

General Information

Mission Information

Project name	RBV20064A_176
Processing date	2020-03-05 14:08:39
Mission date	2020-03-04 13:14:47
Mission duration	03:18:16.000
Processing mode	IN-Fusion SmartBase
GPS Station	ASB

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N9642
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
RBV20064A.670	POS Data
RBV20064A.671	POS Data
RBV20064A.672	POS Data
RBV20064A.673	POS Data
RBV20064A.674	POS Data
RBV20064A.675	POS Data
RBV20064A.676	POS Data
RBV20064A.677	POS Data
RBV20064A.678	POS Data
RBV20064A.679	POS Data
RBV20064A.680	POS Data
RBV20064A.681	POS Data
RBV20064A.682	POS Data
RBV20064A.683	POS Data
RBV20064A.684	POS Data
RBV20064A.685	POS Data
RBV20064A.686	POS Data
RBV20064A.687	POS Data
RBV20064A.688	POS Data
RBV20064A.689	POS Data
RBV20064A.690	POS Data
RBV20064A.691	POS Data
RBV20064A.692	POS Data
RBV20064A.693	POS Data
RBV20064A.694	POS Data
RBV20064A.695	POS Data
RBV20064A.696	POS Data
RBV20064A.697	POS Data
RBV20064A.698	POS Data
RBV20064A.699	POS Data

Input Files

File Name	File Type
Ephm0640.20g	GLONASS Broadcast Ephemeris
Ephm0640.20n	GPS Broadcast Ephemeris
pafu0640.20o	GNSS SingleBase
wvbr0640.20o	GNSS SingleBase
wvbu0640.20o	GNSS SingleBase
wvsh0640.20o	GNSS SingleBase
wvta0640.20o	GNSS SingleBase
brdc0650.20g	GLONASS Broadcast Ephemeris
brdc0650.20n	GPS Broadcast Ephemeris
Ephm0630.20g	GLONASS Broadcast Ephemeris
Ephm0630.20n	GPS Broadcast Ephemeris
igu20951_18.sp3	GPS Precise Ephemeris
igu20952_18.sp3	GPS Precise Ephemeris
igu20953_18.sp3	GPS Precise Ephemeris

Output Files

Filename	File type
sbet_RB20064A_176.out	SBET Trajectory File

Rover Data Summary

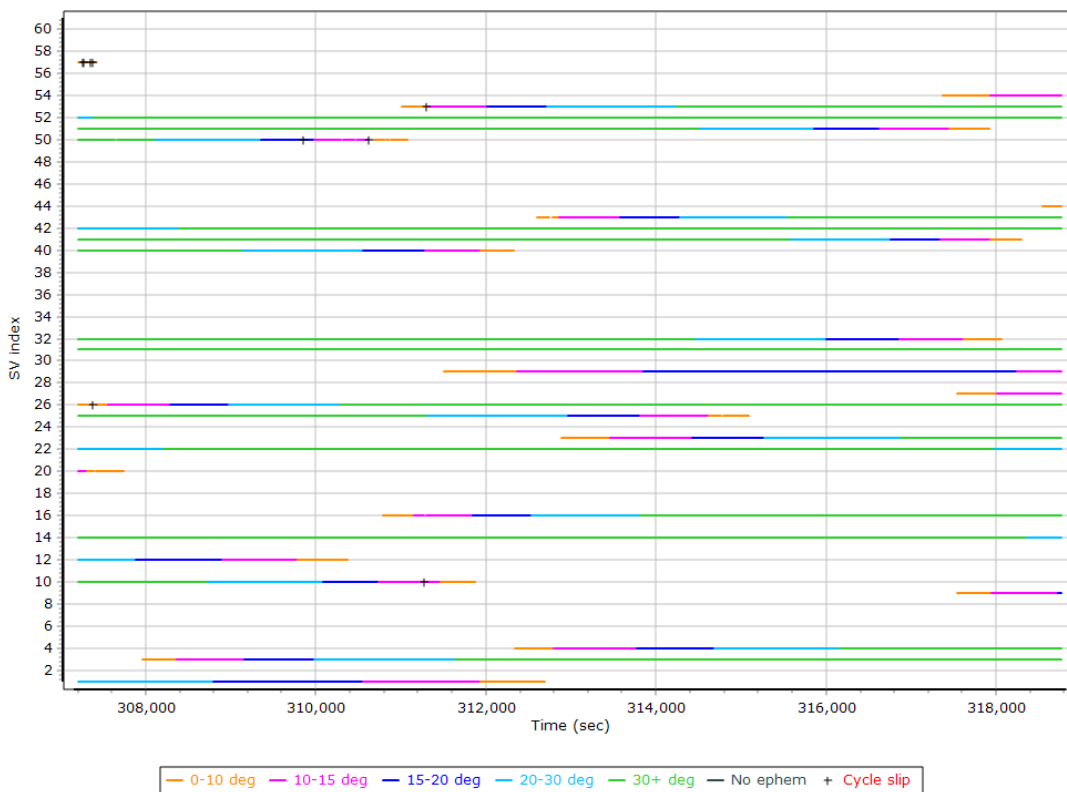
First raw data file	RBV20064A.670		
Last raw data file	RBV20064A.699		
Start GPS week	2095		
Start time	306868.873 (3/4/2020 1:14:28 PM)		
End time	318765.107 (3/4/2020 4:32:45 PM)		
Start of fine alignment	307148.223 (3/4/2020 1:19:08 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event 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

Raw Data QC

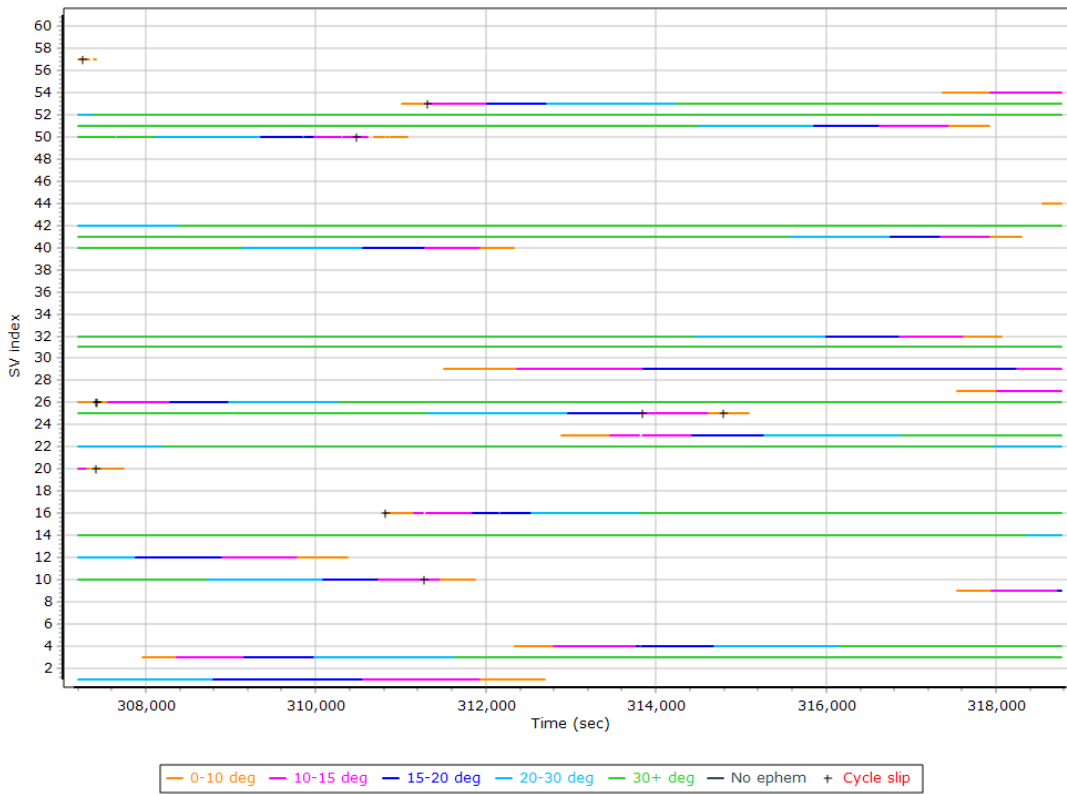
Raw IMU Import QC Summary

IMU data input file	imu_RB20064A_176.dat
IMU data check log file	imudt_RB20064A_176.log
IMU Records Processed	2378975
Termination Status	Normal
IMU Anomalies	0

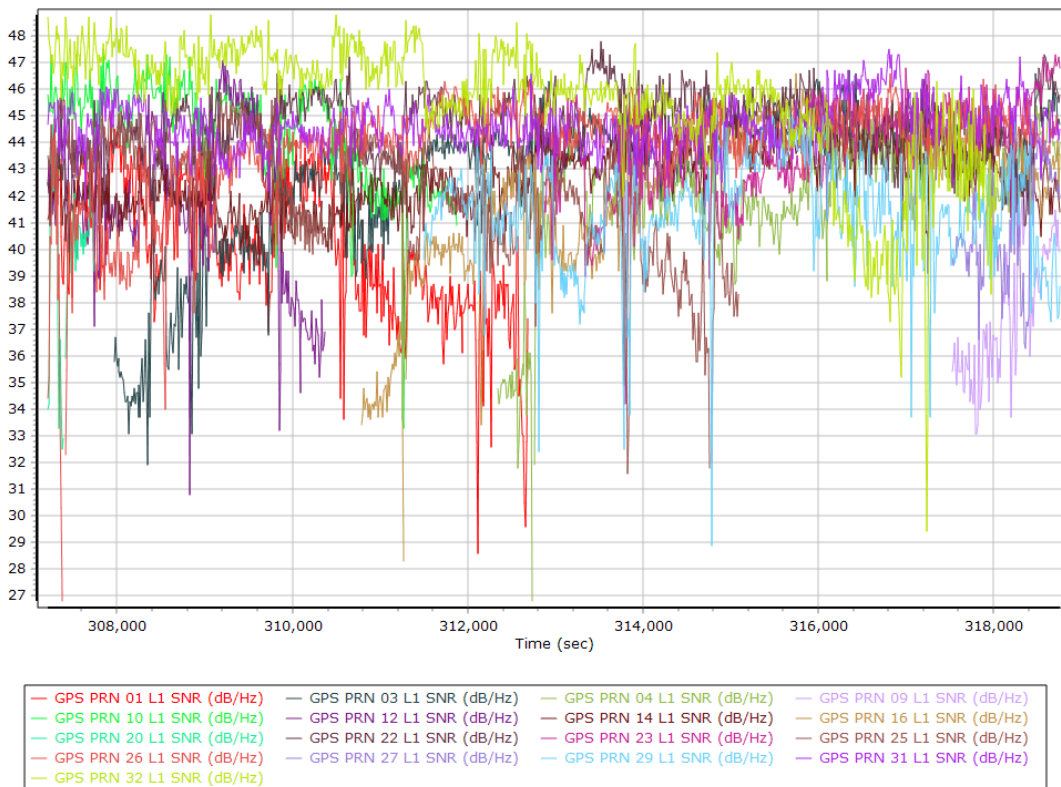
L1 Satellite Lock/Elevation



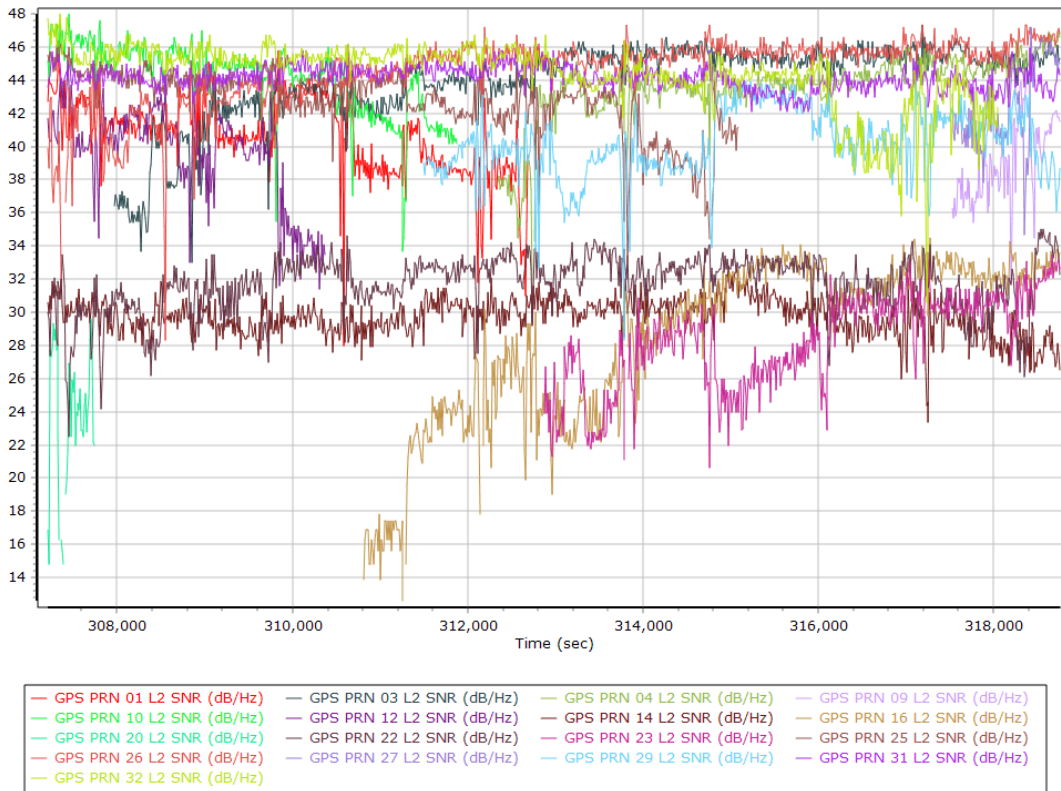
L2 Satellite Lock/Elevation



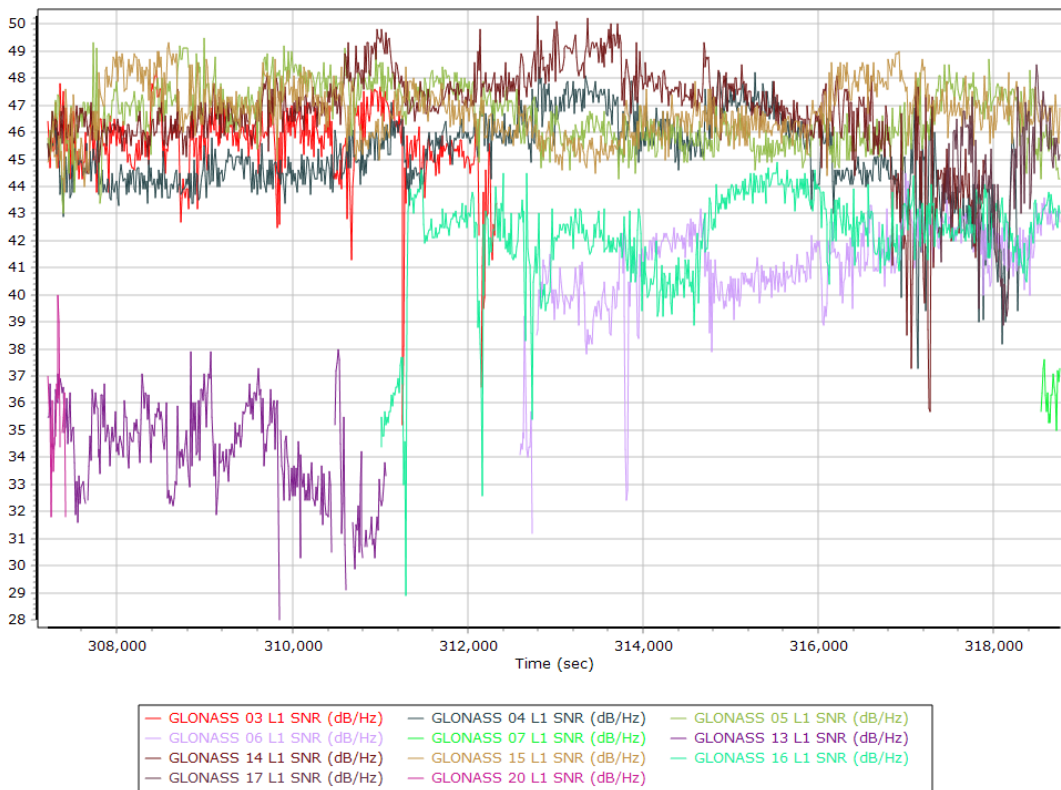
GPS L1 SNR



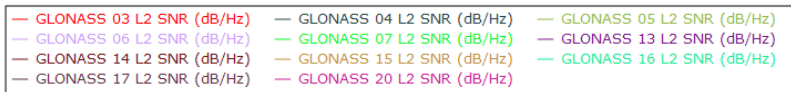
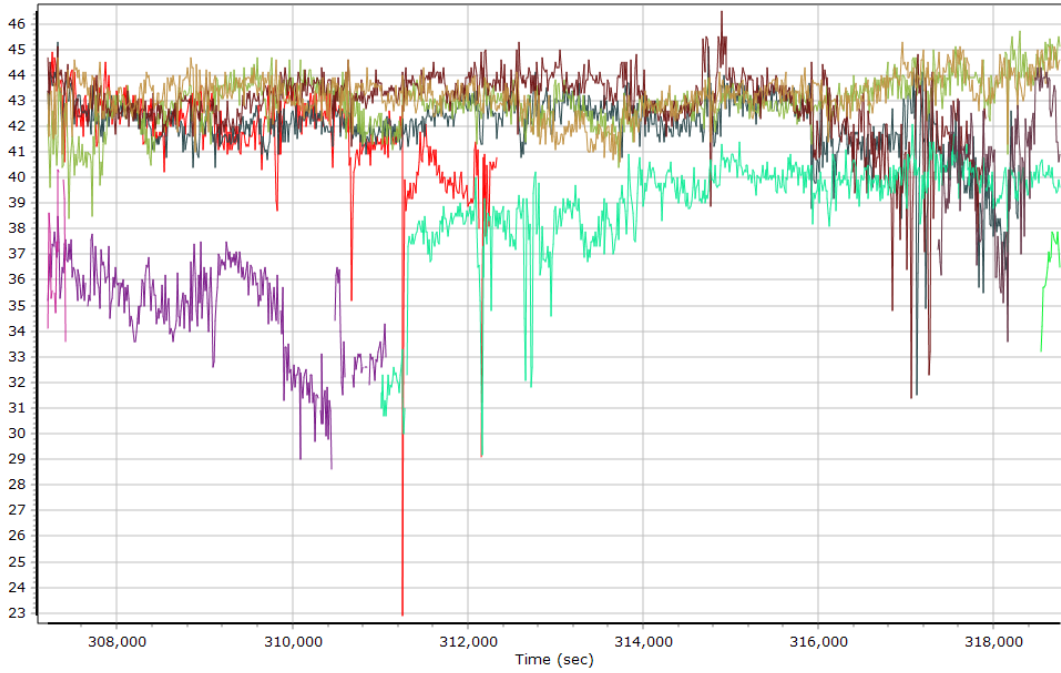
GPS L2 SNR



