

General Information

Mission Information

Project name	XSS20053A_177
Processing date	2020-02-24 21:01:17
Mission date	2020-02-22 13:28:14
Mission duration	04:21:58.000
Processing mode	IN-Fusion SmartBase
GPS Station	ASB

Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N9876
IMU type	57
Receiver type	BD982
Antenna type	Unknown External

Project File List

Rover Data Files

File name	File type
XSS20053.923	POS Data
XSS20053.924	POS Data
XSS20053.925	POS Data
XSS20053.926	POS Data
XSS20053.927	POS Data
XSS20053.928	POS Data
XSS20053.929	POS Data
XSS20053.930	POS Data
XSS20053.931	POS Data
XSS20053.932	POS Data
XSS20053.933	POS Data
XSS20053.934	POS Data
XSS20053.935	POS Data
XSS20053.936	POS Data
XSS20053.937	POS Data
XSS20053.938	POS Data
XSS20053.939	POS Data
XSS20053.940	POS Data
XSS20053.941	POS Data
XSS20053.942	POS Data
XSS20053.943	POS Data
XSS20053.944	POS Data
XSS20053.945	POS Data
XSS20053.946	POS Data
XSS20053.947	POS Data
XSS20053.948	POS Data
XSS20053.949	POS Data
XSS20053.950	POS Data
XSS20053.951	POS Data
XSS20053.952	POS Data
XSS20053.953	POS Data
XSS20053.954	POS Data
XSS20053.955	POS Data
XSS20053.956	POS Data
XSS20053.957	POS Data
XSS20053.958	POS Data
XSS20053.959	POS Data
XSS20053.960	POS Data
XSS20053.961	POS Data
XSS20053.962	POS Data
XSS20053.963	POS Data
XSS20053.964	POS Data
XSS20053.965	POS Data
XSS20053.966	POS Data
XSS20053.967	POS Data
XSS20053.968	POS Data
XSS20053.969	POS Data
XSS20053.970	POS Data
XSS20053.971	POS Data

Input Files

File Name	File Type
Ephm0530.20g	GLONASS Broadcast Ephemeris
Ephm0530.20n	GPS Broadcast Ephemeris
Is080530.20o	GNSS SingleBase
wvbr0530.20o	GNSS SingleBase
wvcv0530.20o	GNSS SingleBase
wvgb0530.20o	GNSS SingleBase
wvmz0530.20o	GNSS SingleBase

File Name	File Type
Ephm0520.20g	GLONASS Broadcast Ephemeris
Ephm0520.20n	GPS Broadcast Ephemeris
Ephm0540.20g	GLONASS Broadcast Ephemeris
Ephm0540.20n	GPS Broadcast Ephemeris
igu20934_18.sp3	GPS Precise Ephemeris
igu20935_18.sp3	GPS Precise Ephemeris
igu20936_18.sp3	GPS Precise Ephemeris
igu20940_18.sp3	GPS Precise Ephemeris
igu20941_12.sp3	GPS Precise Ephemeris

Output Files

Filename	File type
sbet_XSS20053A_177.out	SBET Trajectory File
export_XSS20053A_177.kml	Google KML Export Output

Rover Data Summary

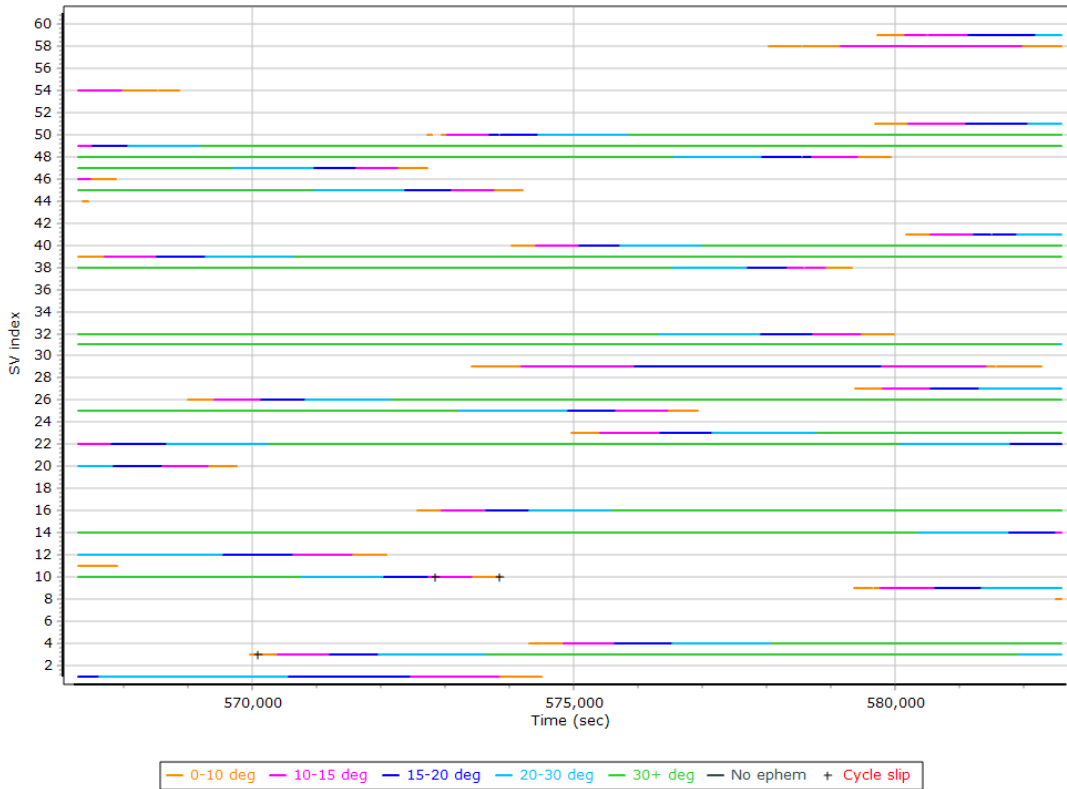
First raw data file	XSS20053.923		
Last raw data file	XSS20053.971		
Start GPS week	2093		
Start time	566875.365 (2/22/2020 1:27:55 PM)		
End time	582594.224 (2/22/2020 5:49:54 PM)		
Start of fine alignment	567227.356 (2/22/2020 1:33:47 PM)		
Available subsystems	Primary GNSS, Gimbal, IMU		
POS Event 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

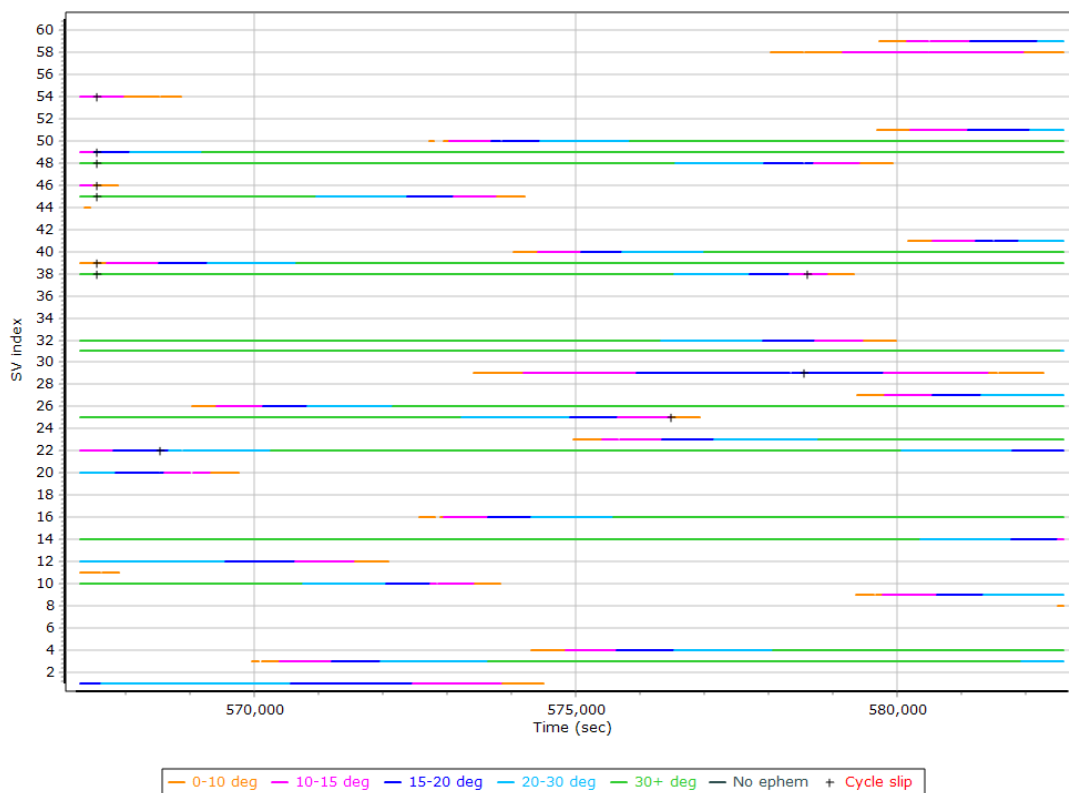
Raw IMU Import QC Summary

IMU data input file	imu_XSS20053A_177.dat
IMU data check log file	imudt_XSS20053A_177.log
IMU Records Processed	3143176
Termination Status	Normal
IMU Anomalies	0

