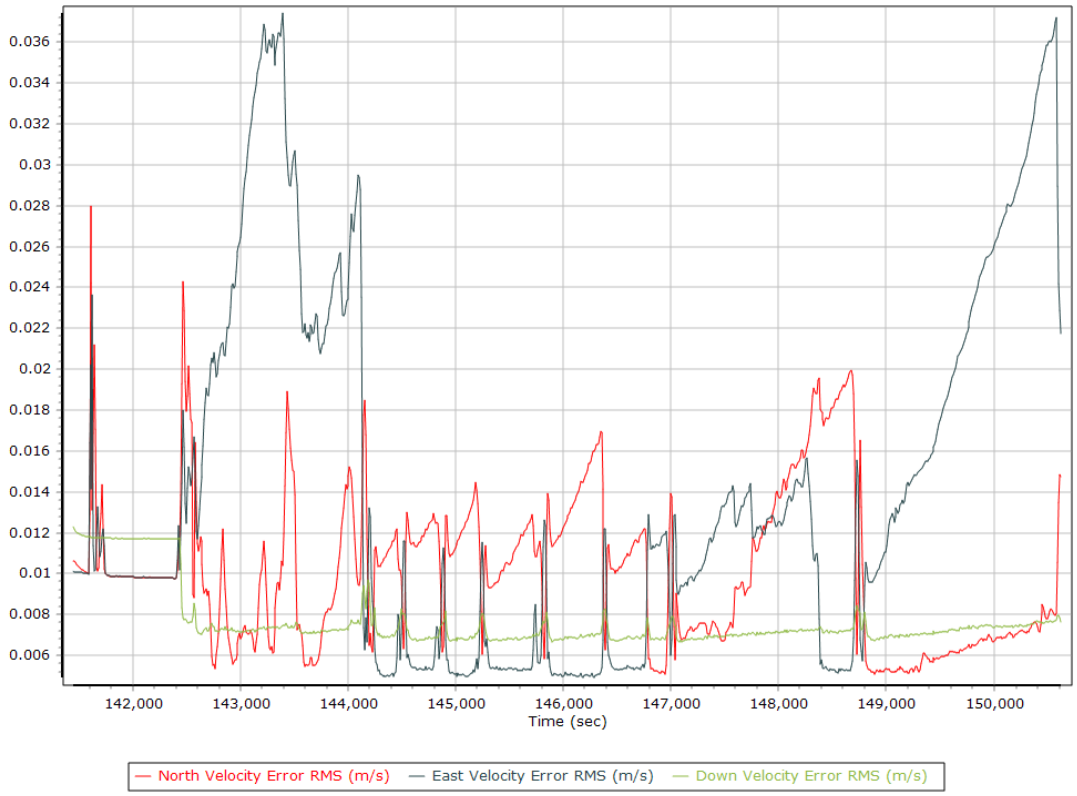


Forward Processed Performance Metrics

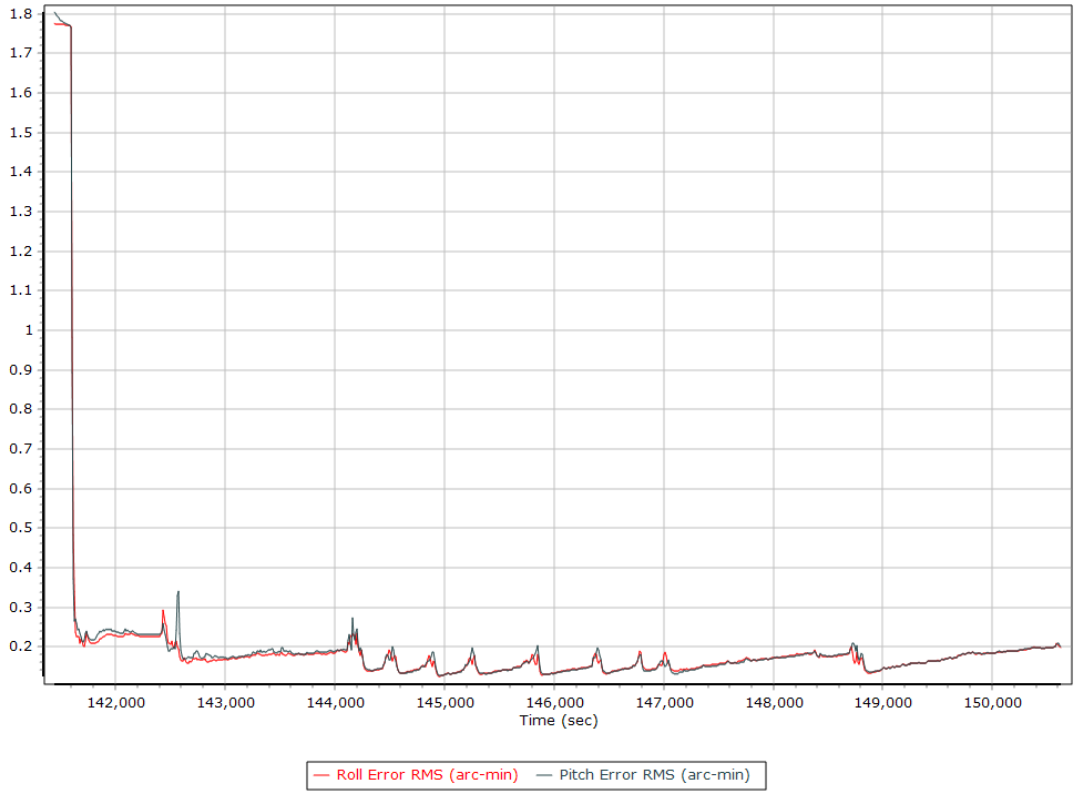
Position Error RMS (m)