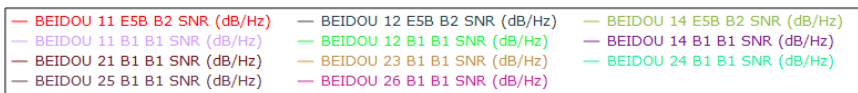
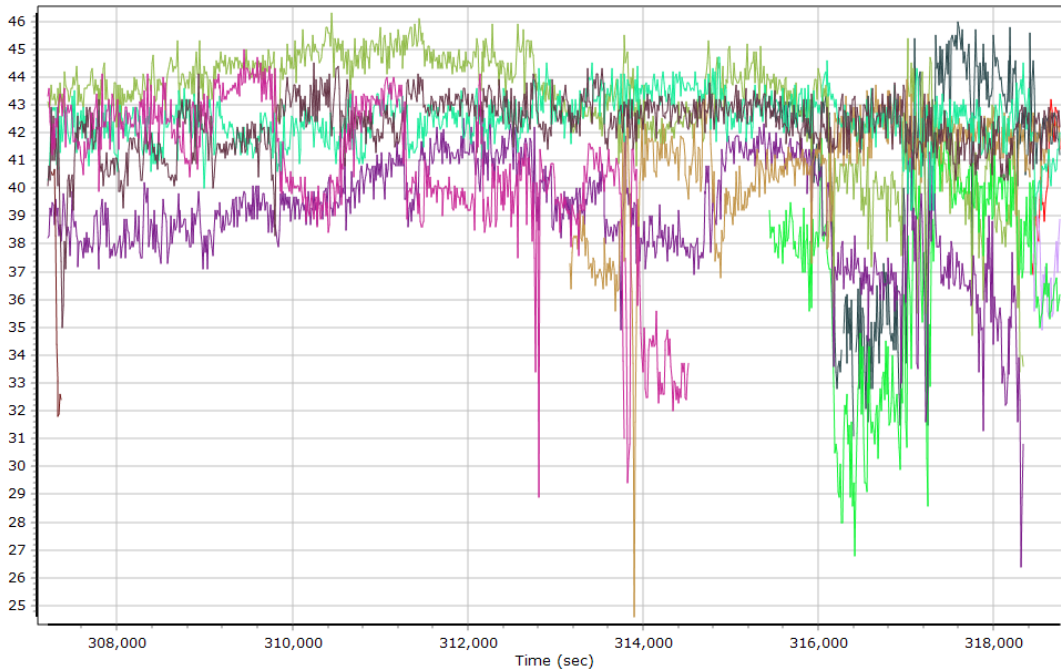
GLONASS L1 SNR



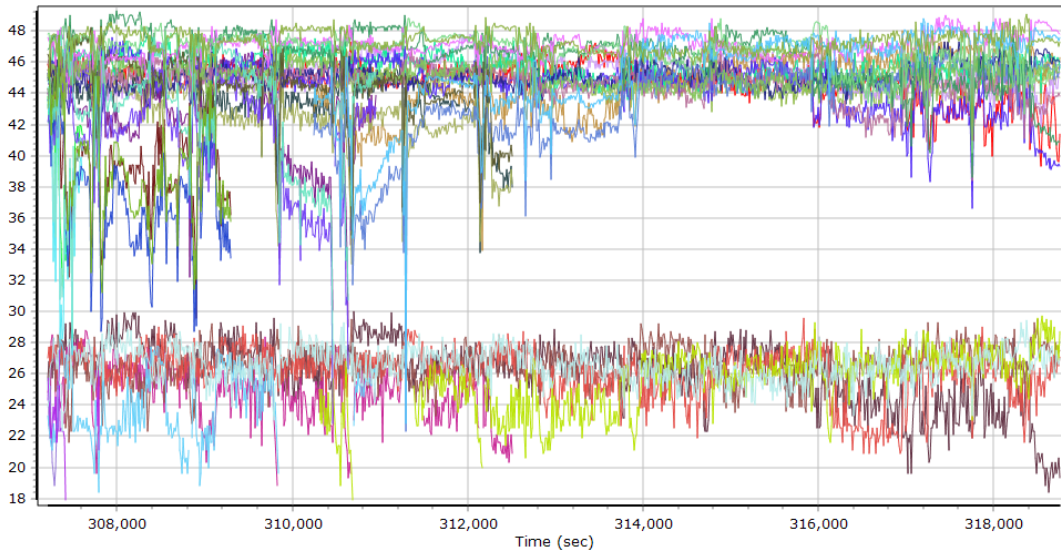
GLONASS L2 SNR



BEIDOU SNR



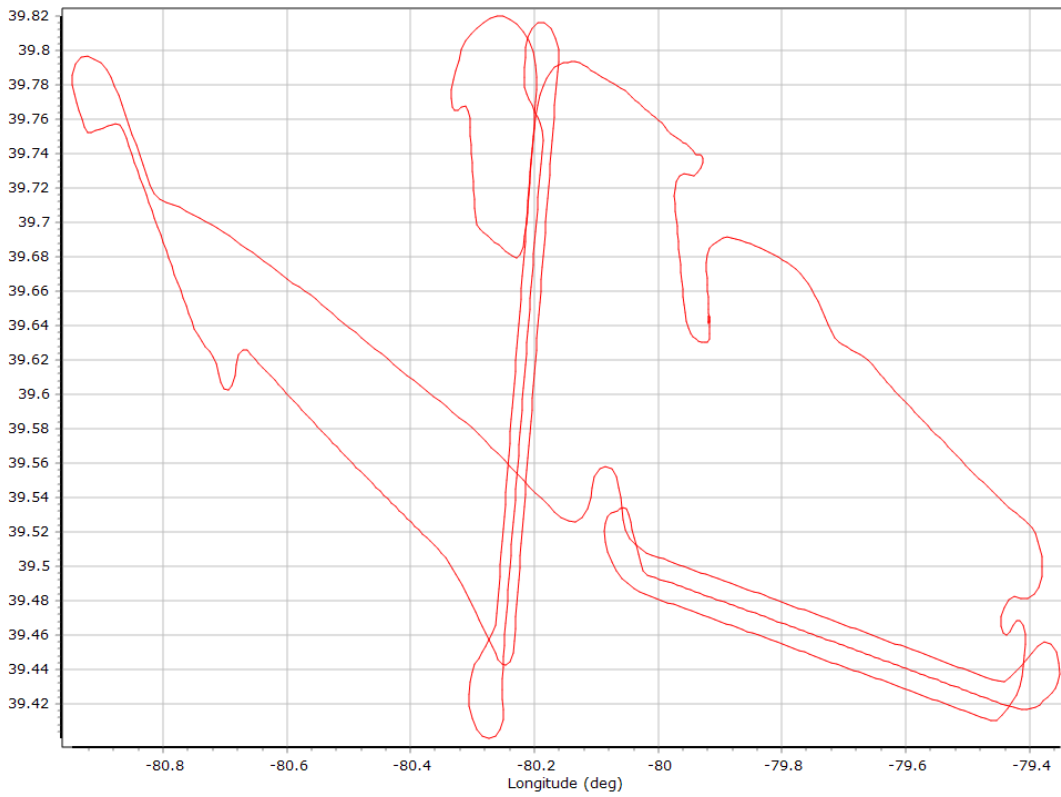
GALILEO SNR



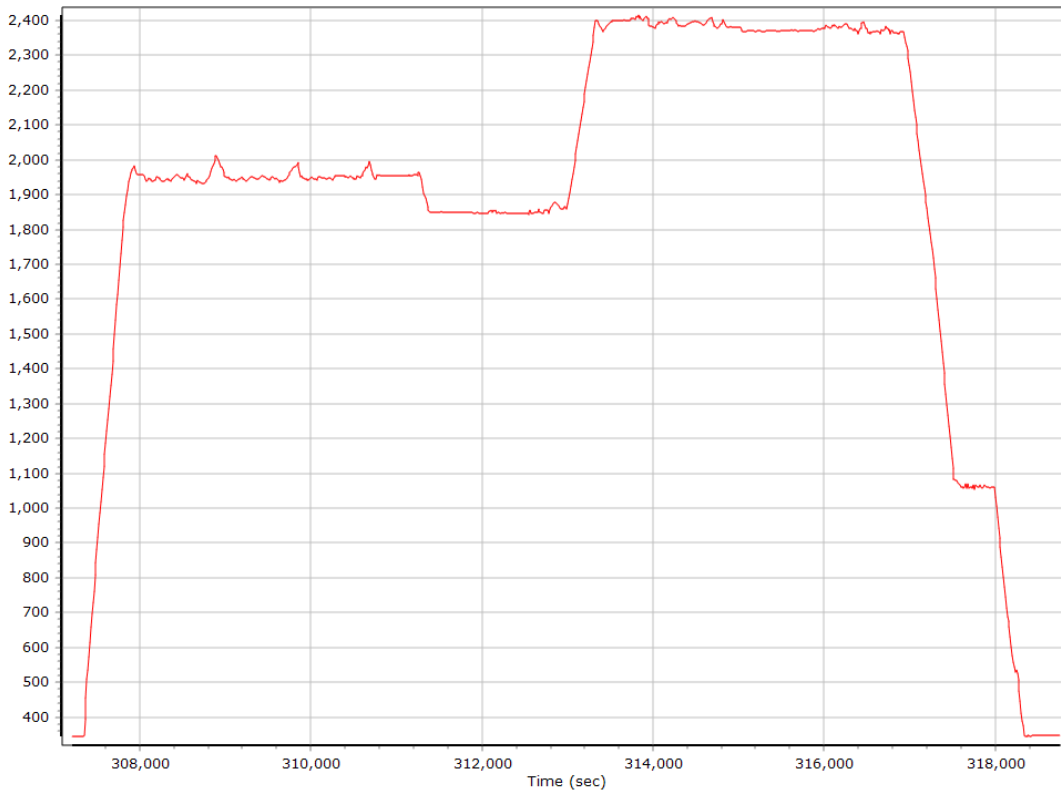
- | | |
|--|--|
| — GALILEO 02 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 03 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 07 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 08 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 13 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 25 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 26 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 27 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 30 L1 BOC_1_1_D_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 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) |
| — GALILEO 02 E5B BPSK10_PD SNR (dB/Hz) | — GALILEO 03 E5B BPSK10_PD SNR (dB/Hz) |

