

## APPENDIX A

### ABGNSS-INERTIAL PROCESSING GRAPHICS

## General Information

### Mission Information

Project name	201212A
Processing date	2020-12-13 13:07:05
Mission date	2020-12-12 18:14:07
Mission duration	01:36:05.327
Processing mode	IN-Fusion Single Base
GPS Station	NCSR

### Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N9450
IMU type	57
Receiver type	BD982
Antenna type	AV39

## Project File List

### Rover Data Files

File name	File type
201212A.484	POS Data
201212A.485	POS Data
201212A.486	POS Data
201212A.487	POS Data
201212A.488	POS Data
201212A.489	POS Data
201212A.490	POS Data
201212A.491	POS Data
201212A.492	POS Data
201212A.493	POS Data
201212A.494	POS Data
201212A.495	POS Data

### Input Files

File Name	File Type
Ephm3470.20g	GLONASS Broadcast Ephemeris
Ephm3470.20n	GPS Broadcast Ephemeris
ncsr3470.20o	GNSS SingleBase

### Output Files

Filename	File type
sbet_201212A.out	SBET Trajectory File

## Rover Data Summary

First raw data file	201212A.484		
Last raw data file	201212A.495		
Start GPS week	2135		
Start time	584046.661 (12/12/2020 6:14:06 PM)		
End time	591716.424 (12/12/2020 8:21:56 PM)		
Start of fine alignment	585202.845 (12/12/2020 6:33:22 PM)		
Available subsystems	Primary GNSS, IMU		
POS Event Input	None		
Correction data	None		
<b>IMU Installation Lever Arms &amp; Mounting Angles</b>			
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

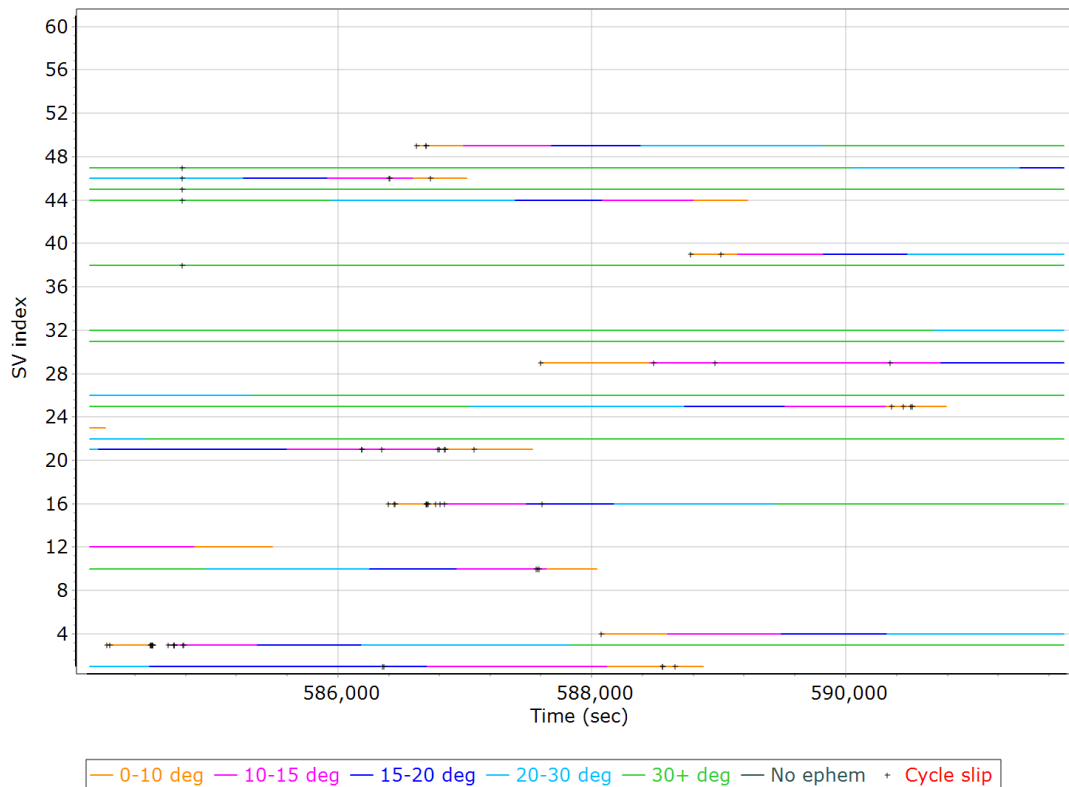
## Rover Data QC

### Raw IMU Import QC Summary

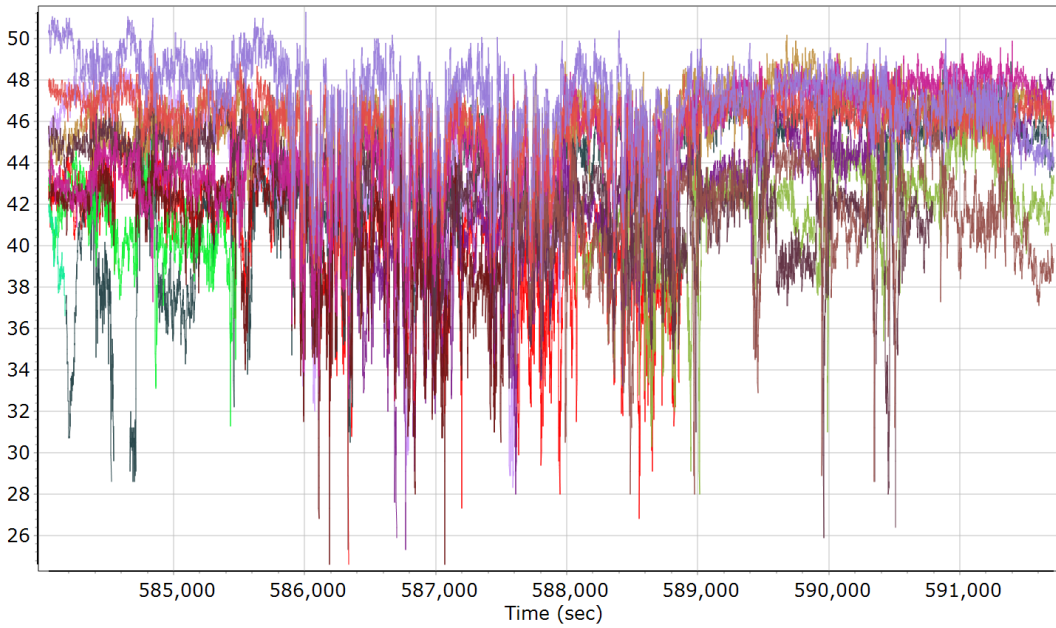
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_201212A.log
IMU Records Processed	1533818
Termination Status	Normal
IMU Anomalies	0