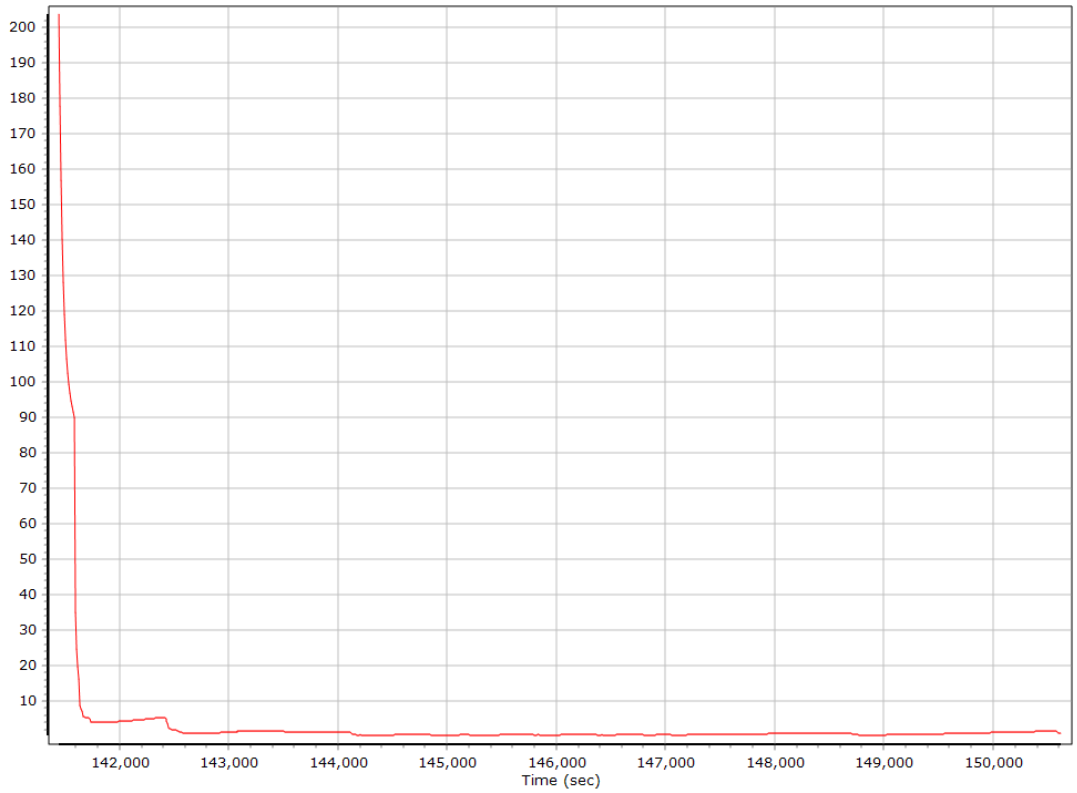
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