Trajectory Information

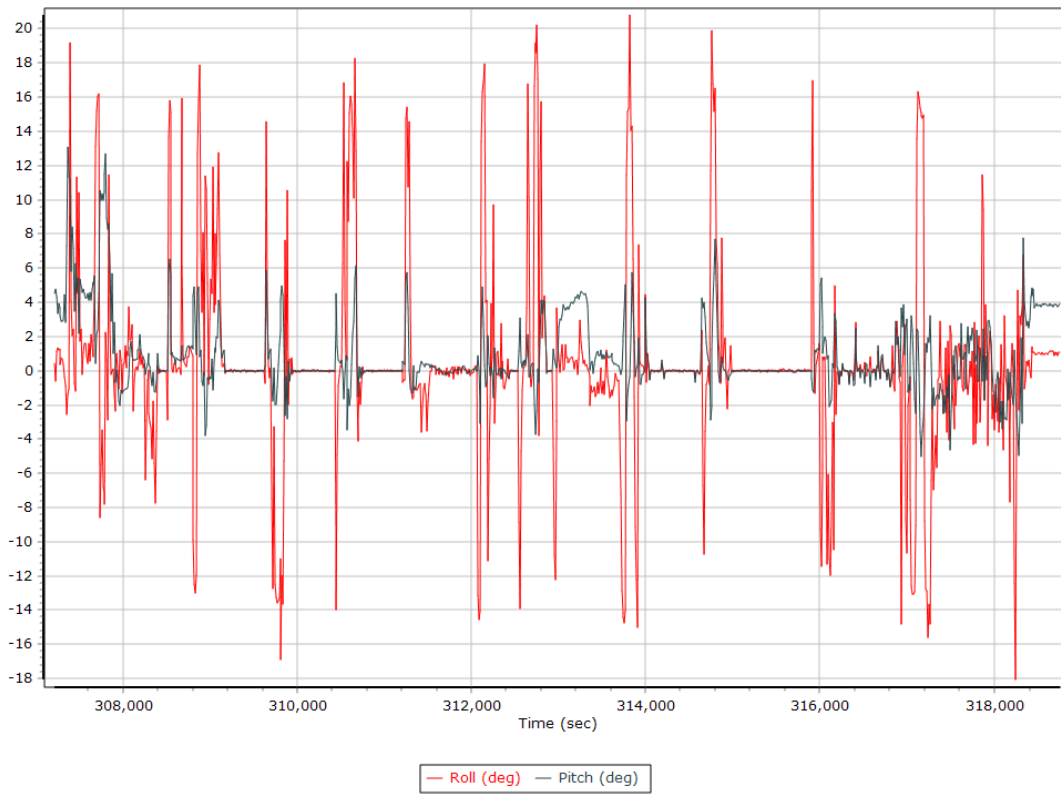
Top View



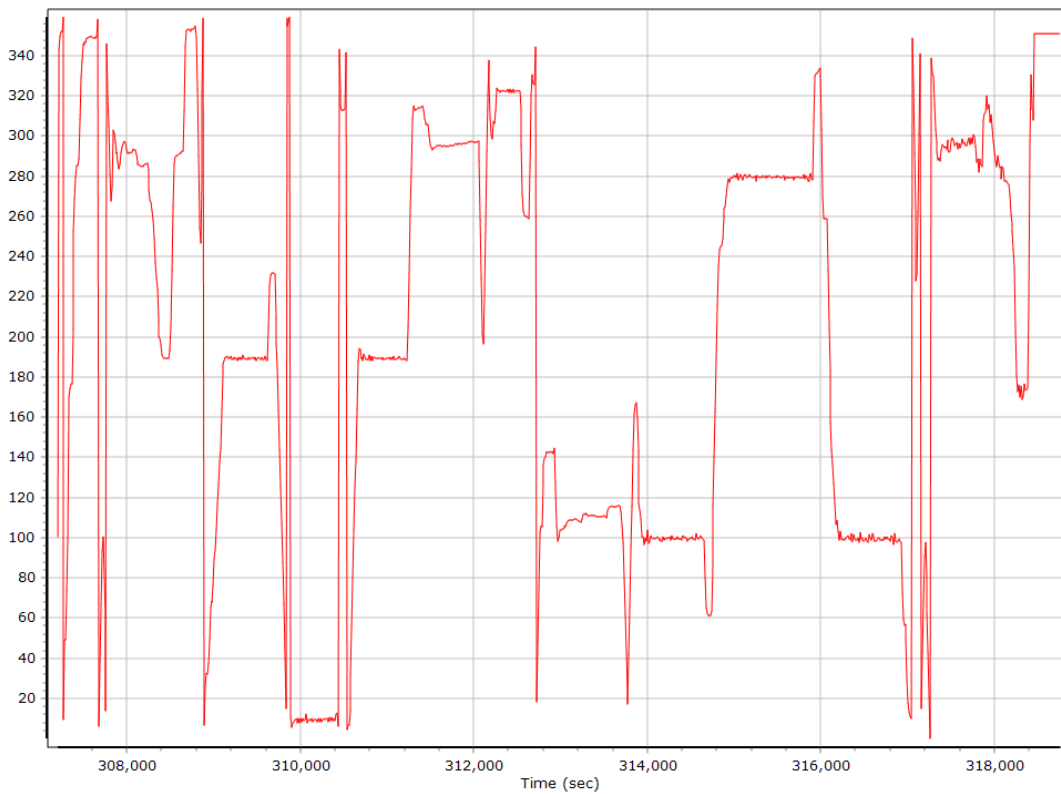
Altitude



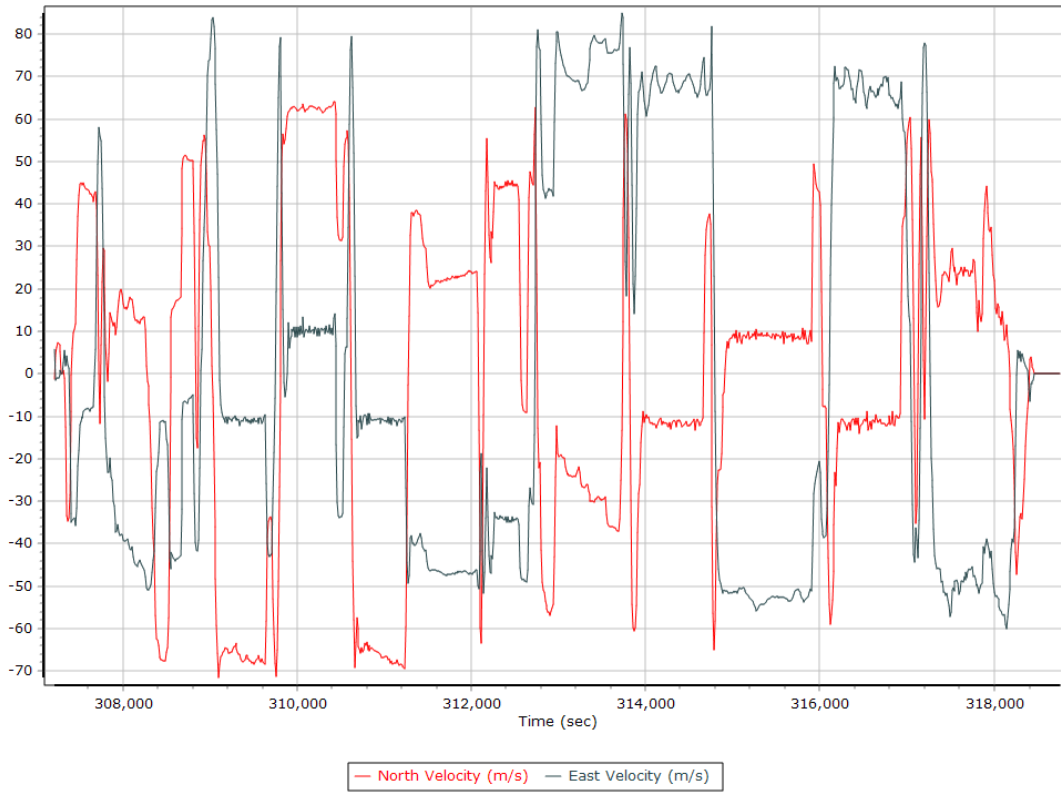
Roll/Pitch



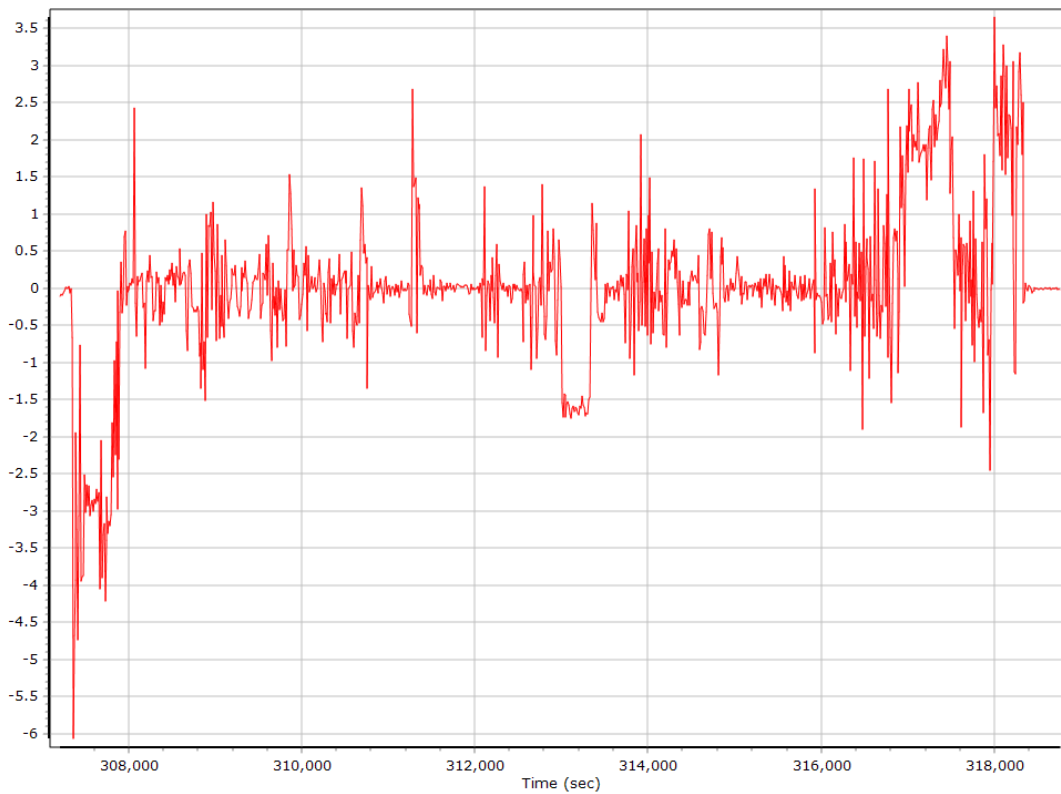
Heading



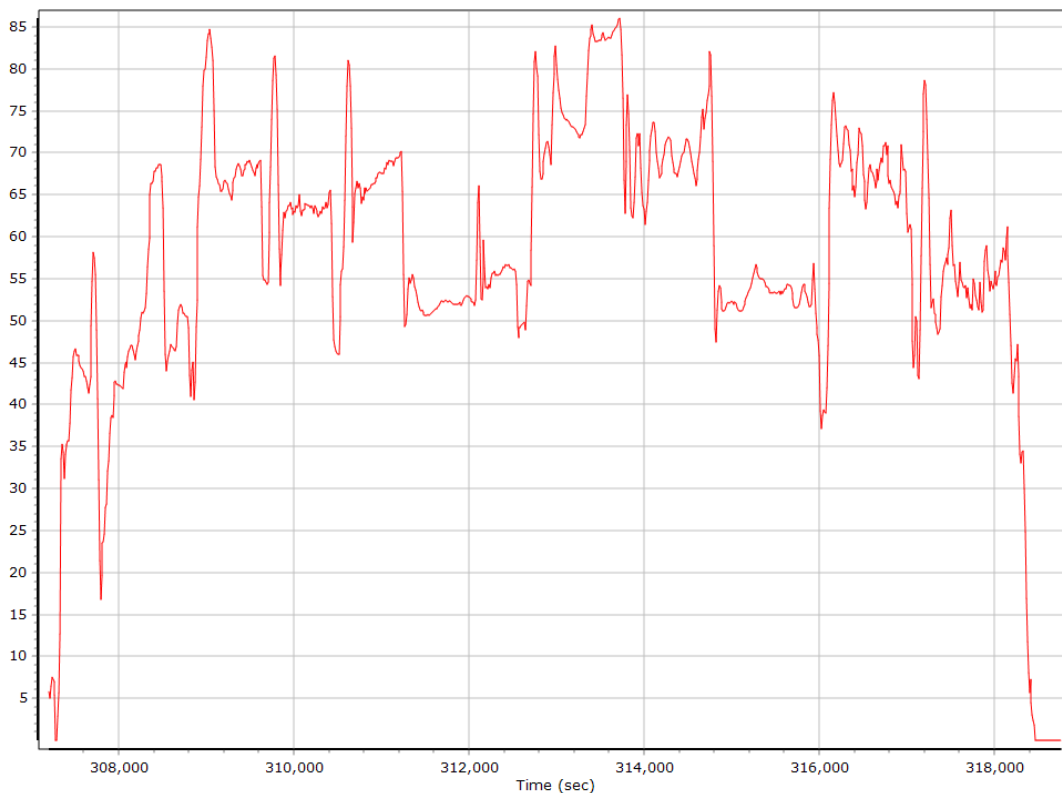
North/East Velocity



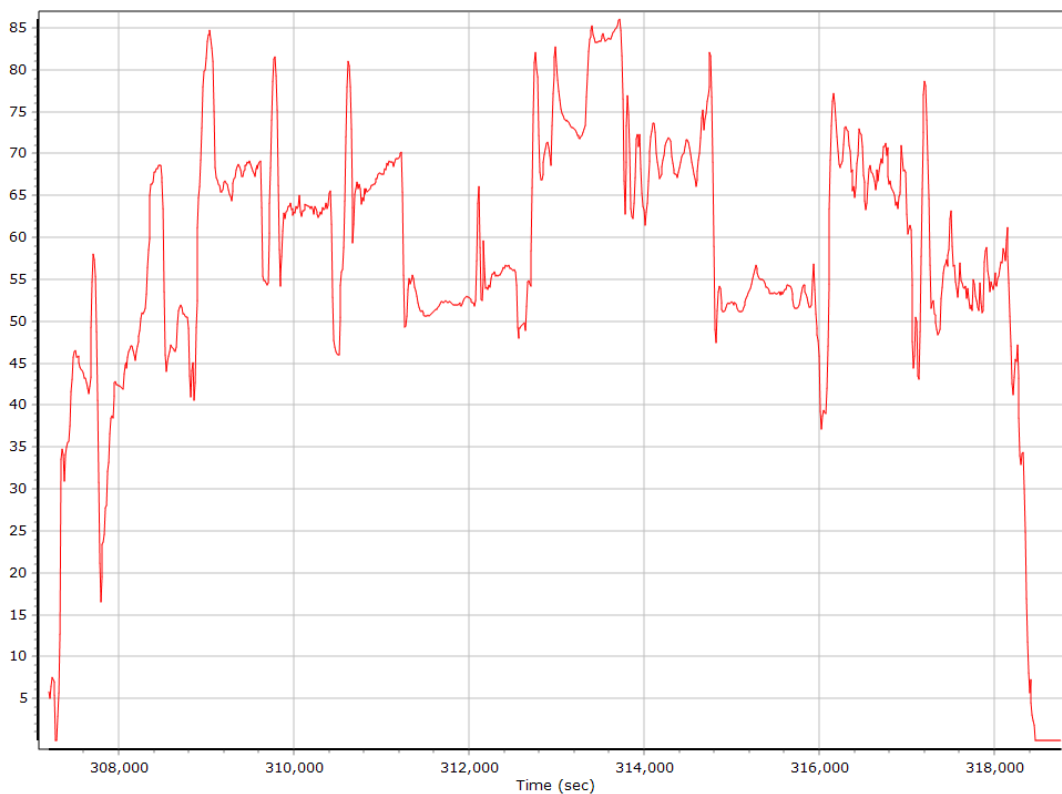
Down Velocity



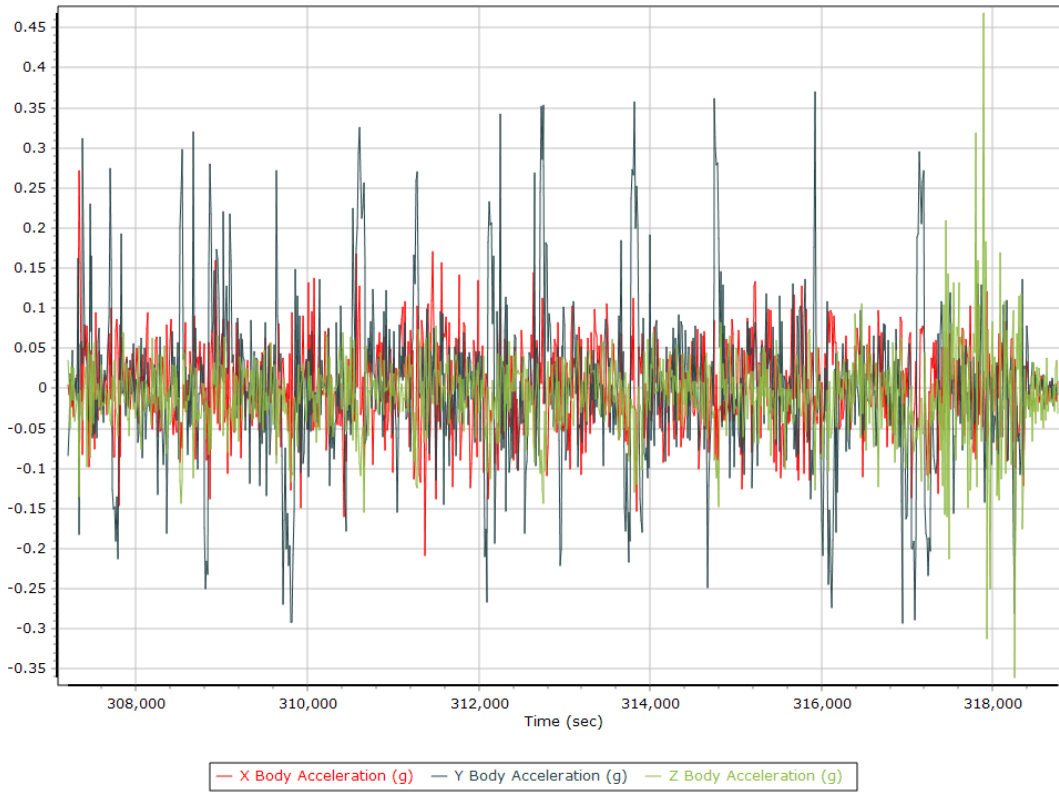
Total Speed



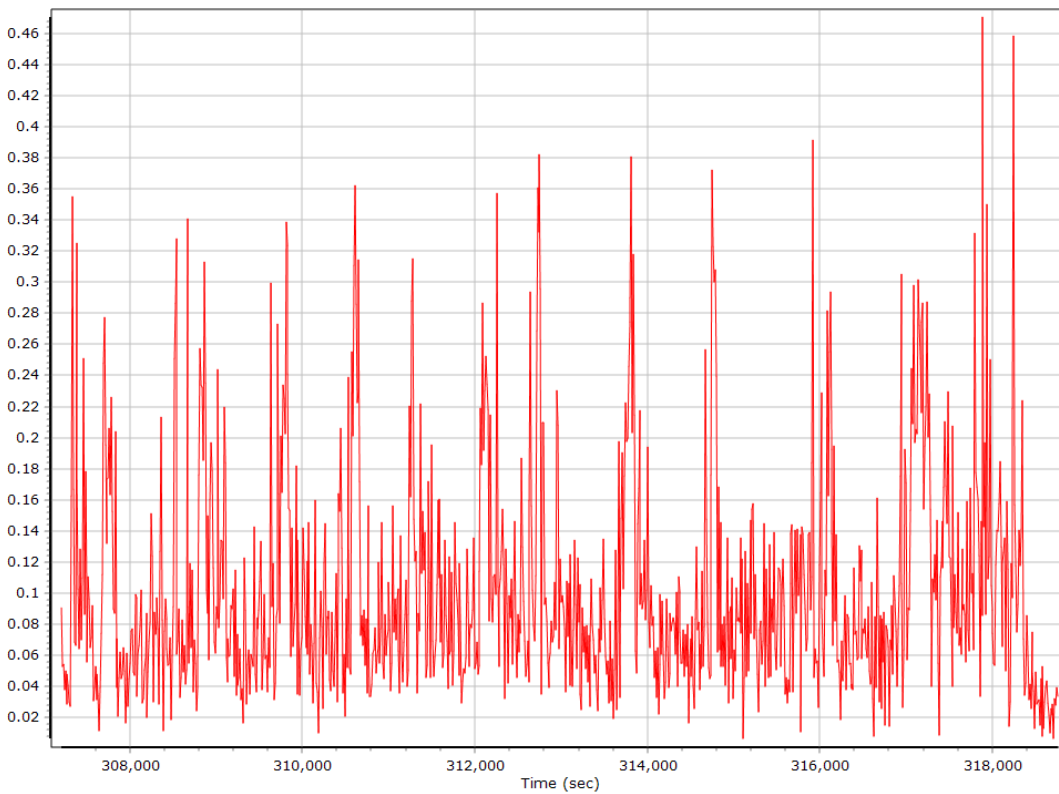
Ground Speed



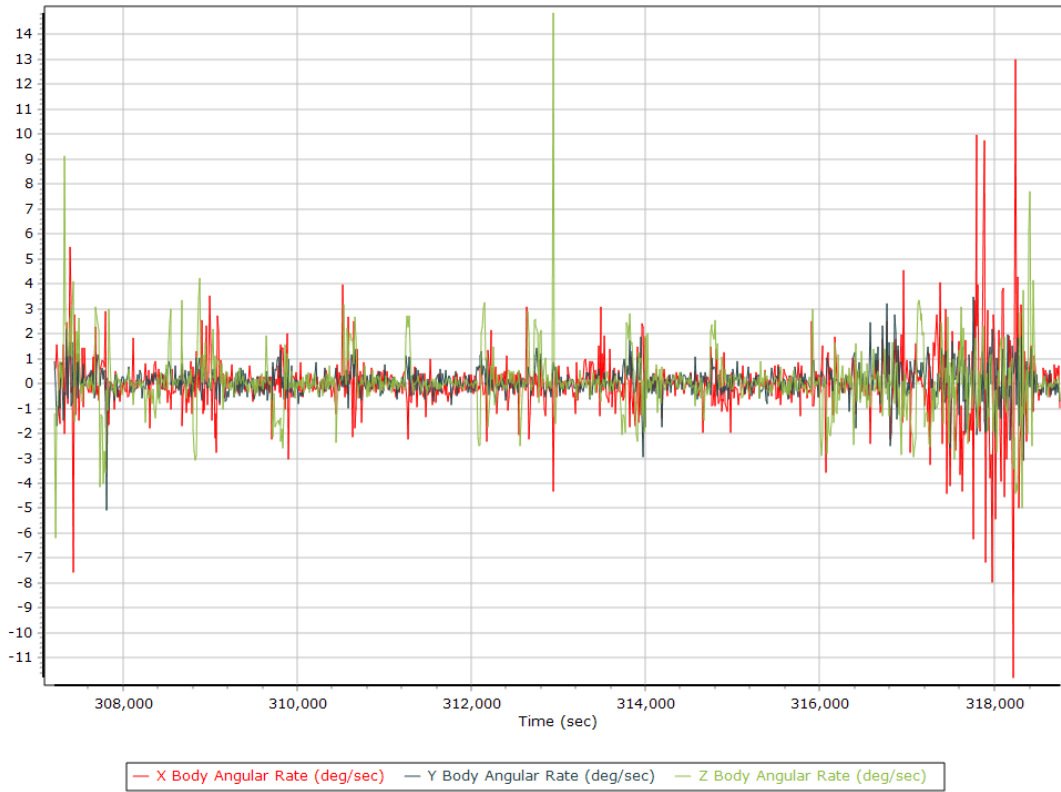
Body Acceleration



Total Body Acceleration



Body Angular Rate



SmartBase Processing Summary

Smart Select Options

Archive enabled	False
User database enabled	False
Include high-rate data sites	True
Target GNSS Selection	GNSS

Basestation Selection

Date	ID	Dist	System	Rate	Service	Database	Status
03/04/2020	WVTA	50.11	GNSS	1	User	None	Imported
03/04/2020	WVSH	69.40	GNSS	1	User	None	Imported
03/04/2020	WVBU	102.81	GNSS	1	User	None	Imported
03/04/2020	WVBR	36.73	GNSS	1	User	None	Imported
03/04/2020	PAFU	48.47	GNSS	1	User	None	Imported

SmartBase Results

SmartBase status	PROC_STATUS_OK
Primary station Id	WVBR
Primary station data rate (sec)	1.0
VRS/ASB generation rate (sec)	1.0
VRS/ASB timespan	11896 s (2095 306887 - 2095 318783)
Number of reference stations	5
Primary station GPS measurement usage (%)	99.6
Primary station GLONASS measurement usage (%)	80.4
Average number of satellites per epoch	14.3
Max number of GPS stations used	5
Min number of GPS stations used	3
Max number of GLONASS stations used	5
Min number of GLONASS stations used	3
Total full data gap (sec)	0
Total GPS full data gaps	0
Total GLONASS full data gaps	0
Total individual satellite data gap (sec)	13835
GPS precise vs. broadcast ephemeris used	93.9 % / 6.2 %
GLONASS precise vs. broadcast ephemeris used	0.0 % / 100.0 %
Termination Status	Normal

SmartBase Quality Check

Base Station - WVTA

Status	CONTROL	SBQI	0	
Duration (Hours)	23.90	Output Coordinates	Control	
Solution Epochs	5736	Mean Epoch SVs	8.5	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°26'16.64399"	W79°30'52.95303"	726.066
Adjusted		N39°26'16.64399"	W79°30'52.95303"	726.066
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.000	0.000	0.000

Base Station Information

Station ID	WVTA		
Filename	wvta0640.20o		
Start date	3/4/2020 12:00:00 AM		
End date	3/4/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4922K62119
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N39°26'16.64399"		
Longitude	W79°30'52.95303"		
Ellipsoidal height (m)	726.06600		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - WVSH

Status	OK	SBQI	0
Duration (Hours)	23.80	Output Coordinates	Original
Solution Epochs	5713	Mean Epoch SVs	8.6
Base Station Coordinates	Latitude	Longitude	Height (m)
Original	N39°59'49.09954"	W80°40'46.36115"	384.551
Adjusted	N39°59'49.09950"	W80°40'46.36188"	384.553
Coordinate Adjustments	Horizontal (m)	Vertical (m)	Total (m)
Adjustments	0.017	0.002	0.017

Base Station Information

Station ID	WVSH		
Filename	wvsh0640.20o		
Start date	3/4/2020 12:00:00 AM		
End date	3/4/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4924K62366
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N39°59'49.09954"		
