

General Information

Mission Information

Project name	RBV20064B_176_1
Processing date	2020-03-05 15:54:22
Mission date	2020-03-04 17:19:17
Mission duration	03:34:17.462
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
200304_171858_INS-GPS_1.raw	POS Data

Input Files

File Name	File Type
Ephm0640.20g	GLONASS Broadcast Ephemeris
Ephm0640.20n	GPS Broadcast Ephemeris
loyq0640.20o	GNSS SingleBase
pafu0640.20o	GNSS SingleBase
wvcv0640.20o	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
igu20954_12.sp3	GPS Precise Ephemeris
wvmf0640.20o	GNSS SingleBase
wvbu0640.20o	GNSS SingleBase

Output Files

Filename	File type
sbet_RB20064B_176_1.out	SBET Trajectory File
export_RB20064B_176_1.shp	Shapefile Export Output

Rover Data Summary

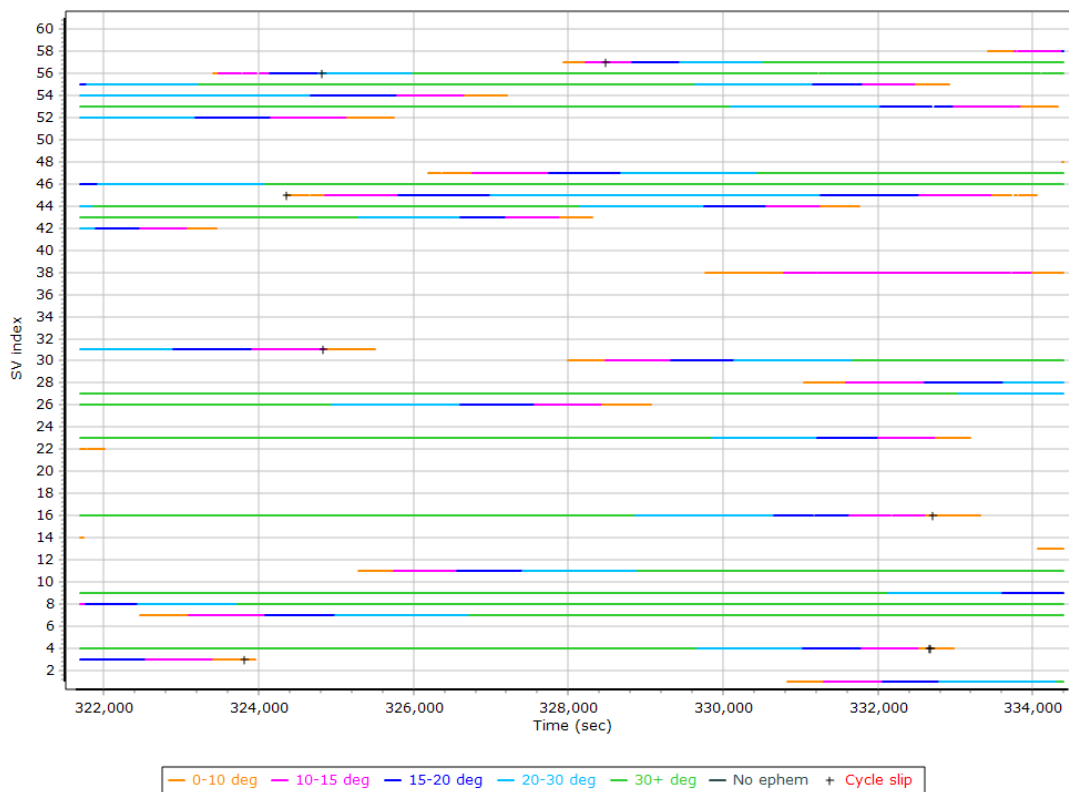
First raw data file	200304_171858_INS-GPS_1.raw		
Last raw data file	200304_171858_INS-GPS_1.raw		
Start GPS week	2095		
Start time	321538.612 (3/4/2020 5:18:58 PM)		
End time	334396.074 (3/4/2020 8:53:16 PM)		
Start of fine alignment	321632.539 (3/4/2020 5:20:32 PM)		
Available subsystems	Primary GNSS, 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

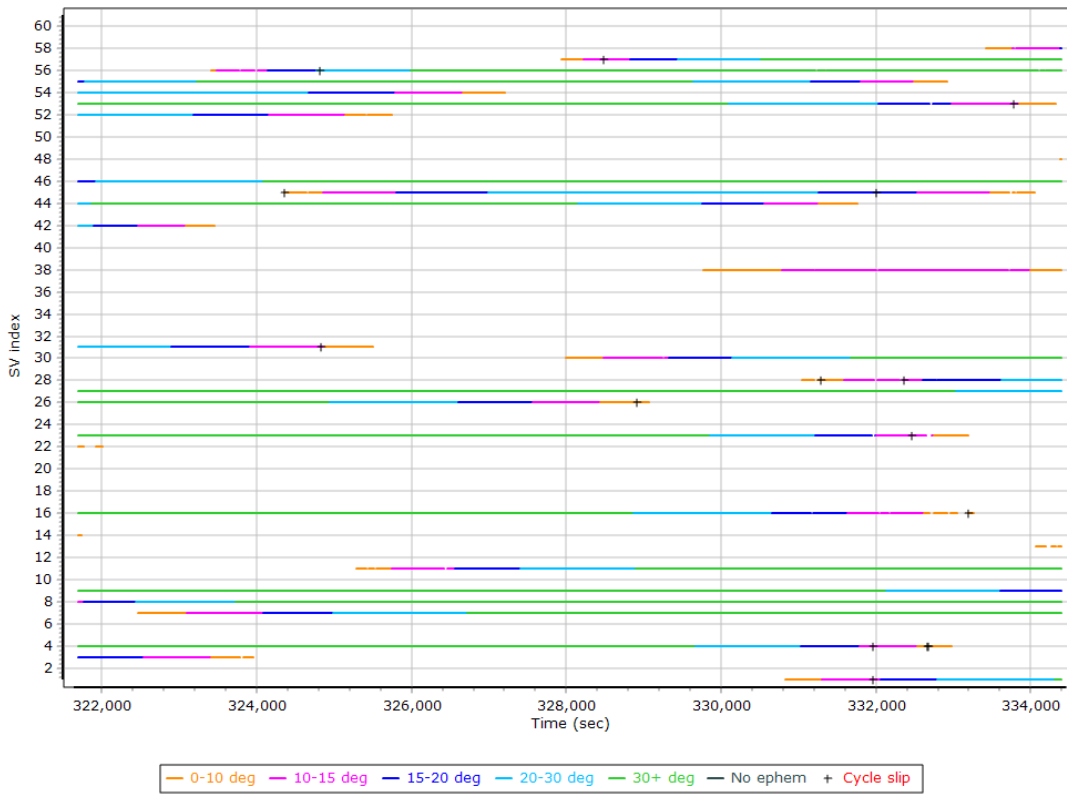
Raw IMU Import QC Summary

IMU data input file	imu_RB20064B_176_1.dat
IMU data check log file	imudt_RB20064B_176_1.log
IMU Records Processed	2571085
Termination Status	Normal
IMU Anomalies	0

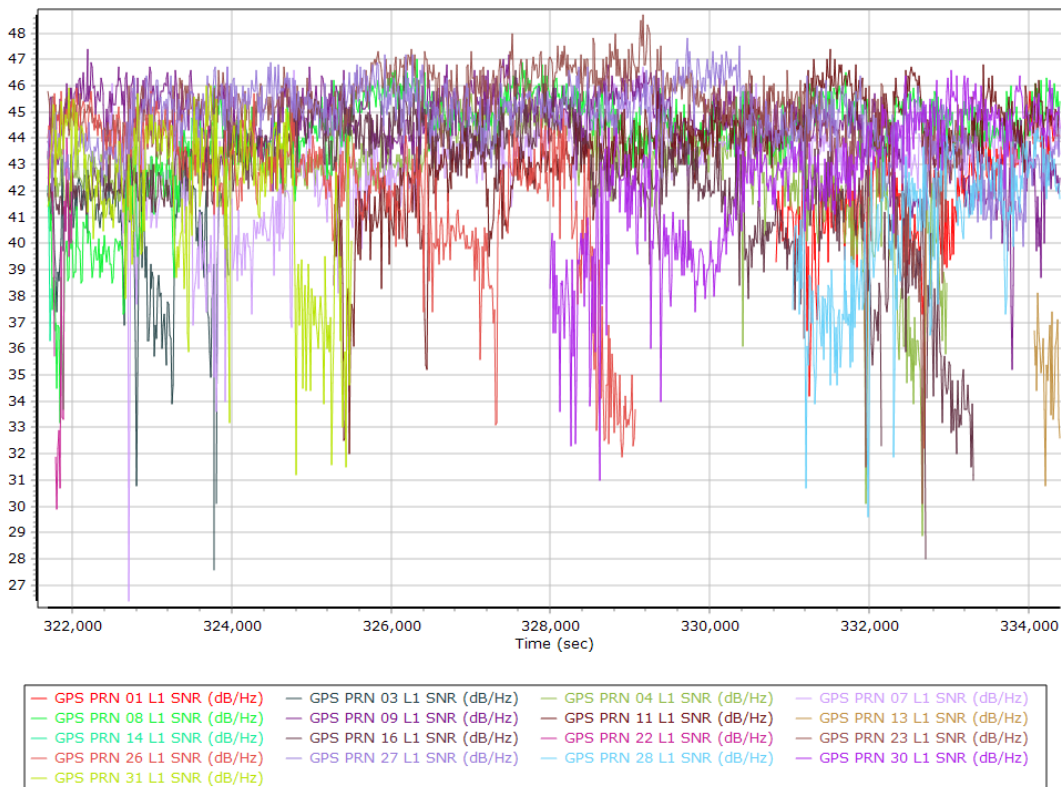
L1 Satellite Lock/Elevation



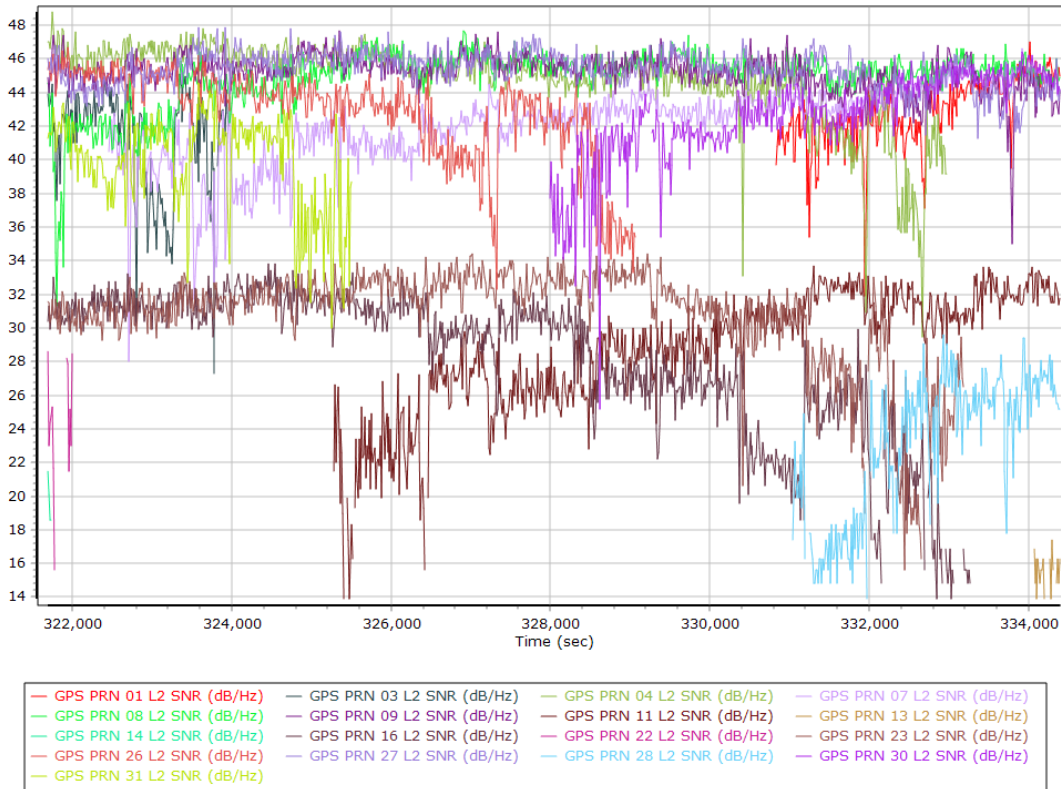
L2 Satellite Lock/Elevation



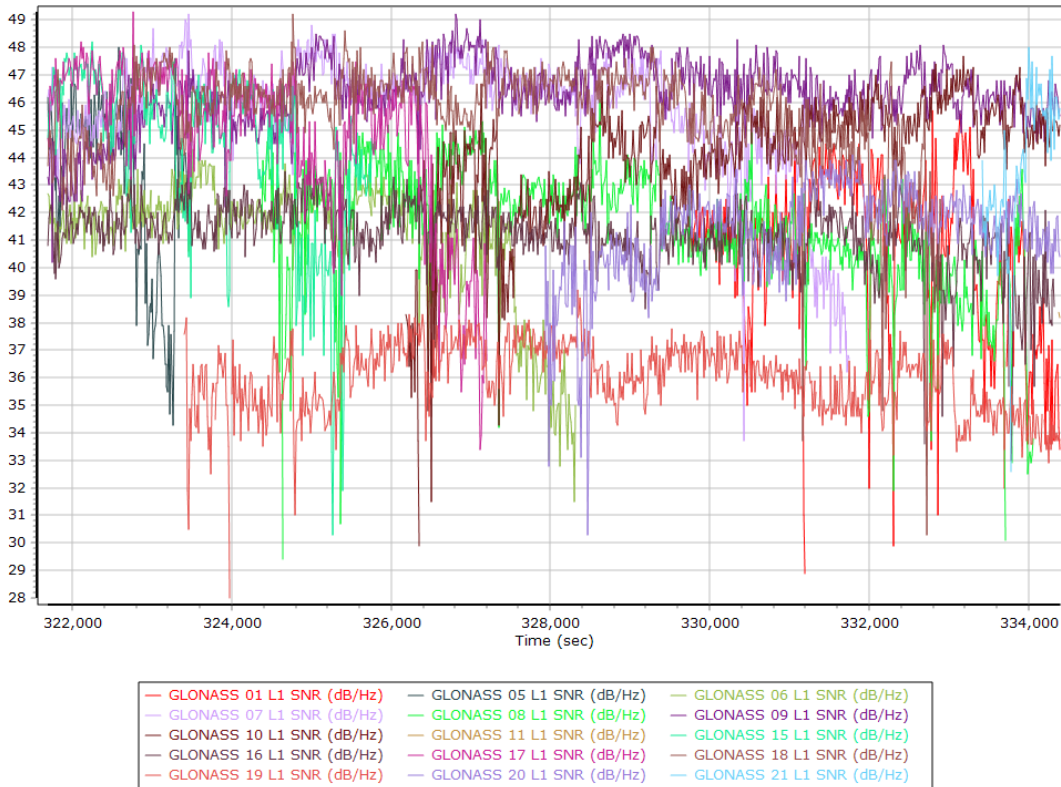
GPS L1 SNR



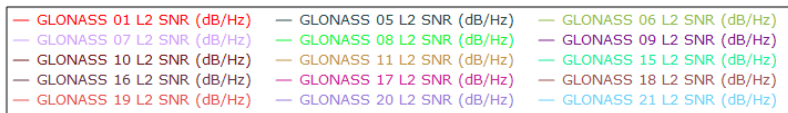
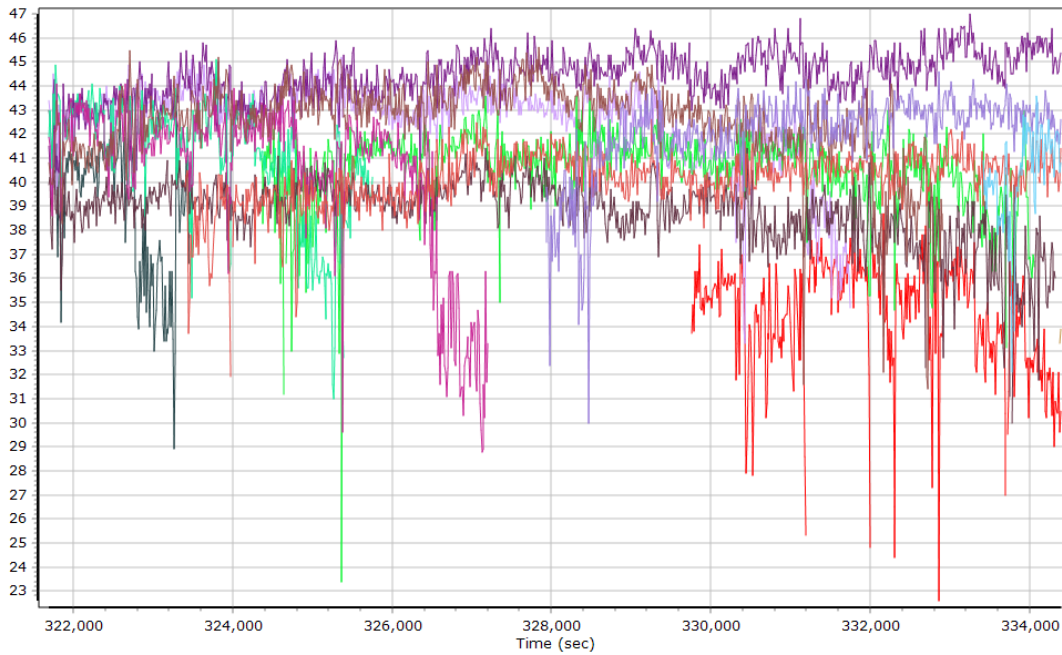
GPS L2 SNR