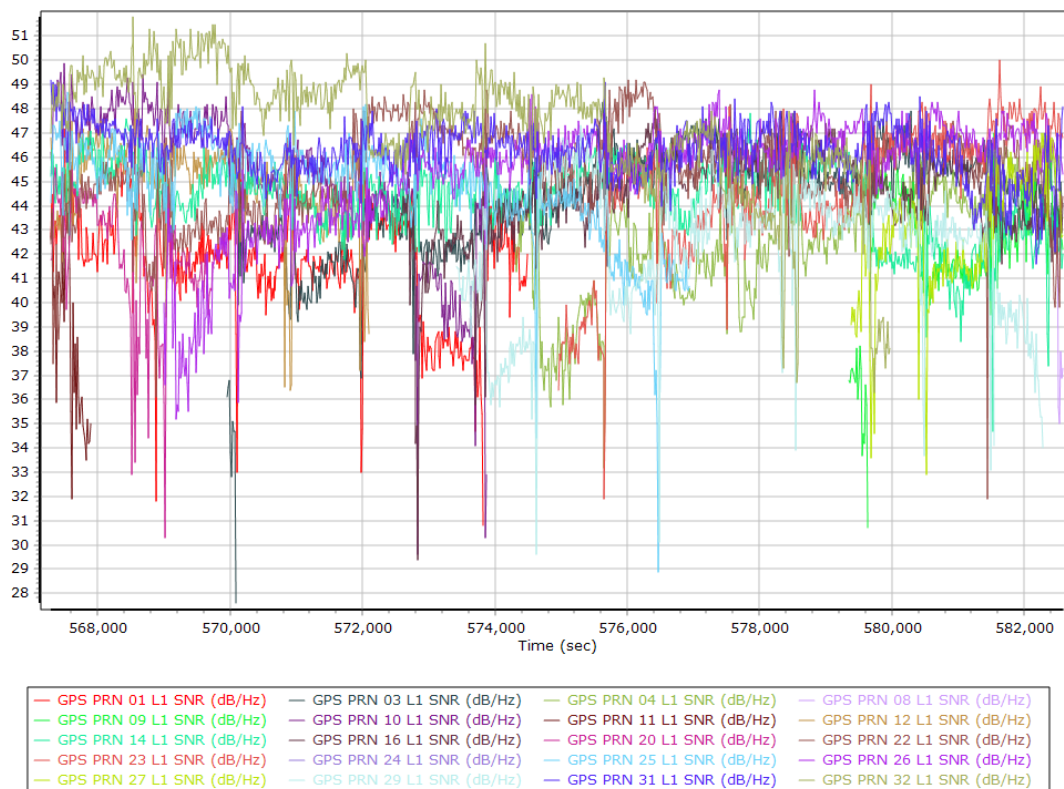
L1 Satellite Lock/Elevation



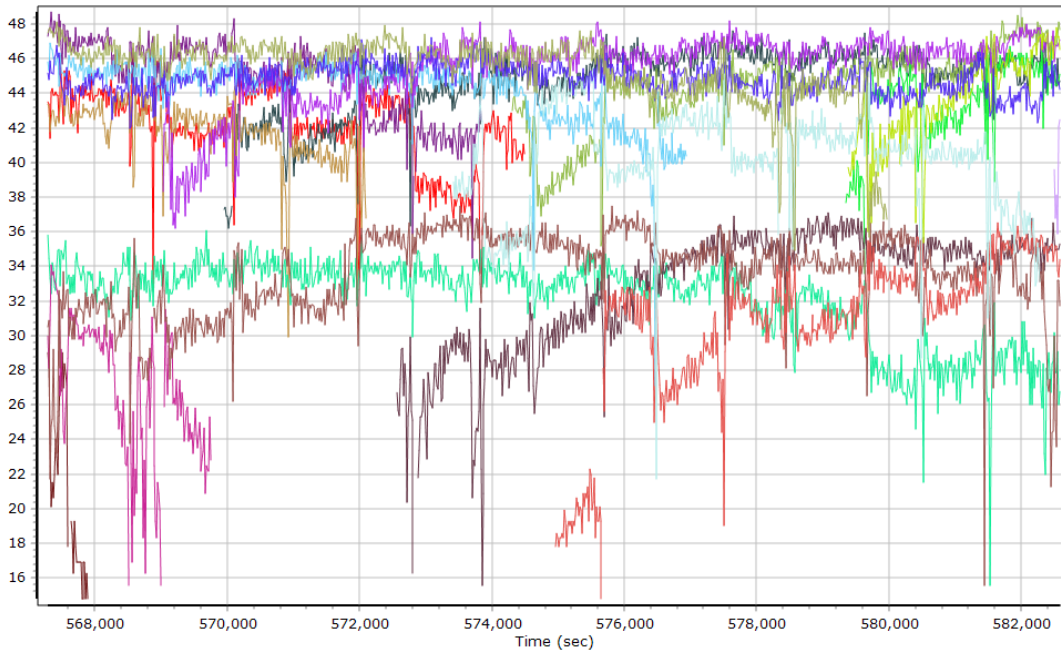
L2 Satellite Lock/Elevation



GPS L1 SNR

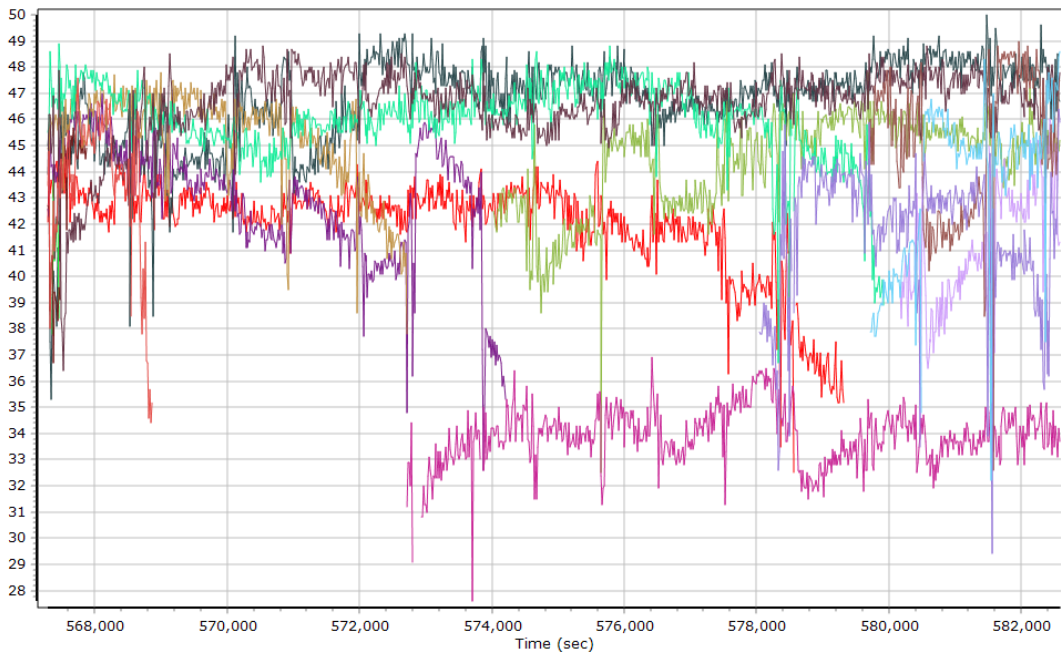


GPS L2 SNR



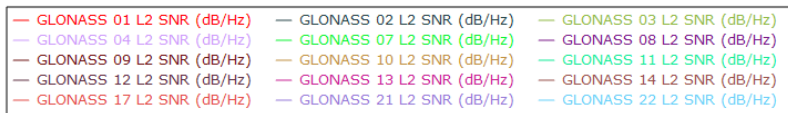
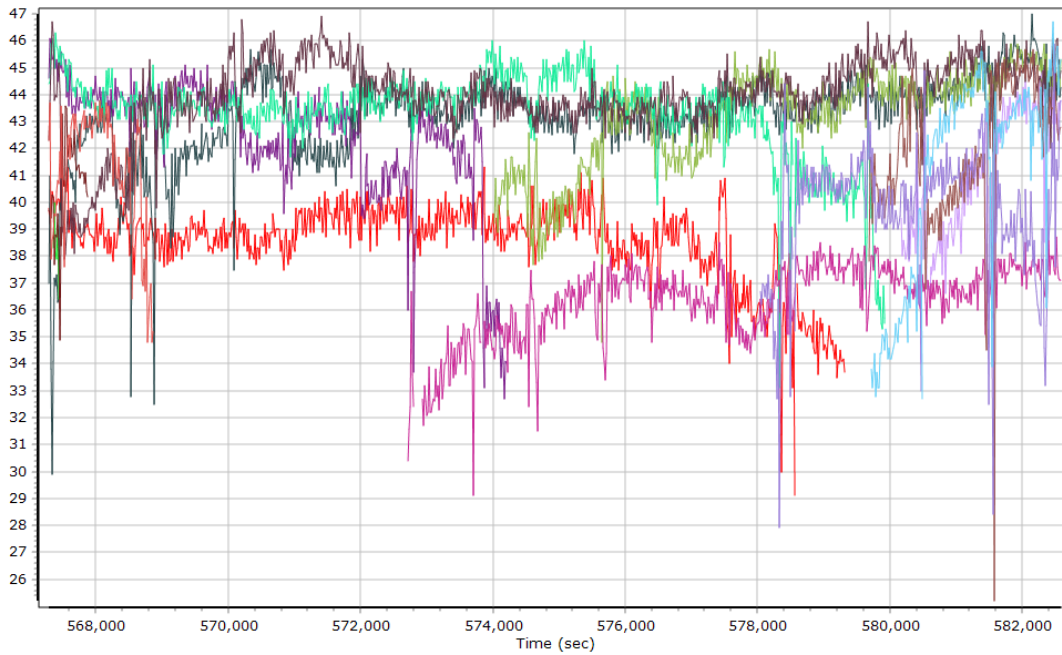
- | | | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| GPS PRN 01 L2 SNR (dB/Hz) | GPS PRN 03 L2 SNR (dB/Hz) | GPS PRN 04 L2 SNR (dB/Hz) | GPS PRN 08 L2 SNR (dB/Hz) |
| GPS PRN 09 L2 SNR (dB/Hz) | GPS PRN 10 L2 SNR (dB/Hz) | GPS PRN 11 L2 SNR (dB/Hz) | GPS PRN 12 L2 SNR (dB/Hz) |
| GPS PRN 14 L2 SNR (dB/Hz) | GPS PRN 16 L2 SNR (dB/Hz) | GPS PRN 20 L2 SNR (dB/Hz) | GPS PRN 22 L2 SNR (dB/Hz) |
| GPS PRN 23 L2 SNR (dB/Hz) | GPS PRN 24 L2 SNR (dB/Hz) | GPS PRN 25 L2 SNR (dB/Hz) | GPS PRN 26 L2 SNR (dB/Hz) |
| GPS PRN 27 L2 SNR (dB/Hz) | GPS PRN 29 L2 SNR (dB/Hz) | GPS PRN 31 L2 SNR (dB/Hz) | GPS PRN 32 L2 SNR (dB/Hz) |

GLONASS L1 SNR

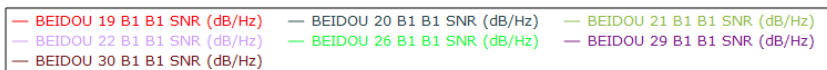
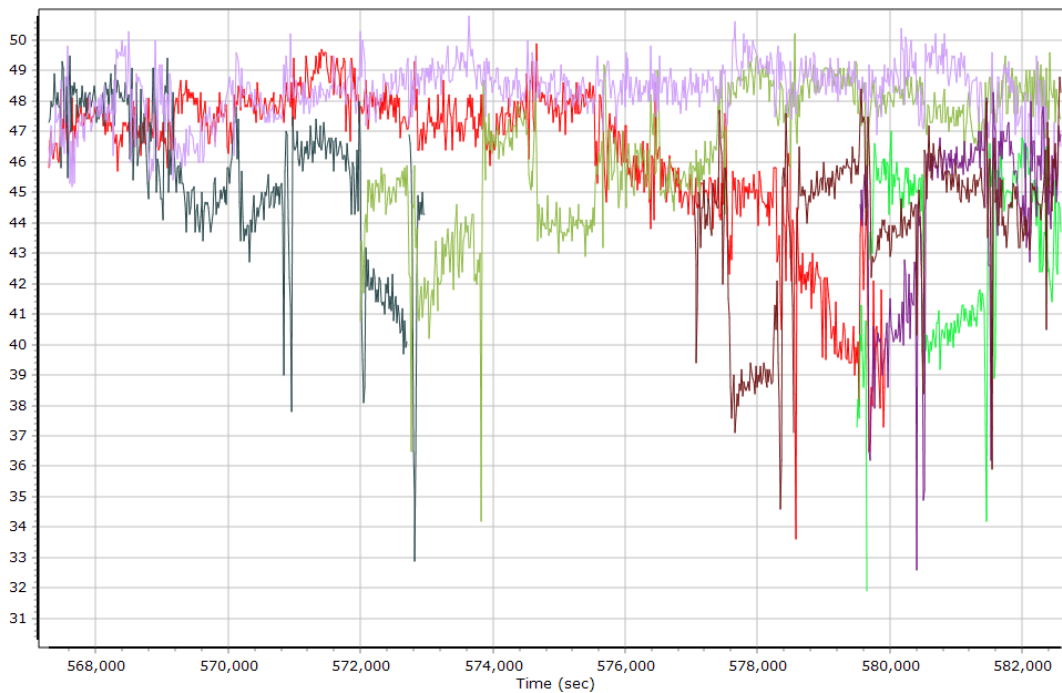


- | | | |
|---------------------------|---------------------------|---------------------------|
| GLONASS 01 L1 SNR (dB/Hz) | GLONASS 02 L1 SNR (dB/Hz) | GLONASS 03 L1 SNR (dB/Hz) |
| GLONASS 04 L1 SNR (dB/Hz) | GLONASS 07 L1 SNR (dB/Hz) | GLONASS 08 L1 SNR (dB/Hz) |
| GLONASS 09 L1 SNR (dB/Hz) | GLONASS 10 L1 SNR (dB/Hz) | GLONASS 11 L1 SNR (dB/Hz) |
| GLONASS 12 L1 SNR (dB/Hz) | GLONASS 13 L1 SNR (dB/Hz) | GLONASS 14 L1 SNR (dB/Hz) |
| GLONASS 17 L1 SNR (dB/Hz) | GLONASS 21 L1 SNR (dB/Hz) | GLONASS 22 L1 SNR (dB/Hz) |

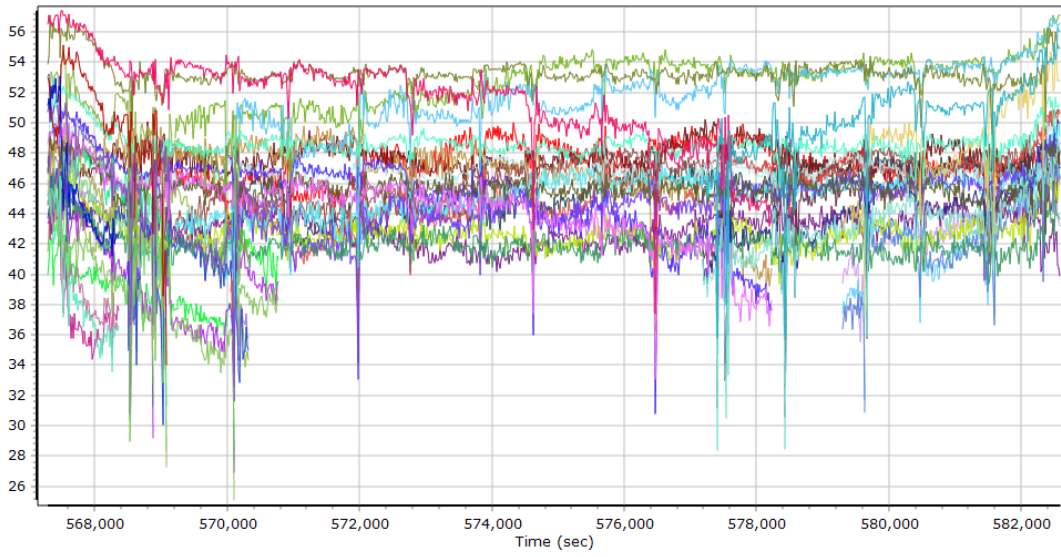
GLONASS L2 SNR



BEIDOU SNR



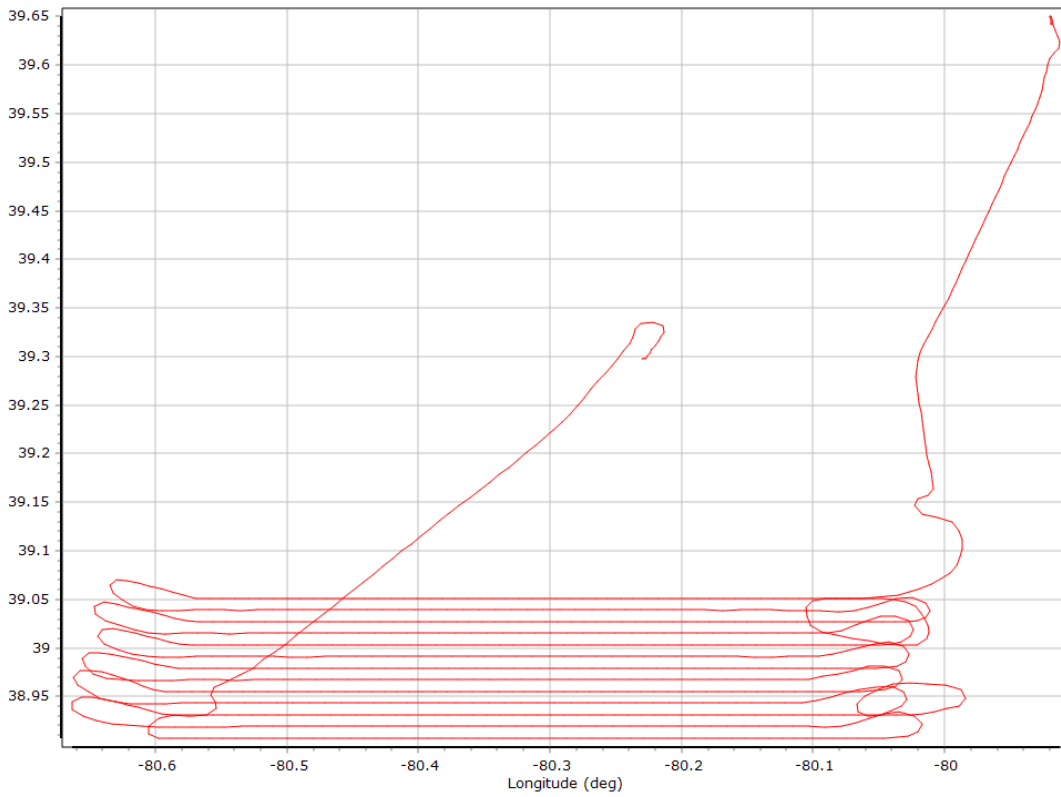
GALILEO SNR



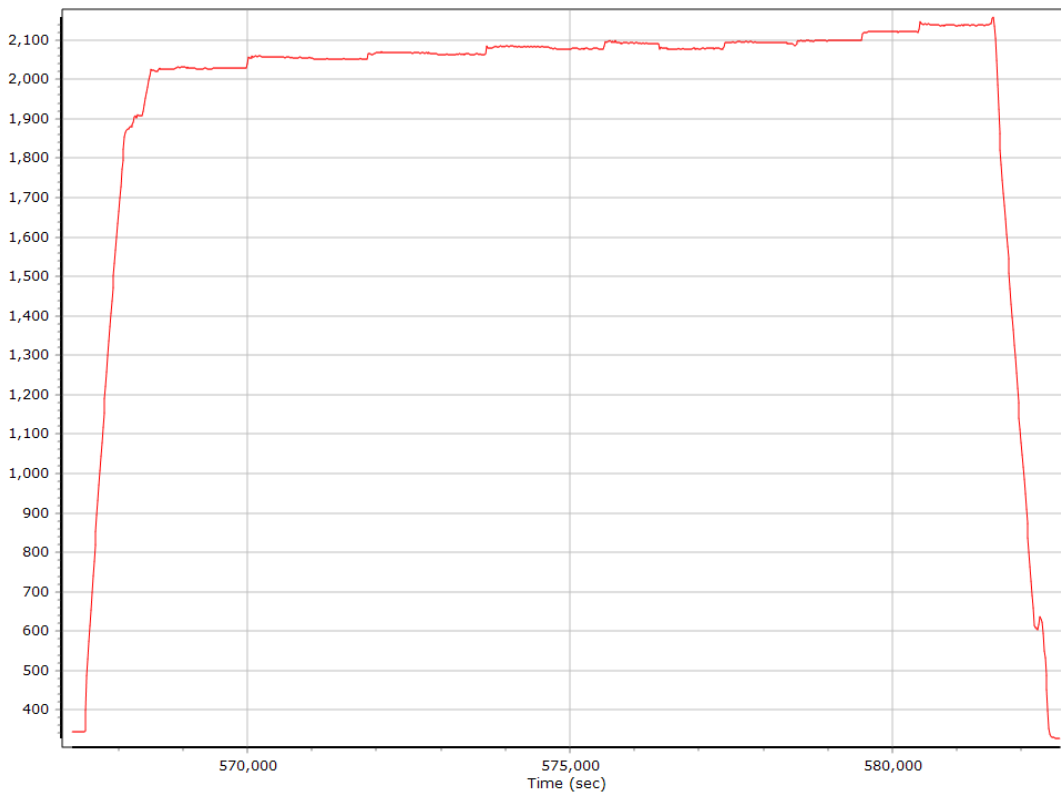
- | | |
|--|--|
| — GALILEO 01 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 04 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 07 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 09 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 12 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 19 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 21 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 31 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 33 L1 BOC_1_1_D_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 27 L5E5A BPSK10_PD SNR (dB/Hz) | — GALILEO 30 L5E5A BPSK10_PD SNR (dB/Hz) |