Longitude	W80°40'46.36115"		
Ellipsoidal height (m)	384.55100		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - WVBU

Status	OK	SBQI	0	
Duration (Hours)	23.80	Output Coordinates	Original	
Solution Epochs	5712	Mean Epoch SVs	8.6	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°20'16.82171"	W78°54'48.58712"	200.059
Adjusted		N39°20'16.82200"	W78°54'48.58767"	200.063
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.016	0.004	0.017

Base Station Information

Station ID	WVBU		
Filename	wvbu0640.20o		
Start date	3/4/2020 12:00:00 AM		
End date	3/4/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4922K62096
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N39°20'16.82171"		
Longitude	W78°54'48.58712"		
Ellipsoidal height (m)	200.05900		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - WVBR

Status	OK	SBQI	0	
Duration (Hours)	23.80	Output Coordinates	Original	
Solution Epochs	5712	Mean Epoch SVs	8.6	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°18'28.88440"	W80°16'38.61885"	270.246
Adjusted		N39°18'28.88424"	W80°16'38.61941"	270.254
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.014	0.008	0.016

Base Station Information

Station ID	WVBR		
Filename	wvbr0640.20o		
Start date	3/4/2020 12:00:00 AM		
End date	3/4/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4922K62070
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N39°18'28.88440"		
Longitude	W80°16'38.61885"		
Ellipsoidal height (m)	270.24600		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - PAFU

Status	OK	SBQI	0	
Duration (Hours)	23.80	Output Coordinates	Original	
Solution Epochs	5711	Mean Epoch SVs	8.6	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°55'35.68892"	W79°41'50.51027"	328.002
Adjusted		N39°55'35.68898"	W79°41'50.51085"	328.015
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.014	0.013	0.019

Base Station Information

Station ID	PAFU		
Filename	pafu0640.20o		
Start date	3/4/2020 12:00:00 AM		
End date	3/4/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	Alloy	5838R40082
Antenna manufacturer, model	Trimble	Zephyr 3 Geodetic	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.06519		
Latitude	N39°55'35.68892"		
Longitude	W79°41'50.51027"		
Ellipsoidal height (m)	328.00200		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

GNSS QC

GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	4.23	78.93	
Number of GPS SV	7	11	10
Number of GLONASS SV	0	6	5
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	0	0	0
Total number of SV	8	16	14
PDOP	1.18	2.49	1.42
QC Solution Gaps	1.00	1.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	11887.00	0.00	1.00
Percentage	99.99	0.00	0.01

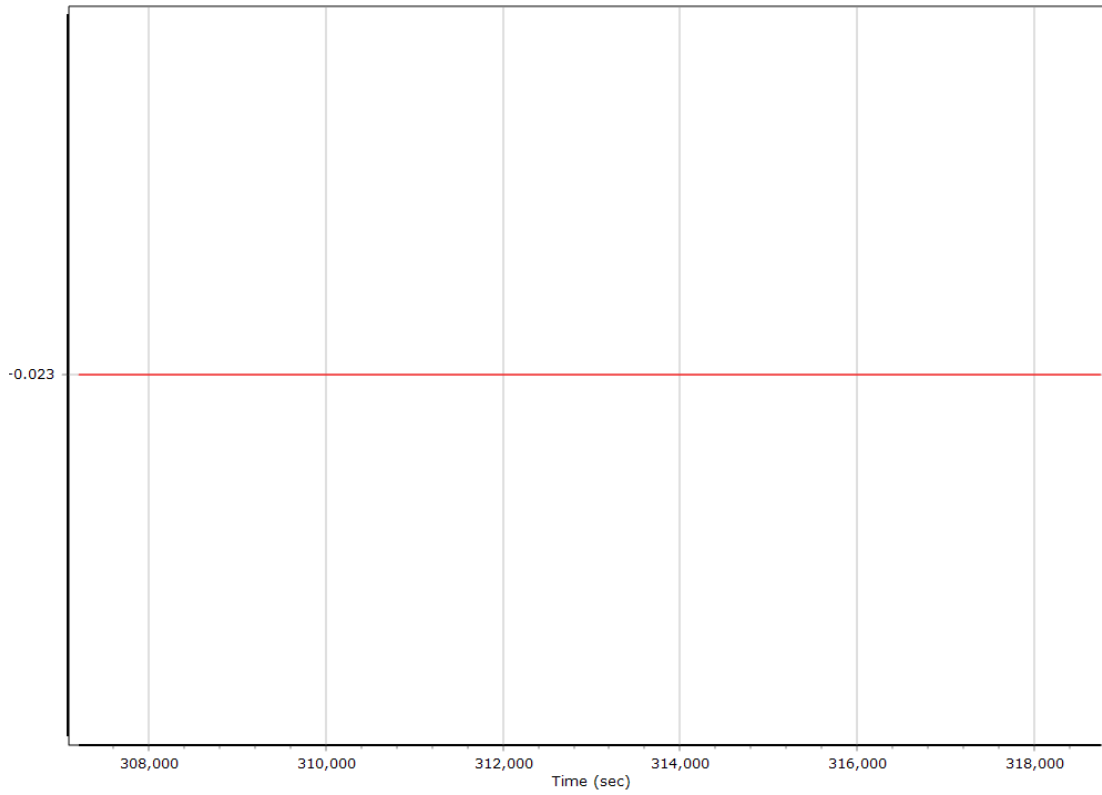
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion SmartBase		
Stabilized mount	True		
Base station	ASB		
Processing start time	306869.000 (3/4/2020 1:14:29 PM)		
Processing end time	318765.000 (3/4/2020 4:32:45 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)	-0.023	0.000	-1.028
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

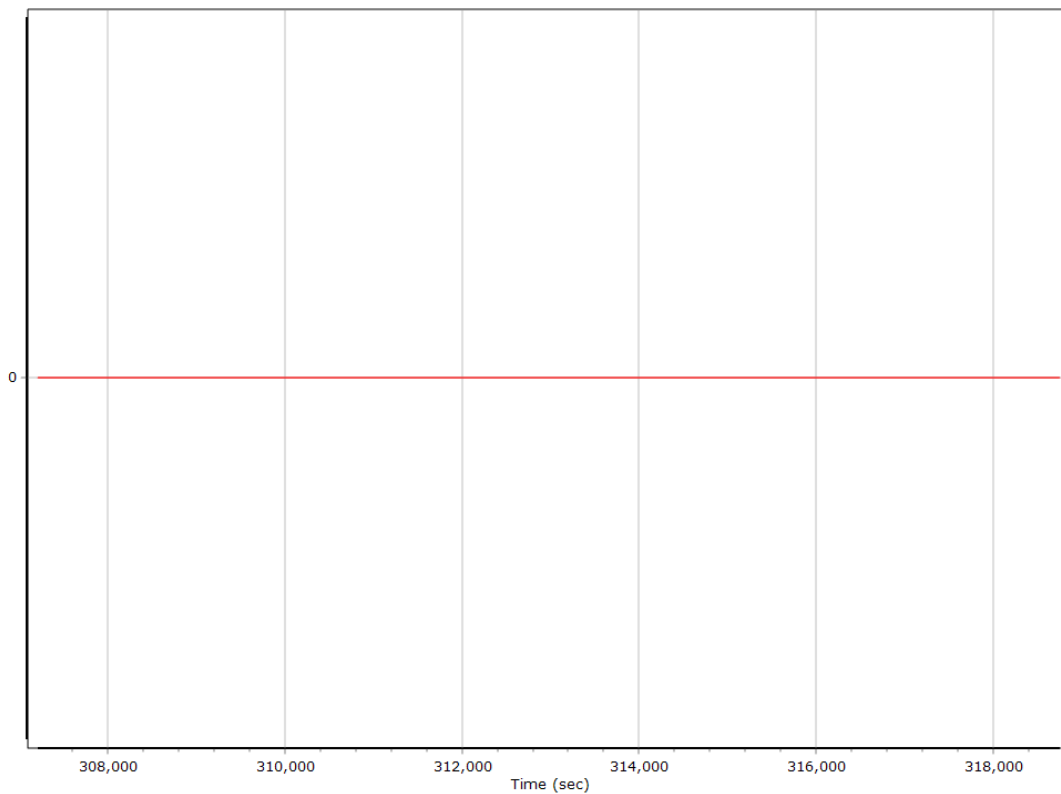
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

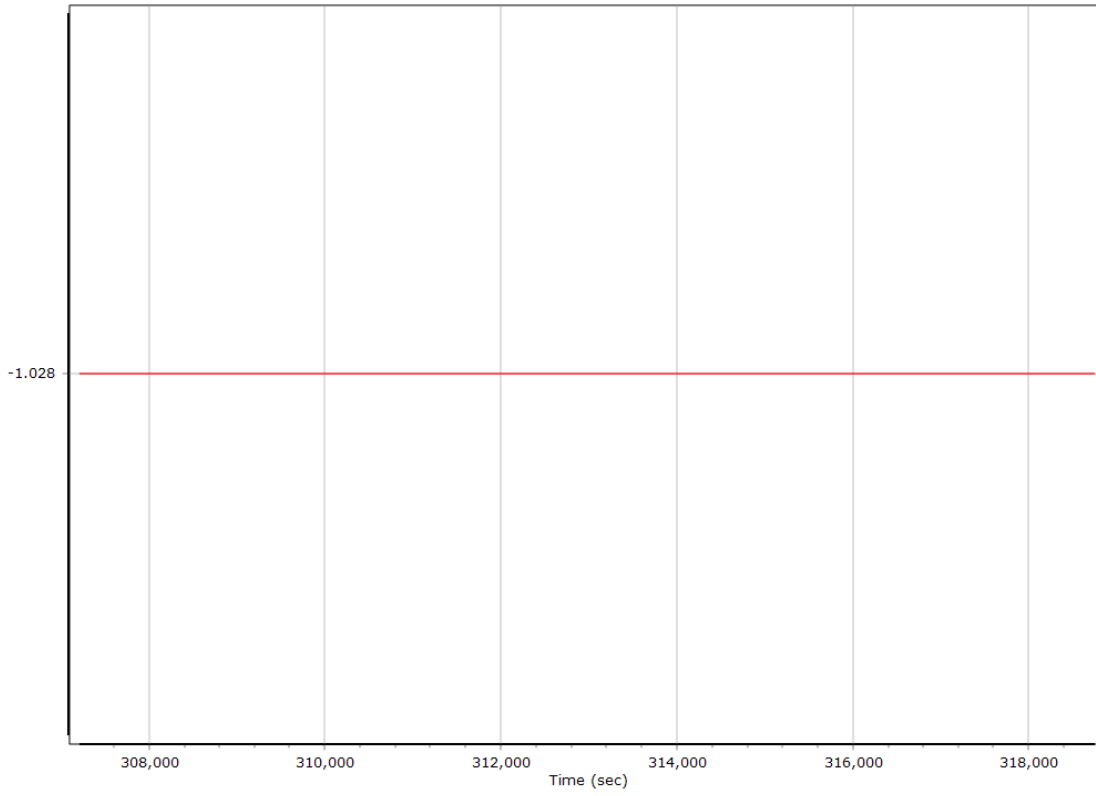
X Reference-Primary GNSS Lever Arm (m)