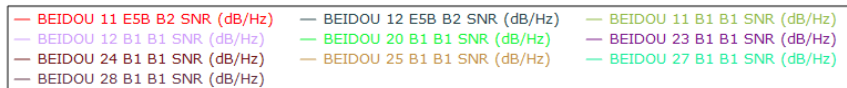
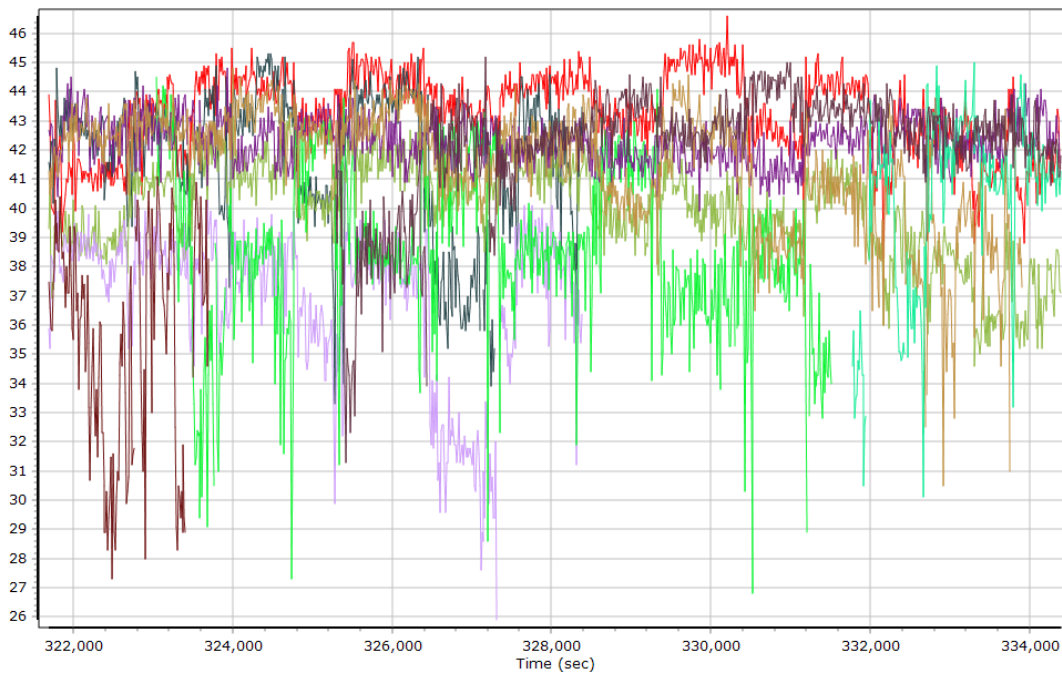
GLONASS L1 SNR



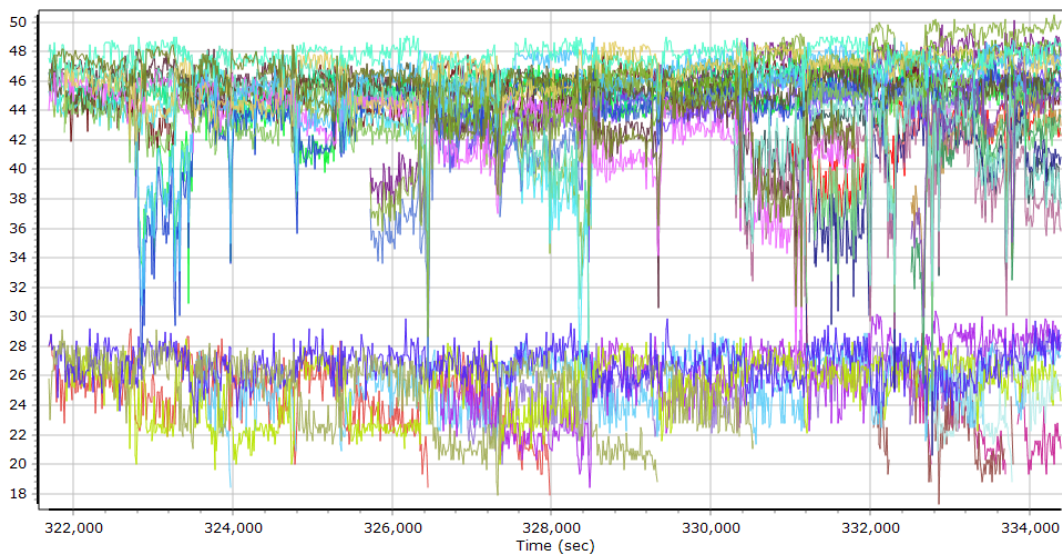
GLONASS L2 SNR



BEIDOU SNR



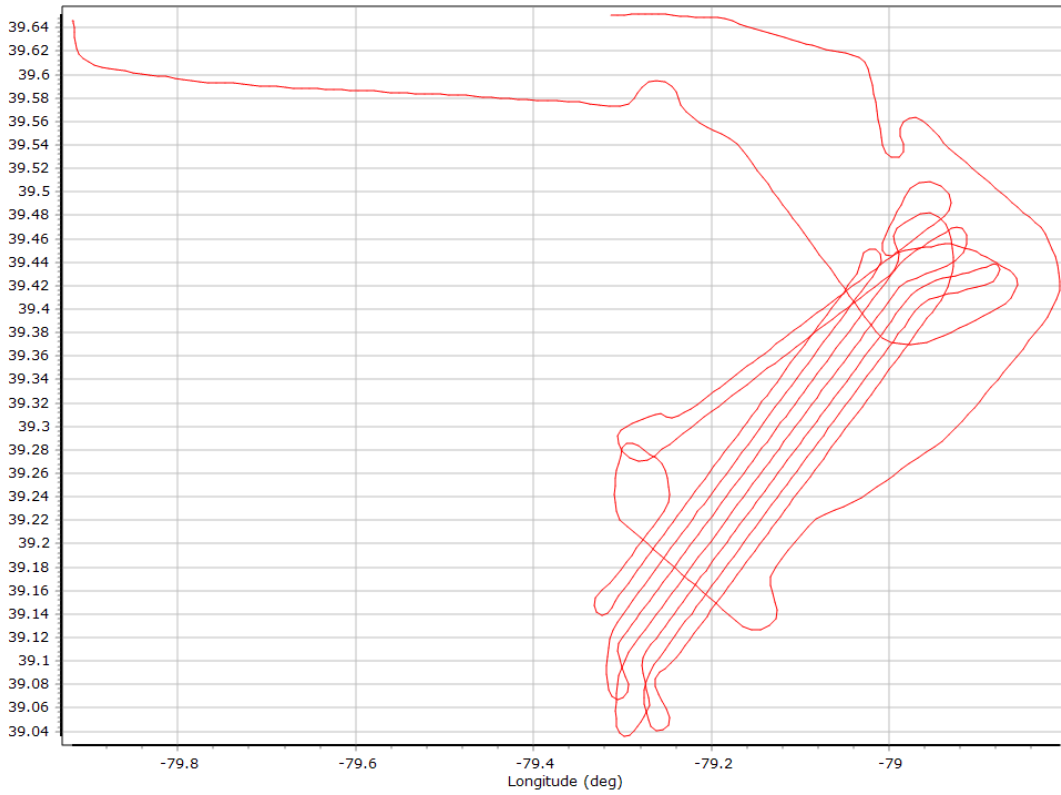
GALILEO SNR



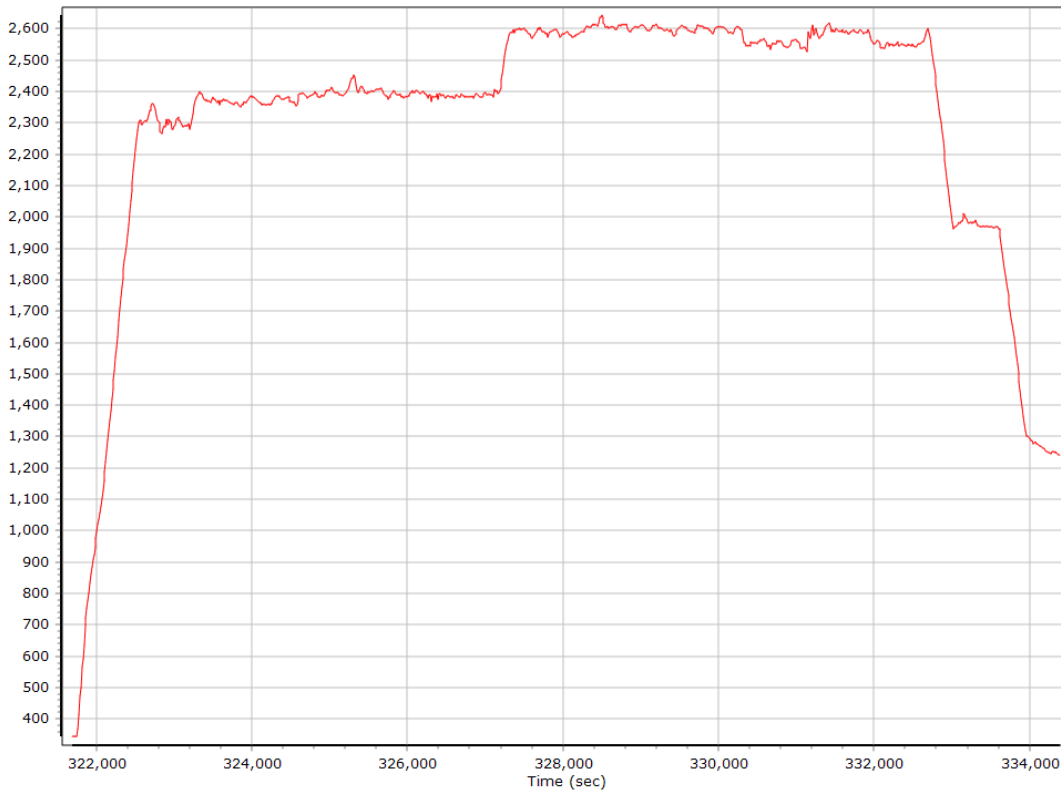
- | | |
|--|--|
| — GALILEO 01 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 04 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 07 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 13 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 15 L1 BOC_1_1_D_MBOC SNR (dB/Hz) | — GALILEO 18 L1 BOC_1_1_D_MBOC SNR (dB/Hz) |
| — GALILEO 21 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 01 L5E5A BPSK10_PD SNR (dB/Hz) | — GALILEO 04 L5E5A BPSK10_PD SNR (dB/Hz) |
| — GALILEO 07 L5E5A BPSK10_PD SNR (dB/Hz) | — GALILEO 13 L5E5A BPSK10_PD SNR (dB/Hz) |
| — GALILEO 15 L5E5A BPSK10_PD SNR (dB/Hz) | — GALILEO 18 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) |