## Primary Observables & Satellite Data

### GPS/GLONASS L1 Satellite Lock/Elevation

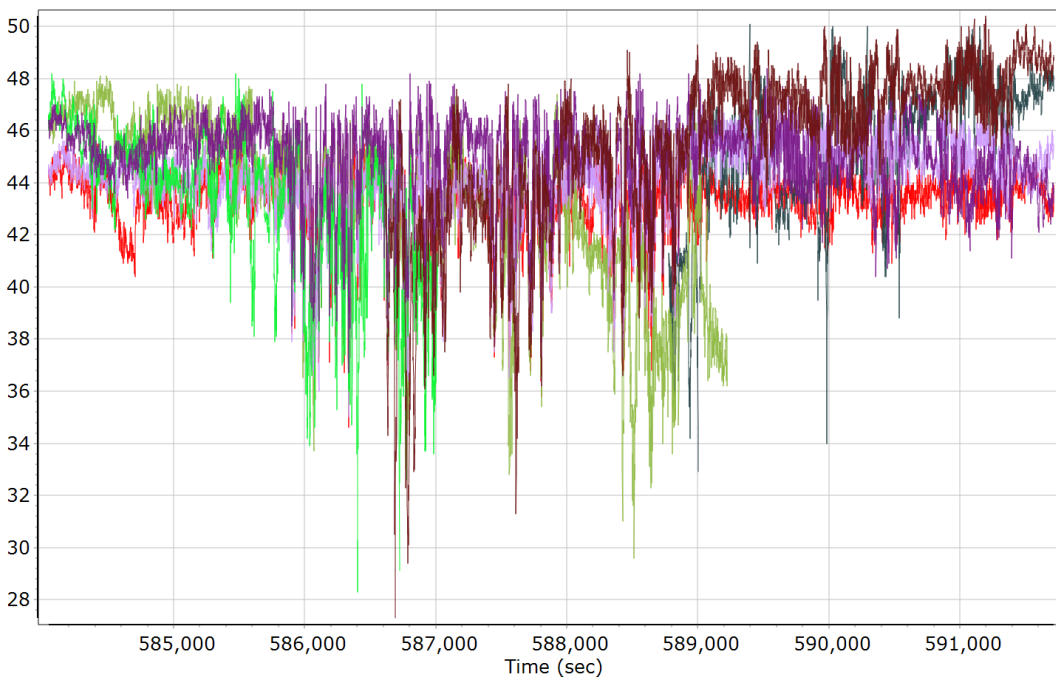


**GPS L1 SNR**



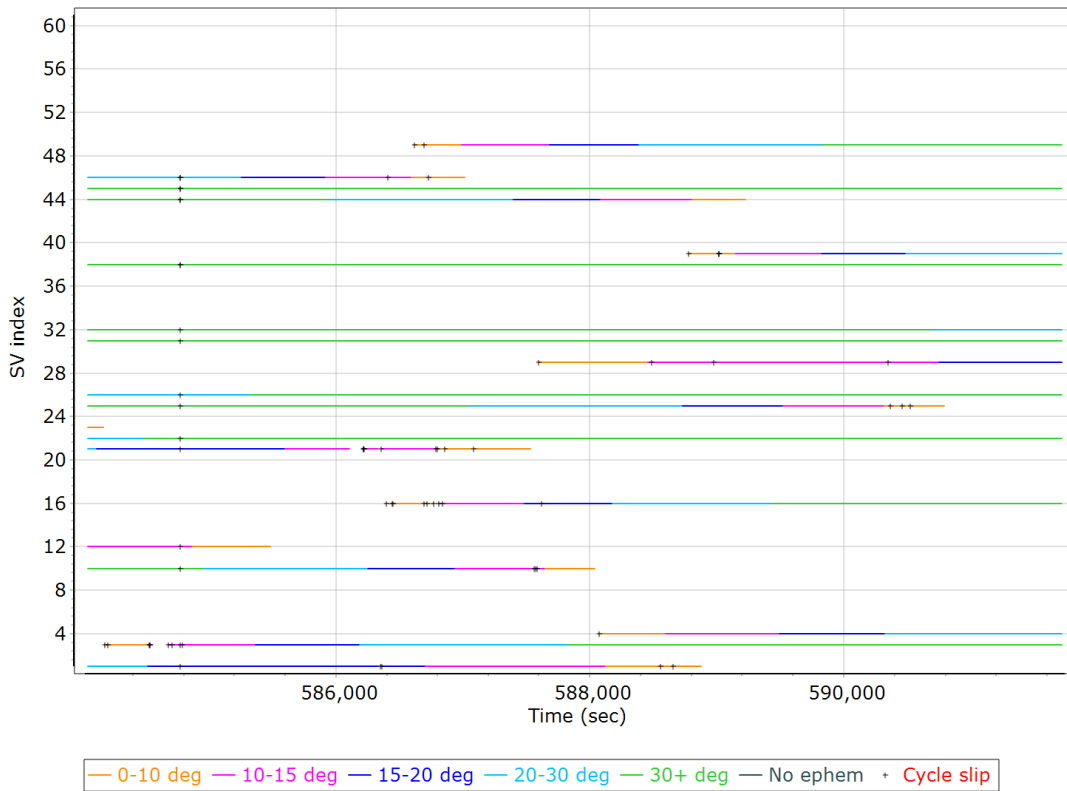
- |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|
| — GPS PRN 01 L1 SNR (dB/Hz) | — GPS PRN 03 L1 SNR (dB/Hz) | — GPS PRN 04 L1 SNR (dB/Hz) |
| — GPS PRN 10 L1 SNR (dB/Hz) | — GPS PRN 12 L1 SNR (dB/Hz) | — GPS PRN 16 L1 SNR (dB/Hz) |
| — GPS PRN 21 L1 SNR (dB/Hz) | — GPS PRN 22 L1 SNR (dB/Hz) | — GPS PRN 23 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**