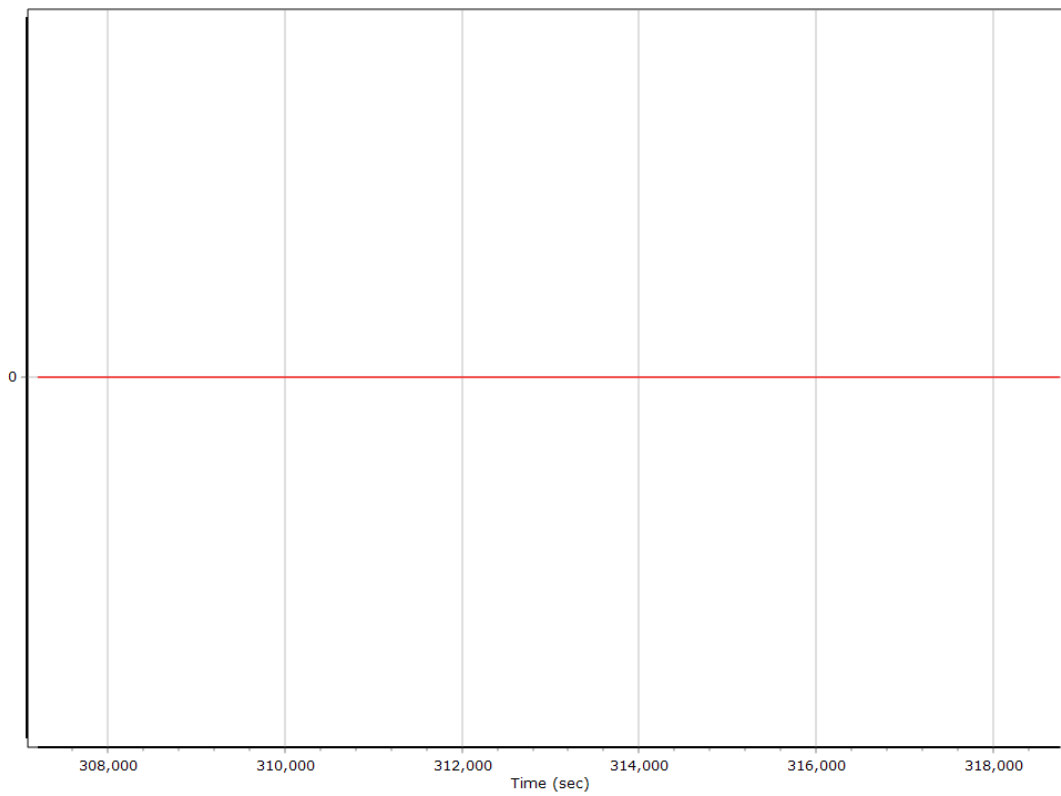
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



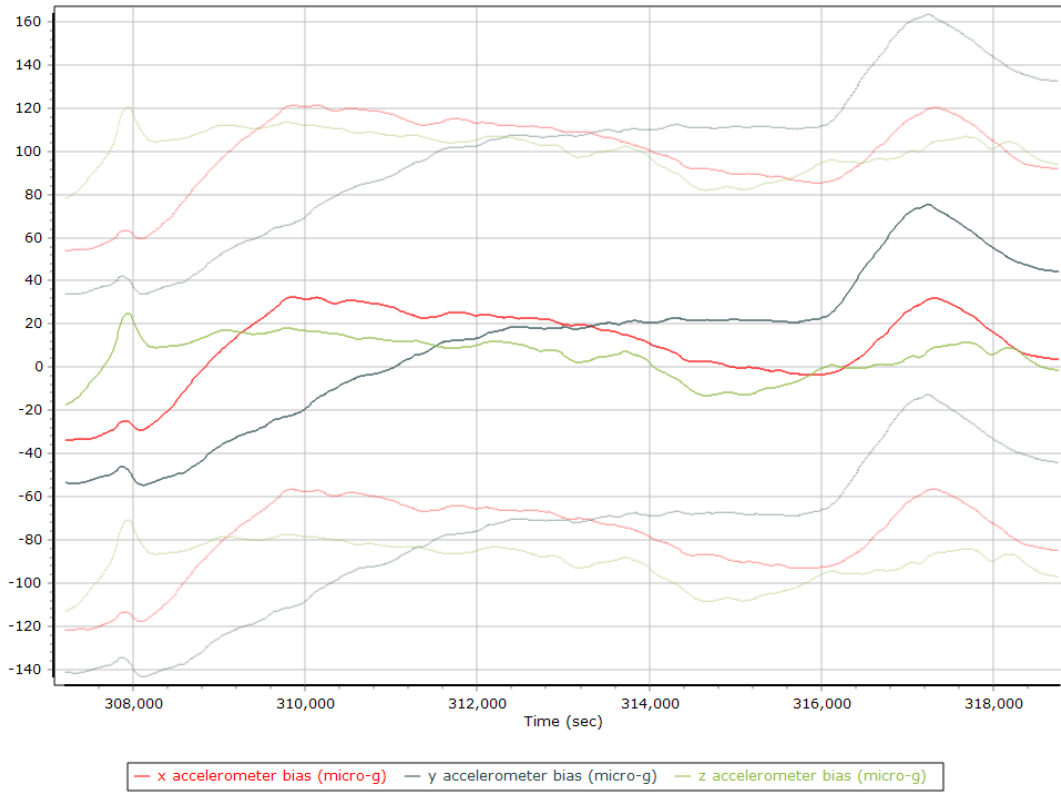
Reference-Primary GNSS Lever Arm Figure of Merit



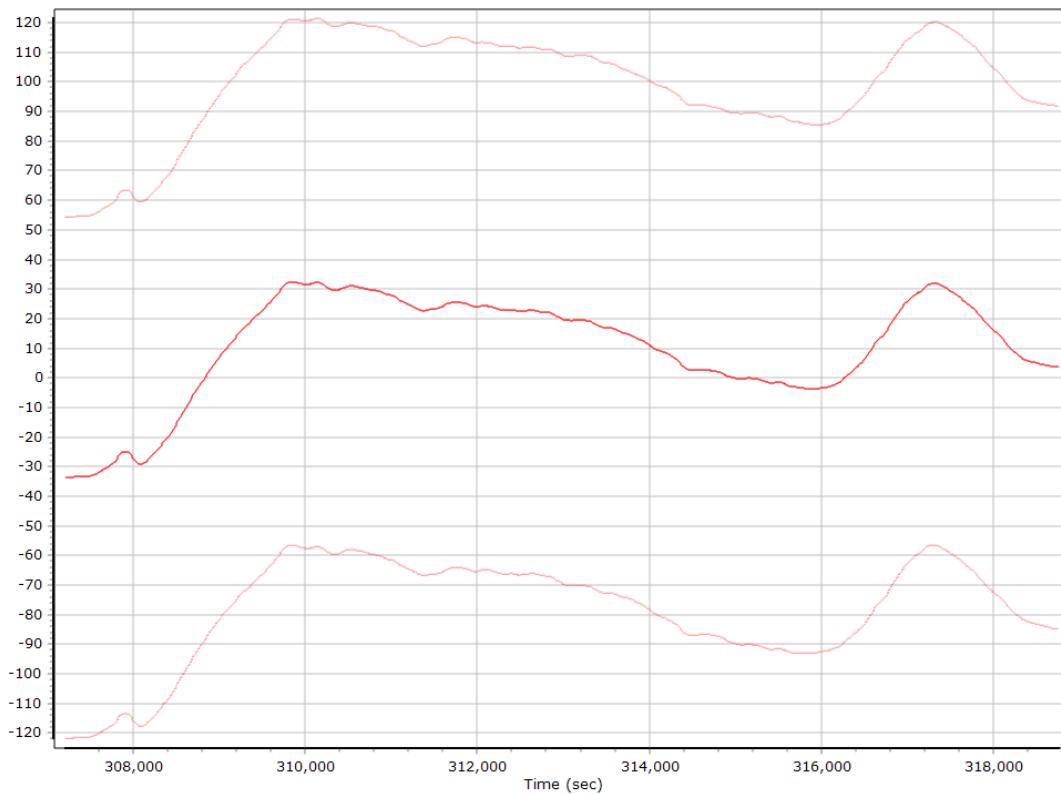
Smoothed IN-Fusion QC

Smoothed Estimated Errors, Reference Frame

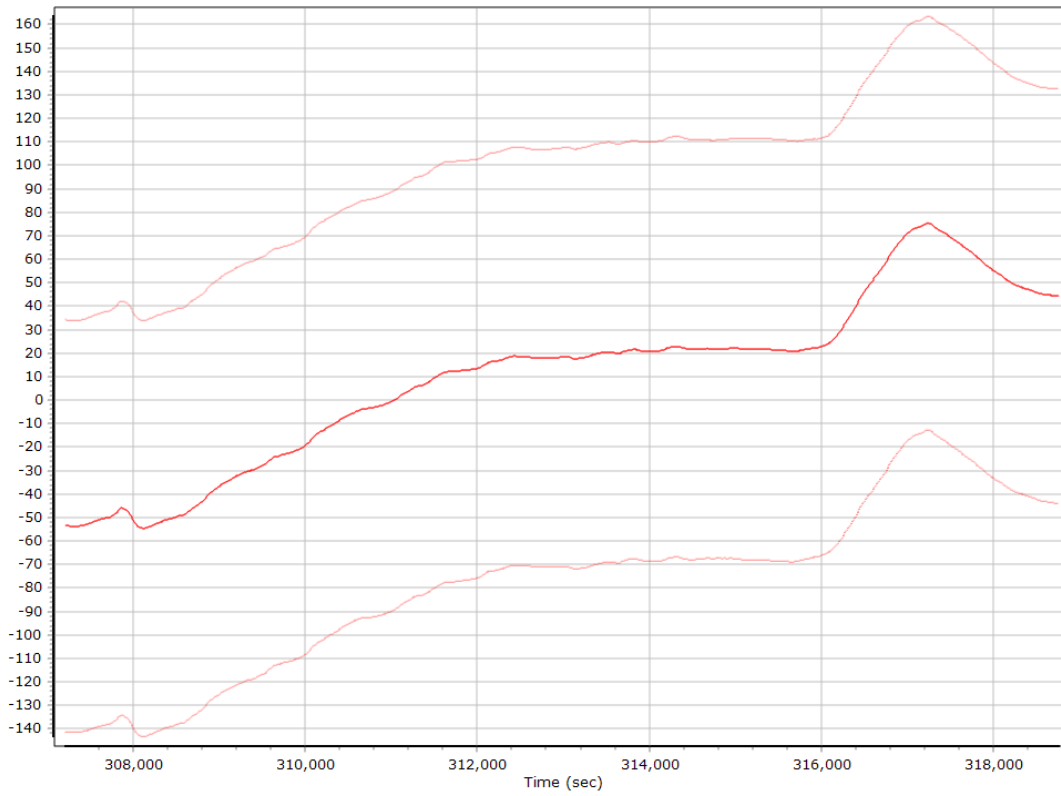
Accelerometer Bias (micro-g)



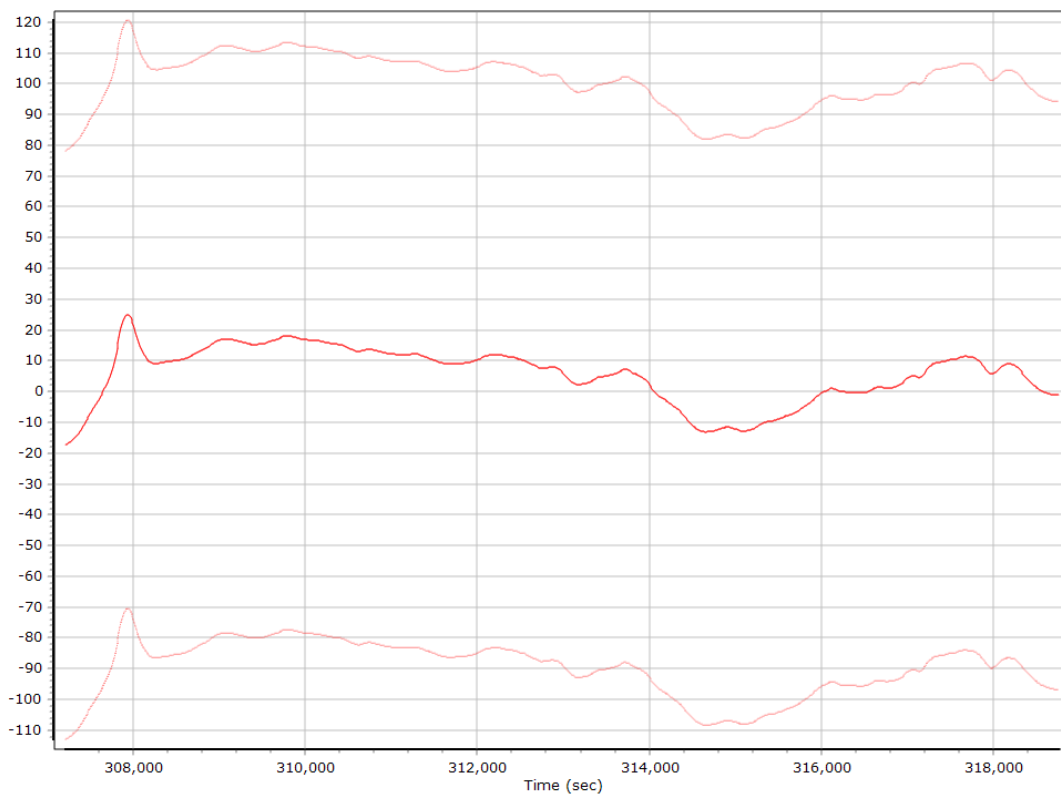
X Accelerometer Bias (micro-g)



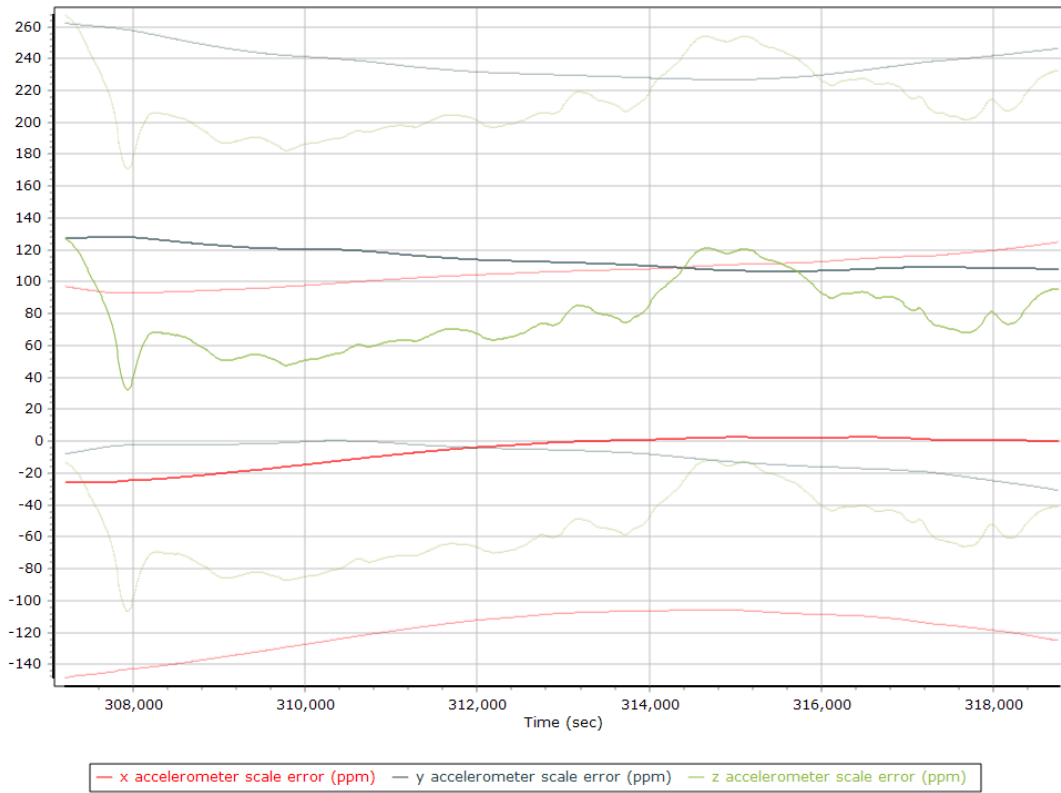
Y Accelerometer Bias (micro-g)