Trajectory Information

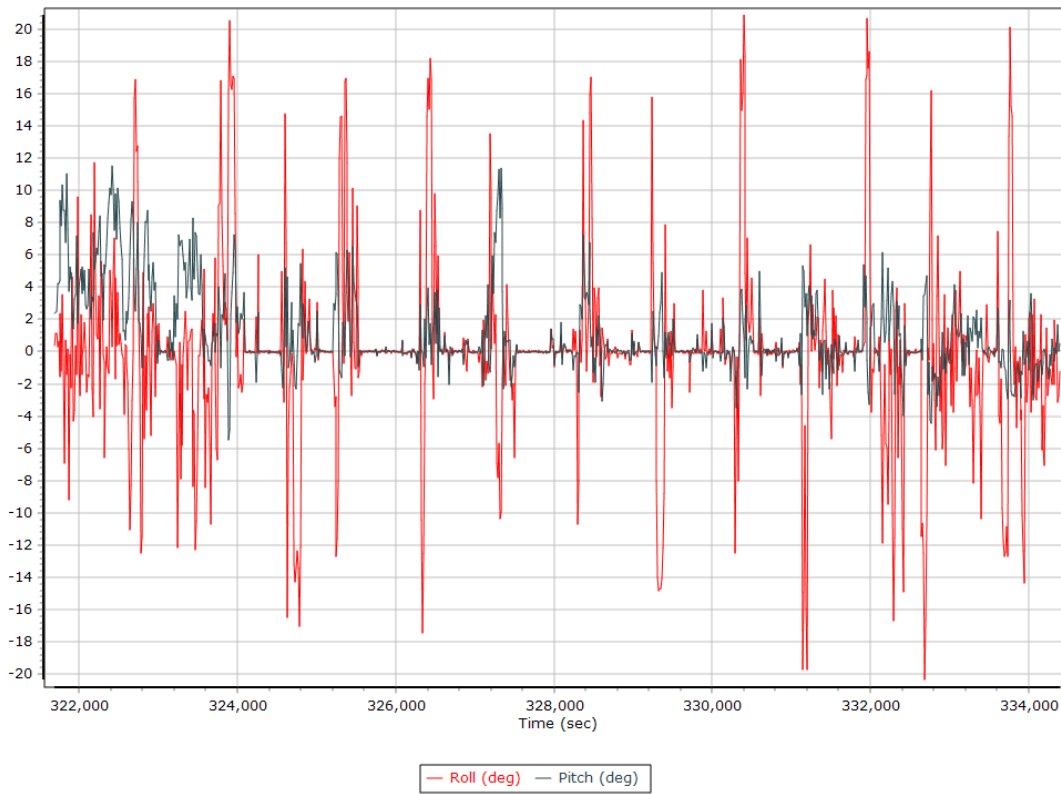
Top View



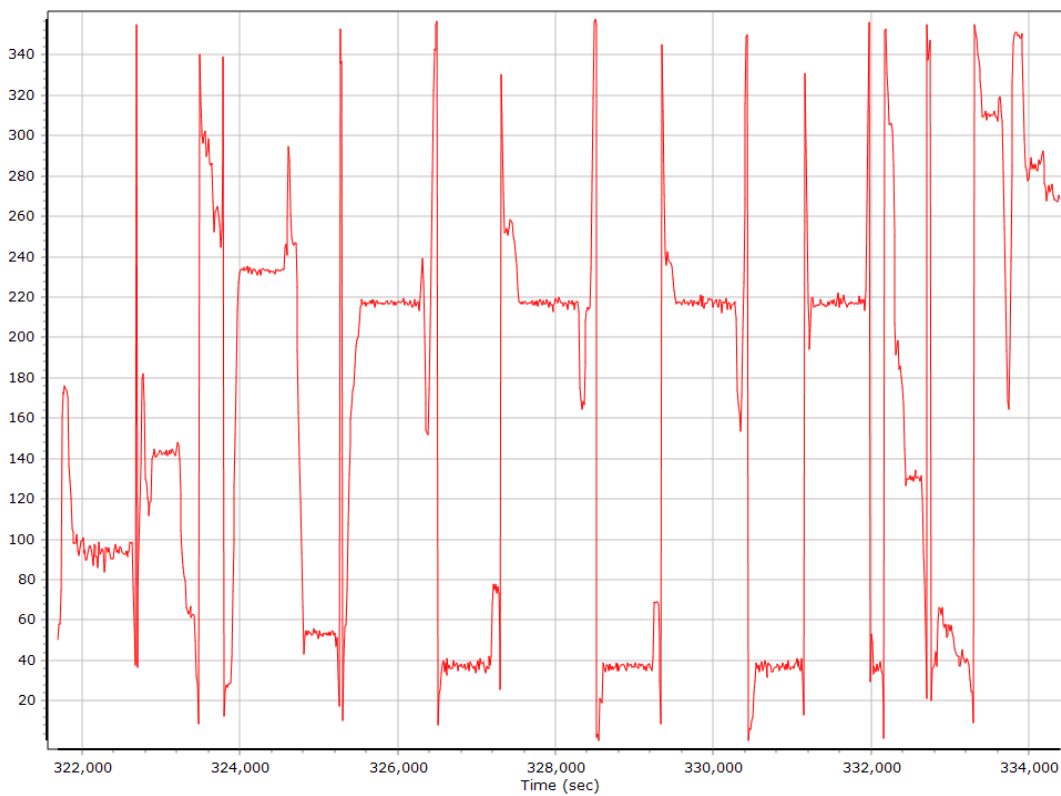
Altitude



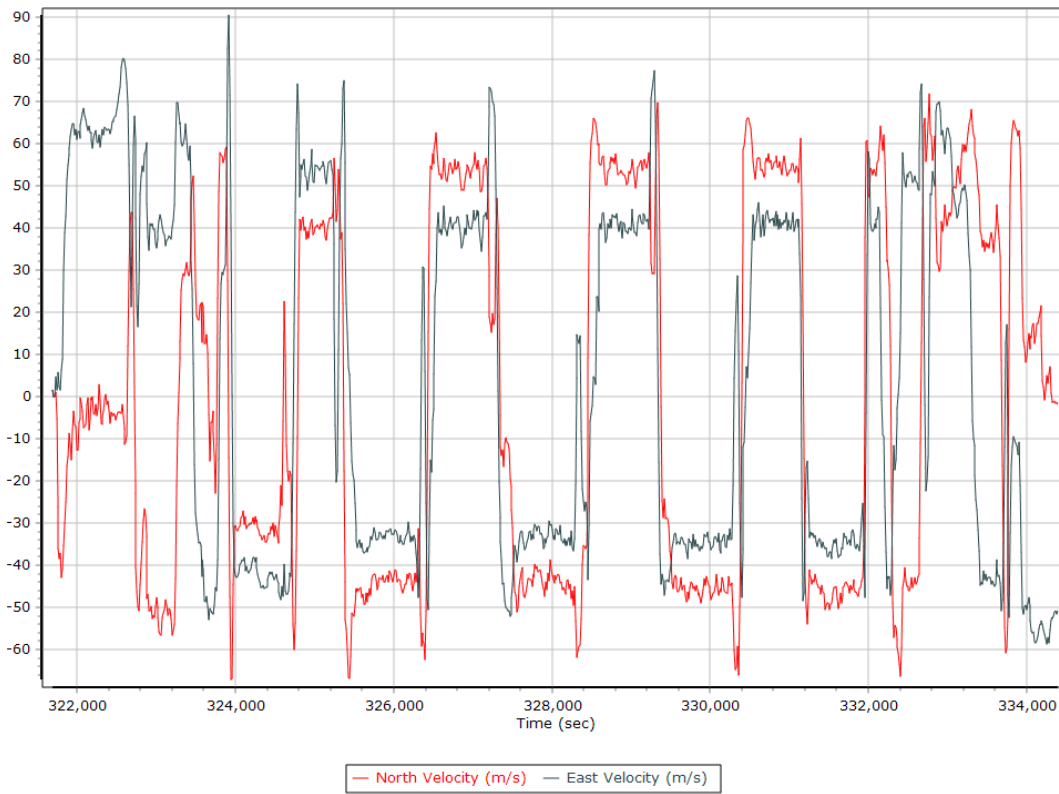
Roll/Pitch



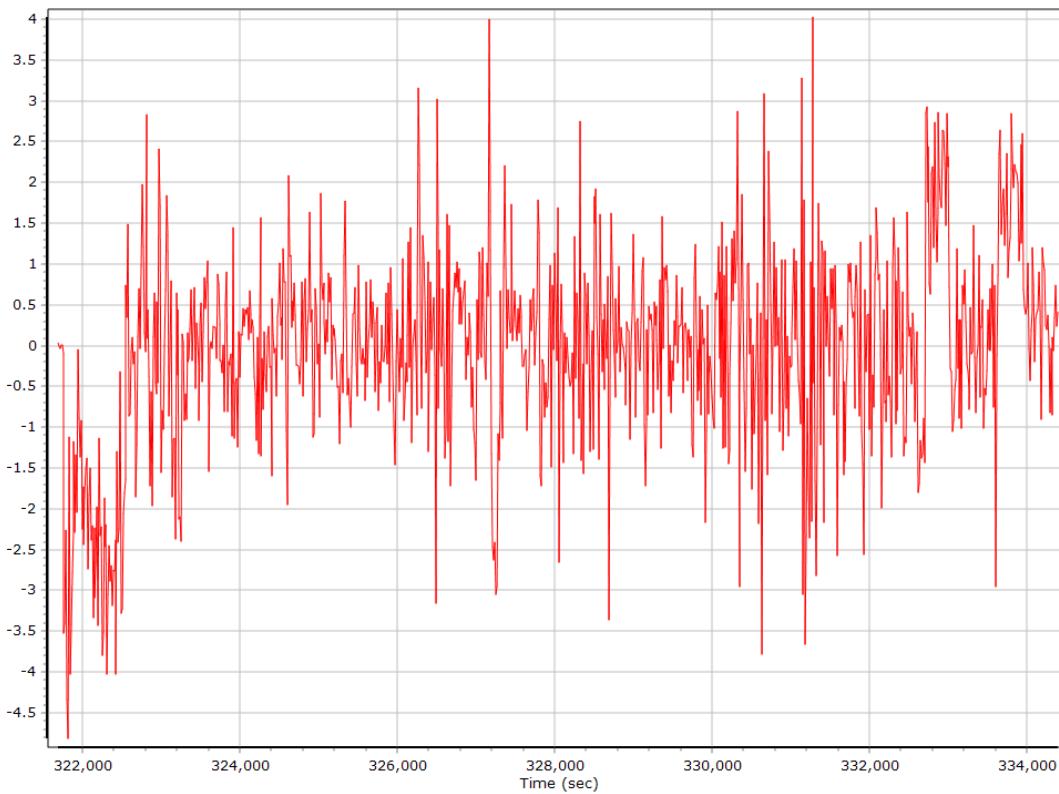
Heading



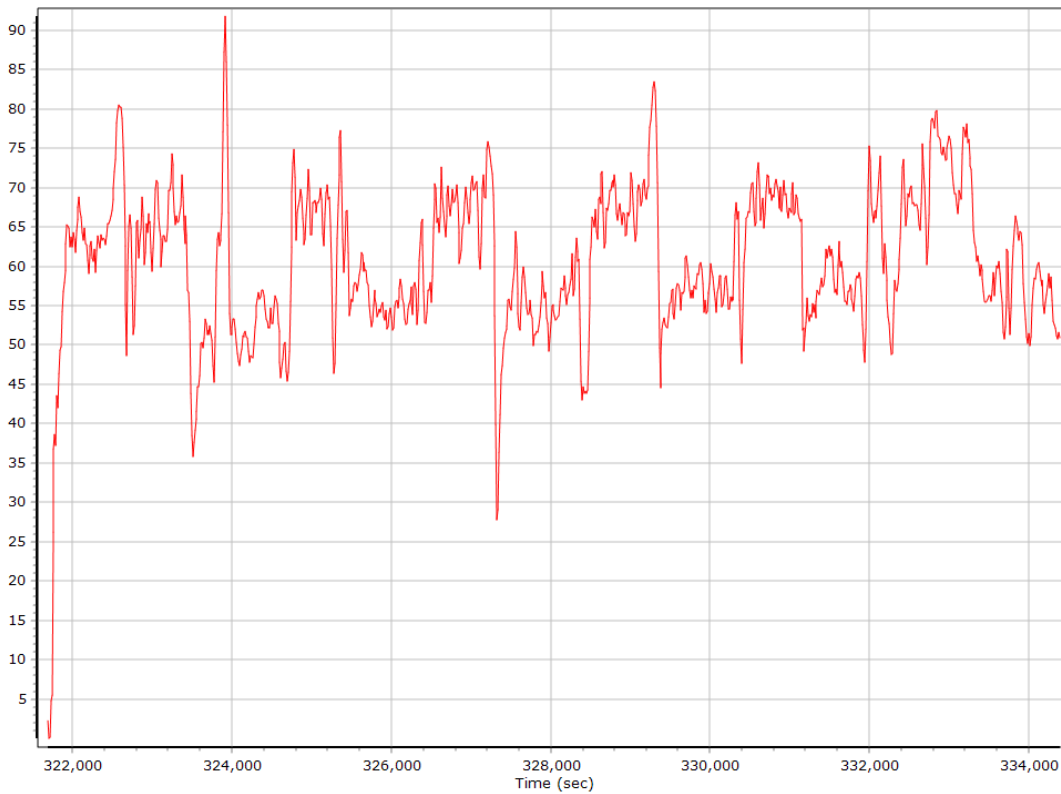
North/East Velocity



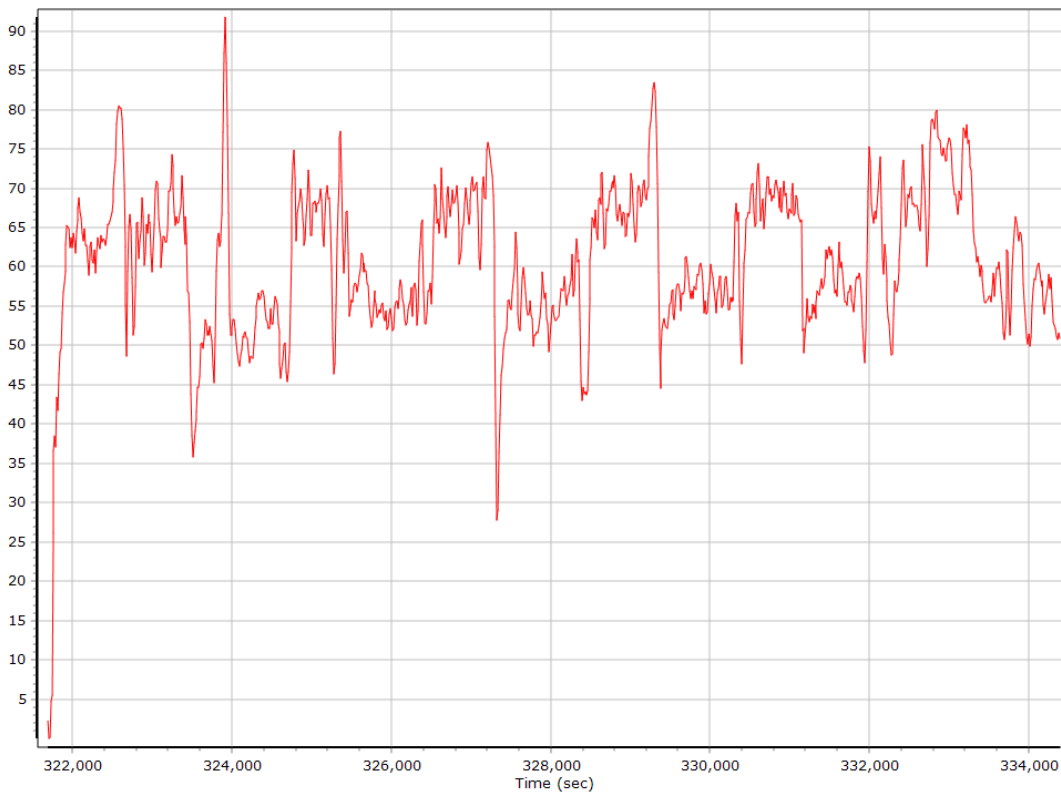
Down Velocity



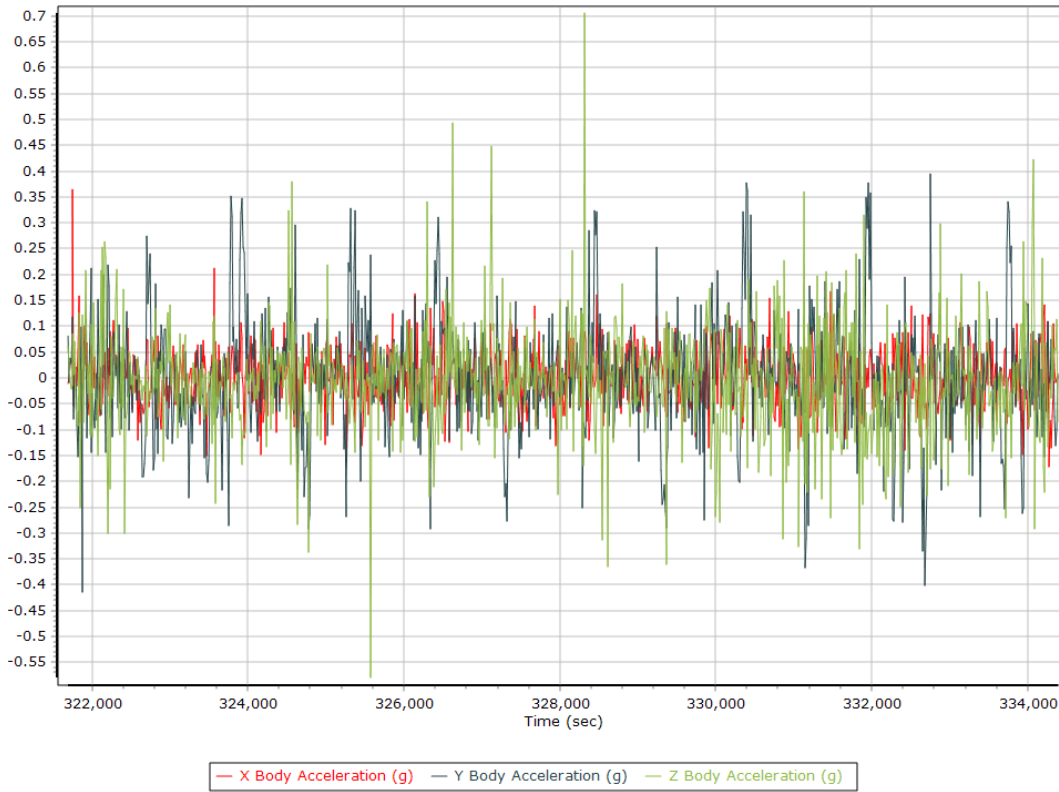
Total Speed



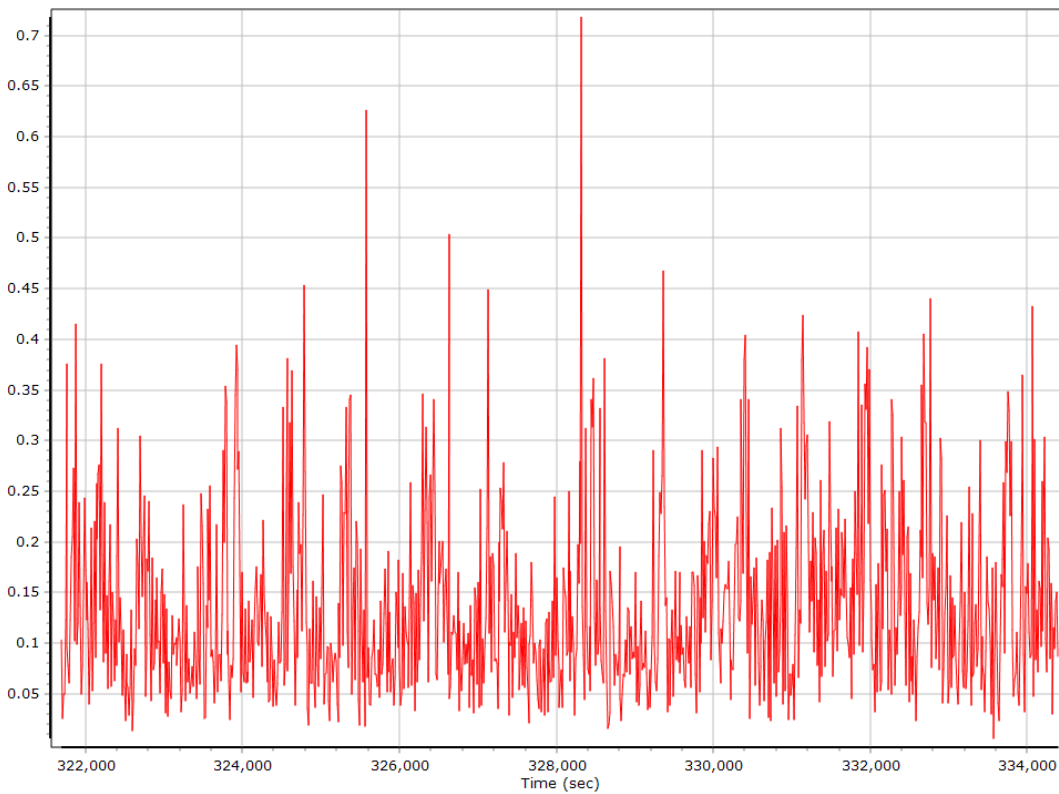
Ground Speed



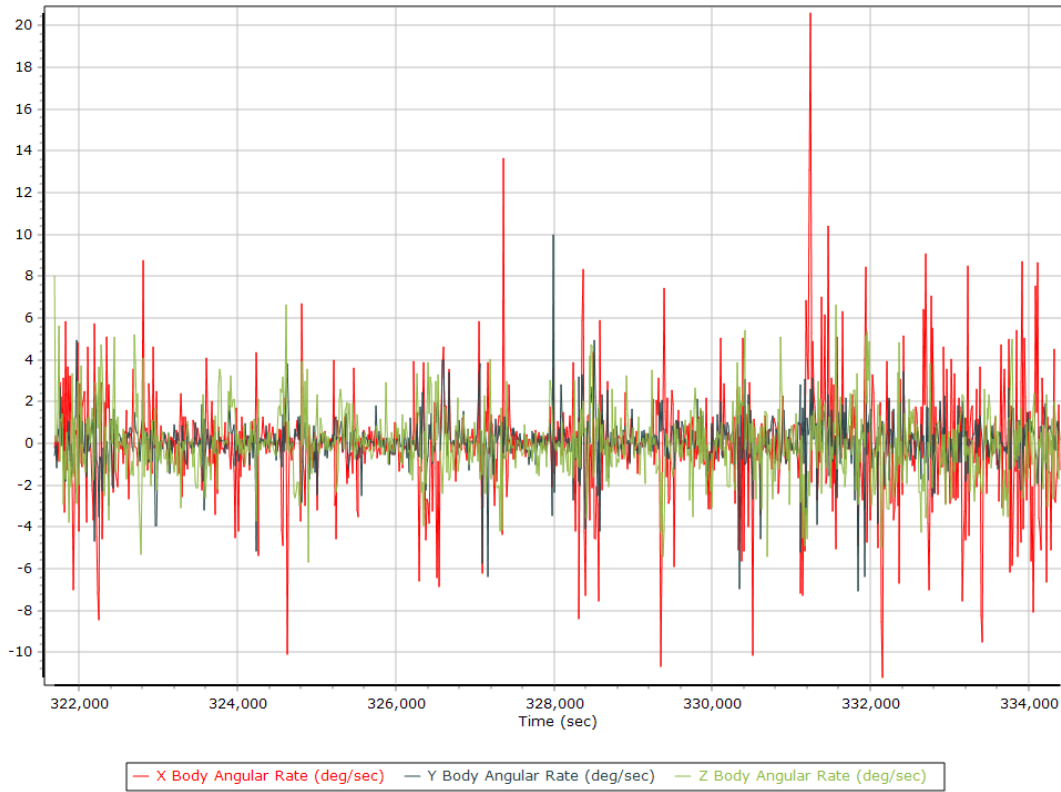
Body Acceleration



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	WVBU	21.38	GNSS	1	User	None	Imported
03/04/2020	WVMF	36.30	GNSS	1	User	None	Imported
03/04/2020	WVTA	32.14	GNSS	1	User	None	Imported
03/04/2020	WVCV	45.20	GNSS	1	User	None	Imported
03/04/2020	PAFU	78.95	GNSS	1	User	None	Imported
03/04/2020	LOYQ	128.33	GNSS	1	User	None	Imported

SmartBase Results

SmartBase status	PROC_STATUS_OK
Primary station Id	WVBU
Primary station data rate (sec)	1.0
VRS/ASB generation rate (sec)	1.0
VRS/ASB timespan	12856 s (2095 321557 - 2095 334413)
Number of reference stations	6
Primary station GPS measurement usage (%)	99.9
Primary station GLONASS measurement usage (%)	73.2
Average number of satellites per epoch	14.6
Max number of GPS stations used	6
Min number of GPS stations used	3
Max number of GLONASS stations used	6
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)	26404
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 - 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°54'48.58769"	200.063
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.016	0.004	0.017

Base Station Information

Station ID	WVBU		
Filename	wvbu0640.200		
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 - WVMF

Status	OK	SBQI	0	
Duration (Hours)	23.90	Output Coordinates	Original	
Solution Epochs	5736	Mean Epoch SVs	8.7	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°04'32.34430"	W78°55'56.99819"	313.553
Adjusted		N39°04'32.34483"	W78°55'56.99879"	313.558
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.022	0.005	0.022

Base Station Information

Station ID	WVMF		
Filename	wvmf0640.20o		
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	4924K62476
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°04'32.34430"		
Longitude	W78°55'56.99819"		
Ellipsoidal height (m)	313.55300		
Frame	ITRF00		