Trajectory Information

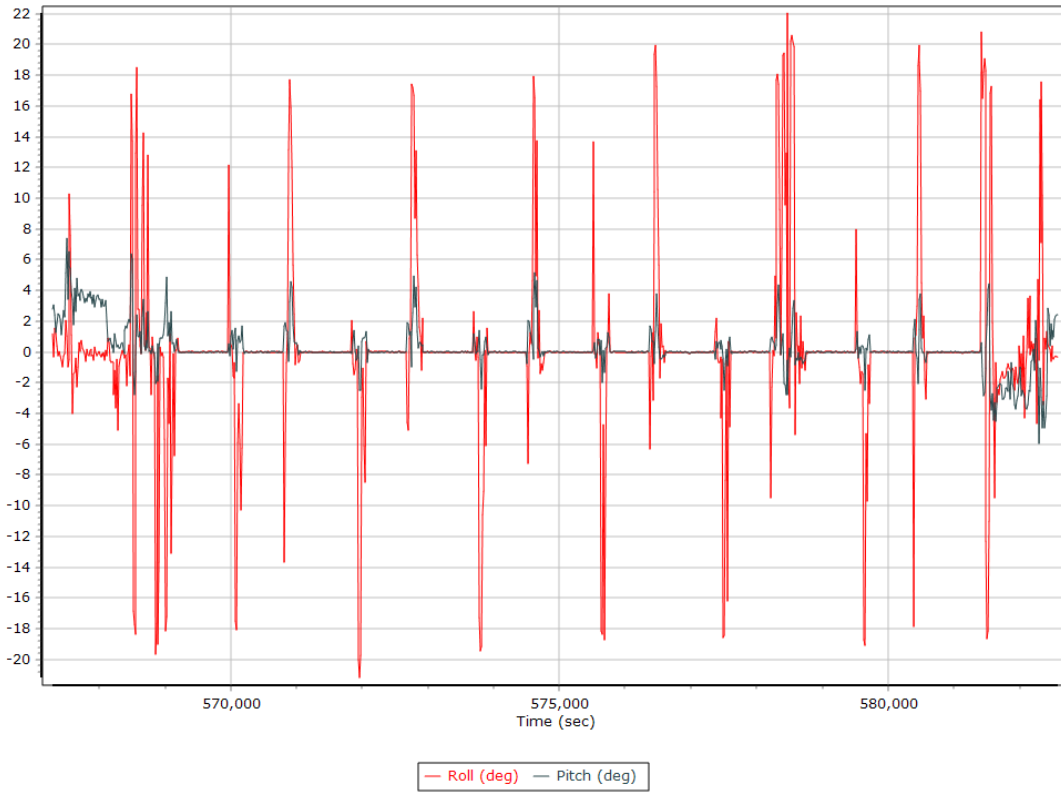
Top View



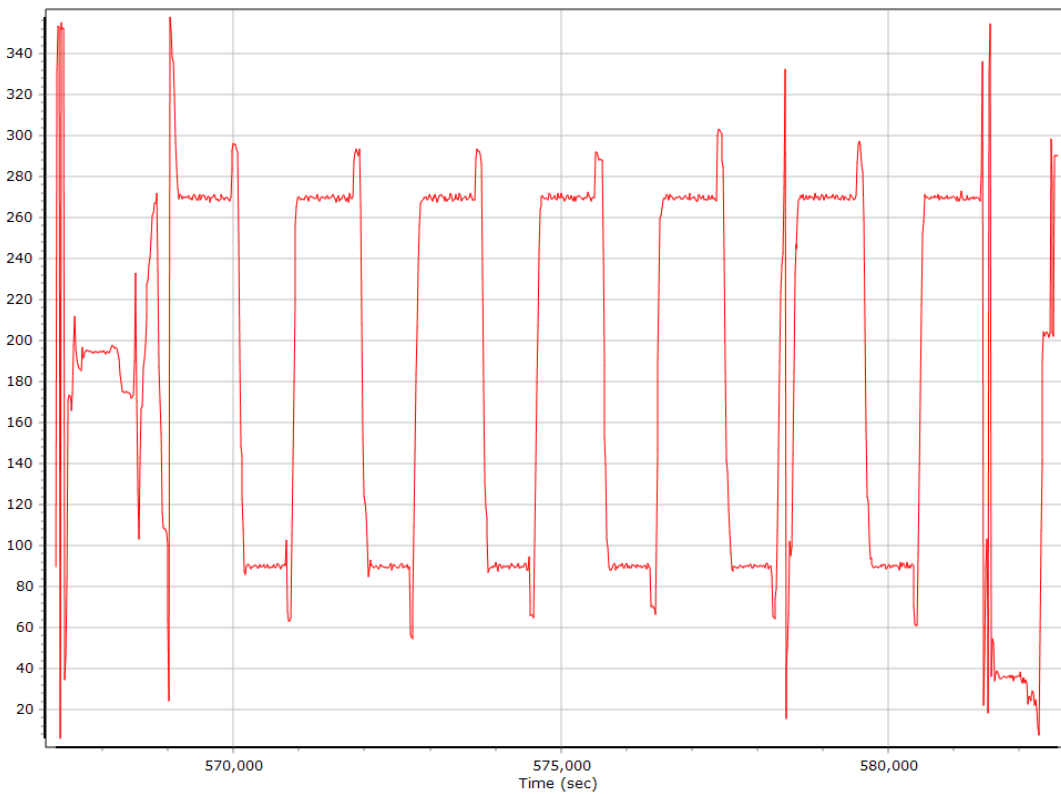
Altitude



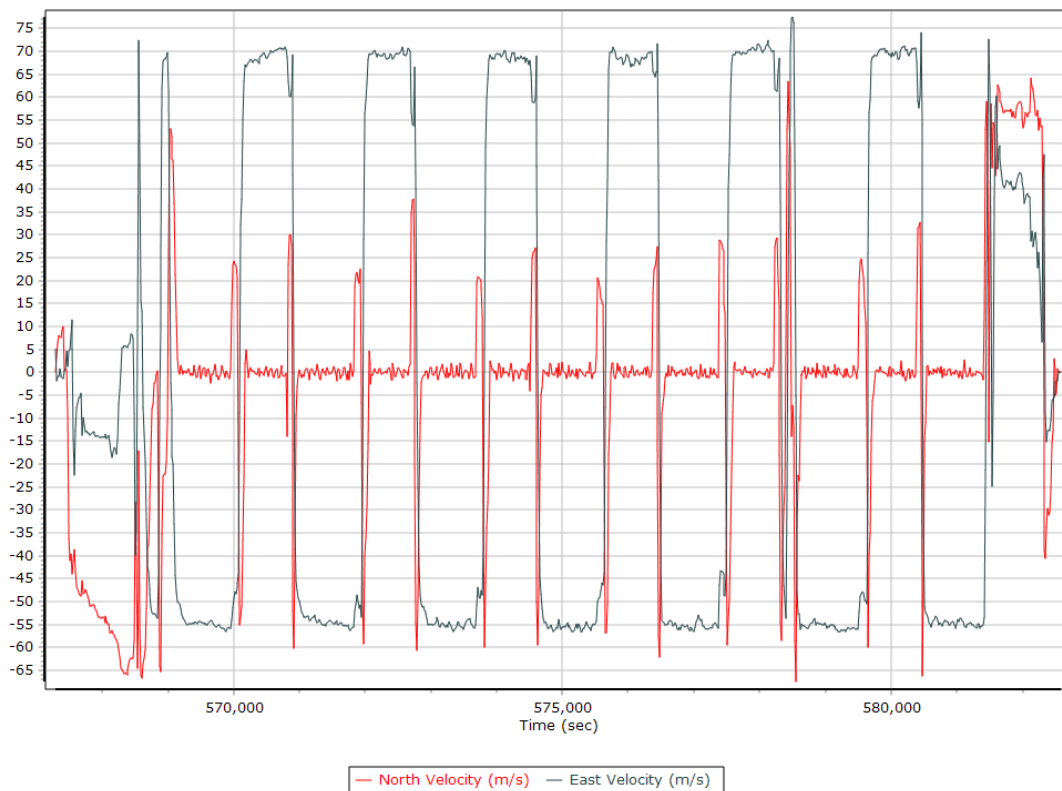
Roll/Pitch



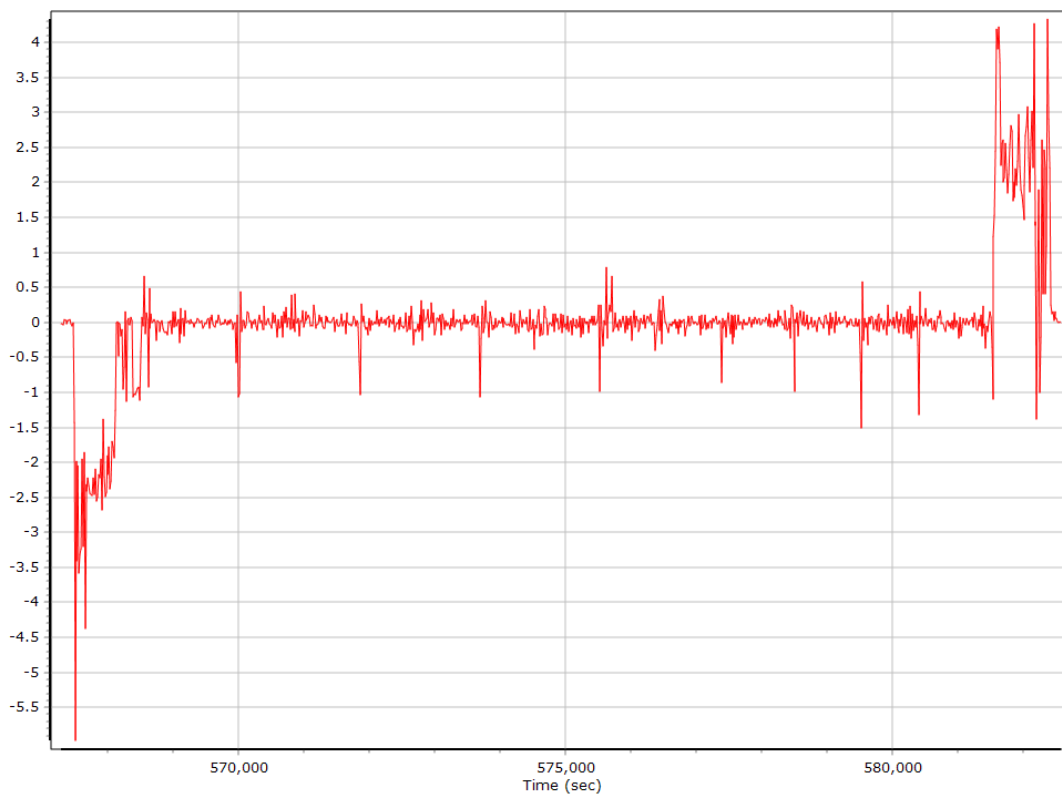
Heading



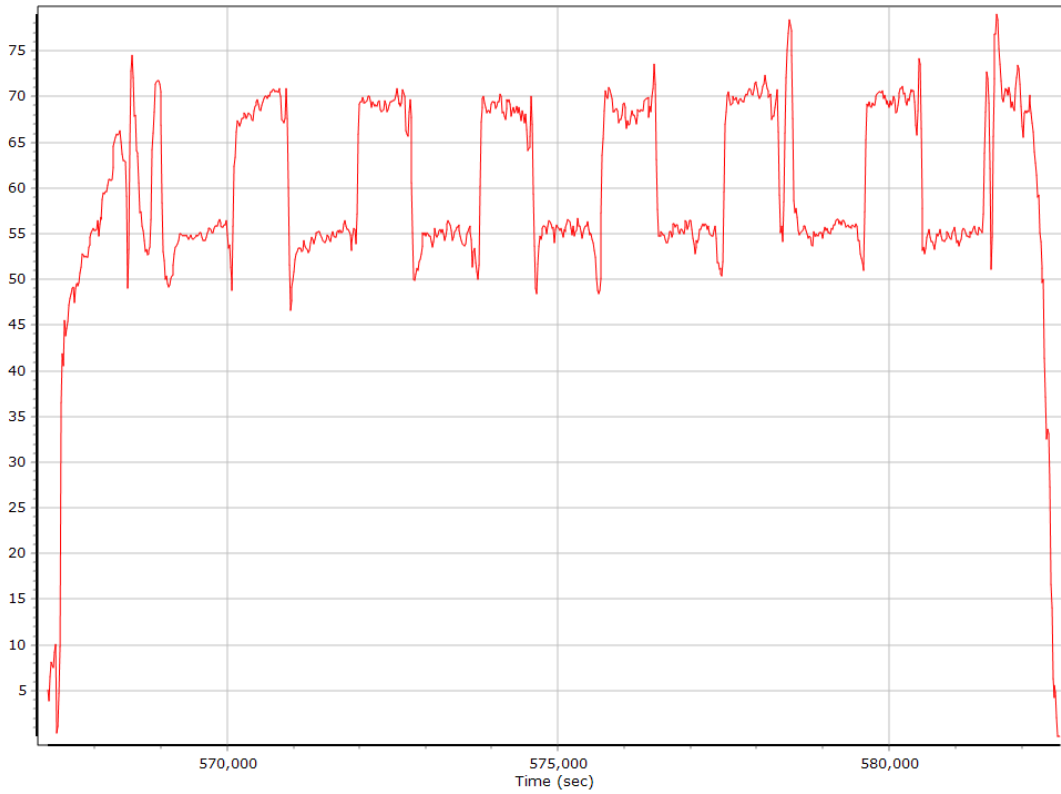
North/East Velocity



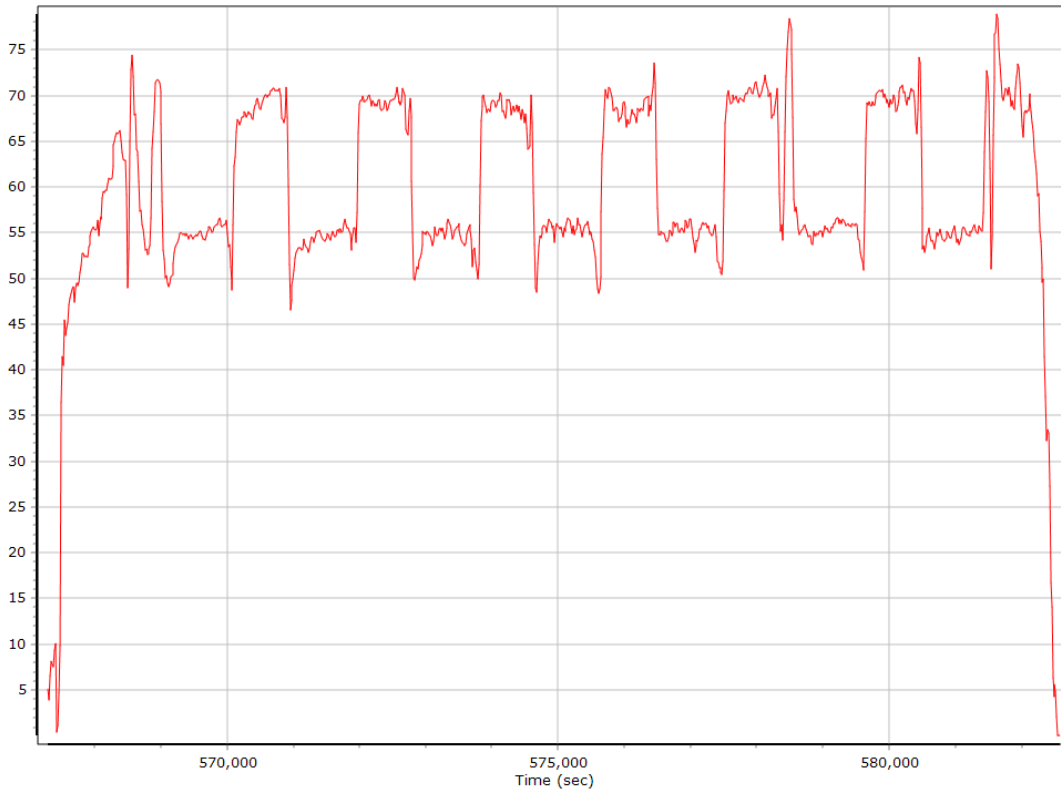
Down Velocity



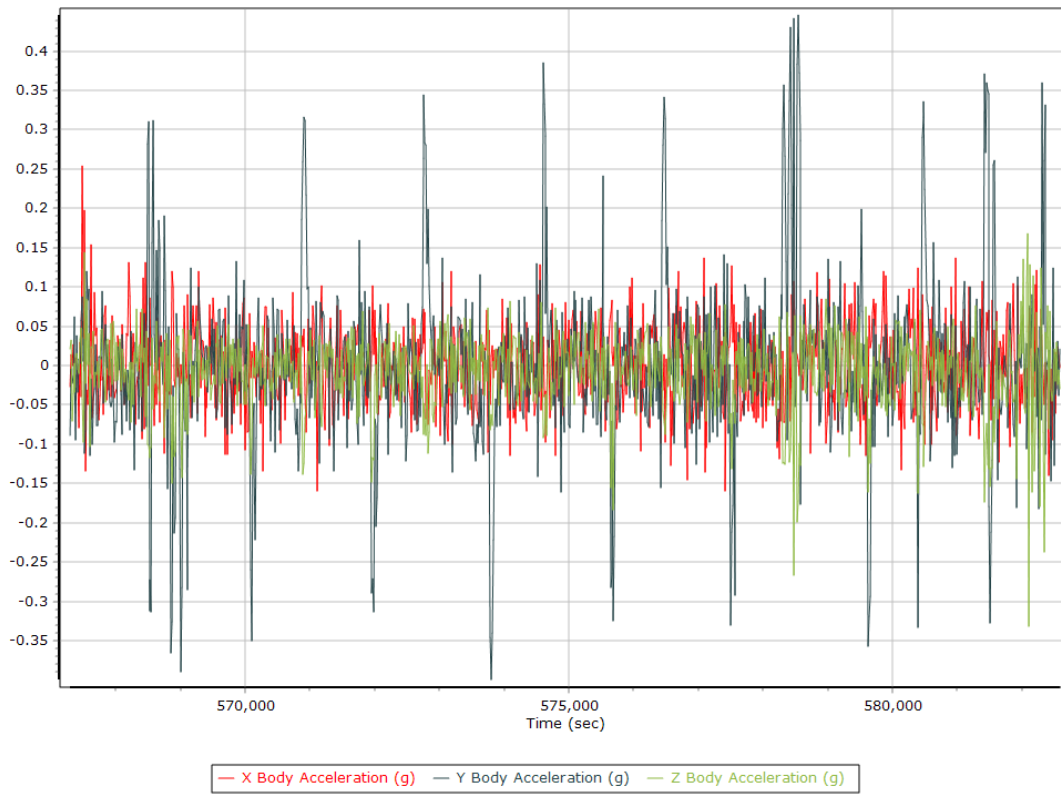
Total Speed



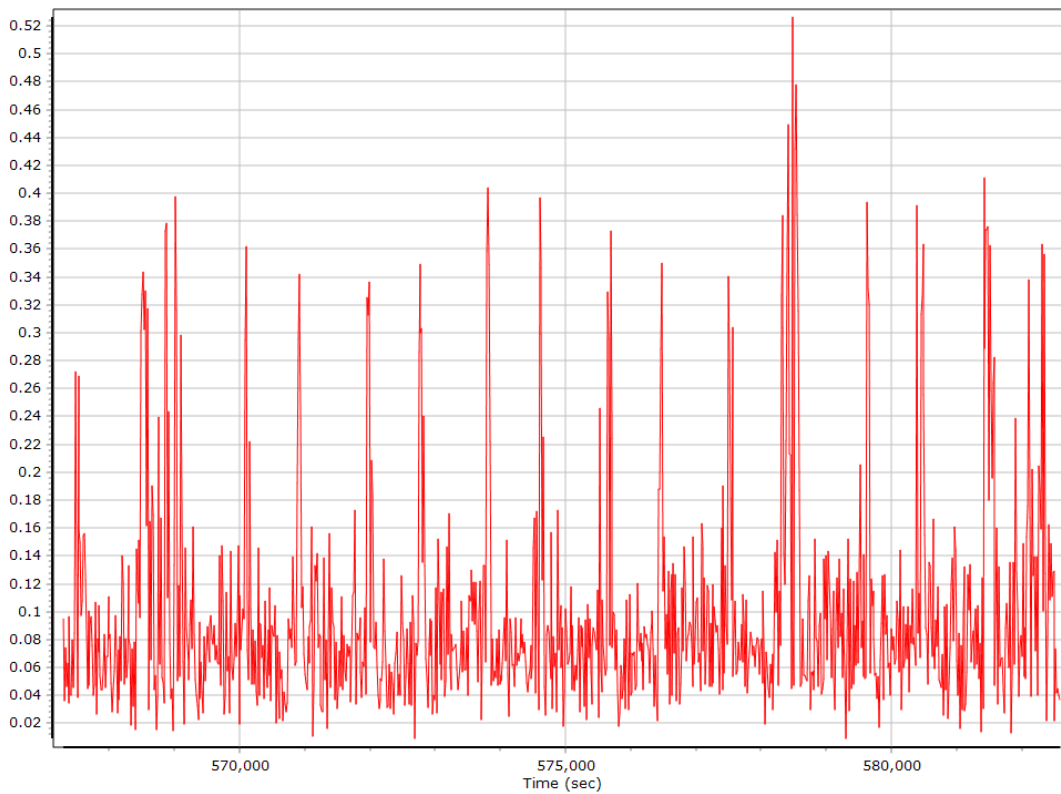
Ground Speed



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
02/22/2020	WVMZ	75.53	GNSS	1	User	None	Imported
02/22/2020	WVGB	79.82	GNSS	1	User	None	Imported
02/22/2020	WVCV	71.48	GNSS	1	User	None	Imported
02/22/2020	WVBR	28.66	GNSS	1	User	None	Imported
02/22/2020	LS08	9.53	GNSS	1	User	None	Imported

SmartBase Results

SmartBase status	PROC_STATUS_OK
Primary station Id	LS08
Primary station data rate (sec)	1.0
VRS/ASB generation rate (sec)	1.0
VRS/ASB timespan	15718 s (2093 566894 - 2093 582612)
Number of reference stations	5
Primary station GPS measurement usage (%)	99.8
Primary station GLONASS measurement usage (%)	76.6
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)	22273
GPS precise vs. broadcast ephemeris used	100.0 % / 0.0 %
GLONASS precise vs. broadcast ephemeris used	0.0 % / 100.0 %
Termination Status	Normal

SmartBase Quality Check

Base Station - WVMZ

Status	OK	SBQI	0	
Duration (Hours)	23.90	Output Coordinates	Original	
Solution Epochs	5736	Mean Epoch SVs	8.6	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N38°50'20.04352"	W81°06'31.58289"	296.834
Adjusted		N38°50'20.04338"	W81°06'31.58273"	296.805
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.006	0.029	0.030

Base Station Information

Station ID	WVMZ		
Filename	wvmz0530.20o		
Start date	2/22/2020 12:00:00 AM		
End date	2/22/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4922K62061
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	N38°50'20.04352"		
Longitude	W81°06'31.58289"		
Ellipsoidal height (m)	296.83400		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - WVGB

Status	OK	SBQI	0
Duration (Hours)	23.90	Output Coordinates	Original
Solution Epochs	5736	Mean Epoch SVs	8.6
Base Station Coordinates	Latitude	Longitude	Height (m)
Original	N38°25'48.42517"	W79°49'01.29518"	812.475
Adjusted	N38°25'48.42540"	W79°49'01.29498"	812.460
Coordinate Adjustments	Horizontal (m)	Vertical (m)	Total (m)
Adjustments	0.009	0.015	0.017

Base Station Information

Station ID	WVGB		
Filename	wvgb0530.20o		
Start date	2/22/2020 12:00:00 AM		
End date	2/22/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4924K62448
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	N38°25'48.42517"		
Longitude	W79°49'01.29518"		
Ellipsoidal height (m)	812.47500		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