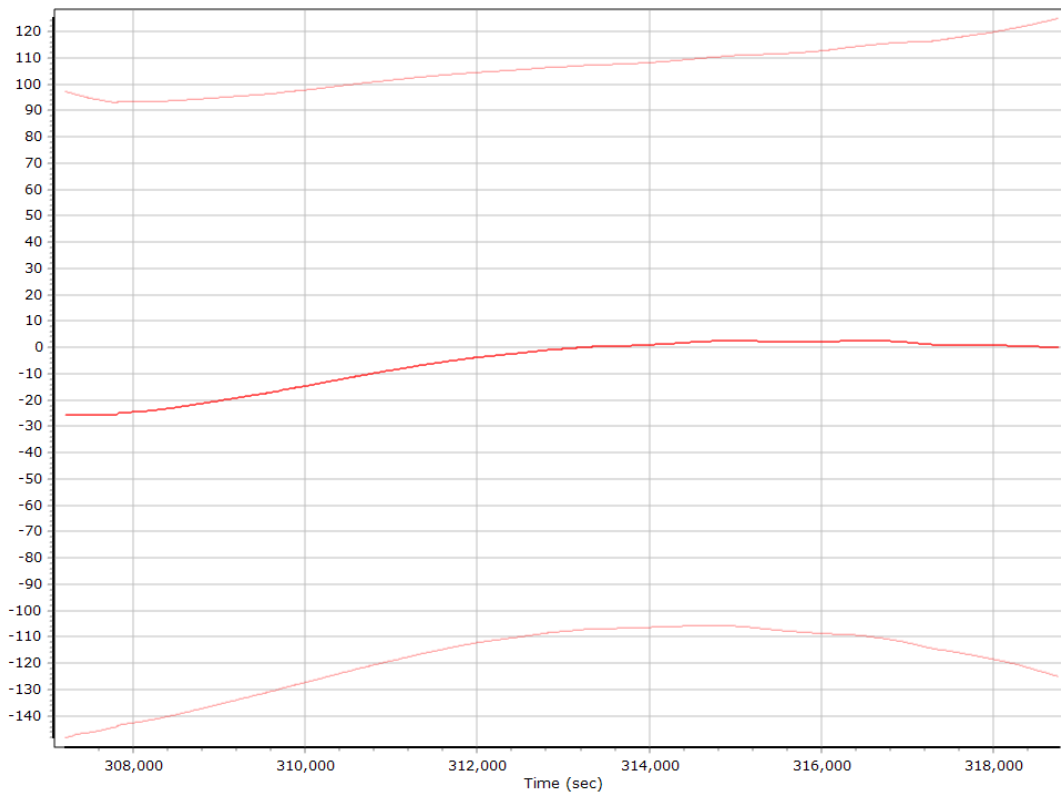
Z Accelerometer Bias (micro-g)



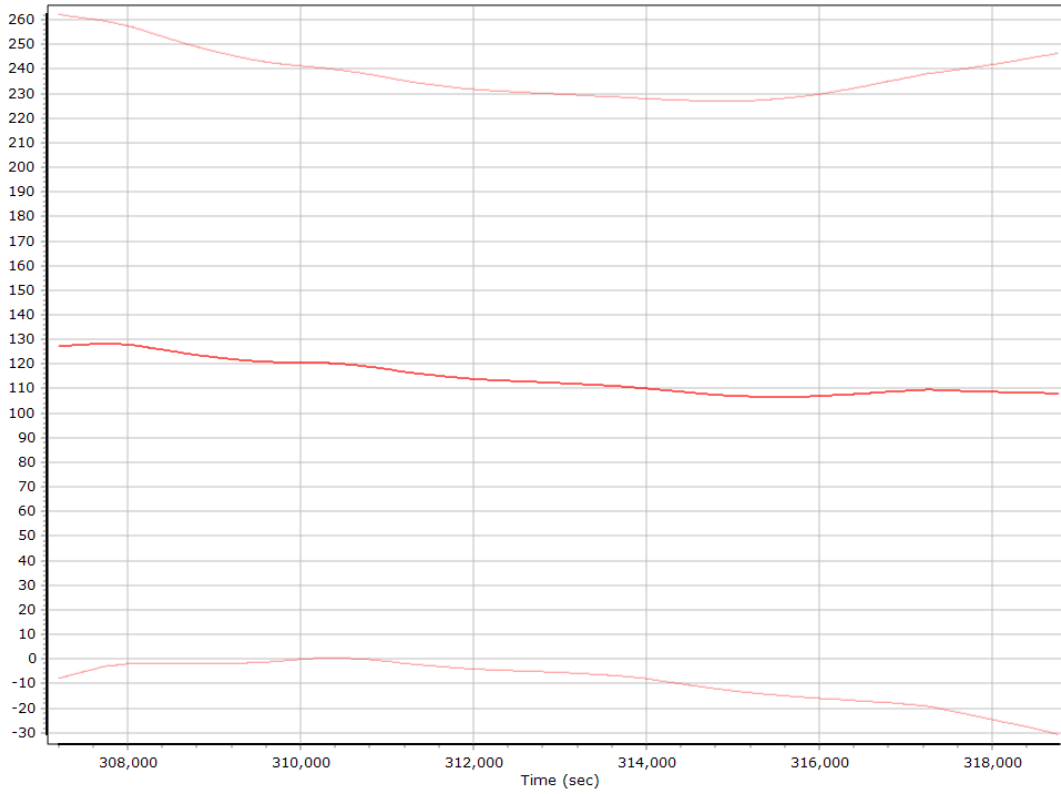
Accelerometer Scale Error (ppm)



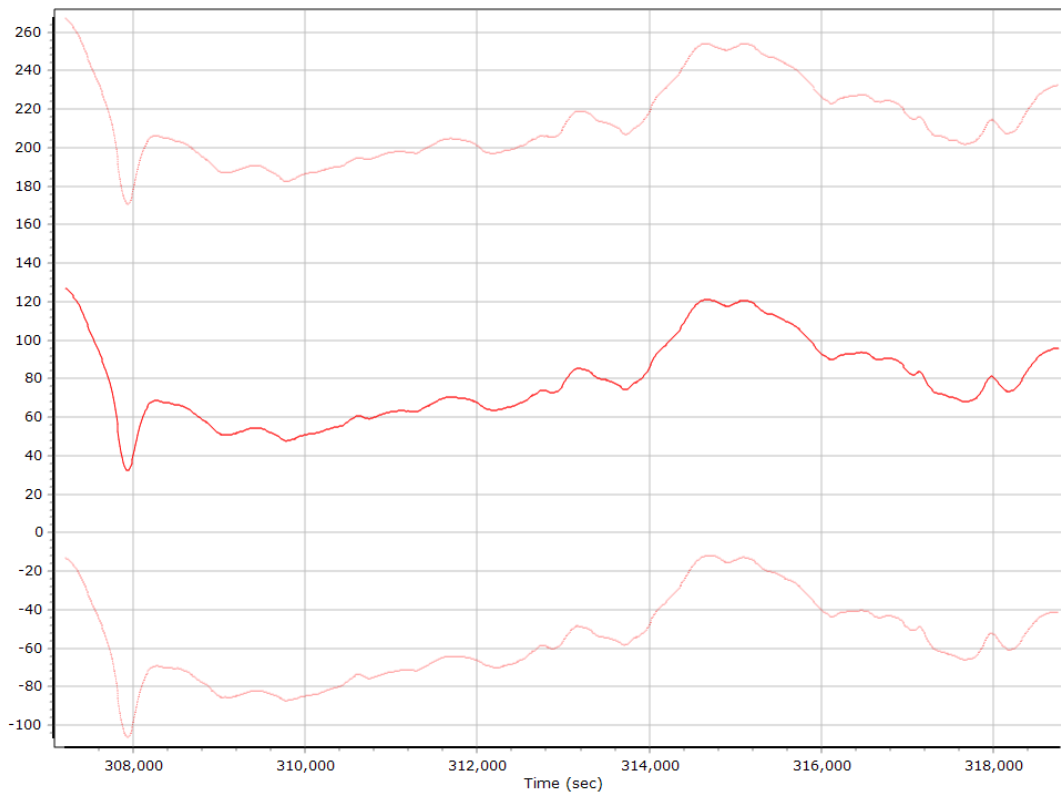
X Accelerometer Scale Error (ppm)



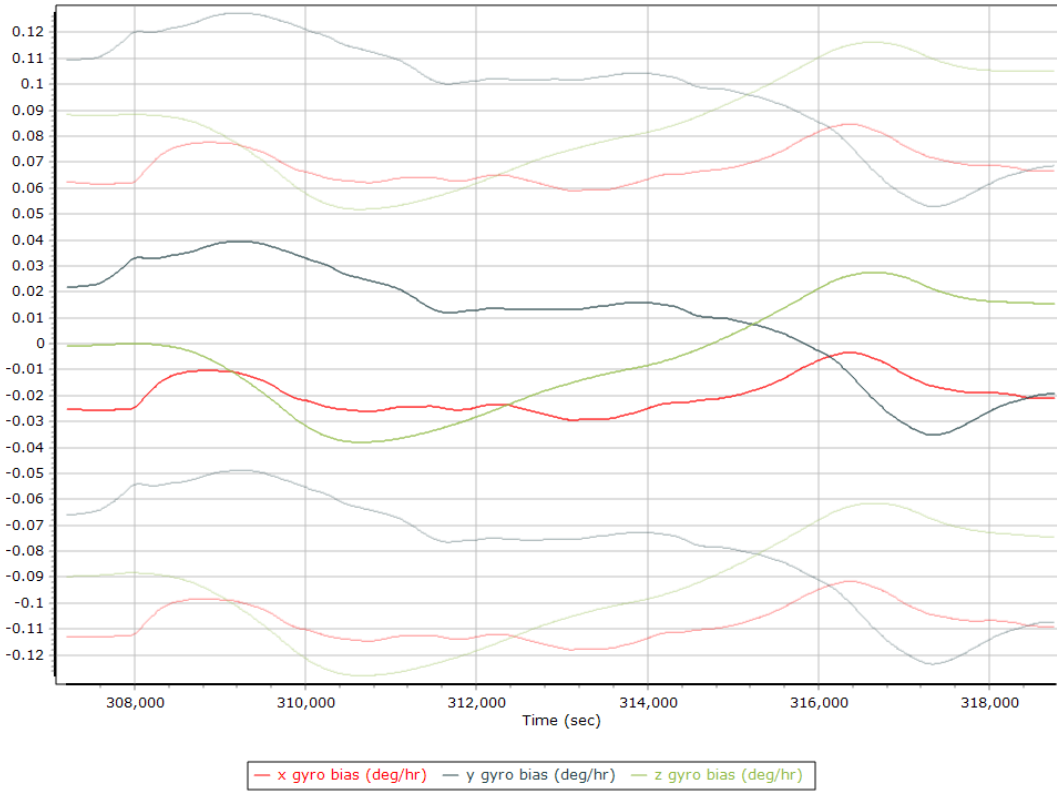
Y Accelerometer Scale Error (ppm)



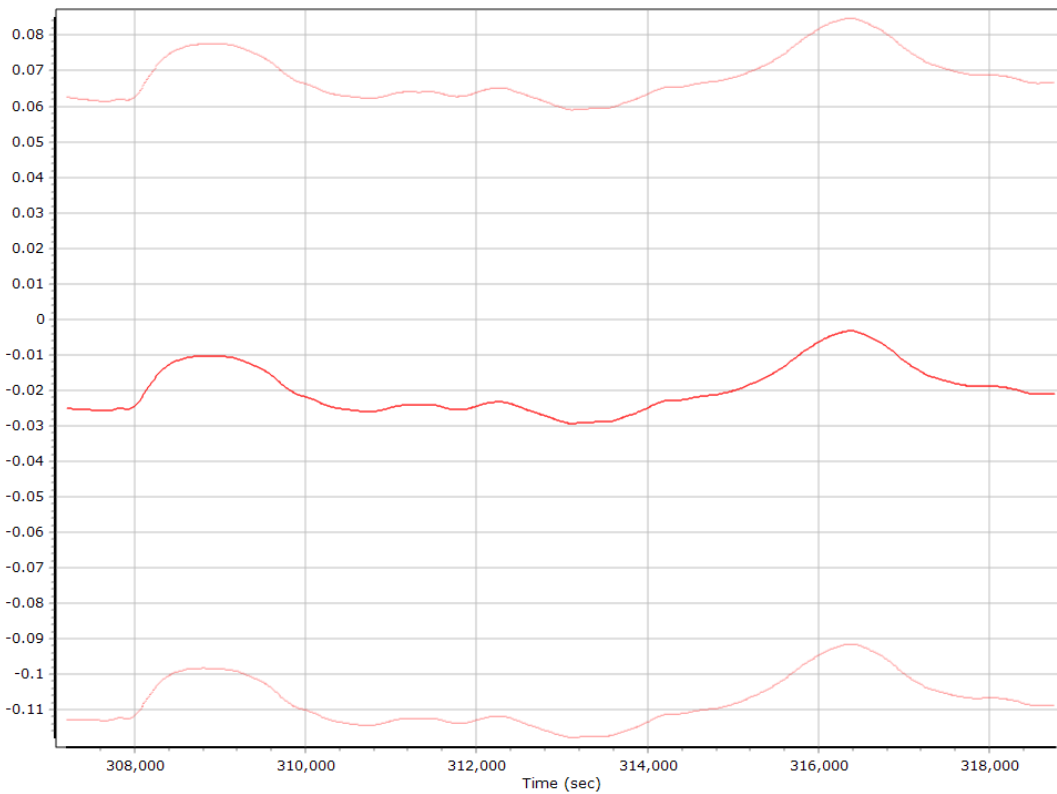
Z Accelerometer Scale Error (ppm)



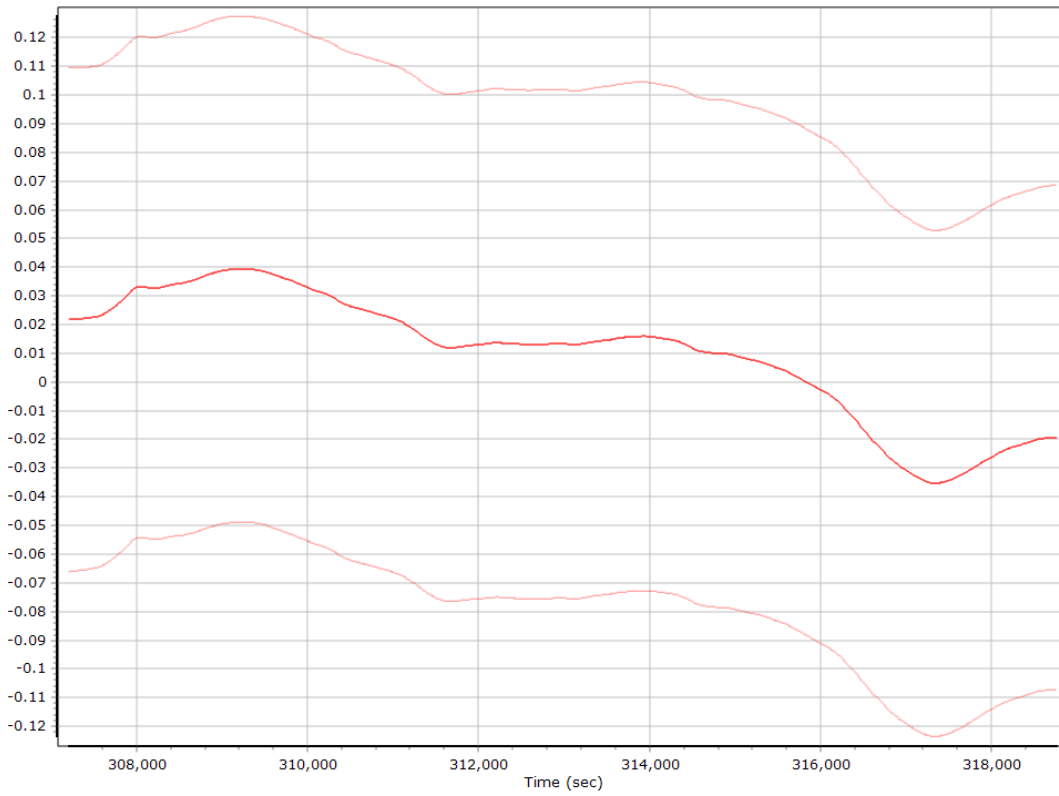
Gyro Bias (deg/h)