Epoch	1997		
Ellipsoid	WGS84		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

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 - WVCV

Status	OK	SBQI	0	
Duration (Hours)	23.64	Output Coordinates	Original	
Solution Epochs	5674	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°00'55.07537"	W79°27'25.00856"	969.234
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.036	0.001	0.036

Base Station Information

Station ID	WVCV		
Filename	wvcv0640.20o		
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	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 - 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°55'35.68896"	W79°41'50.51088"	328.012
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.015	0.010	0.018

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		

Base Station - LOYQ

Status	OK	SBQI	0	
Duration (Hours)	23.90	Output Coordinates	Original	
Solution Epochs	5736	Mean Epoch SVs	8.7	
Base Station Coordinates		Latitude	Longitude	Height (m)
Original		N39°38'02.59341"	W77°42'51.09793"	128.499
Adjusted		N39°38'02.59391"	W77°42'51.09899"	128.495
Coordinate Adjustments		Horizontal (m)	Vertical (m)	Total (m)
Adjustments		0.030	0.004	0.030

Base Station Information

Station ID	LOYQ		
Filename	loyq0640.20o		
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.	Leica	GR30	1705744
Antenna manufacturer, model	Leica	AR10	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.1085		
Latitude	N39°38'02.59341"		
Longitude	W77°42'51.09793"		
Ellipsoidal height (m)	128.49900		
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)	0.13	73.14	
Number of GPS SV	7	11	9
Number of GLONASS SV	0	7	6
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	17	15
PDOP	1.07	2.56	1.54
QC Solution Gaps	1.00	1.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	12854.00	0.00	1.00
Percentage	99.99	0.00	0.01

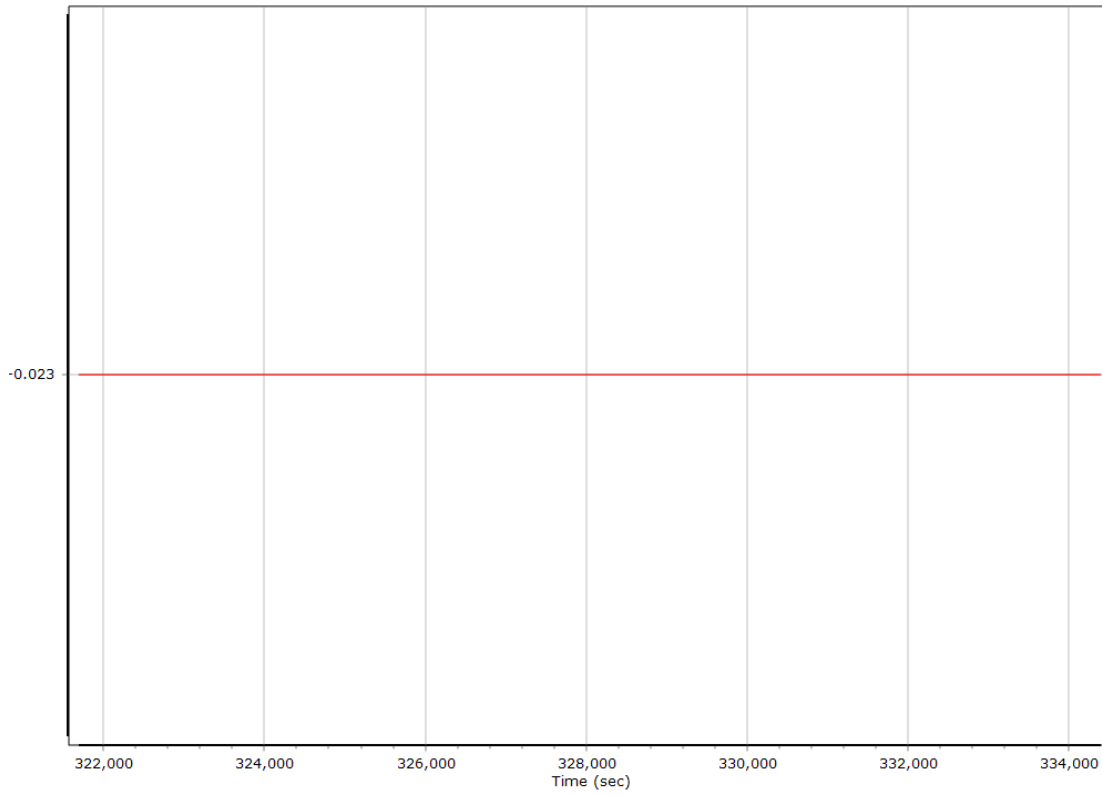
GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion SmartBase		
Stabilized mount	True		
Base station	ASB		
Processing start time	321539.000 (3/4/2020 5:18:59 PM)		
Processing end time	334395.000 (3/4/2020 8:53:15 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

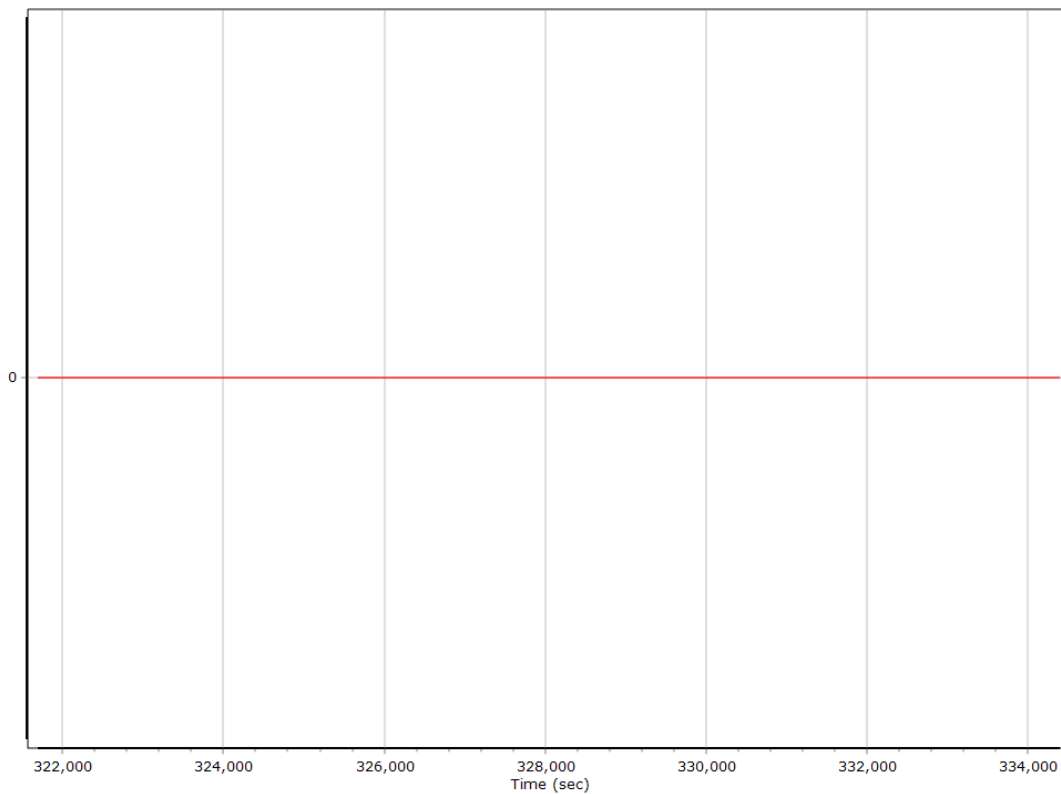
Calibrated Installation Parameters

Reference-Primary GNSS Lever Arm (m)

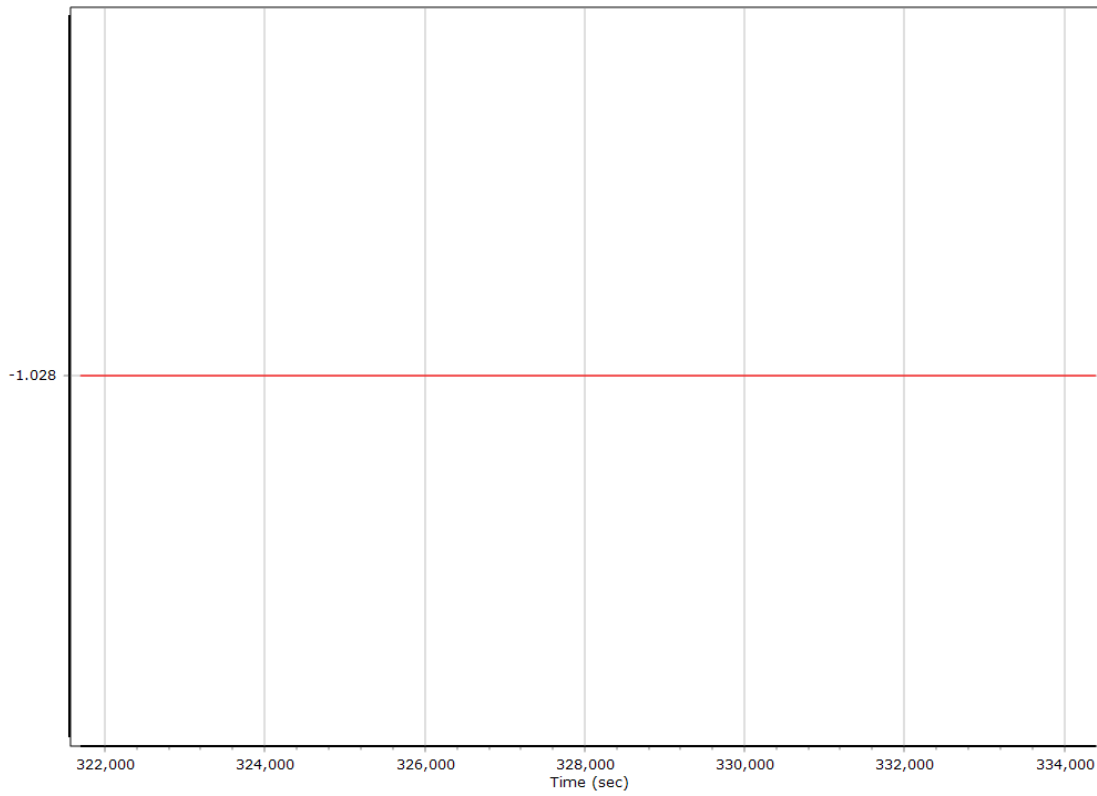
X Reference-Primary GNSS Lever Arm (m)