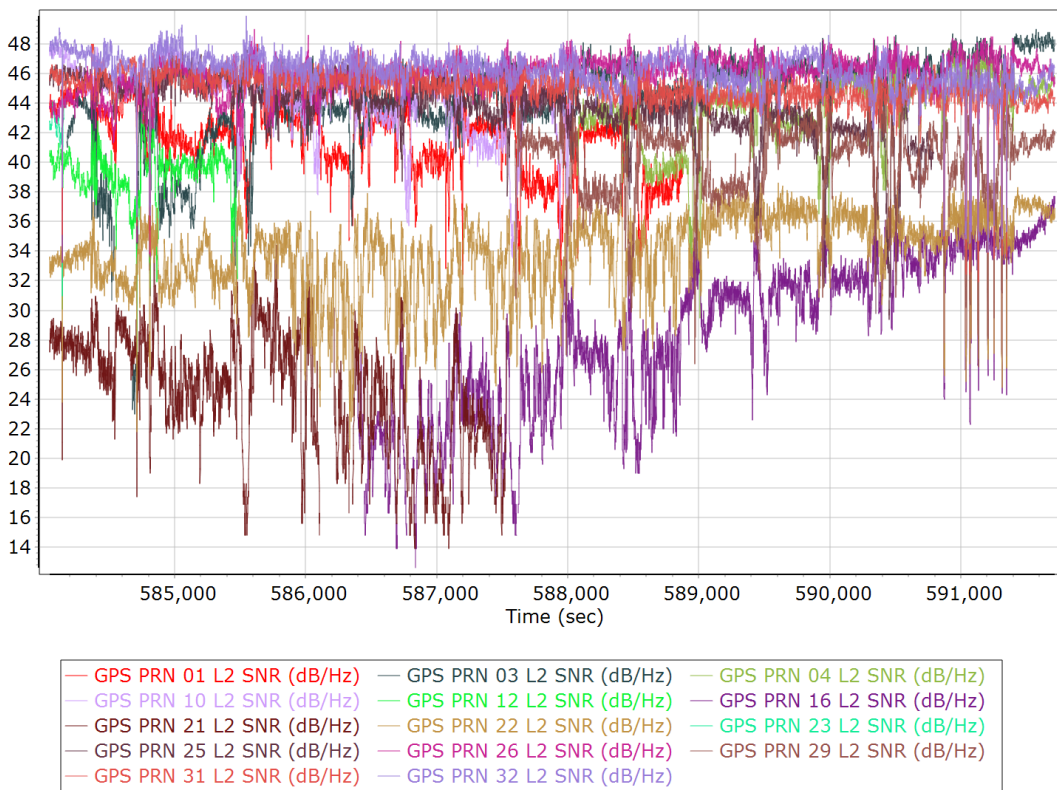


- |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|
| — GLONASS 01 L1 SNR (dB/Hz) | — GLONASS 02 L1 SNR (dB/Hz) | — GLONASS 07 L1 SNR (dB/Hz) |
| — GLONASS 08 L1 SNR (dB/Hz) | — GLONASS 09 L1 SNR (dB/Hz) | — GLONASS 10 L1 SNR (dB/Hz) |
| — GLONASS 12 L1 SNR (dB/Hz) |                             |                             |

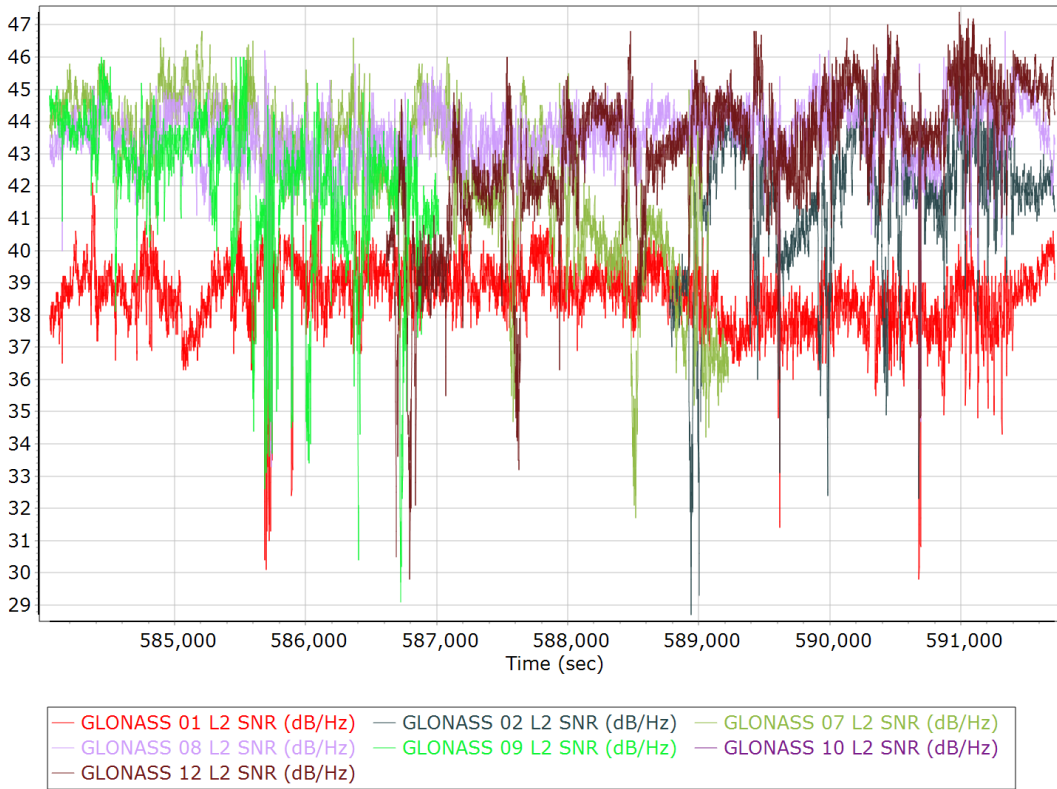
### GPS/GLONASS L2 Satellite Lock/Elevation