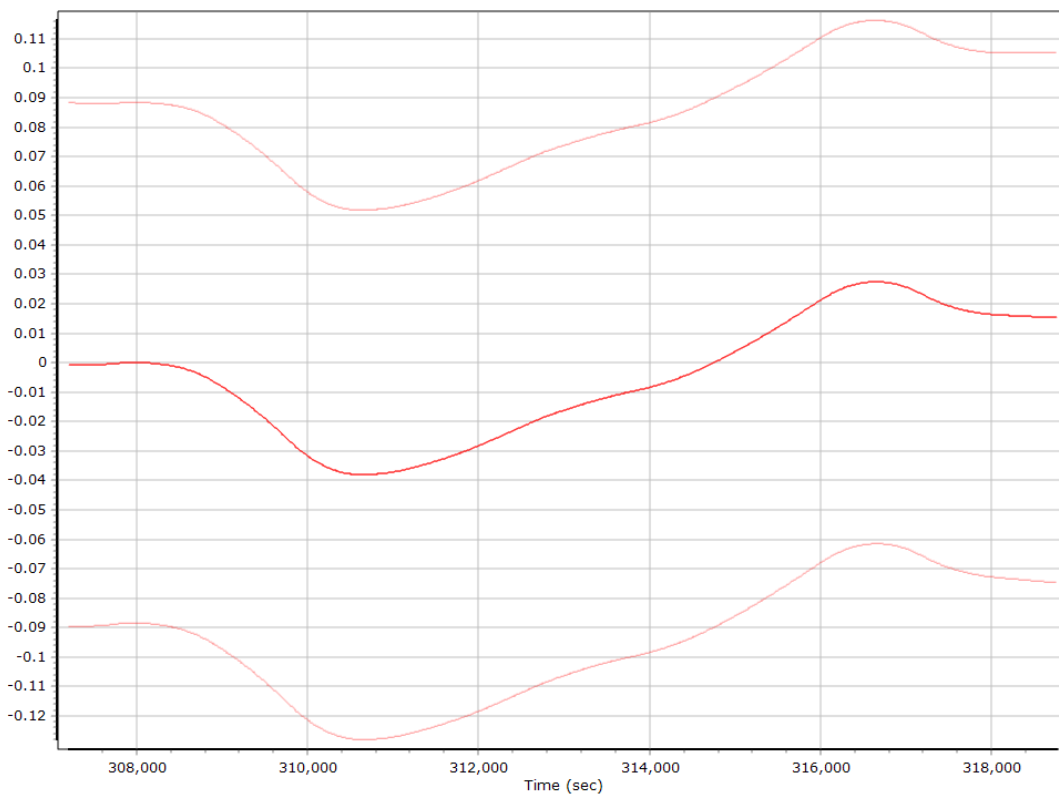
X Gyro Bias (deg/h)



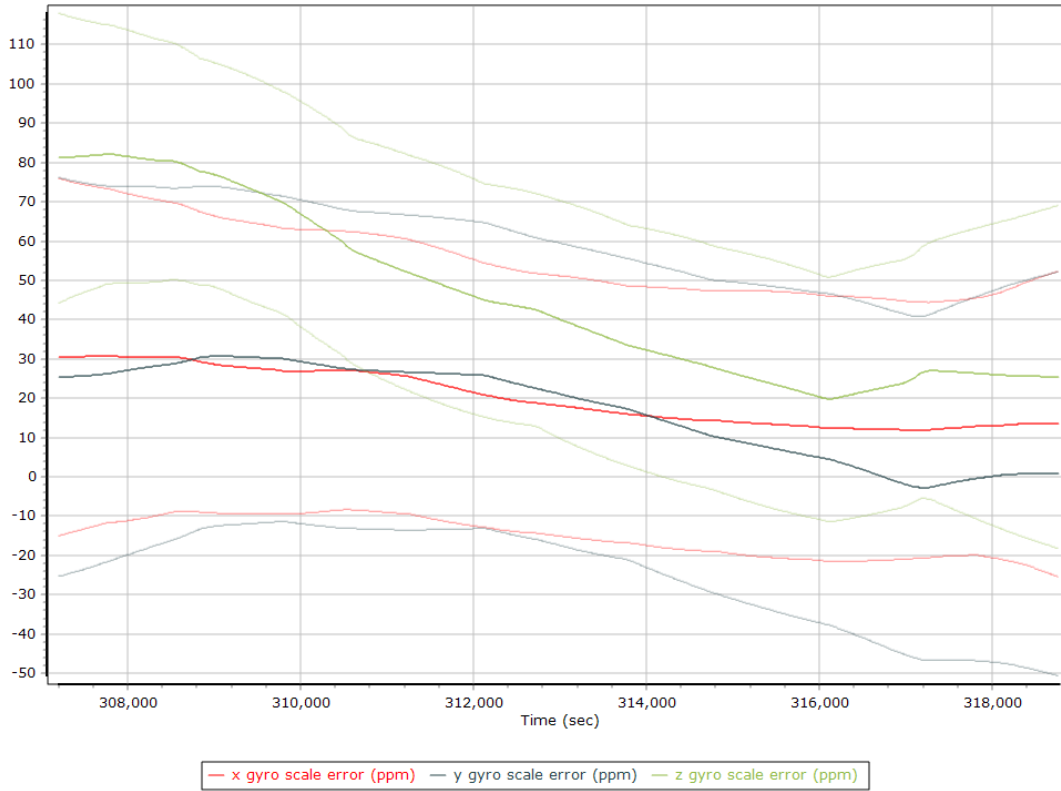
Y Gyro Bias (deg/h)



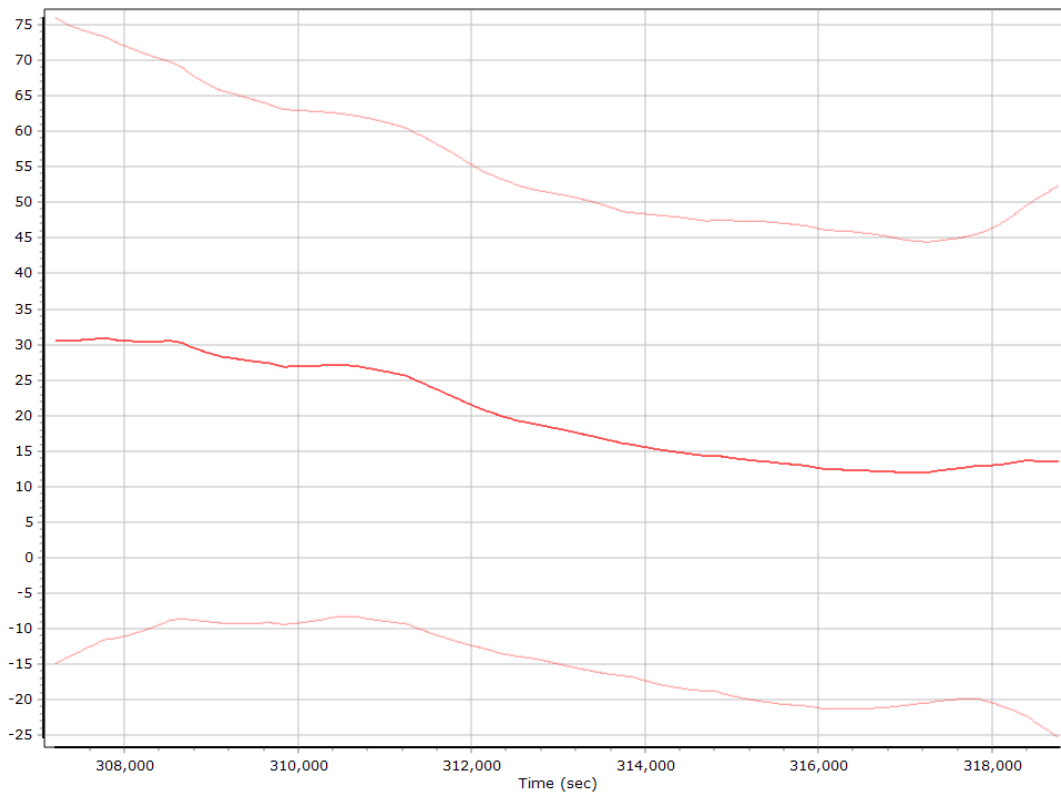
Z Gyro Bias (deg/h)



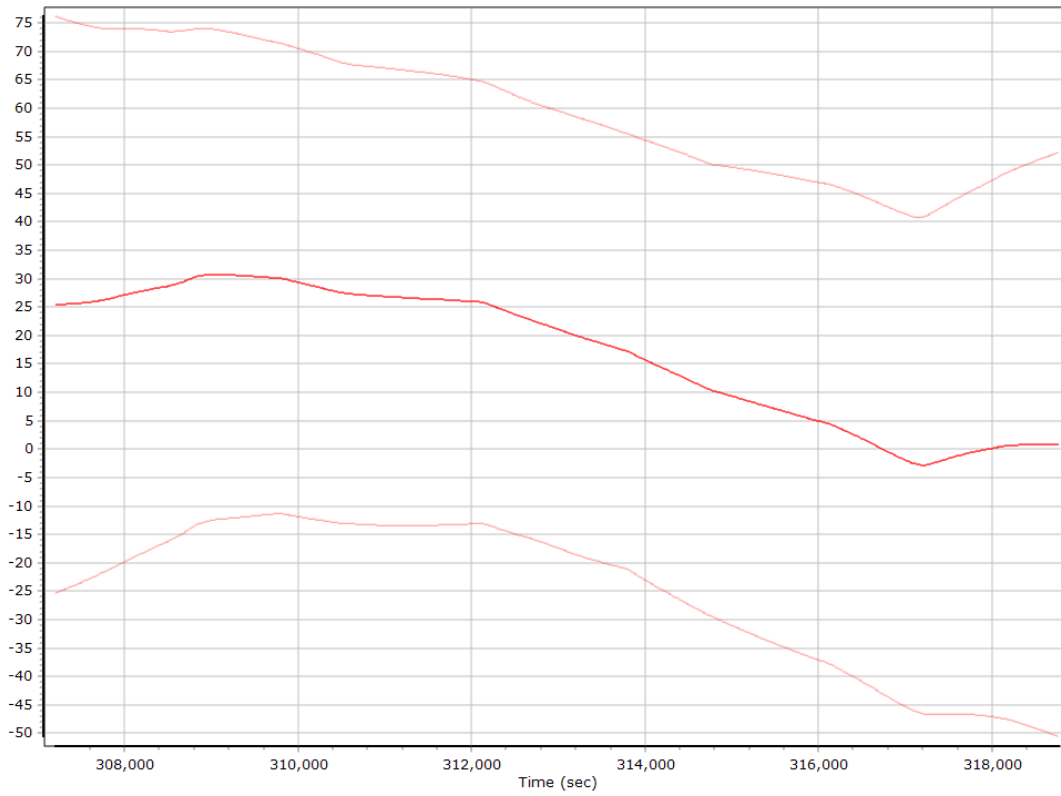
Gyro Scale Error (ppm)



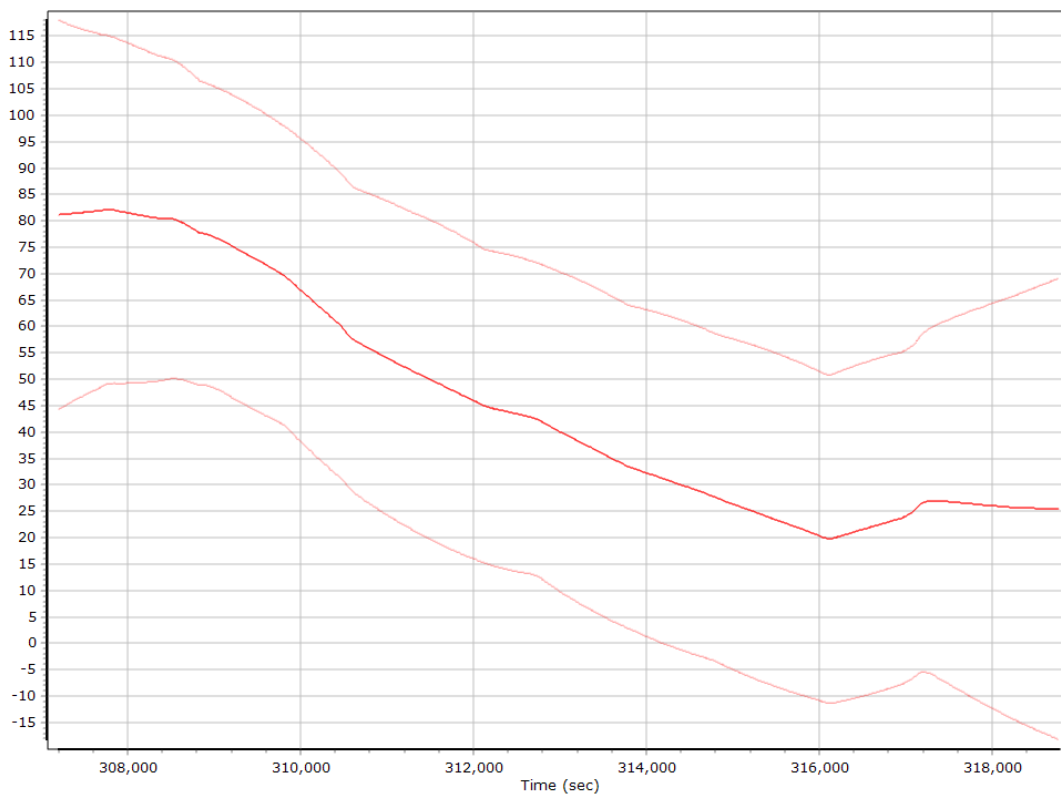
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

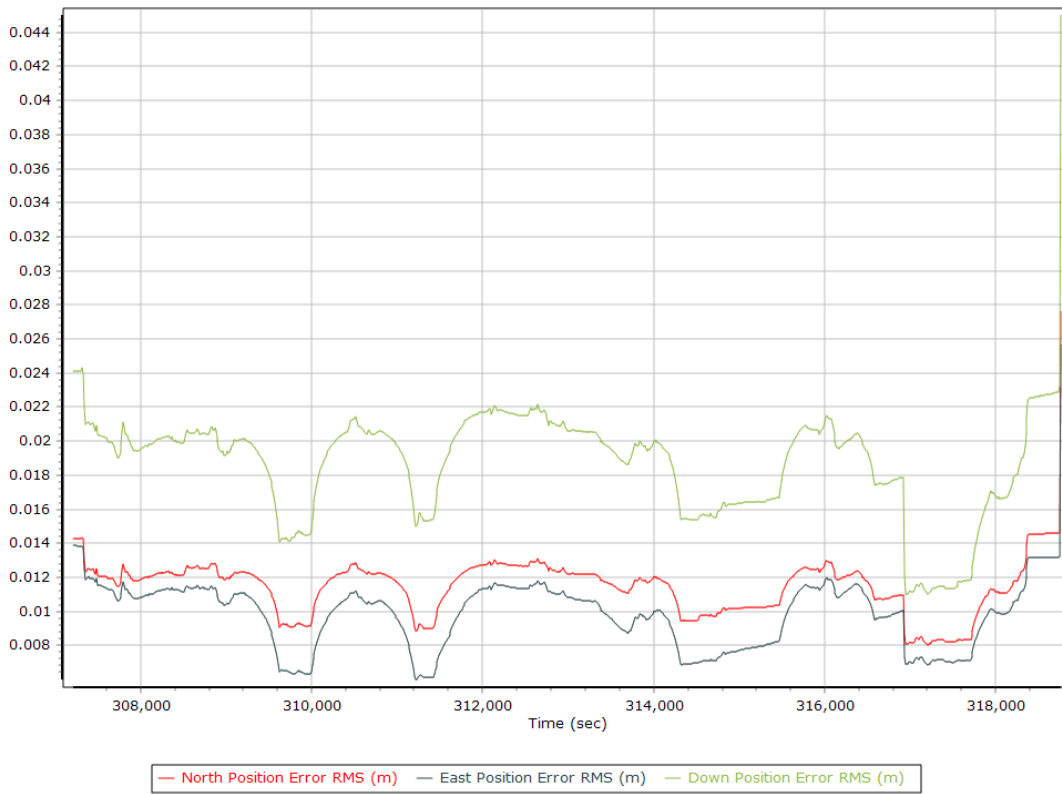


Z Gyro Scale Error (ppm)