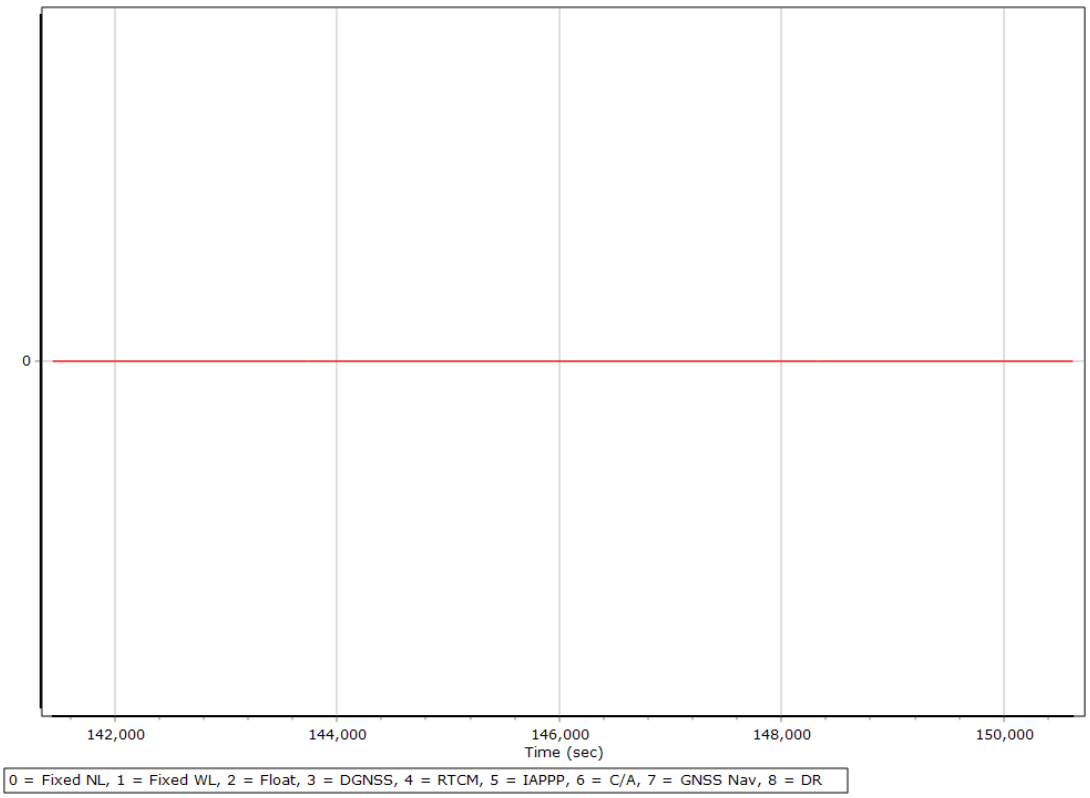


Heading Error RMS (arc-min)

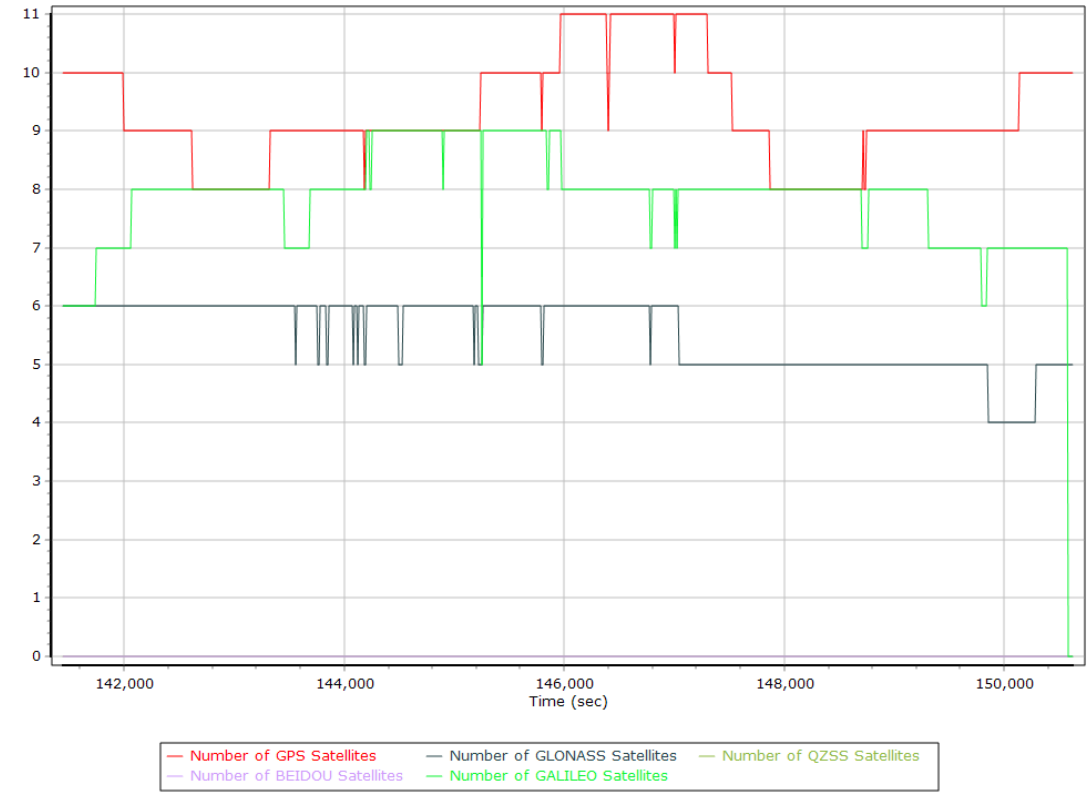


Forward Processed Solution Status

Processing Mode



Number of Satellites



Baseline Length