Base Station - WVCV

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°00'55.07616"	W79°27'25.00965"	969.235
Adjusted		N39°00'55.07548"	W79°27'25.00801"	969.225
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.045	0.010	0.046

Base Station Information

Station ID	WVCV		
Filename	wvcv0530.20o		
Start date	2/22/2020 12:00:00 AM		
End date	2/22/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	4922K62079
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°00'55.07616"		
Longitude	W79°27'25.00965"		
Ellipsoidal height (m)	969.23500		
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	CONTROL	SBQI	0	
Duration (Hours)	23.90	Output Coordinates	Control	
Solution Epochs	5736	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°18'28.88440"	W80°16'38.61885"	270.246
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.000	0.000	0.000

Base Station Information

Station ID	WVBR		
Filename	wvbr0530.20o		
Start date	2/22/2020 12:00:00 AM		
End date	2/22/2020 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 - LS08

Status	OK	SBQI	0
Duration (Hours)	23.70	Output Coordinates	Original
Solution Epochs	5688	Mean Epoch SVs	8.6
Base Station Coordinates	Latitude	Longitude	Height (m)
Original	N38°58'49.21723"	W80°13'11.03487"	407.315
Adjusted	N38°58'49.21723"	W80°13'11.03453"	407.304
Coordinate Adjustments	Horizontal (m)	Vertical (m)	Total (m)
Adjustments	0.008	0.011	0.013

Base Station Information

Station ID	LS08		
Filename	1s080530.20o		
Start date	2/22/2020 12:00:00 AM		
End date	2/22/2020 11:59:59 PM		
Duration	23:59:59.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Leica	GRX1200+GNSS	495025
Antenna manufacturer, model	Leica	AX1203+GNSS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.0825		
Latitude	N38°58'49.21723"		
Longitude	W80°13'11.03487"		
Ellipsoidal height (m)	407.31500		
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)	0.14	73.61	
Number of GPS SV	7	11	10
Number of GLONASS SV	0	7	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	9	18	14
PDOP	1.08	2.42	1.42
QC Solution Gaps	1.00	1.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	15699.00	0.00	2.00
Percentage	99.99	0.00	0.01

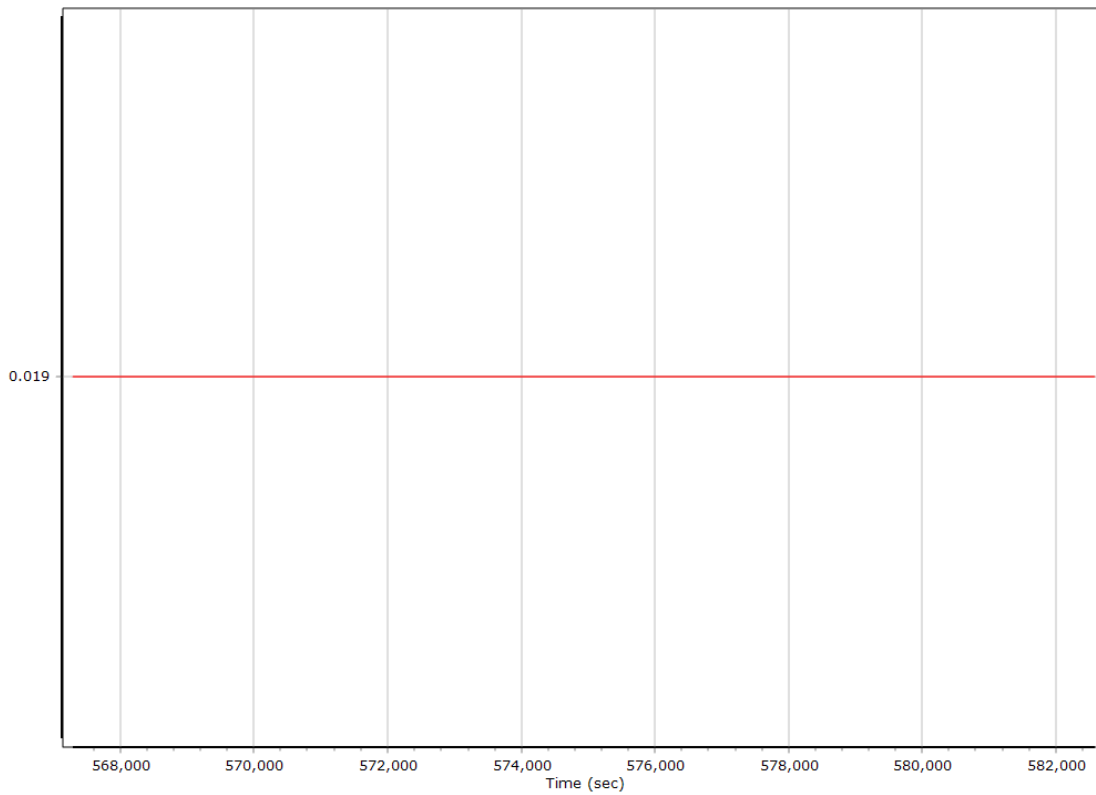
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion SmartBase		
Stabilized mount	True		
Base station	ASB		
Processing start time	566876.000 (2/22/2020 1:27:56 PM)		
Processing end time	582594.000 (2/22/2020 5:49:54 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)	0.019	0.153	-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

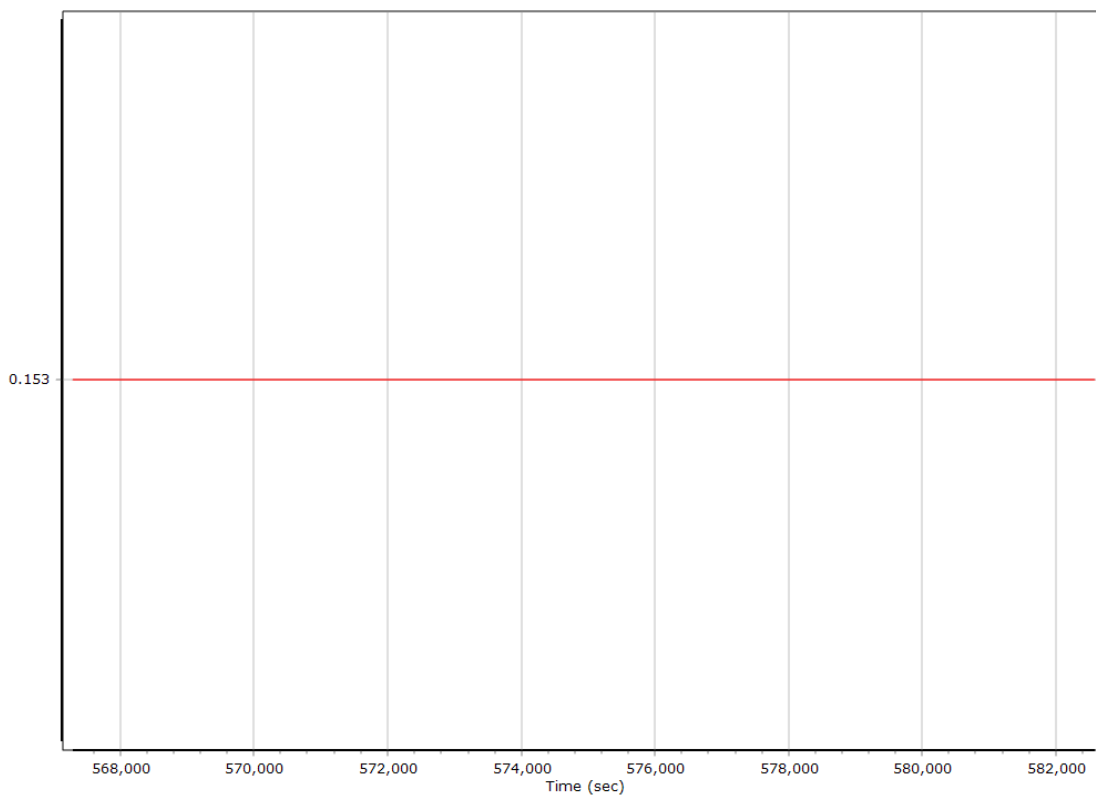
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

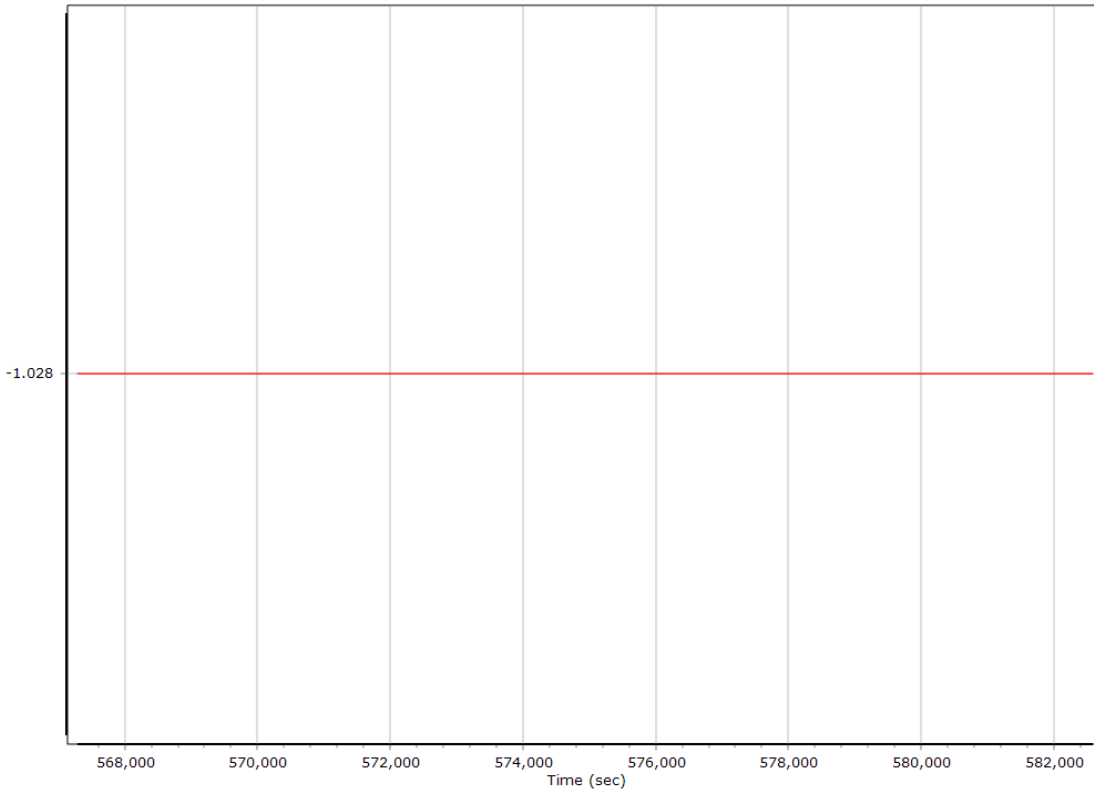
X Reference-Primary GNSS Lever Arm (m)