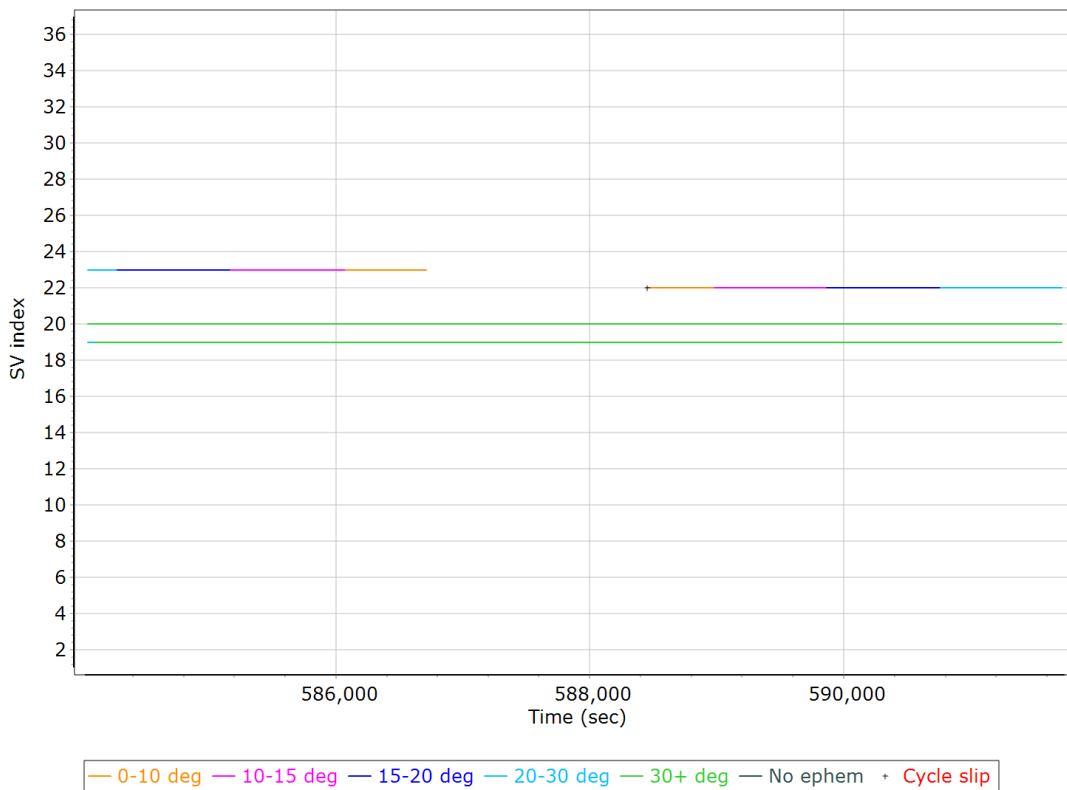
### GPS L2 SNR



### GLONASS L2 SNR

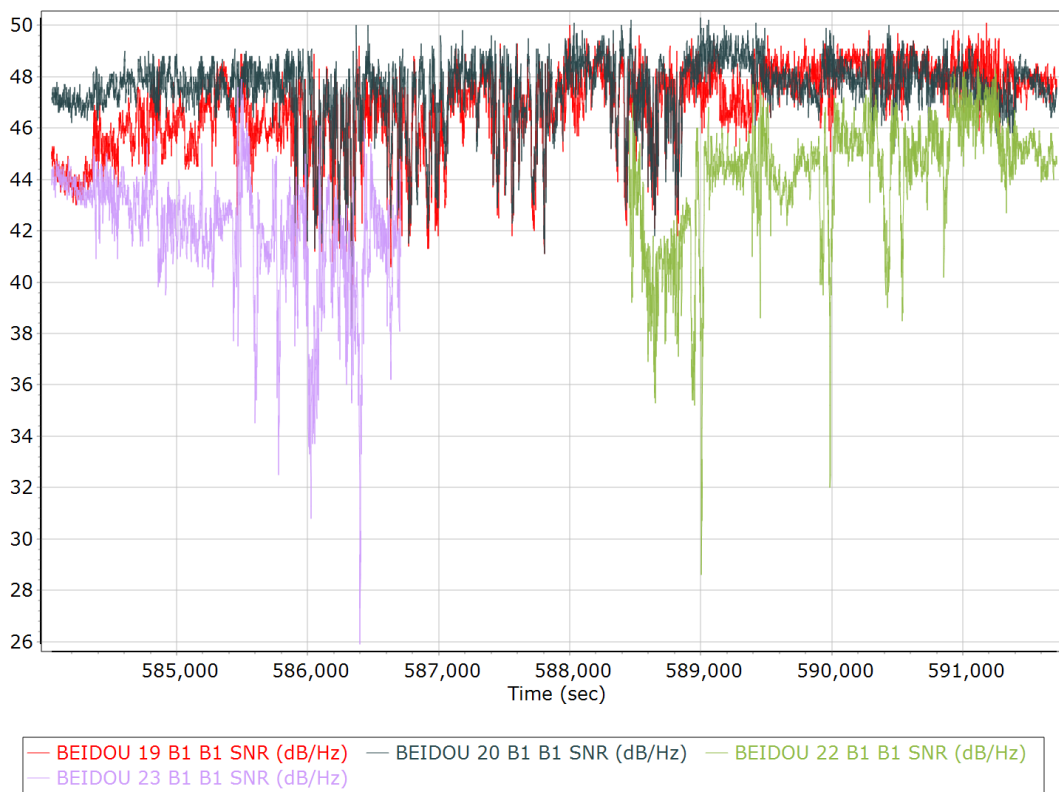


### BEIDOU Satellite Lock/Elevation

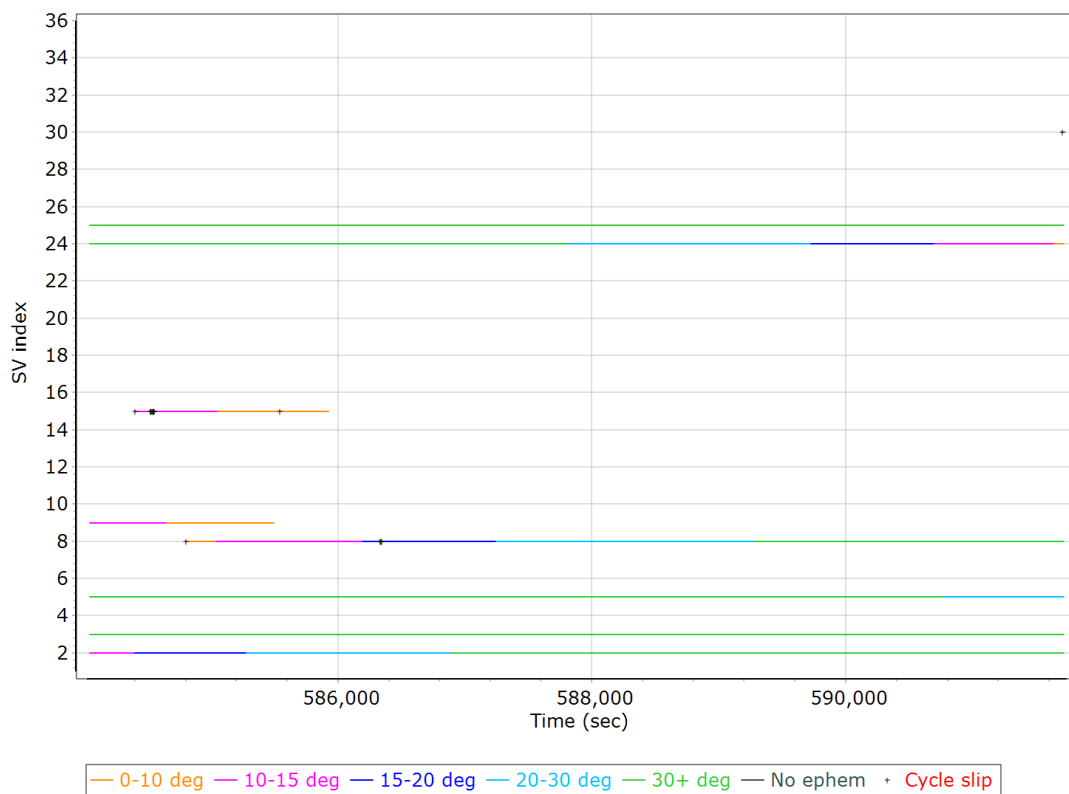




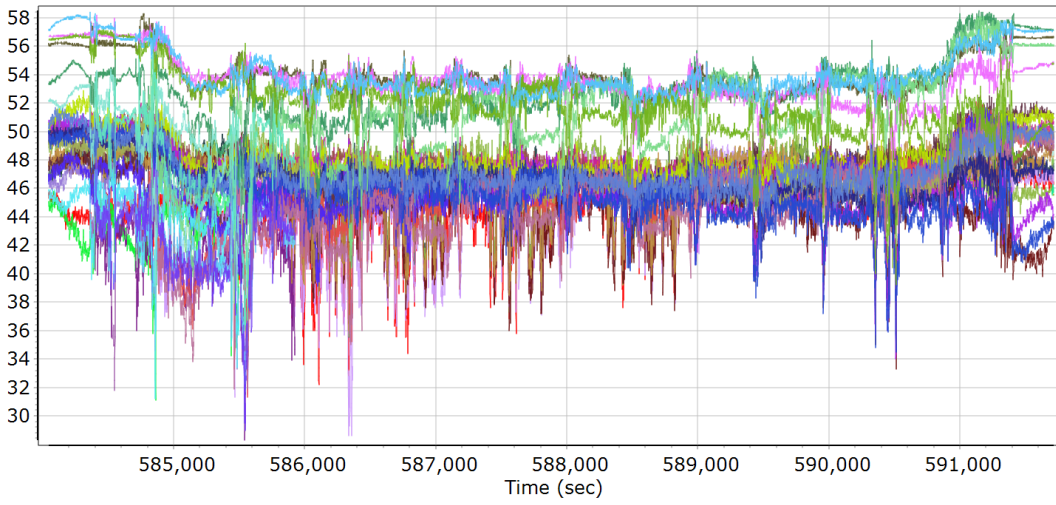