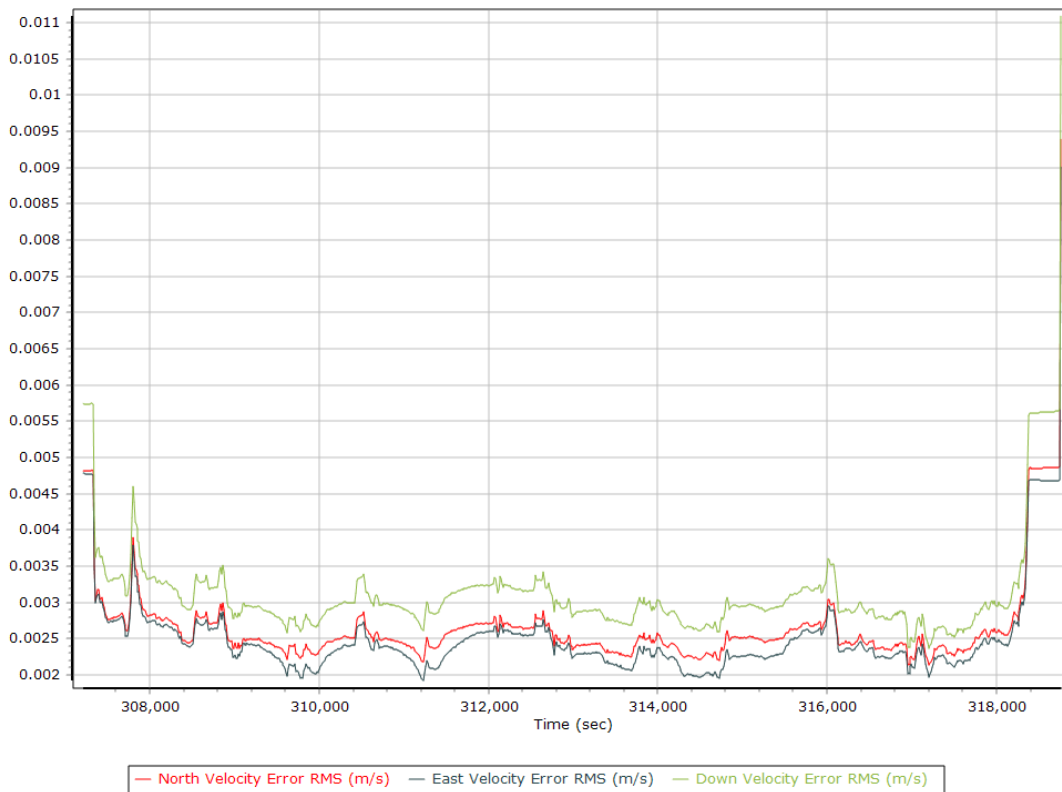


Smoothed Performance Metrics

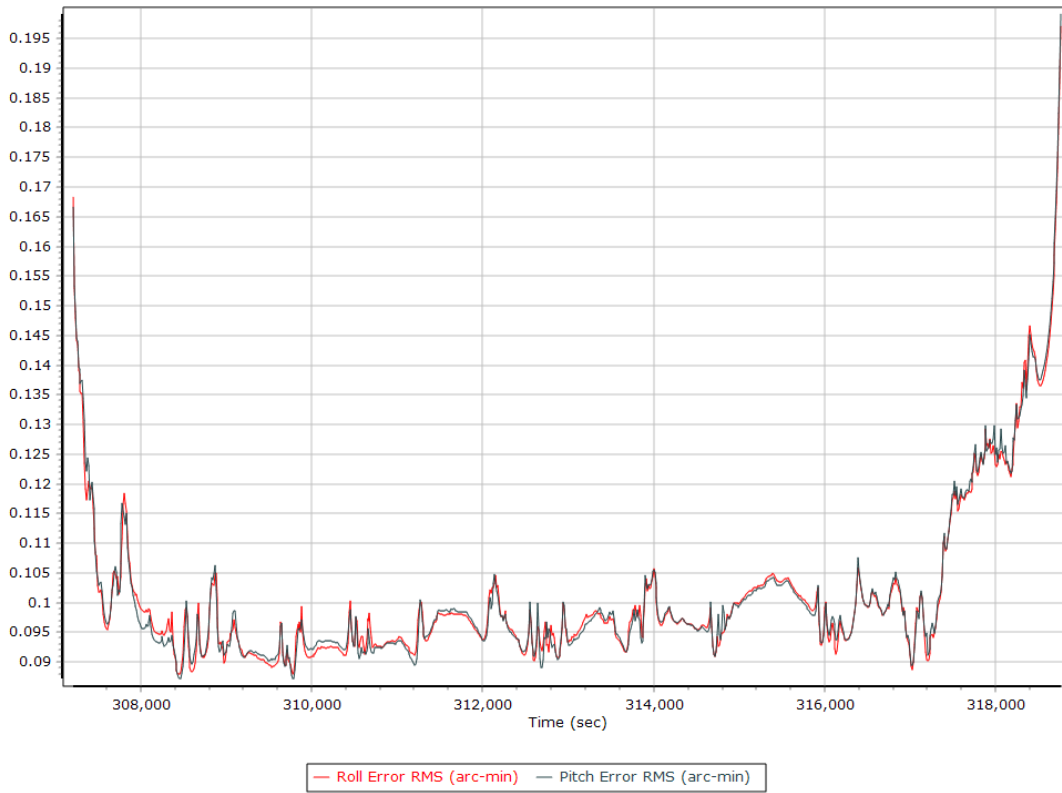
Position Error RMS (m)



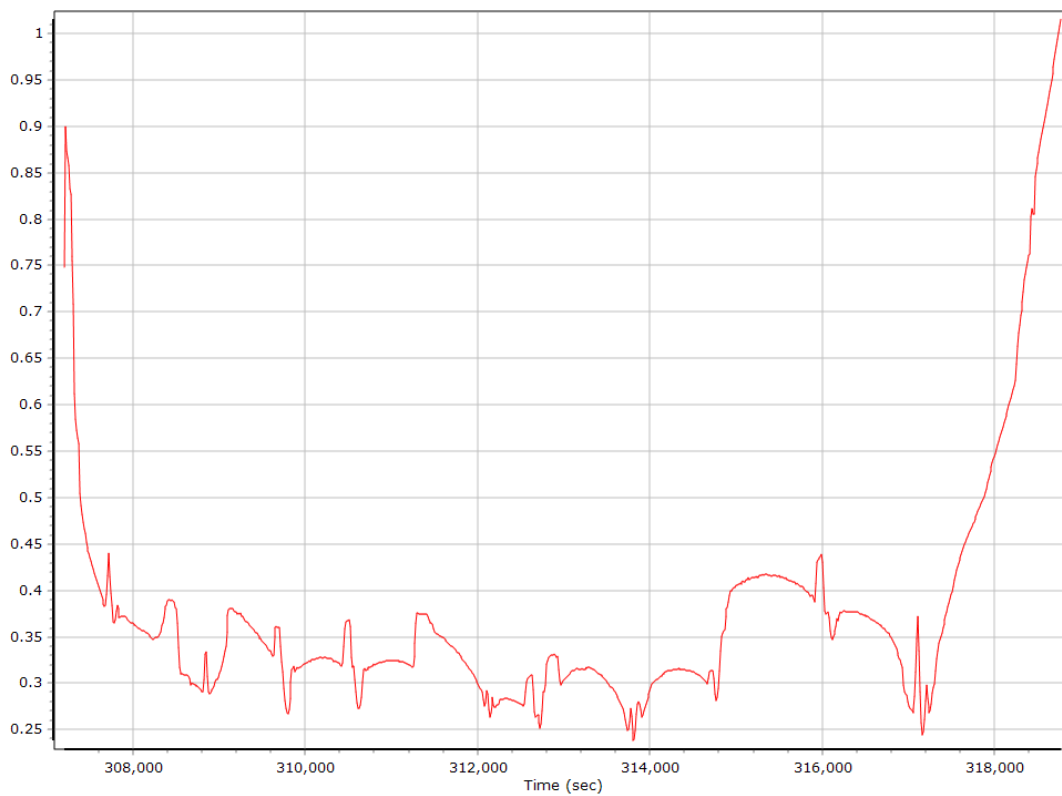
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

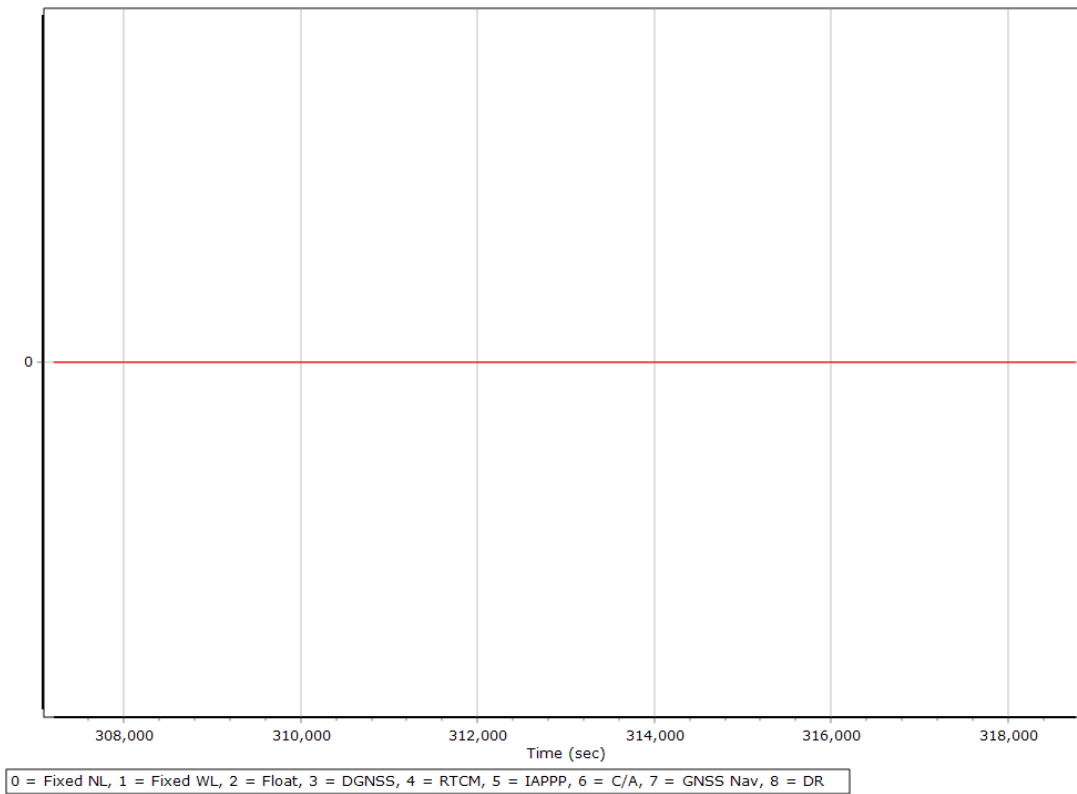


Heading Error RMS (arc-min)

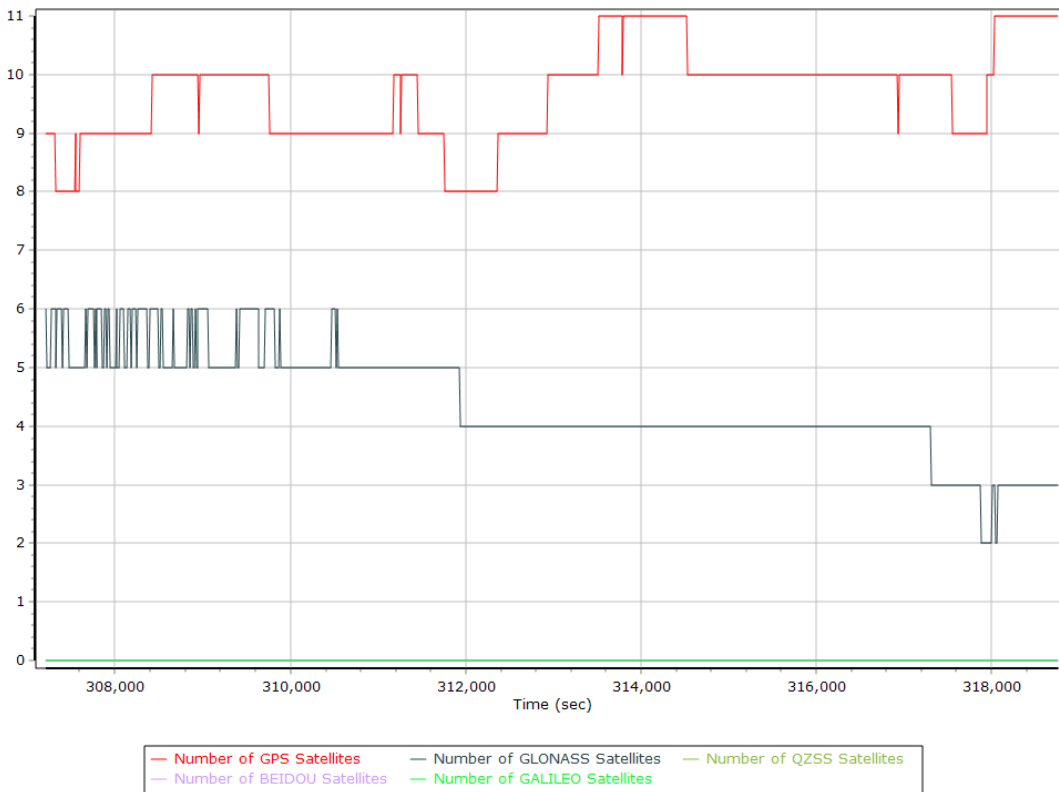


Smoothed Solution Status

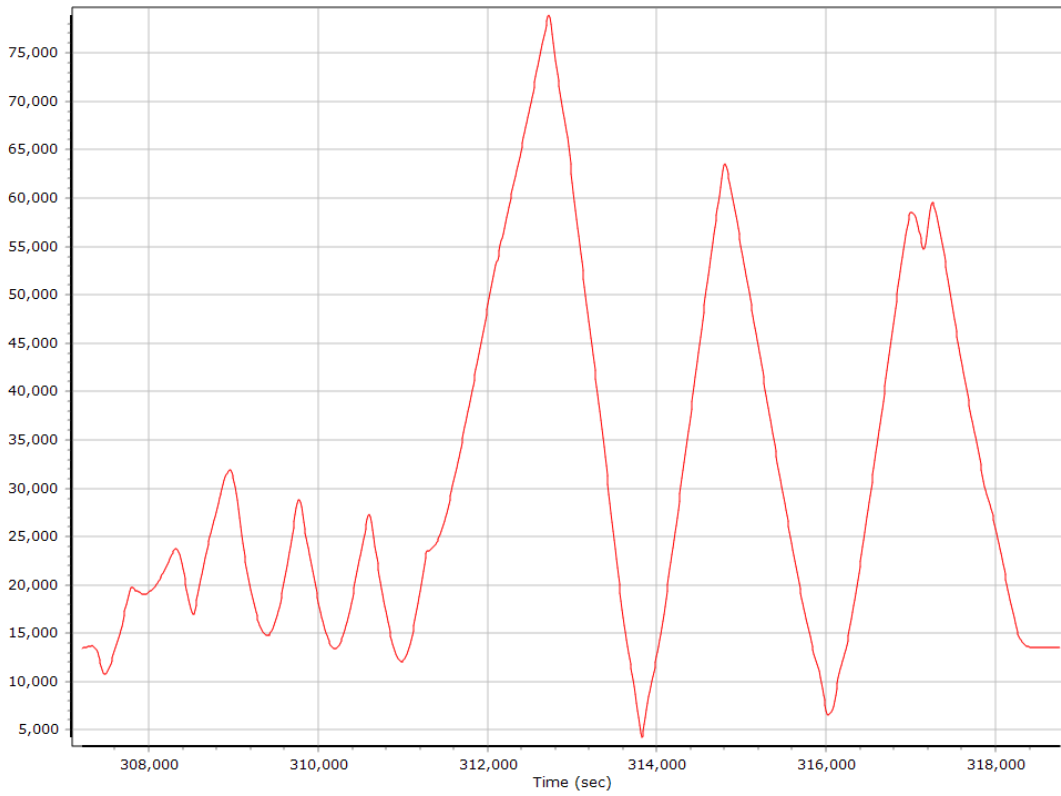
Processing Mode



Number of Satellites



Baseline Length



SBET IAKAR Separation