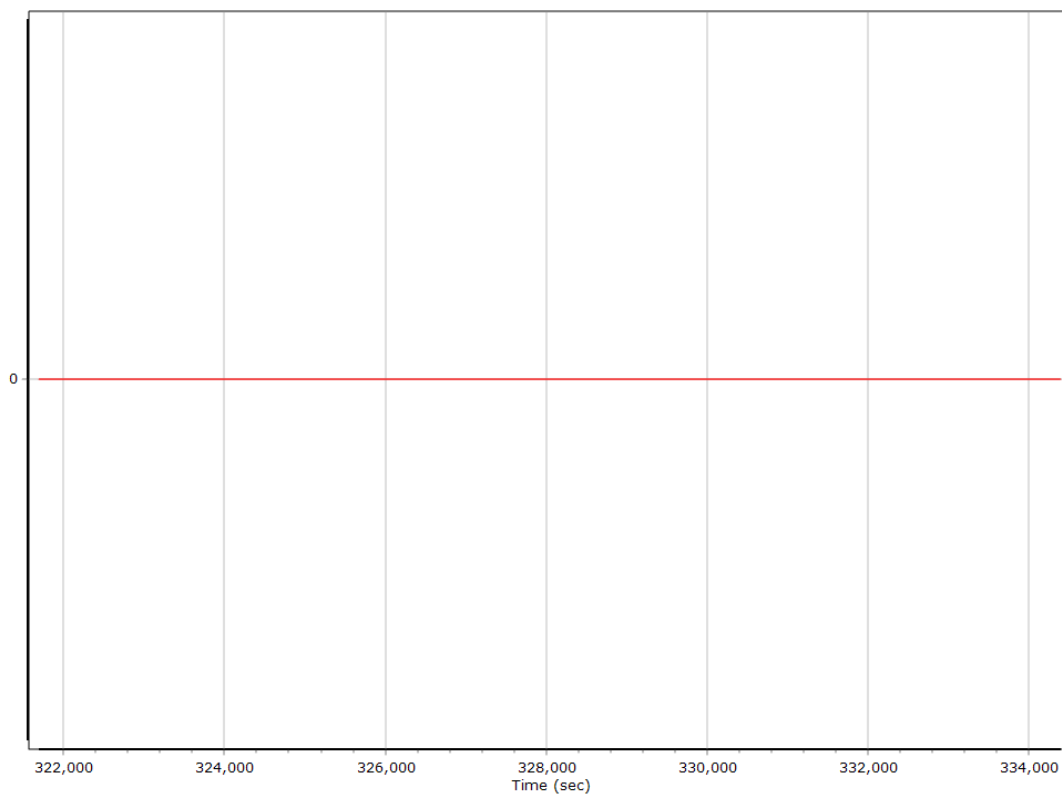
Y Reference-Primary GNSS Lever Arm (m)



Z Reference-Primary GNSS Lever Arm (m)



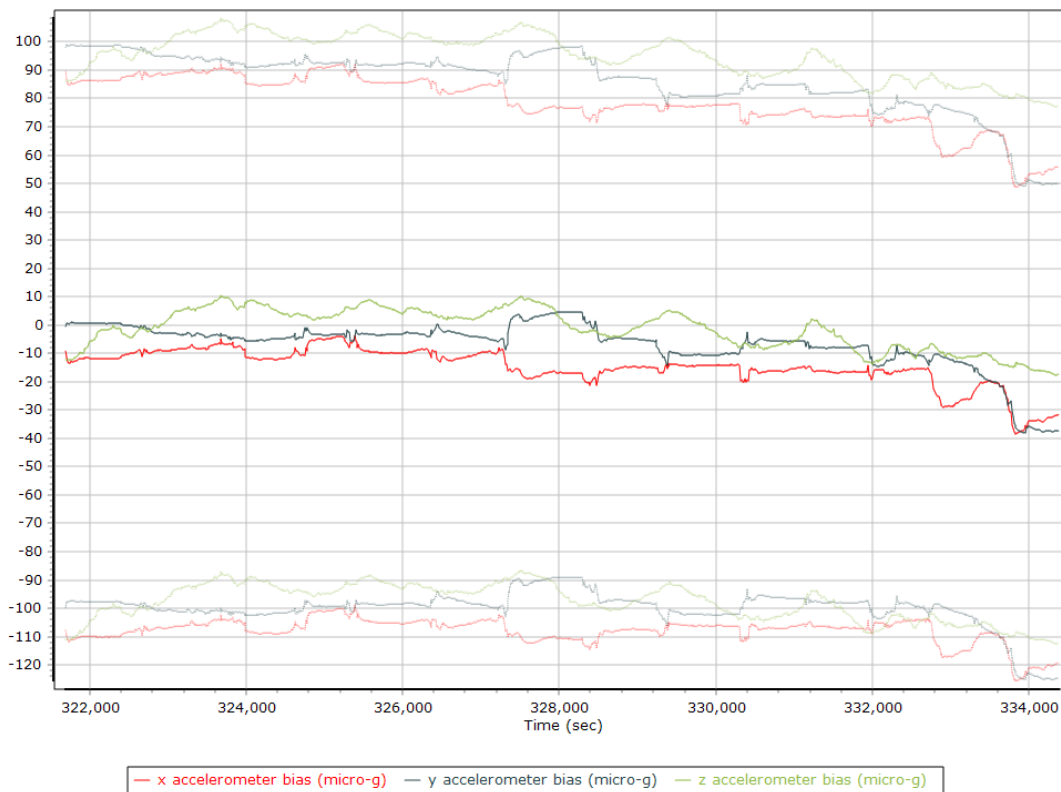
Reference-Primary GNSS Lever Arm Figure of Merit



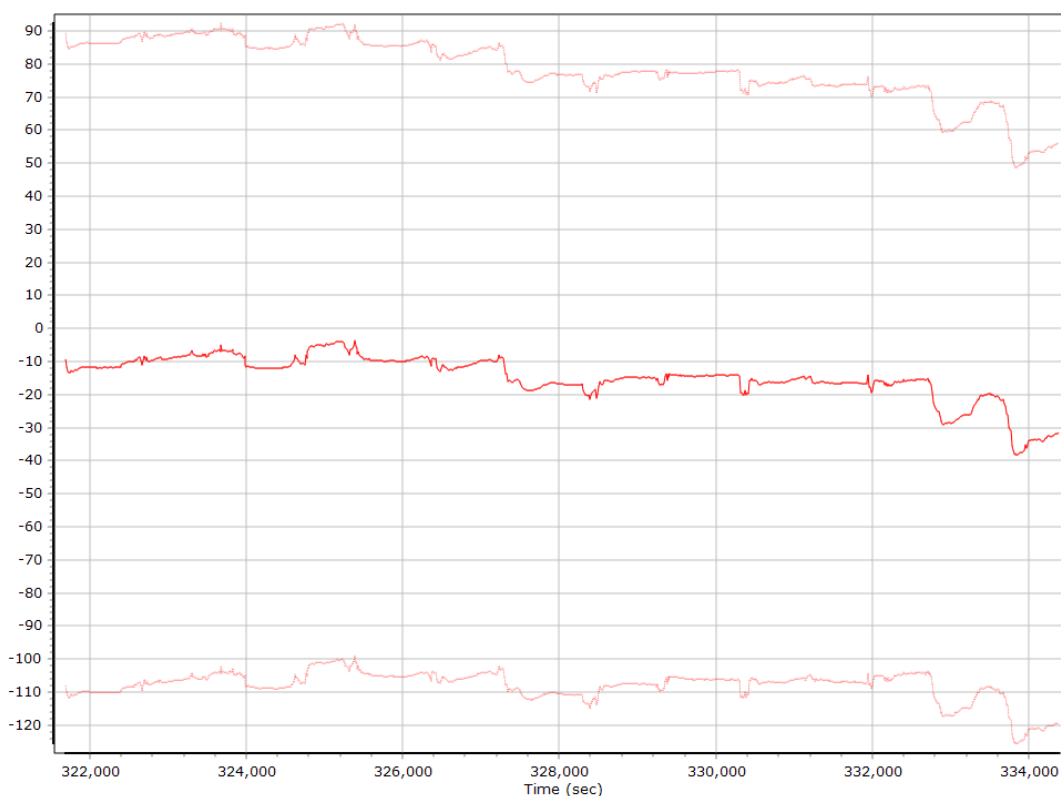
Forward Processed IN-Fusion QC

Forward Processed Estimated Errors, Reference Frame

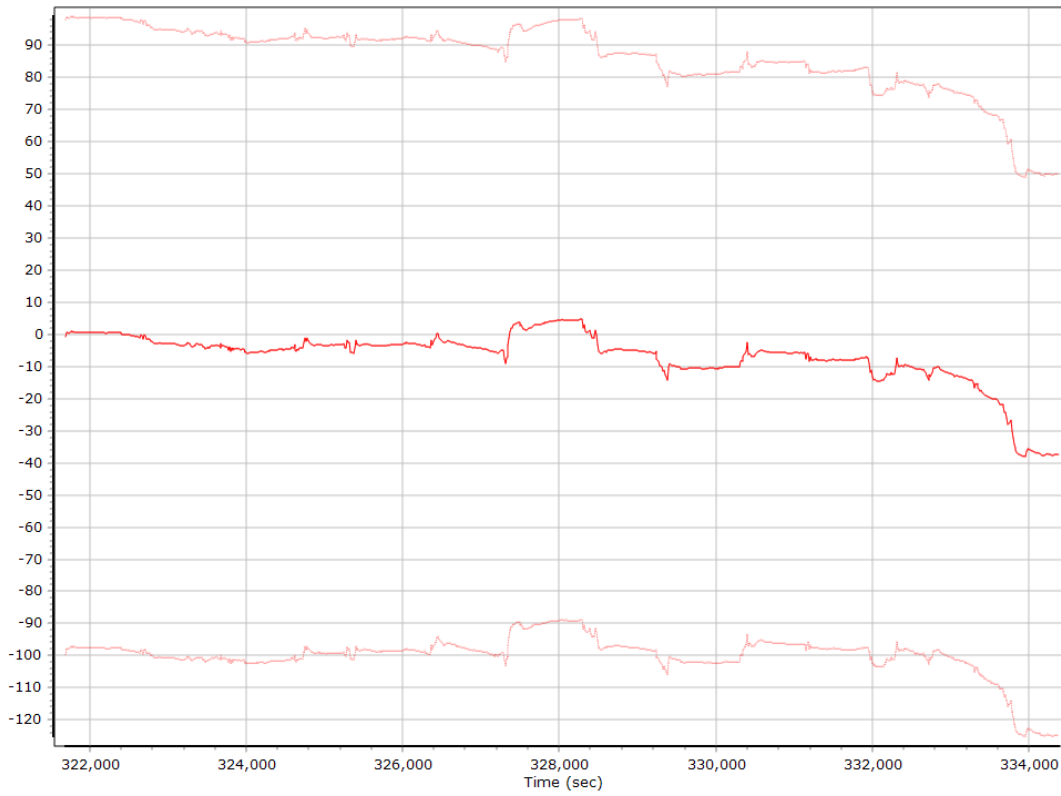
Accelerometer Bias (micro-g)



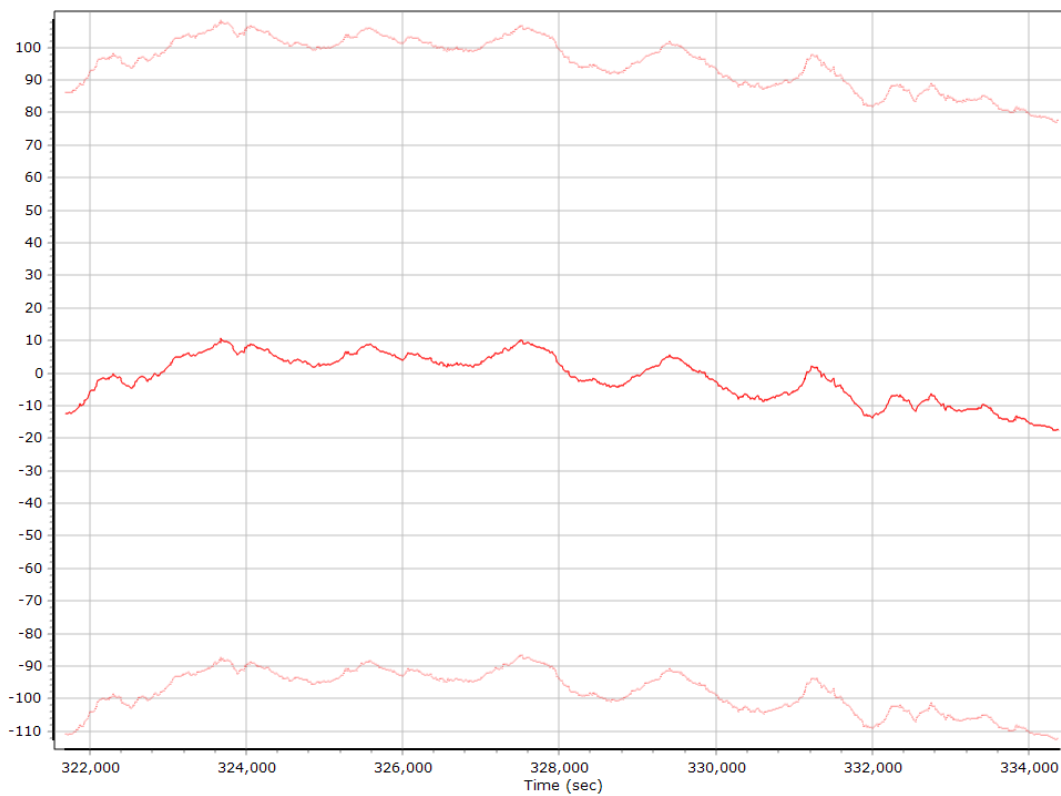
X Accelerometer Bias (micro-g)