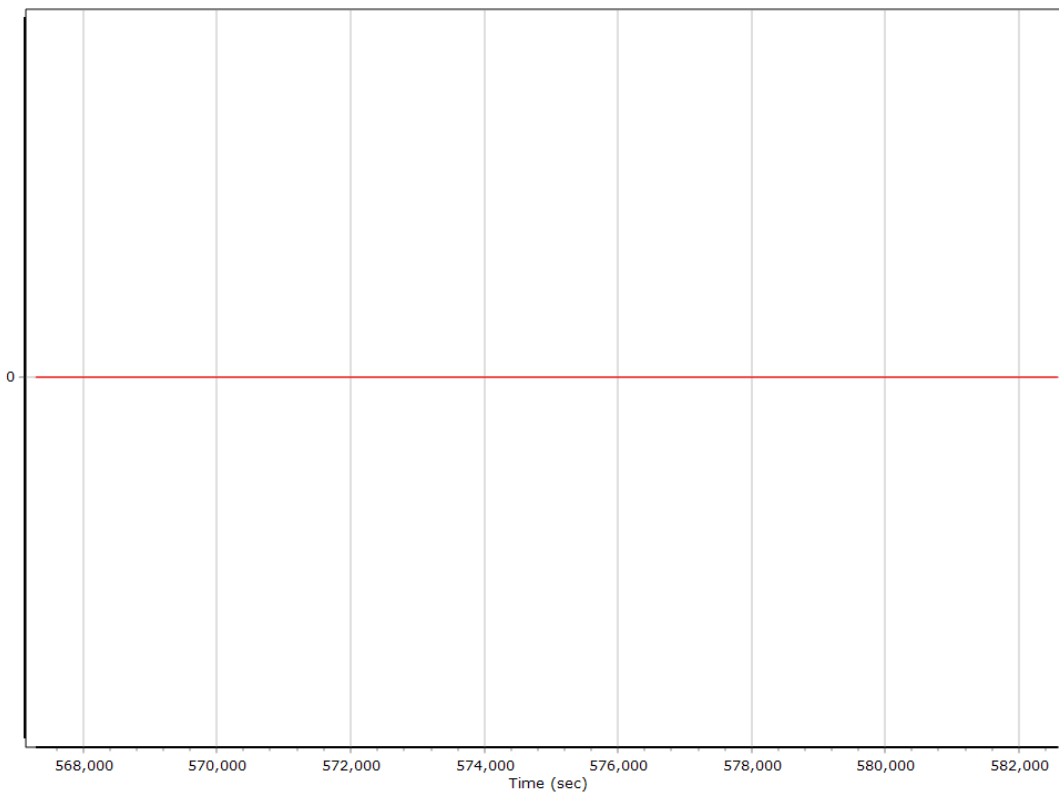
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



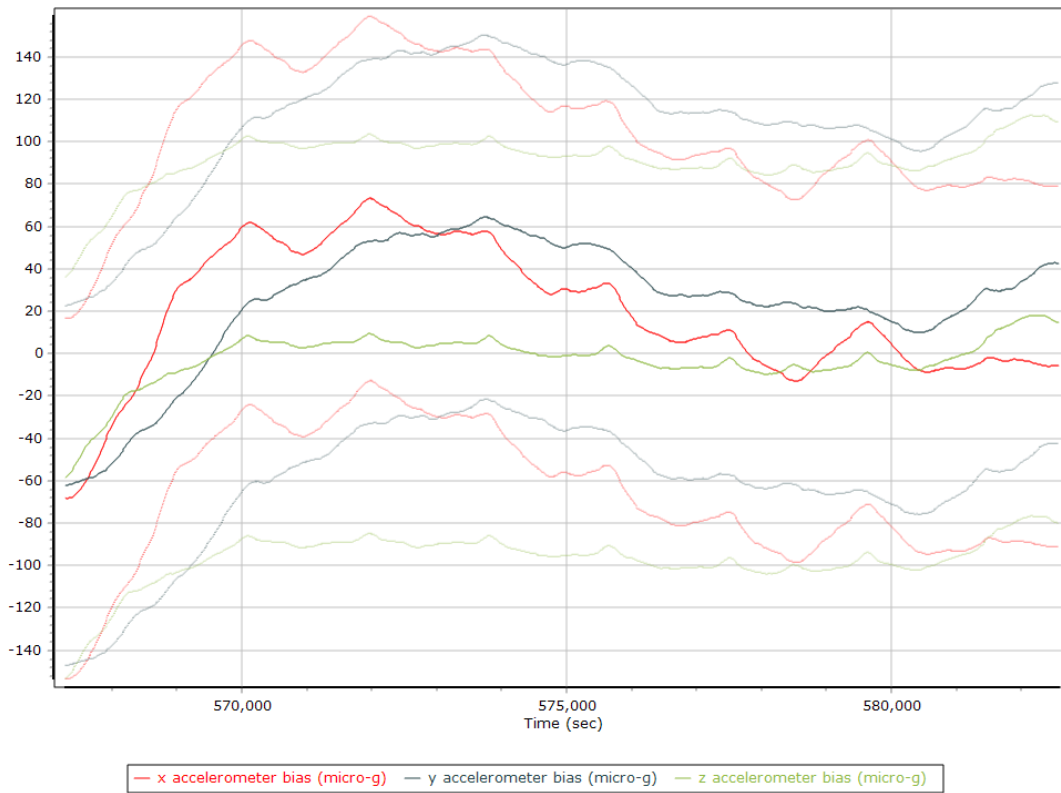
Reference-Primary GNSS Lever Arm Figure of Merit



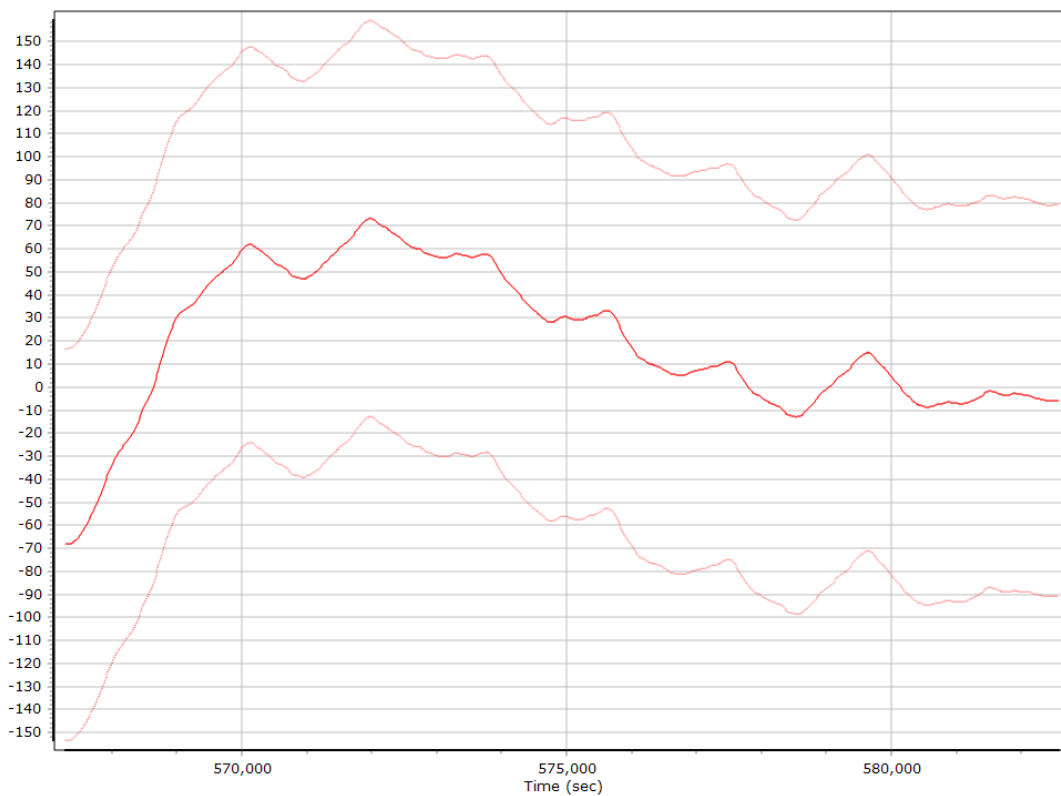
Smoothed IN-Fusion QC

Smoothed Estimated Errors, Reference Frame

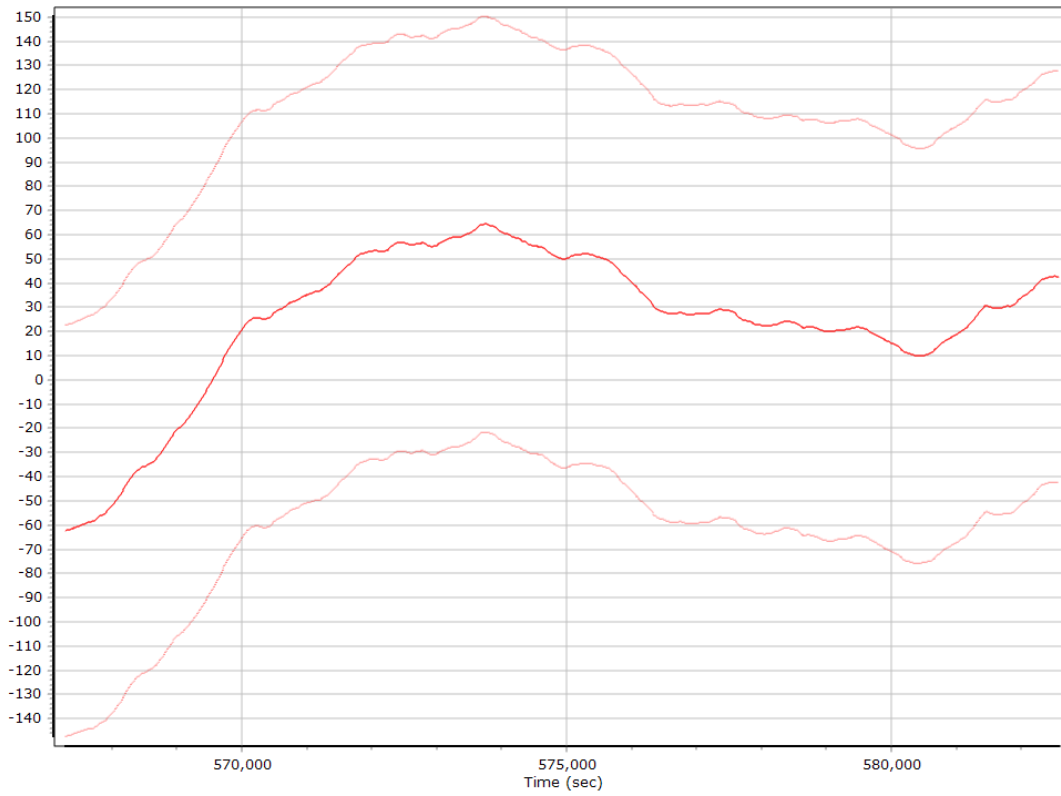
Accelerometer Bias (micro-g)



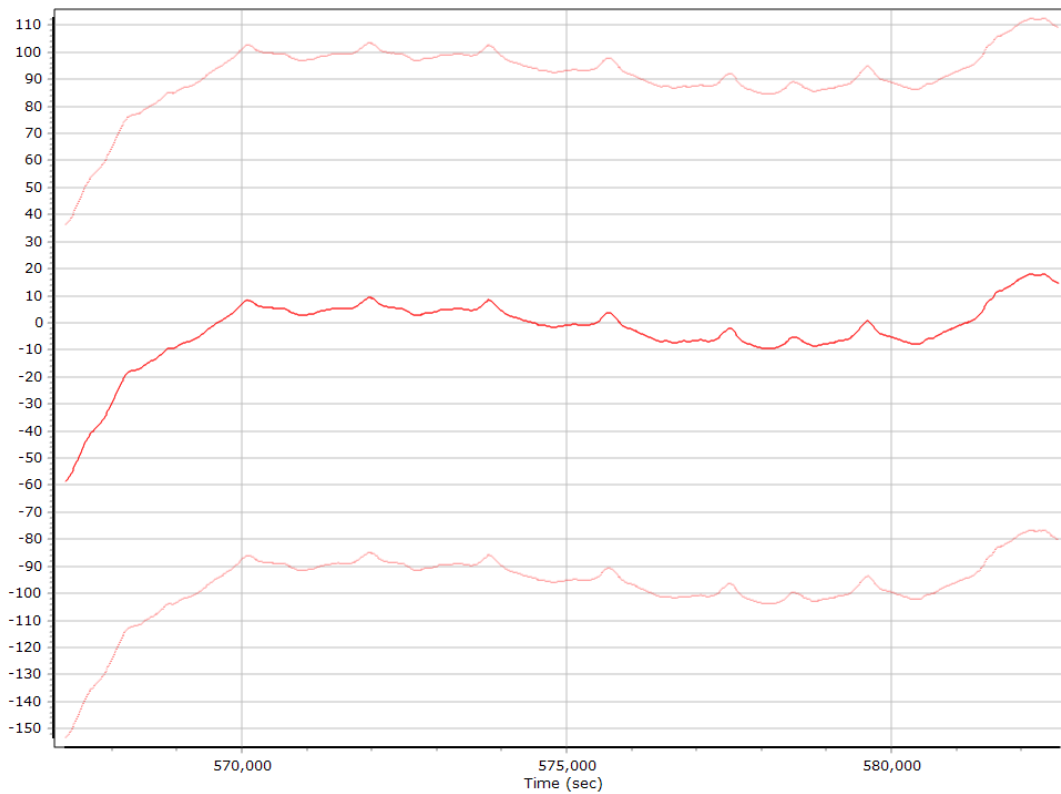
X Accelerometer Bias (micro-g)



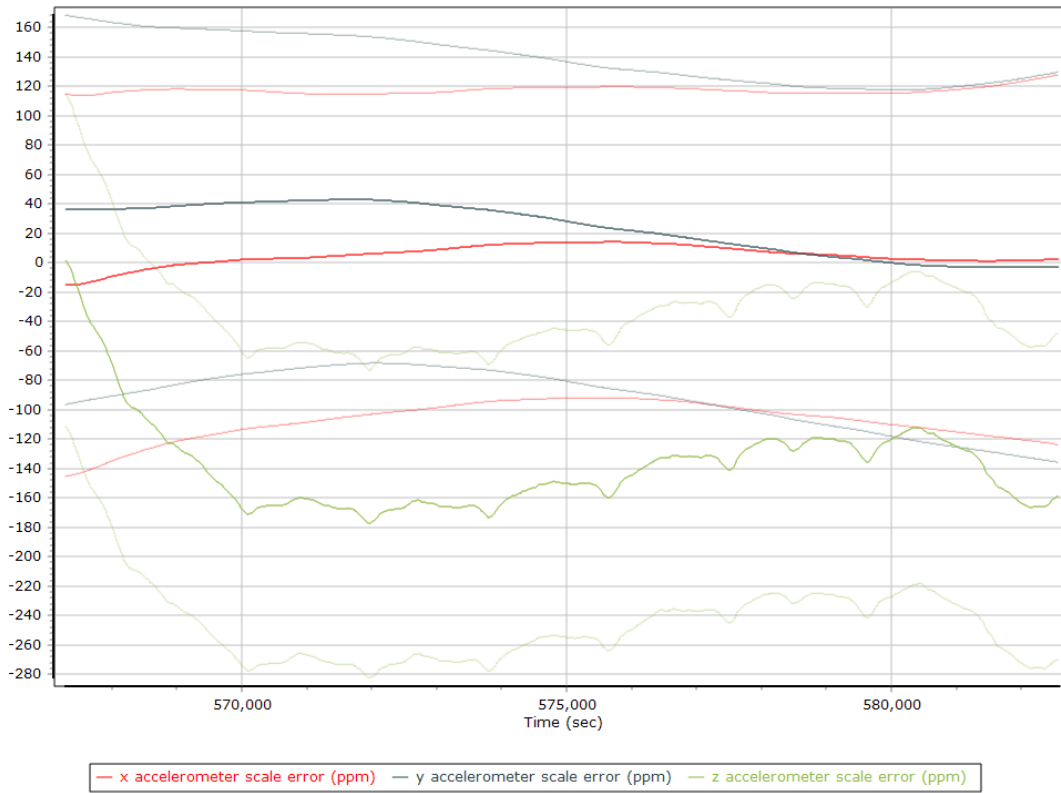
Y Accelerometer Bias (micro-g)