### BEIDOU SNR



### GALILEO Satellite Lock/Elevation



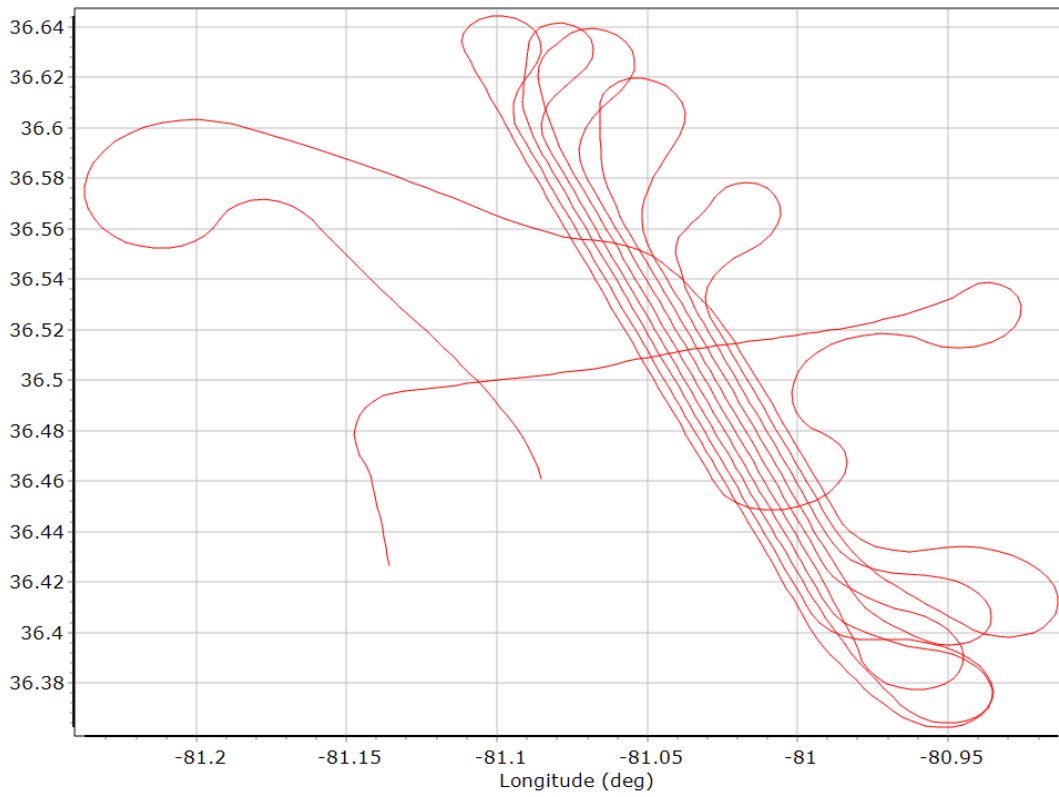
## GALILEO SNR



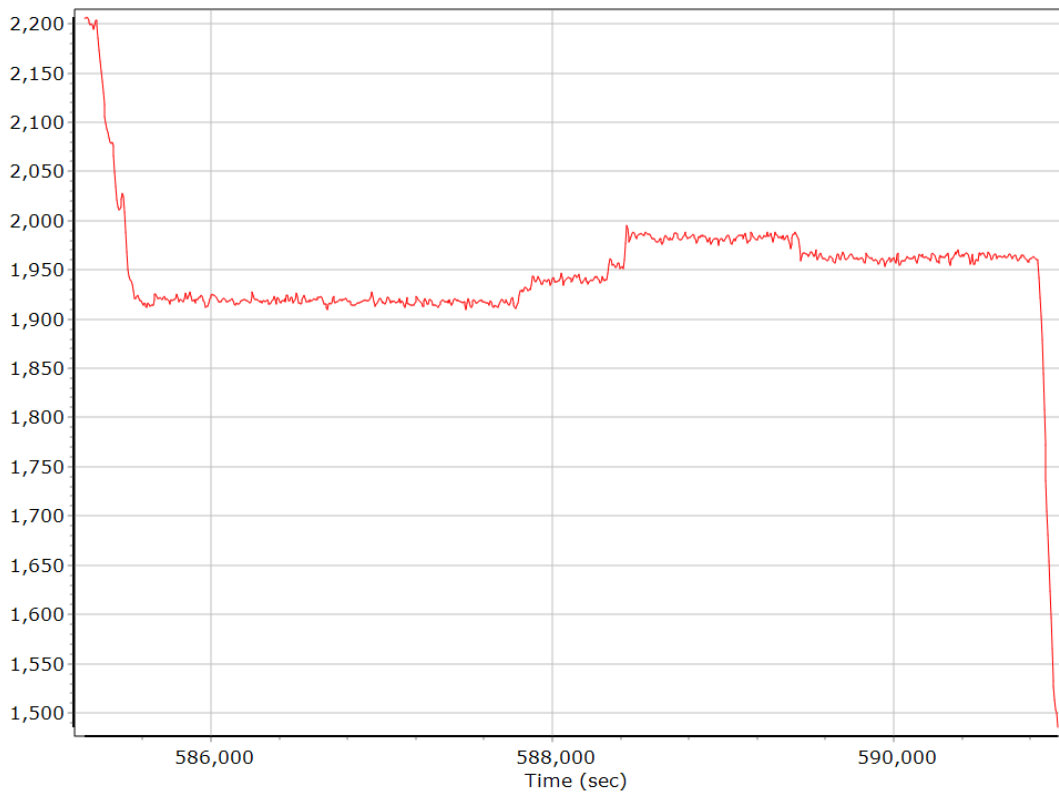
- GALILEO 02 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 03 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 05 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 08 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 09 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 15 L1 BOC\_1\_1\_DP\_MBOC SNR (dB/Hz)
- GALILEO 24 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 02 L5E5A BPSK10\_PD SNR (dB/Hz)