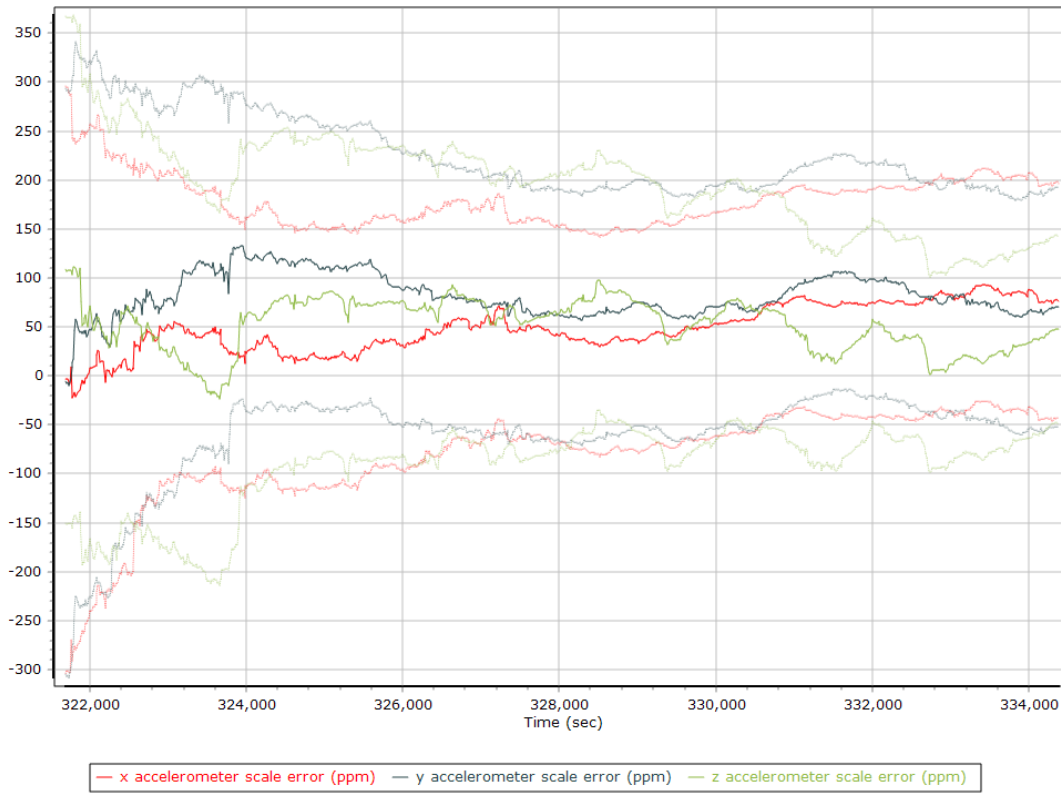
Y Accelerometer Bias (micro-g)



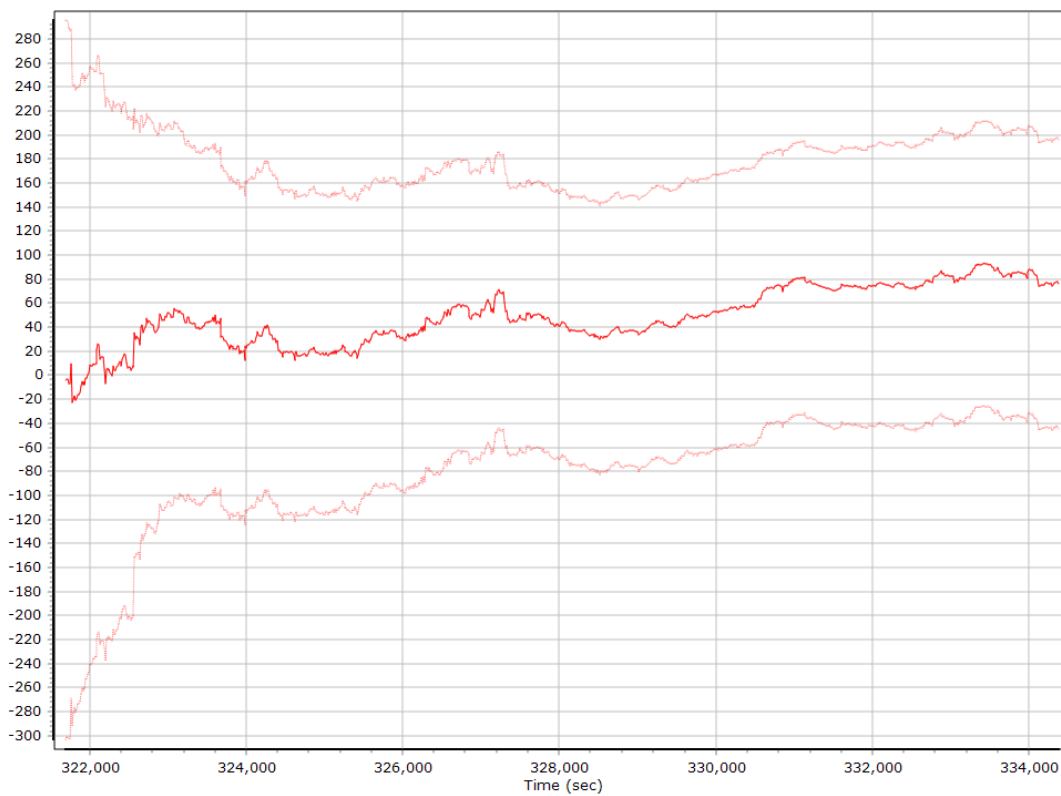
Z Accelerometer Bias (micro-g)



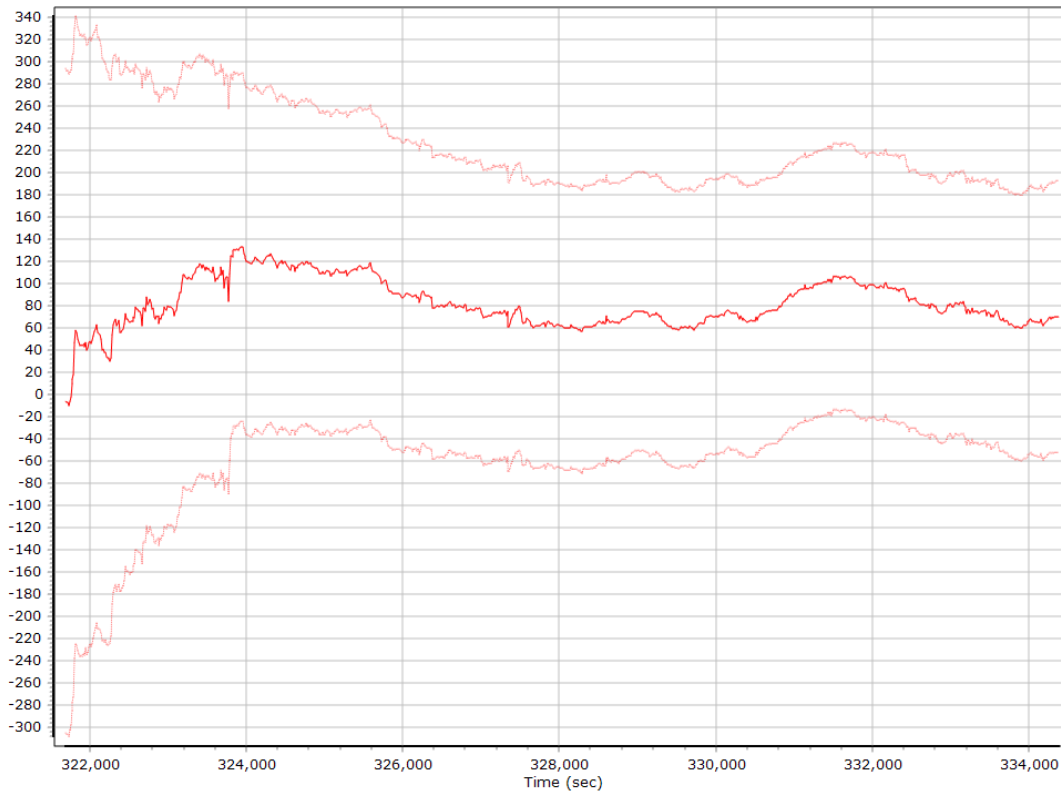
Accelerometer Scale Error (ppm)



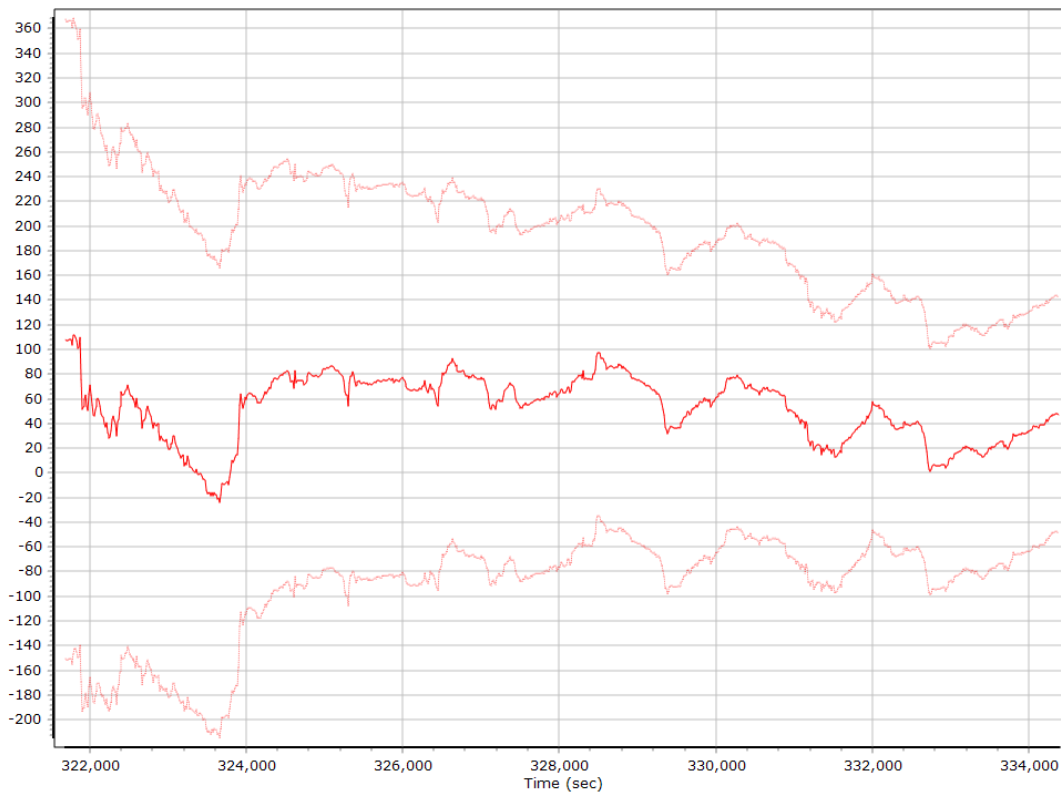
X Accelerometer Scale Error (ppm)



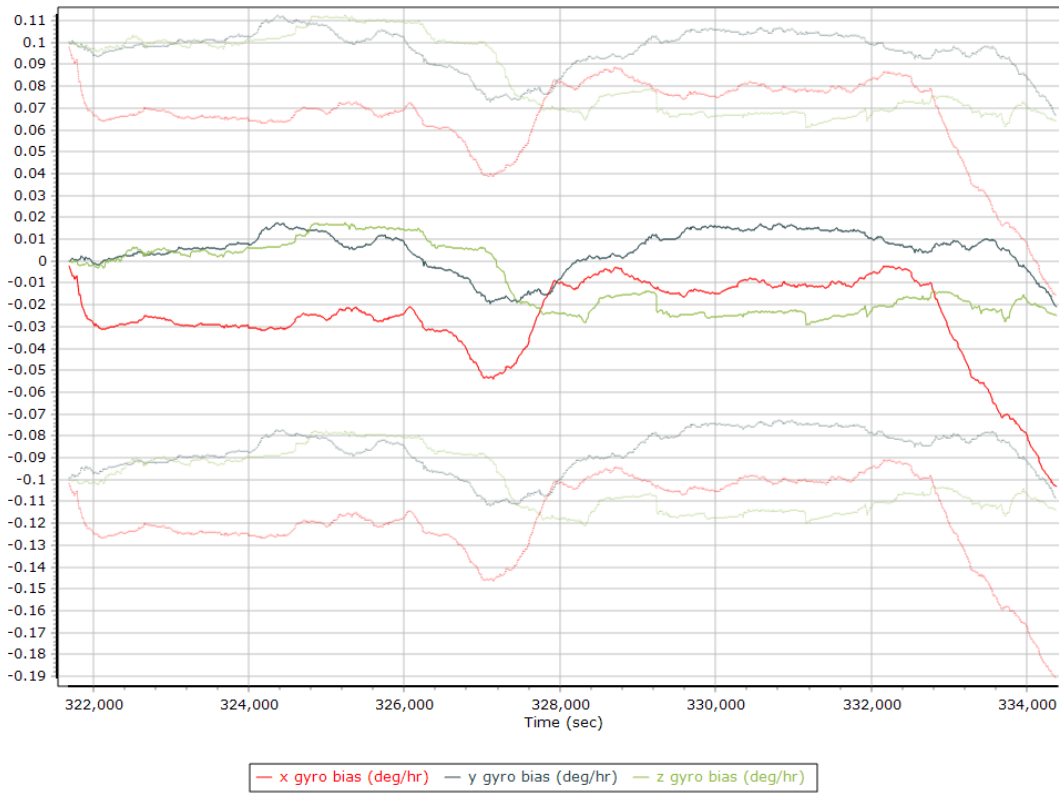
Y Accelerometer Scale Error (ppm)



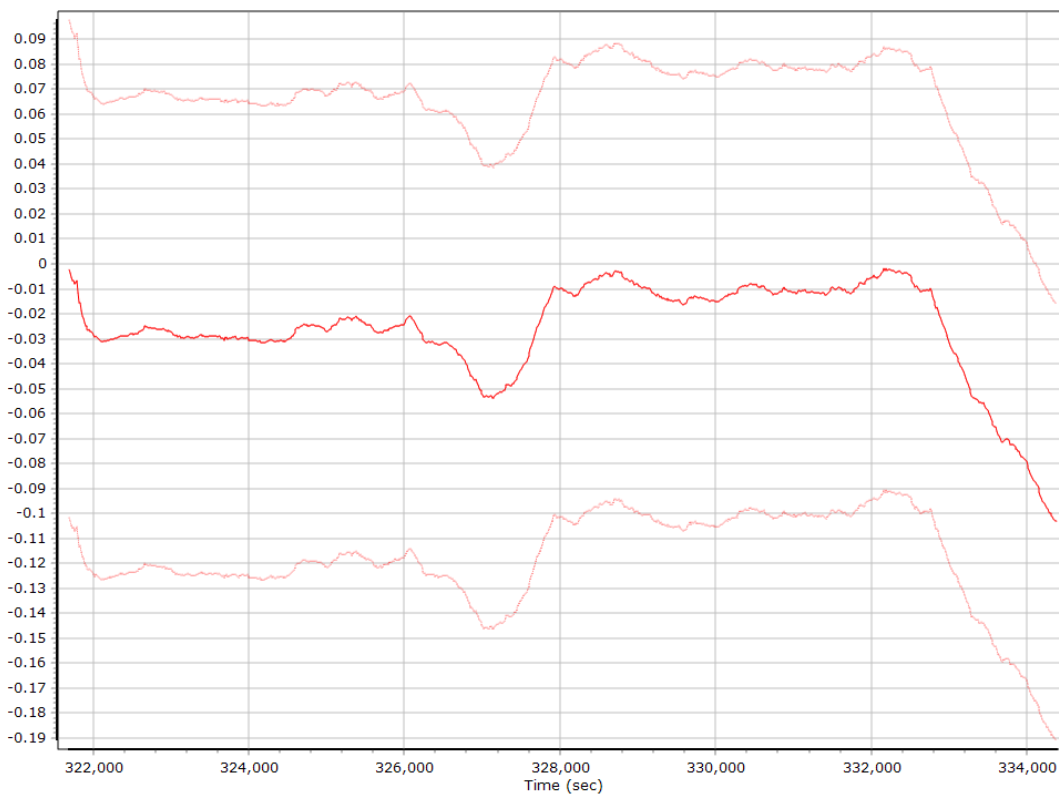
Z Accelerometer Scale Error (ppm)