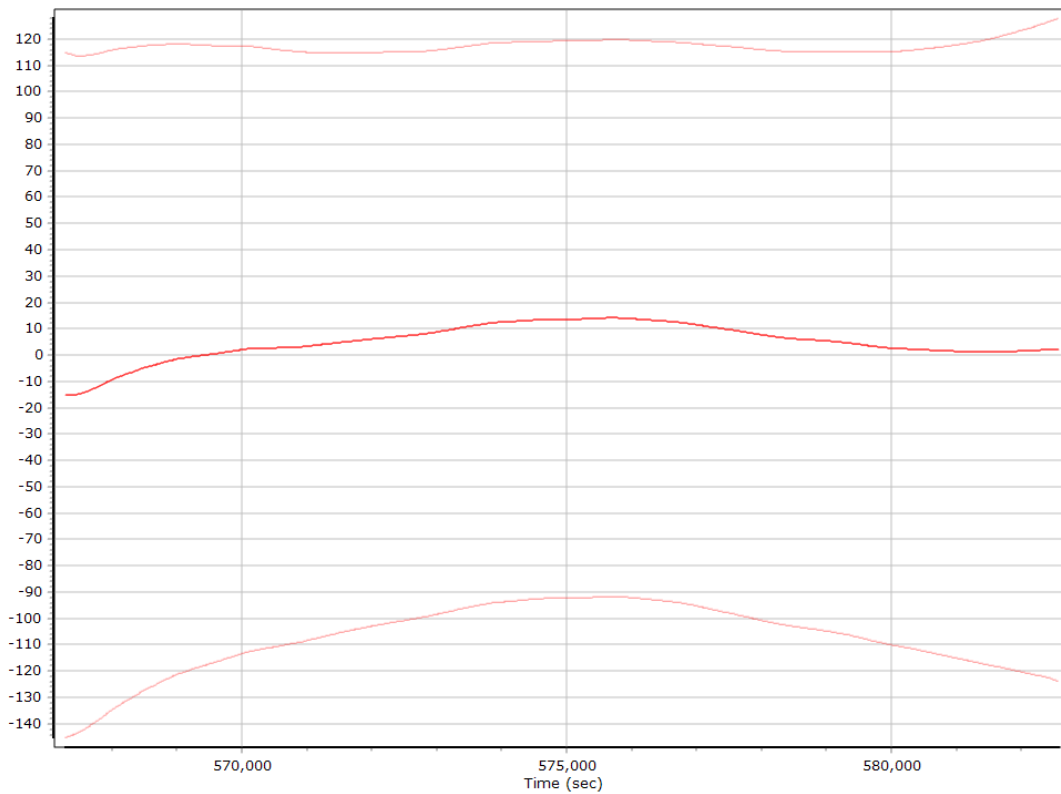
Z Accelerometer Bias (micro-g)



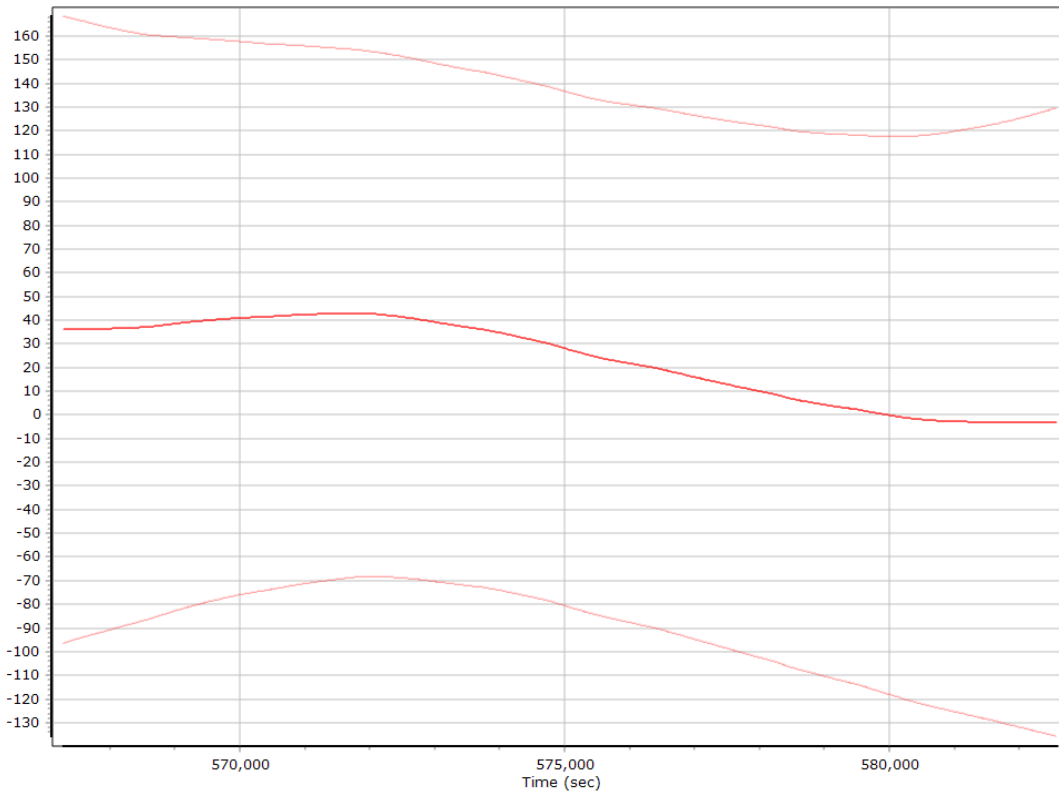
Accelerometer Scale Error (ppm)



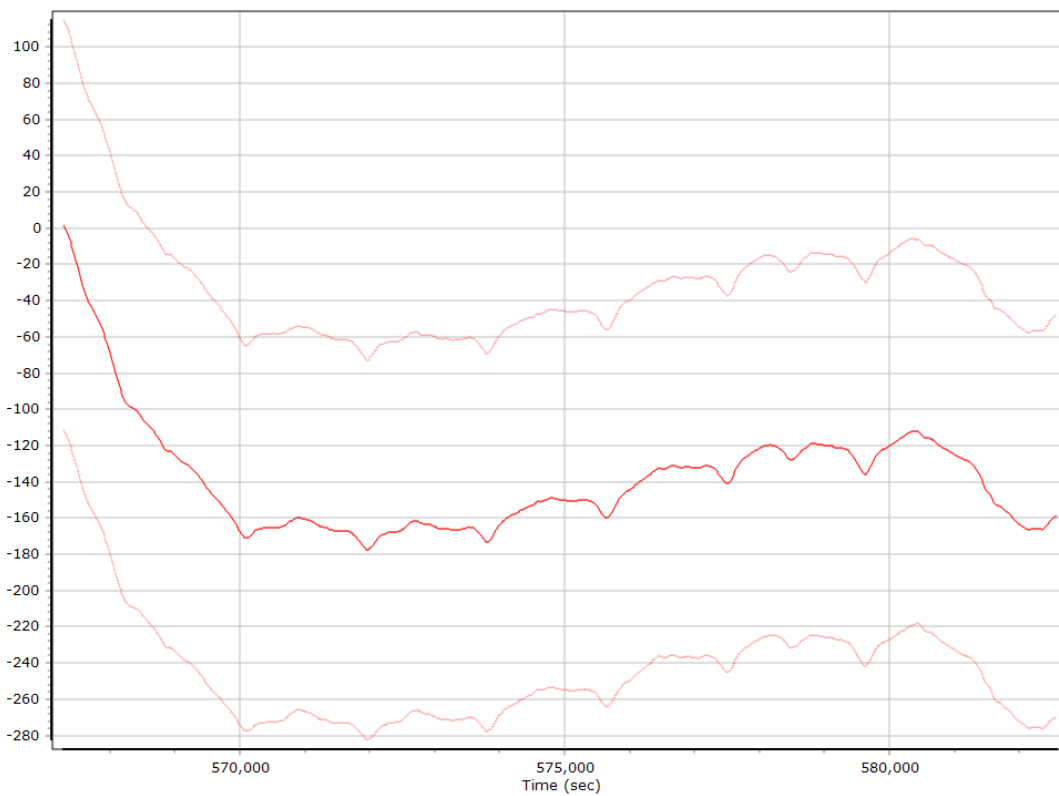
X Accelerometer Scale Error (ppm)



Y Accelerometer Scale Error (ppm)



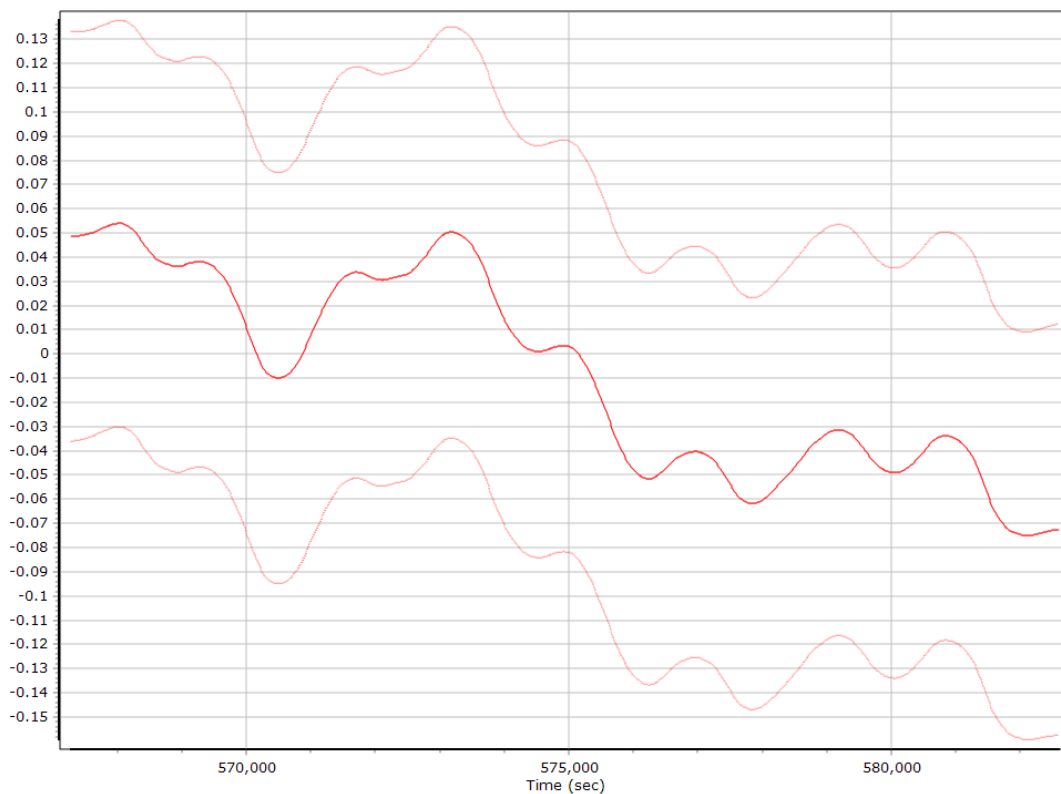
Z Accelerometer Scale Error (ppm)



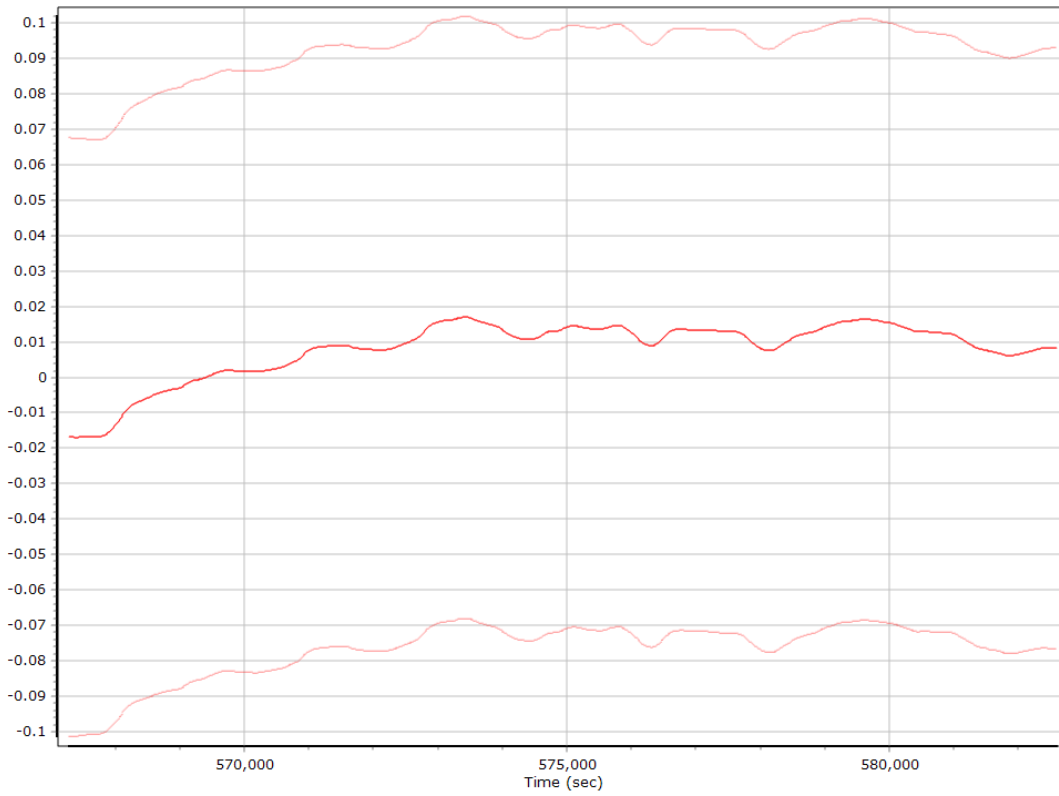
Gyro Bias (deg/h)



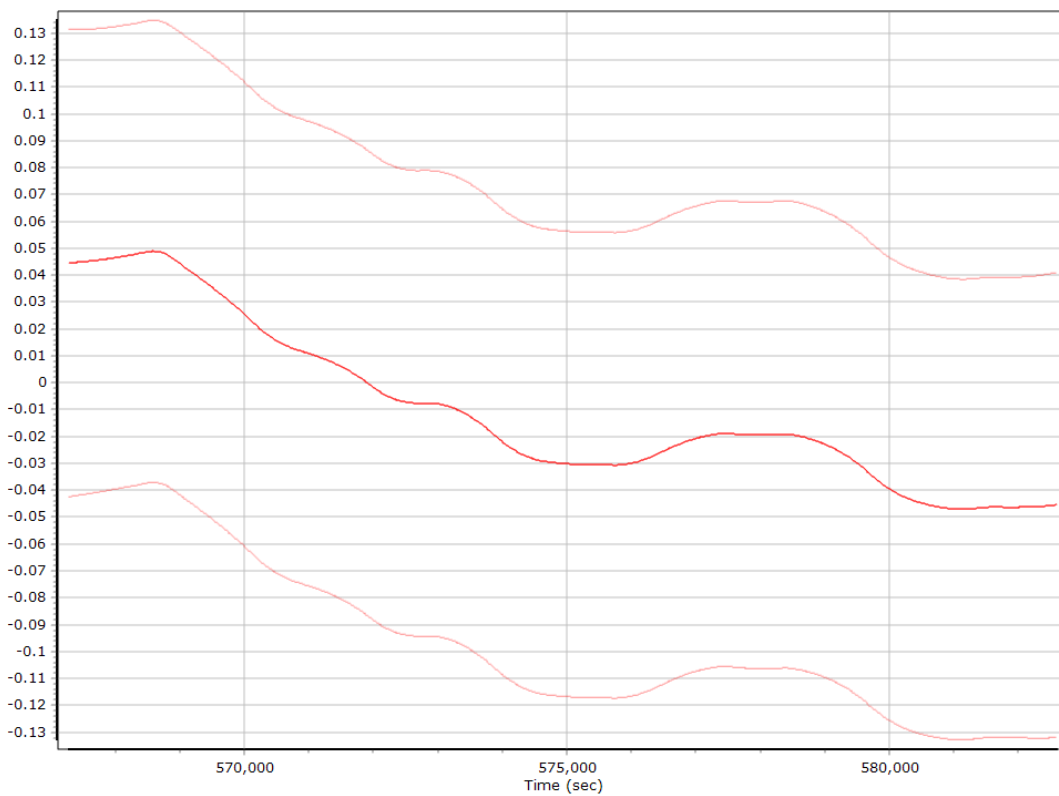
X Gyro Bias (deg/h)