## Smoothed Trajectory Information

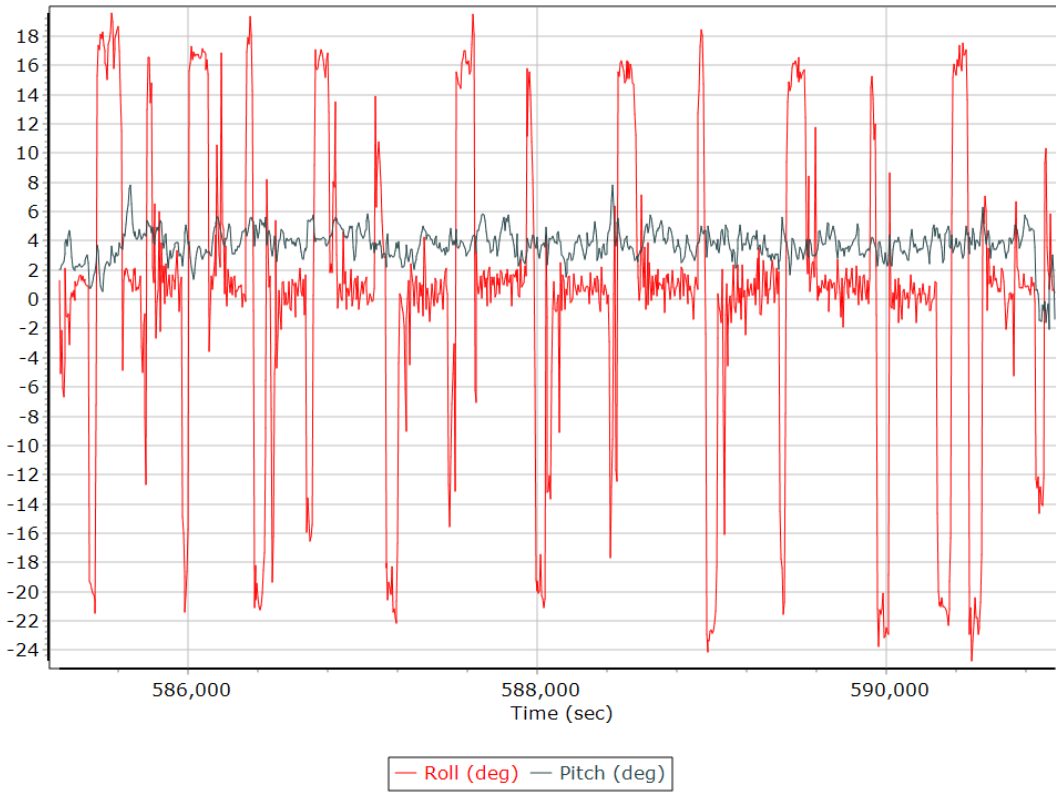
### Top View



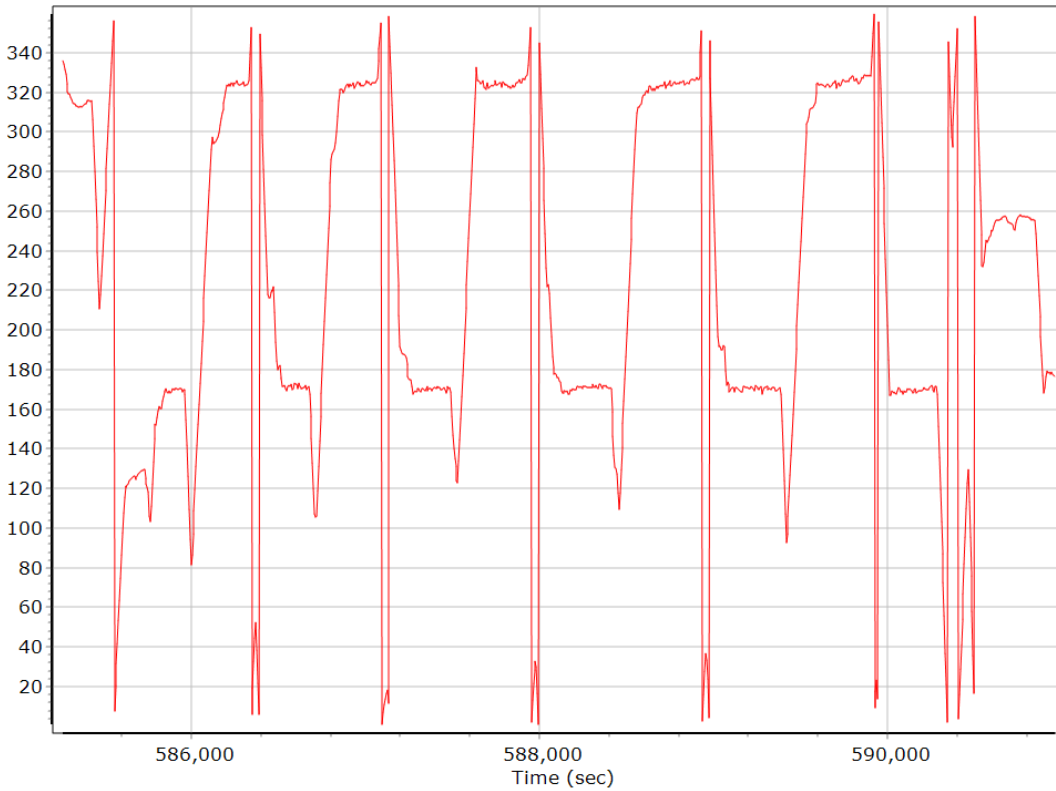
### Altitude