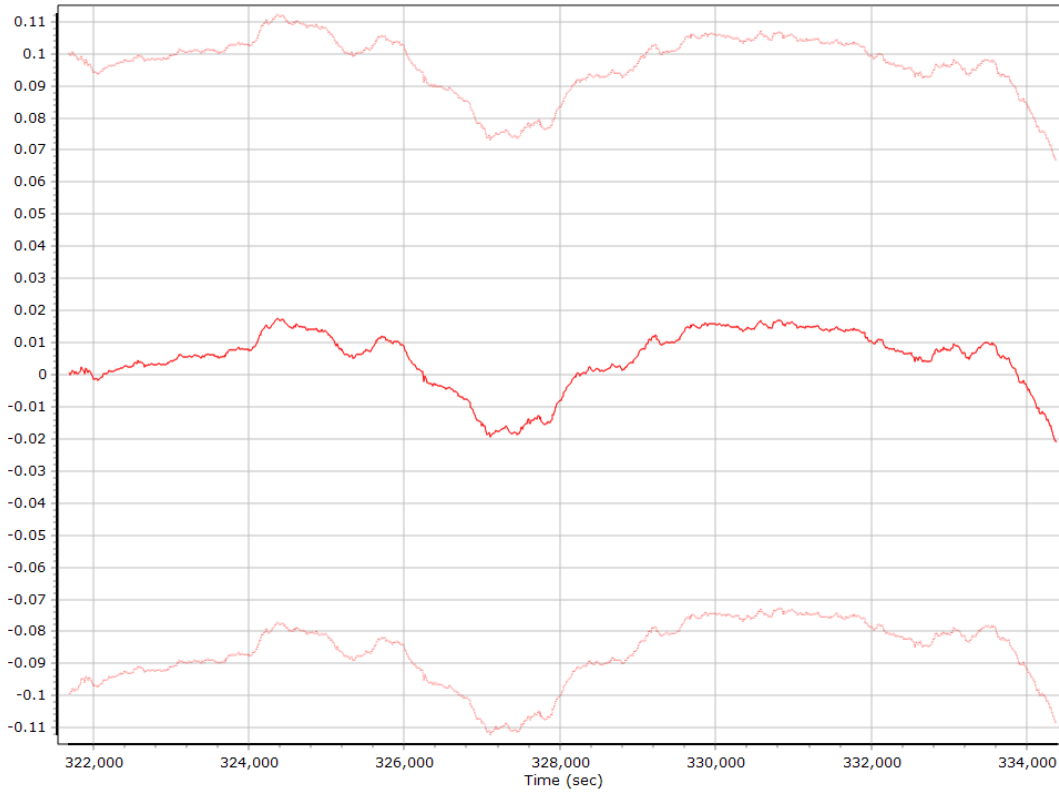
Gyro Bias (deg/h)



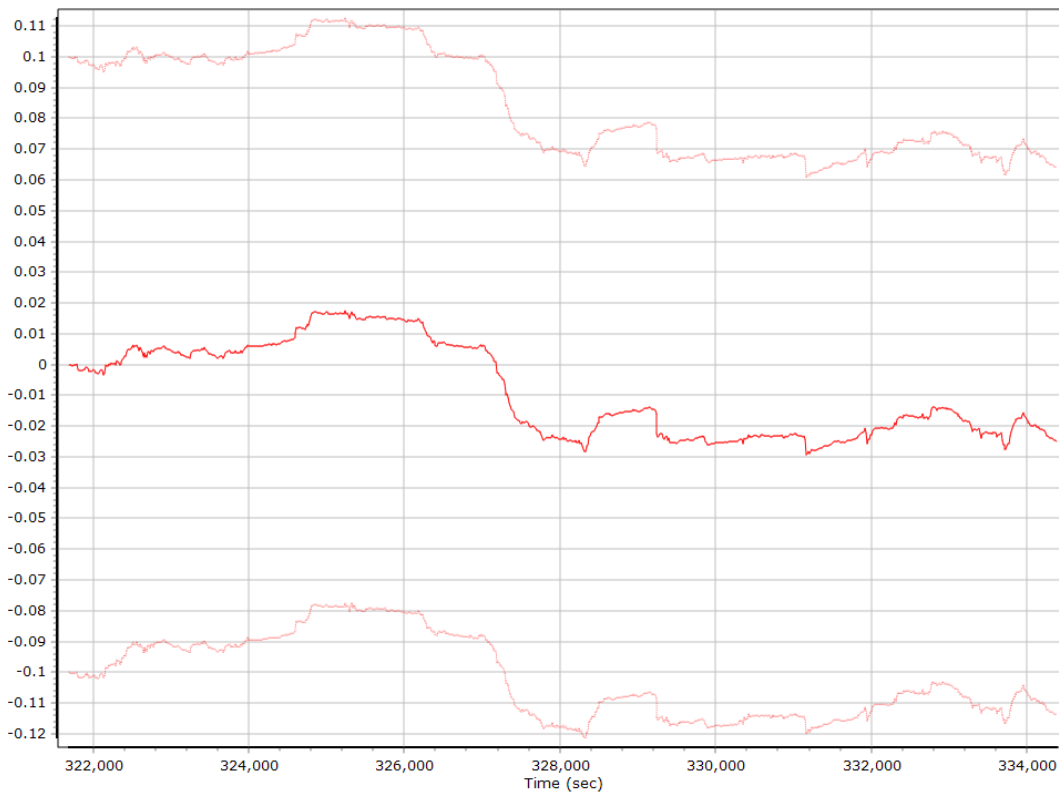
X Gyro Bias (deg/h)



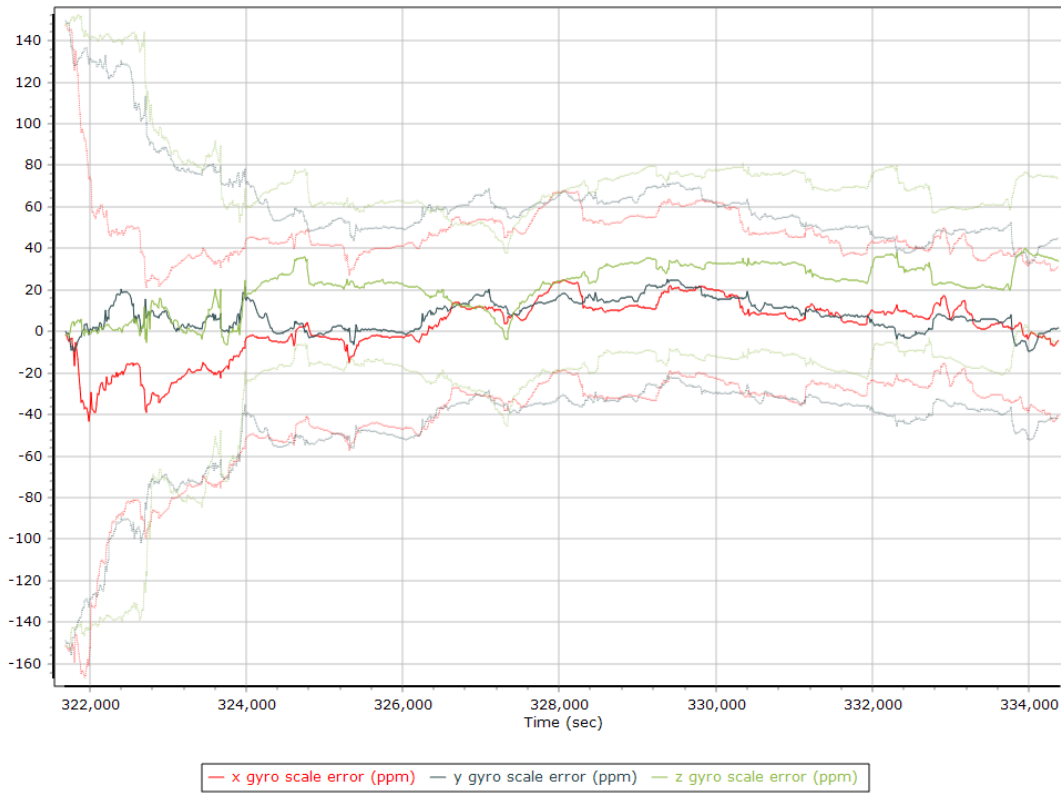
Y Gyro Bias (deg/h)



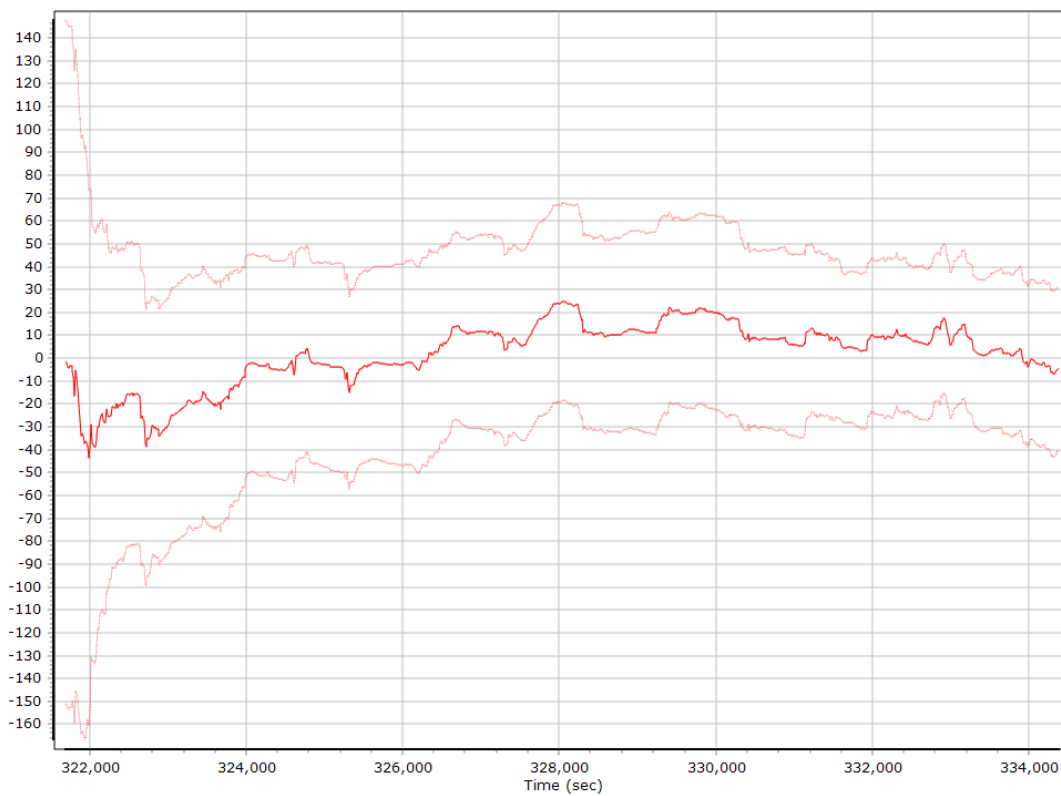
Z Gyro Bias (deg/h)



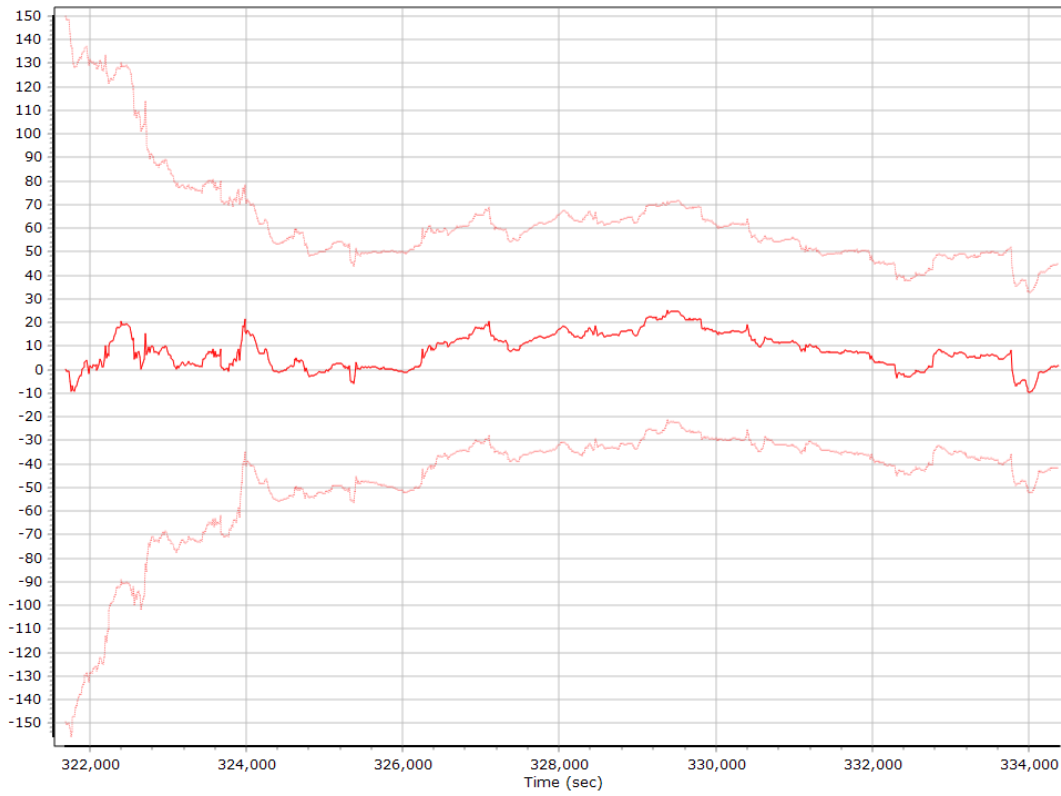
Gyro Scale Error (ppm)



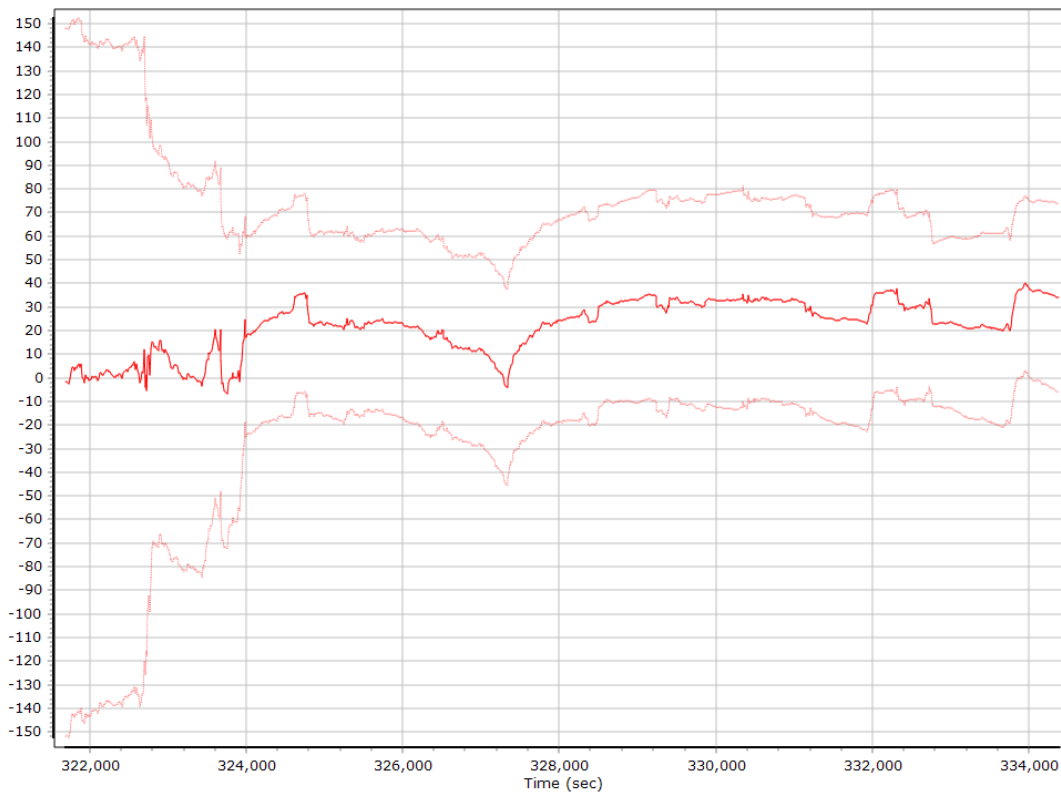
X Gyro Scale Error (ppm)



Y Gyro Scale Error (ppm)



Z Gyro Scale Error (ppm)