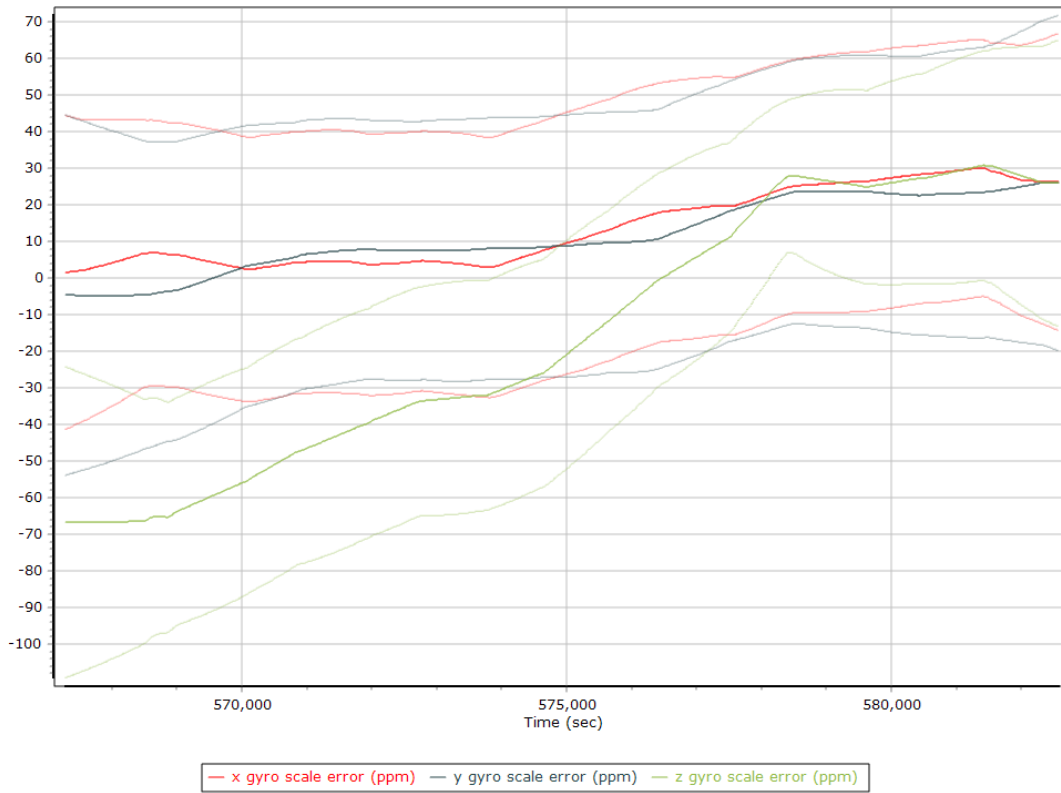
Y Gyro Bias (deg/h)



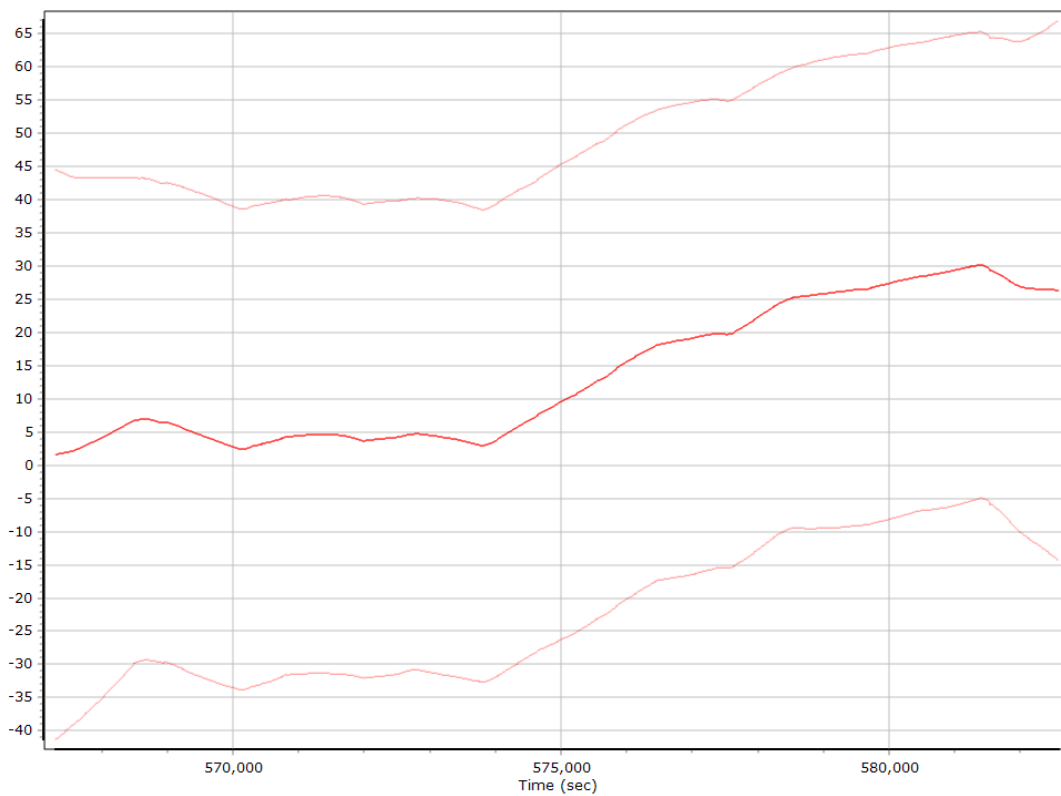
Z Gyro Bias (deg/h)



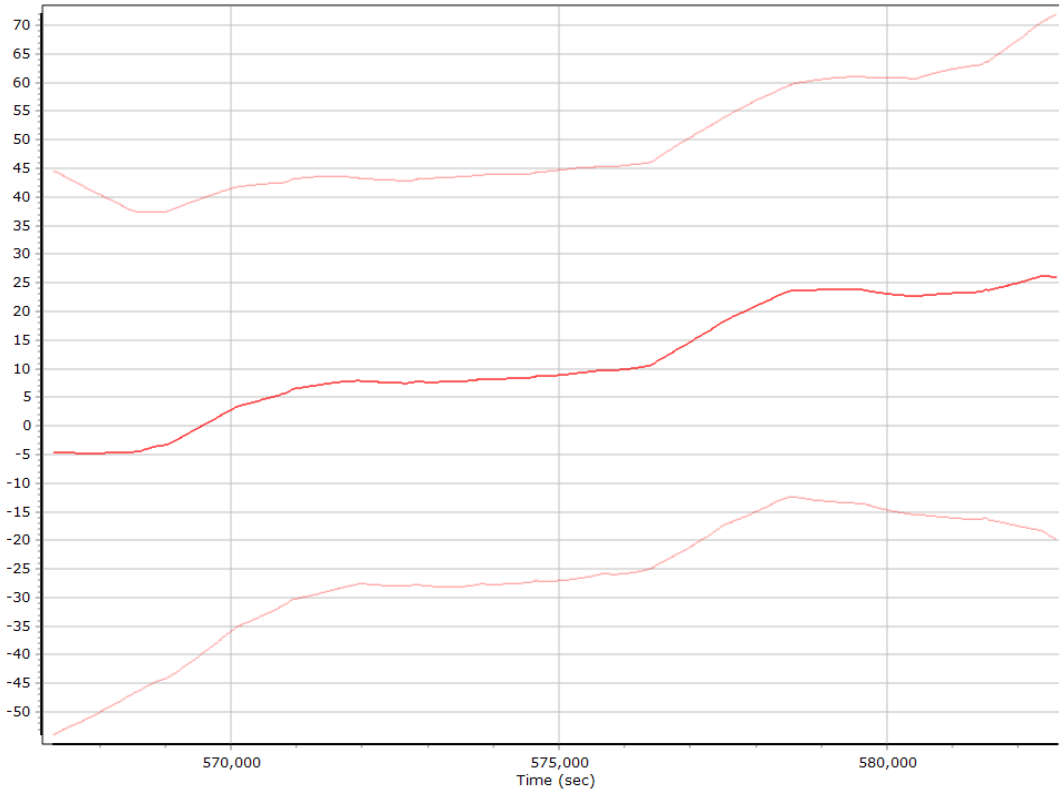
Gyro Scale Error (ppm)



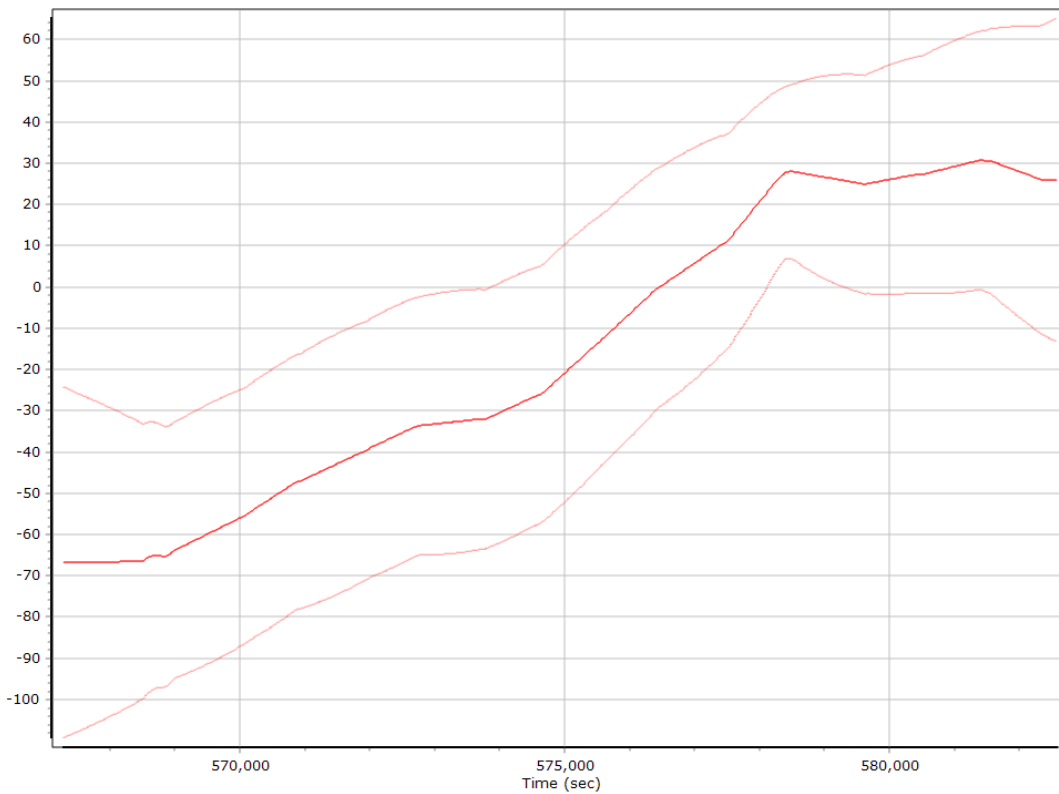
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)

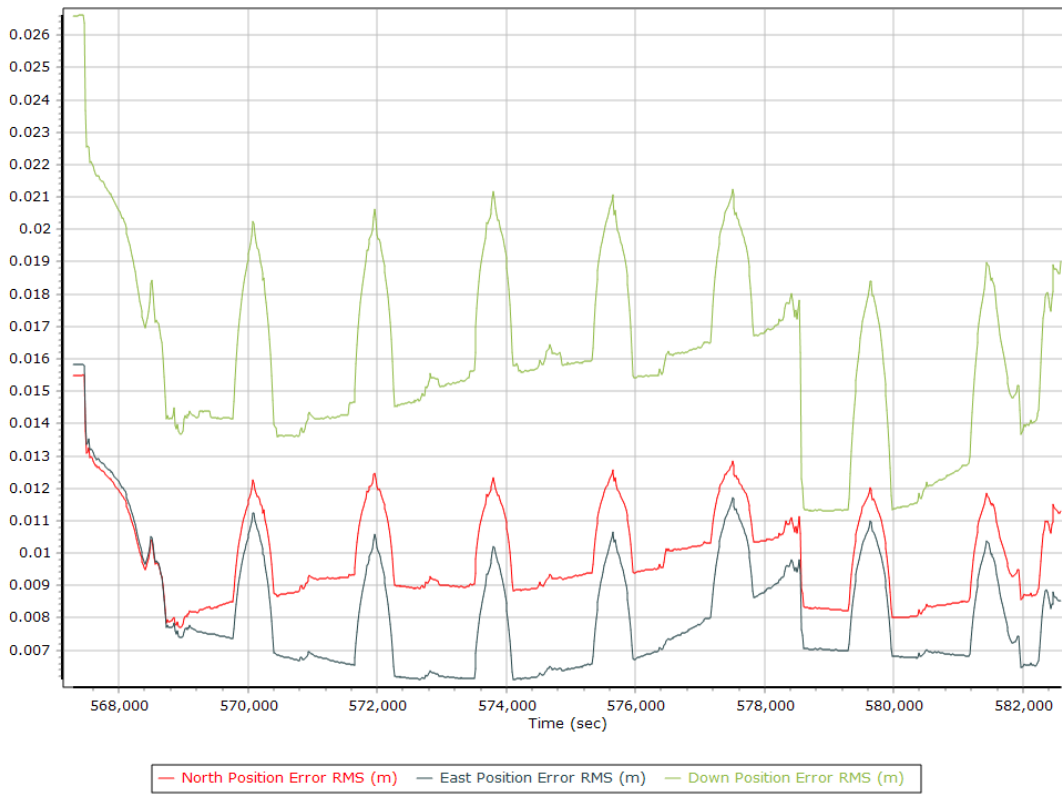


Z Gyro Scale Error (ppm)

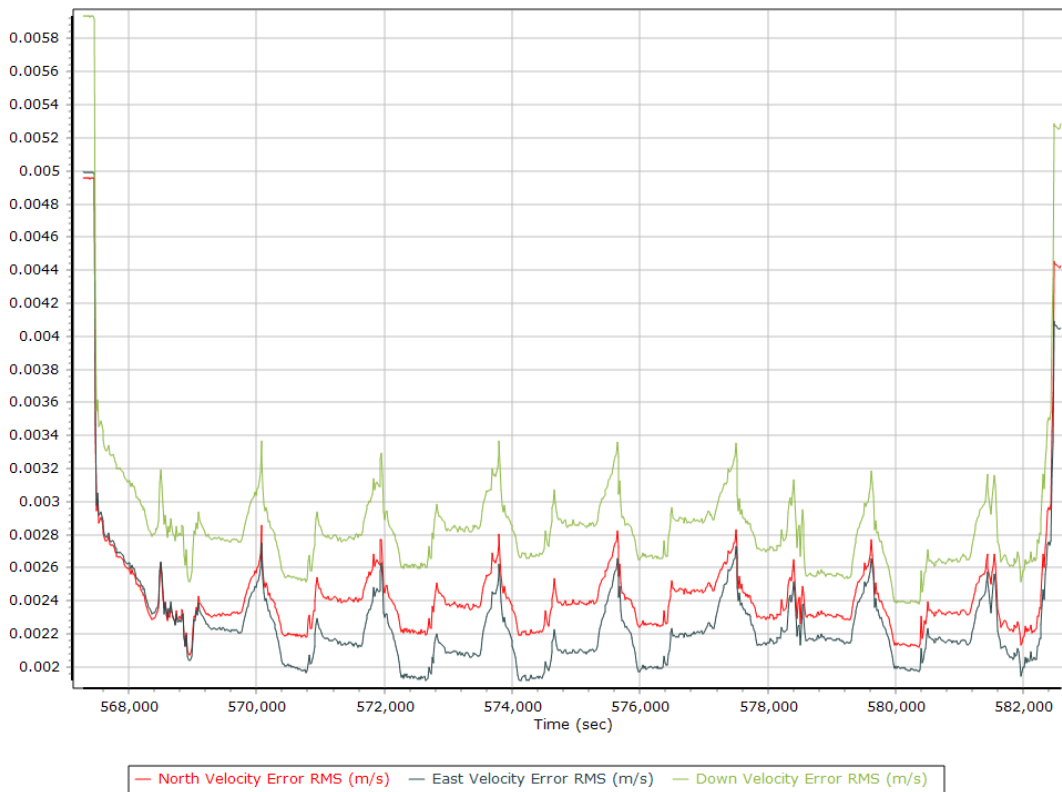


Smoothed Performance Metrics

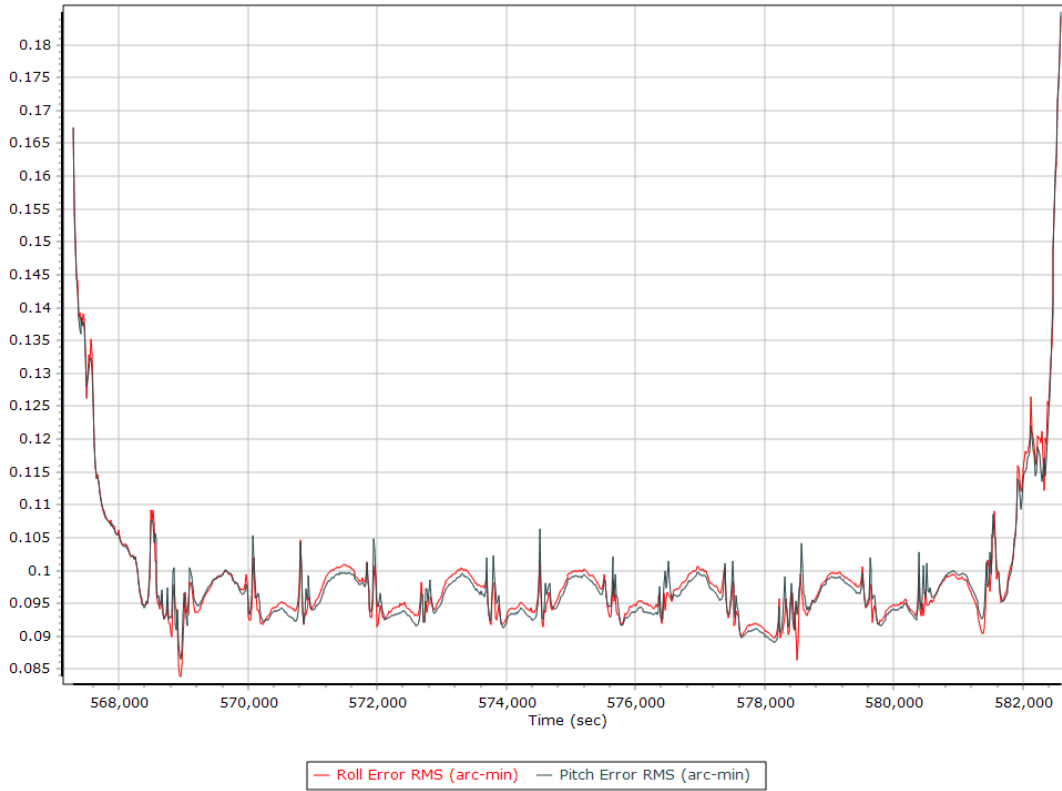
Position Error RMS (m)



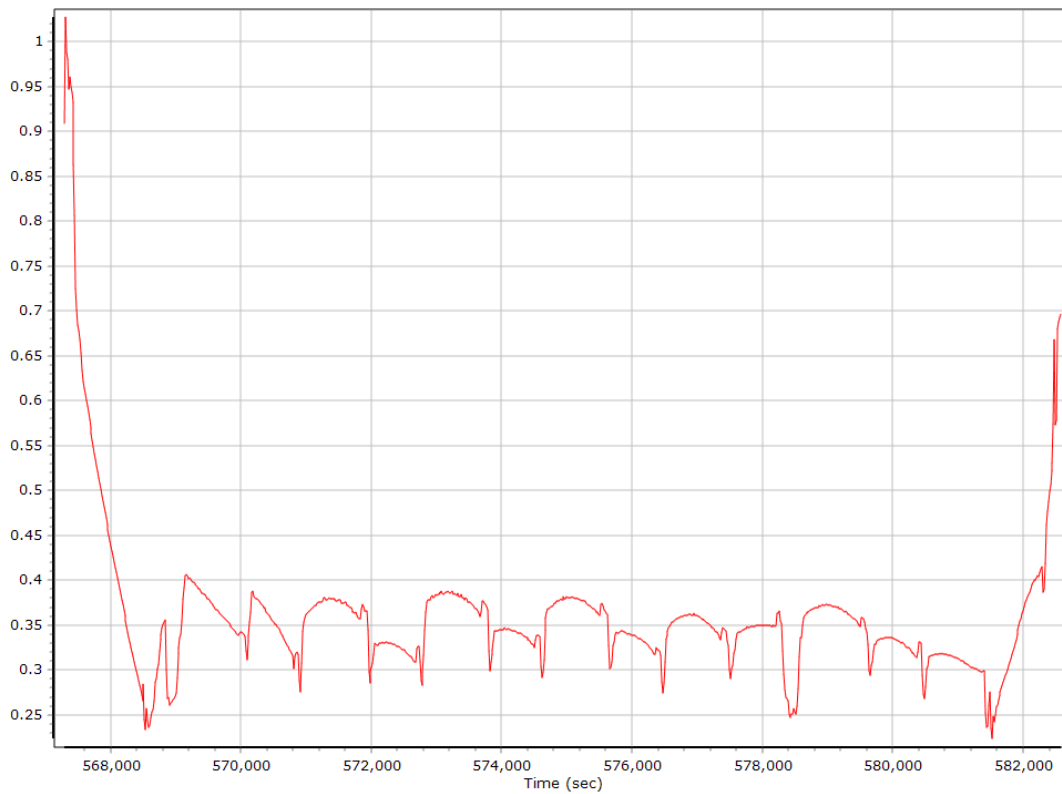
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

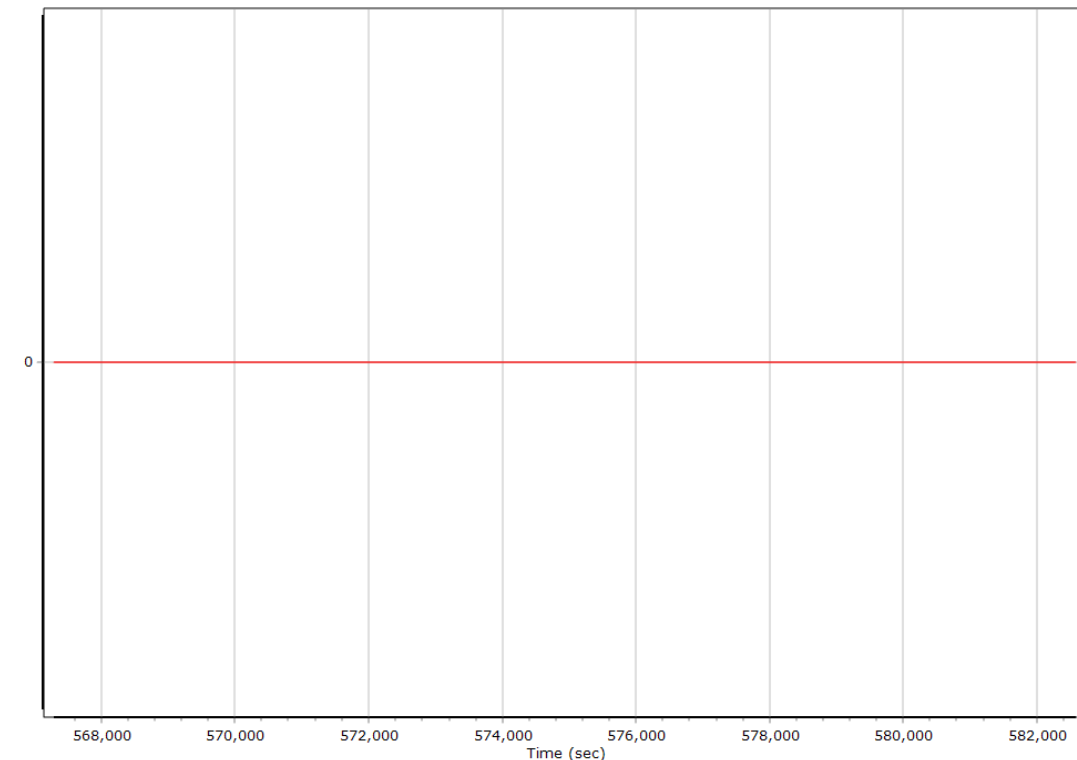


Heading Error RMS (arc-min)



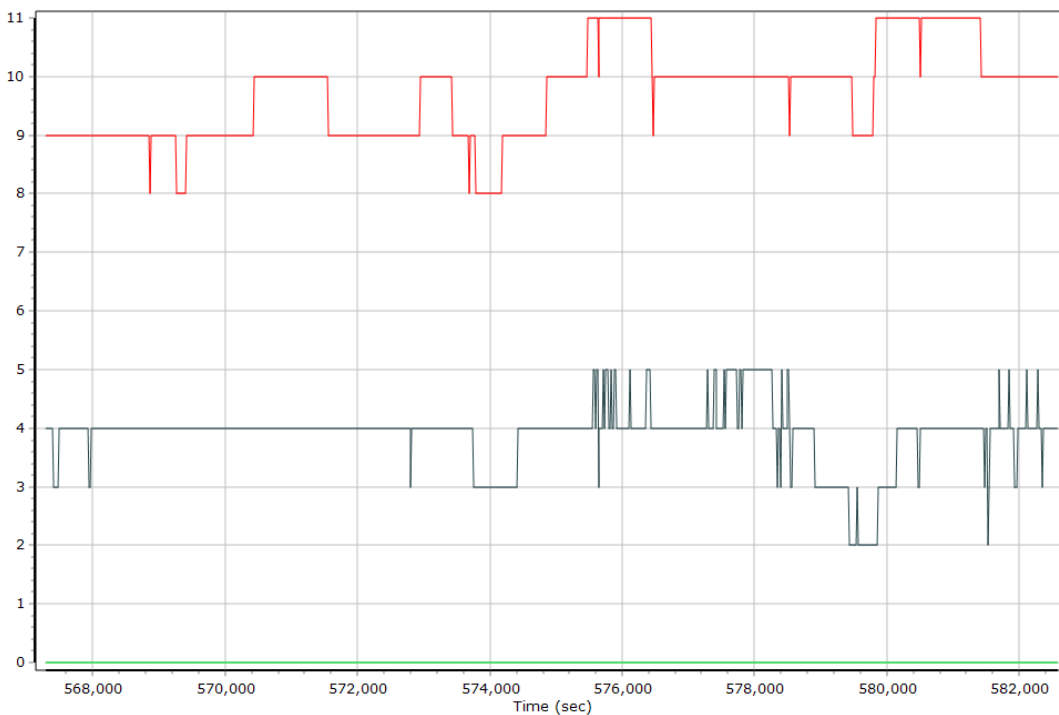
Smoothed Solution Status

Processing Mode



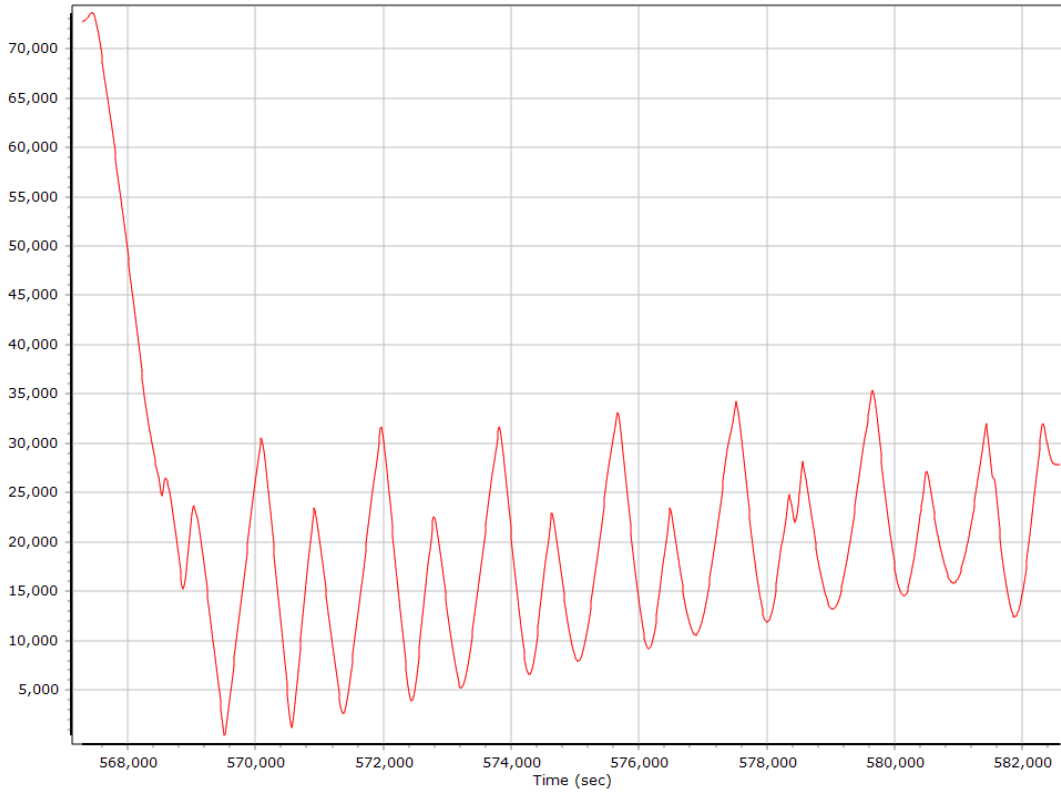
0 = Fixed NL, 1 = Fixed WL, 2 = Float, 3 = DGNSS, 4 = RTCM, 5 = IAPPP, 6 = C/A, 7 = GNSS Nav, 8 = DR

Number of Satellites

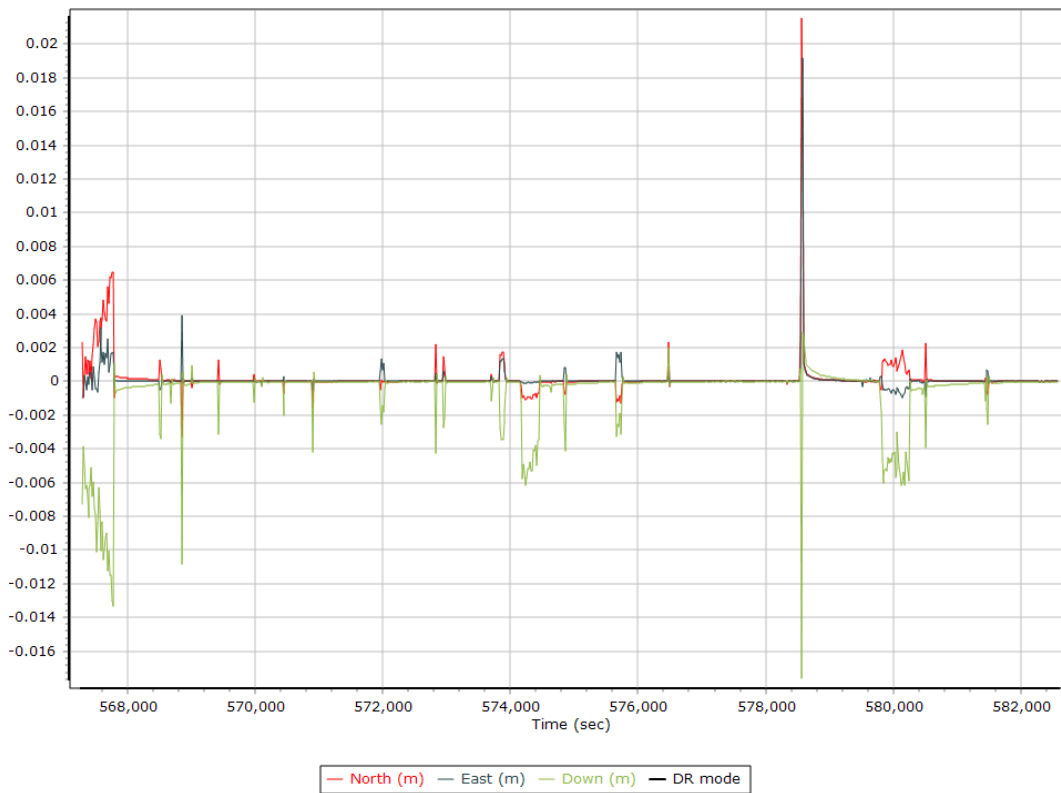


— Number of GPS Satellites
 — Number of GLONASS Satellites
 — Number of QZSS Satellites
— Number of BEIDOU Satellites
 — Number of GALILEO Satellites

Baseline Length



SBET IAkar Separation



Export Summary

Export file	export_XSS20053A_177.kml		
Export format	Google KML		
Solution in use	Post-processed		
Output rate	Specified Distance Interval		
Distance Interval (m)	10.000		
Reference to Output lever arm (m)	0.000	0.000	0.000
Reference mounting angles (deg)	0.000	0.000	0.000
Output units (Coordinate / Lat & Lon)	Meter	Deg Decimal	
Export start time	567229.002 (2/22/2020 1:33:49 PM)		
Export end time	582594.004 (2/22/2020 5:49:54 PM)		
Height option	Ellipsoid Height		
WGS84 height flag	False		
Grid	Universal Transverse Mercator		
Zone	UTM North 17 (84W to 78W)		
Datum	WGS84		
Ellipsoid	WGS84		
Local Transformation	NONE		
Target Epoch	2020.142077		