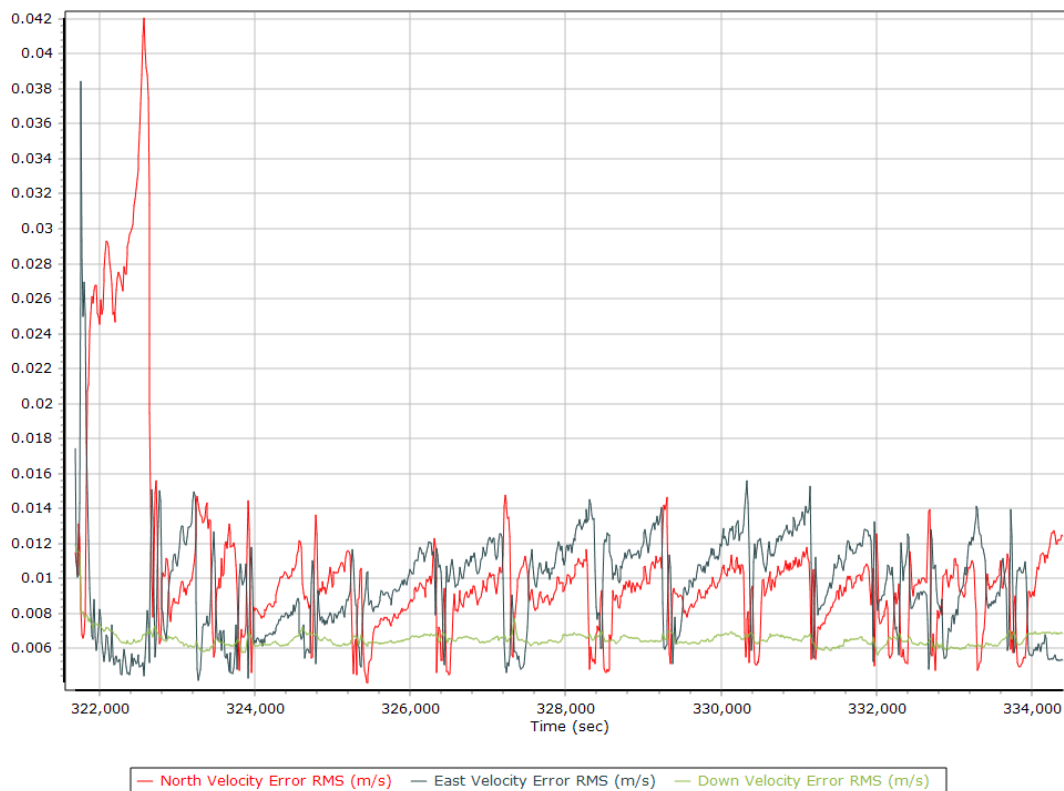


Foward Processed Performance Metrics

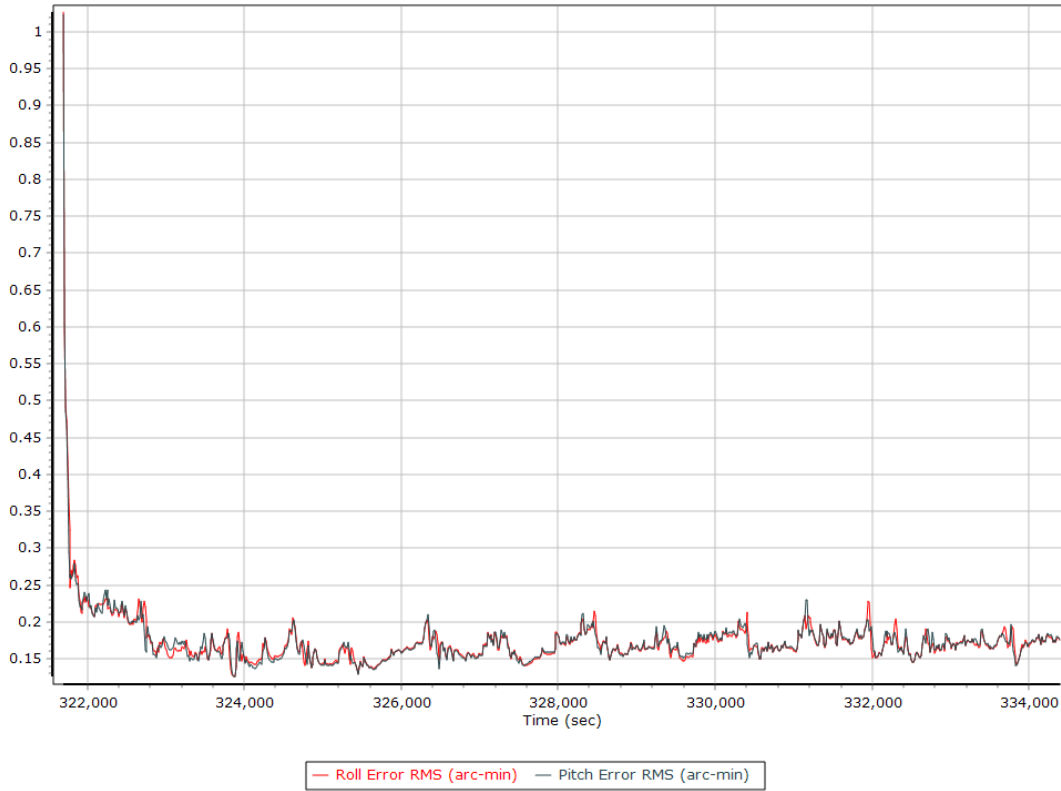
Position Error RMS (m)



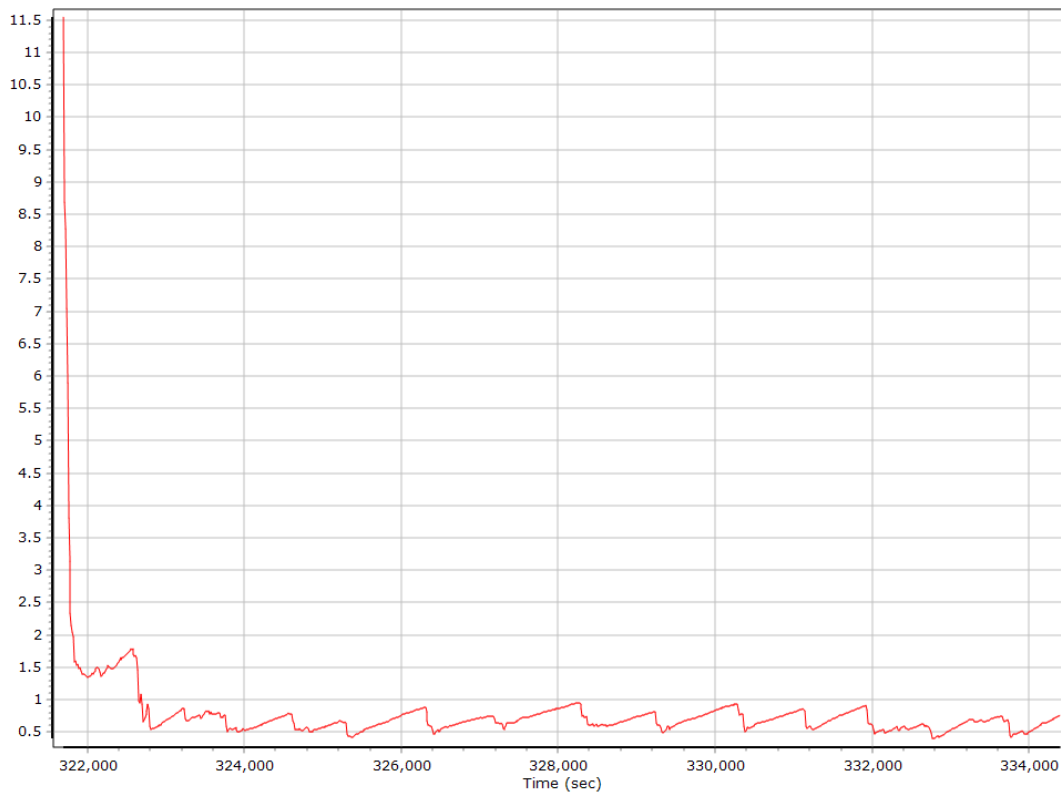
Velocity Error RMS (m/s)



Roll/Pitch Error RMS (arc-min)

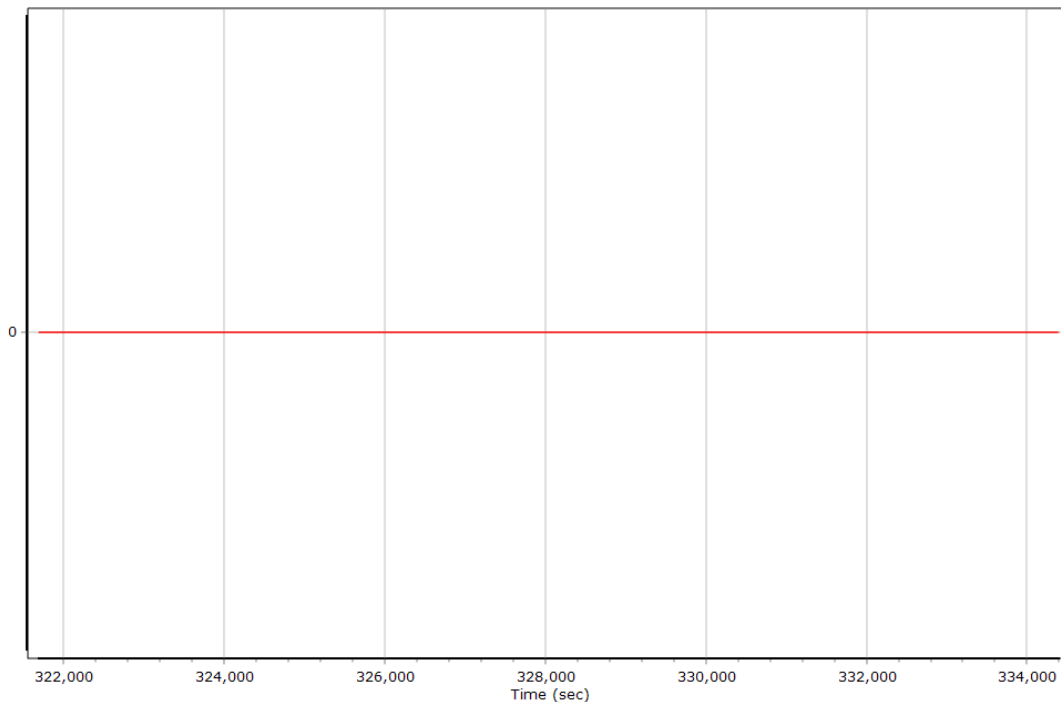


Heading Error RMS (arc-min)



Forward Processed Solution Status

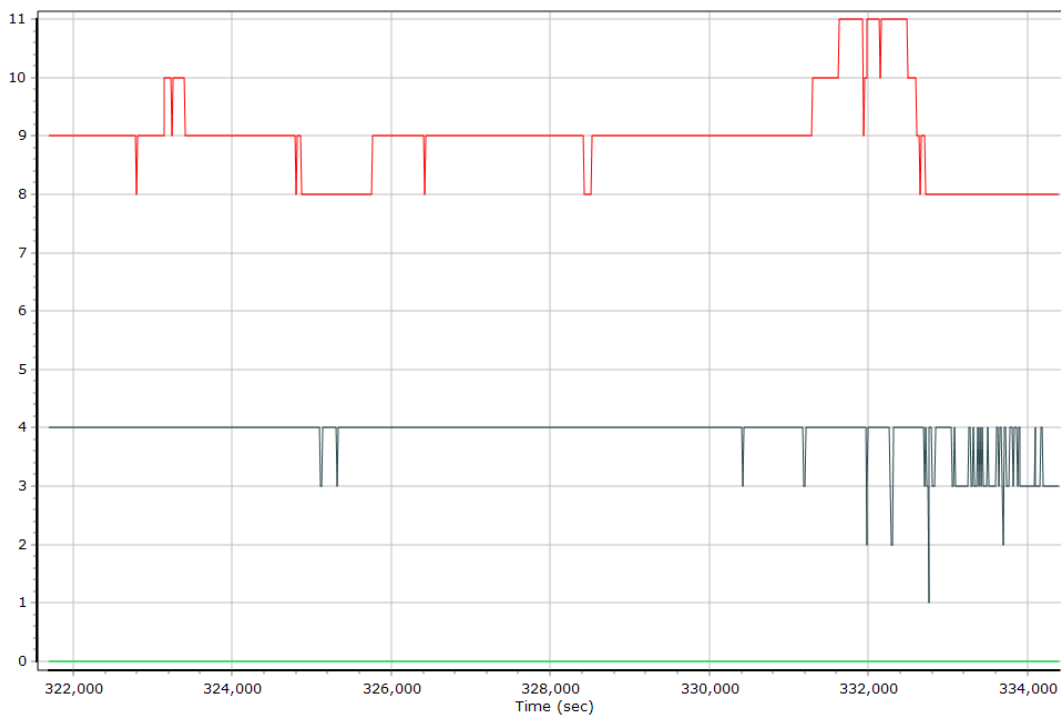
Processing Mode



Forward Reverse

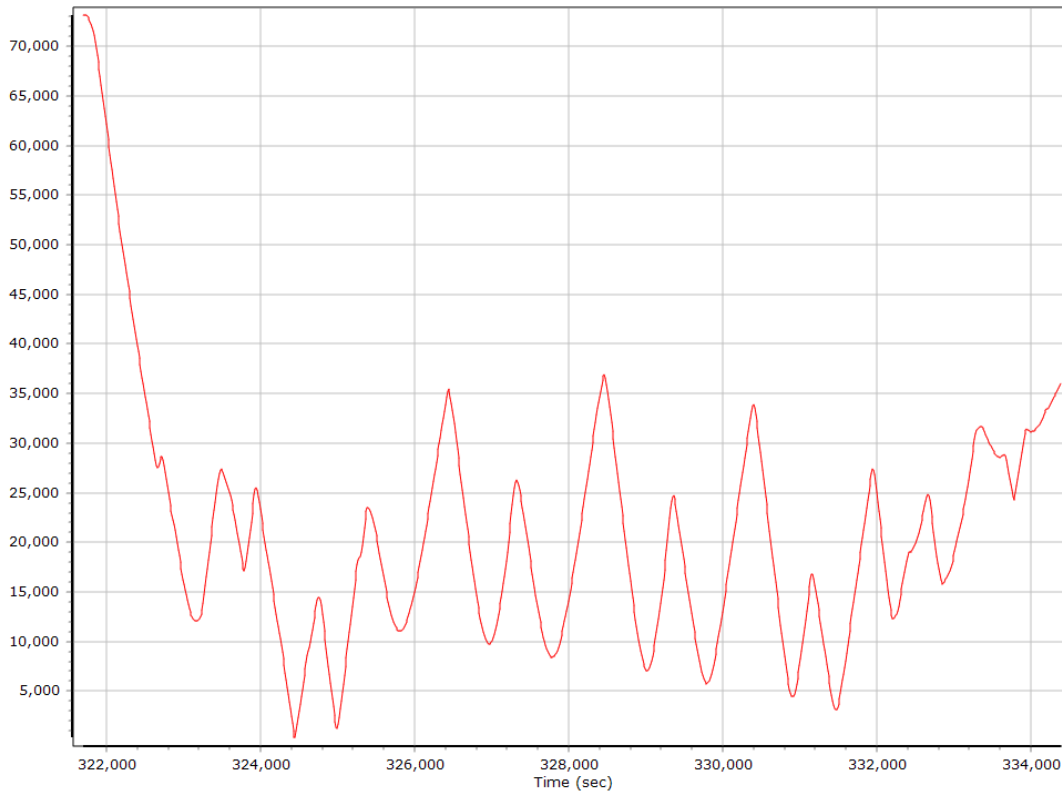
0 = Fixed NL, 1 = Fixed WL, 2 = Float, 3 = DGNSS, 4 = RTCM, 5 = IAPPP, 6 = C/A, 7 = GNSS Nav, 8 = DR

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



Export Summary

Export file	export_RB20064B_176_1.shp		
Export format	Shapefile		
Solution in use	Post-processed		
Output rate	All Records		
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	321634.005 (3/4/2020 5:20:34 PM)		
Export end time	334395.004 (3/4/2020 8:53:15 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	2020.172131		