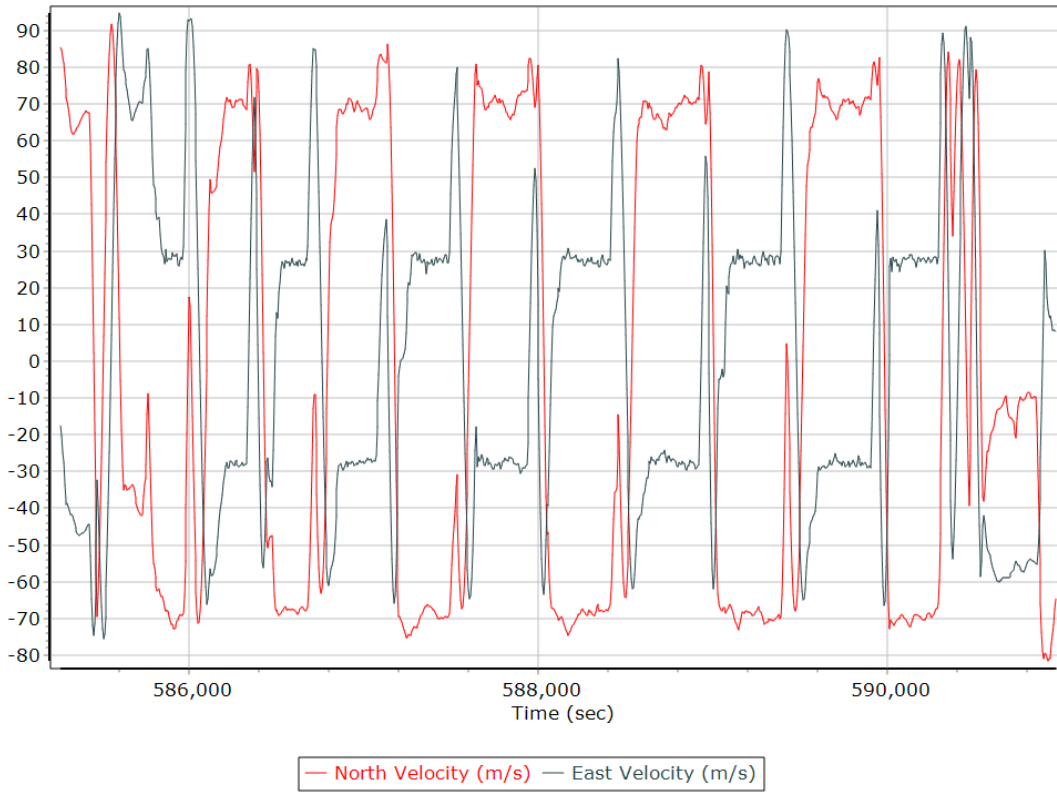
## Roll/Pitch



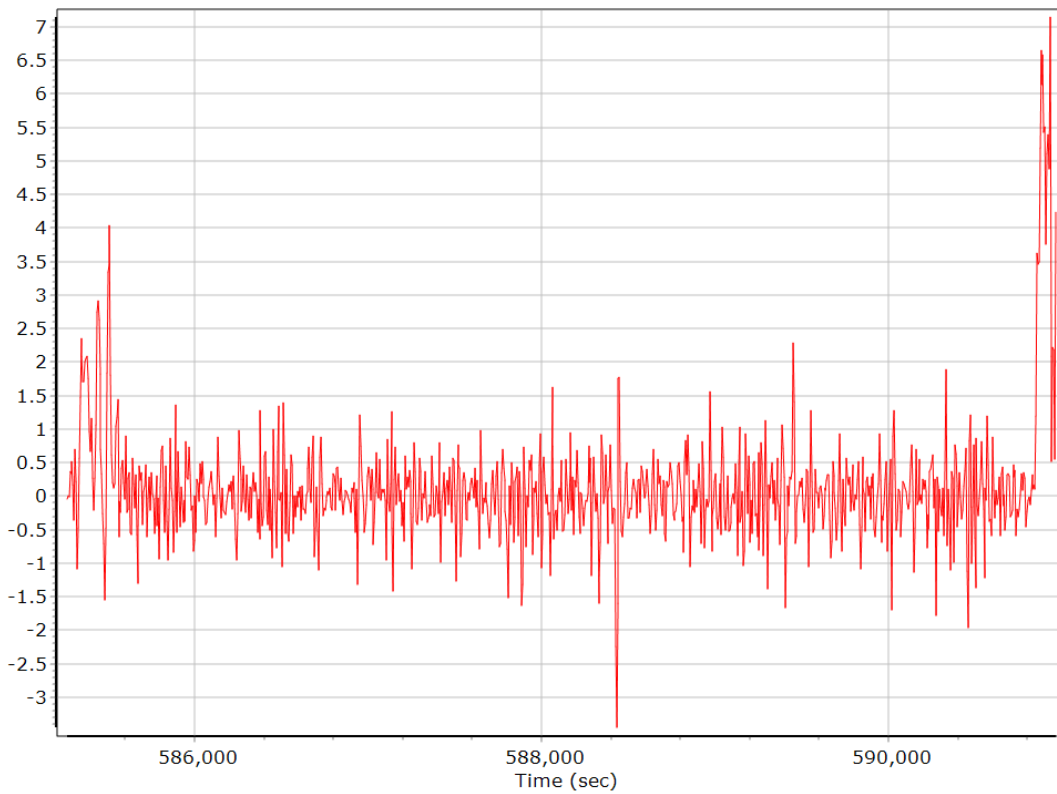
## Heading



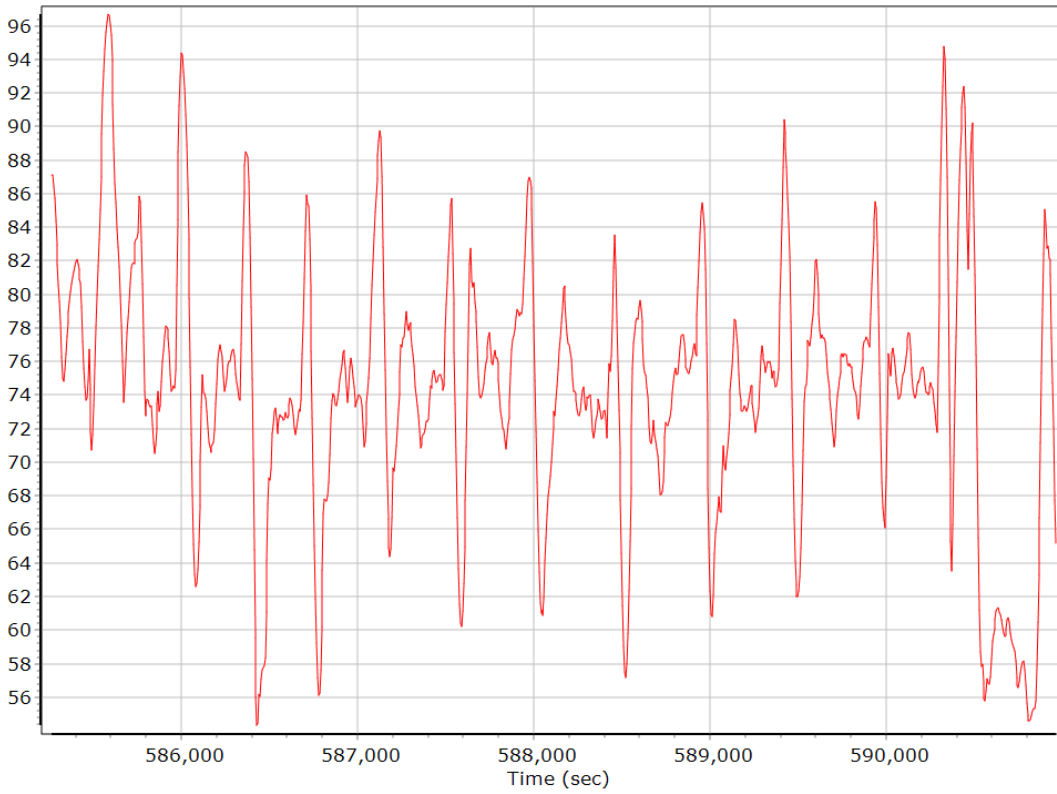
### North/East Velocity



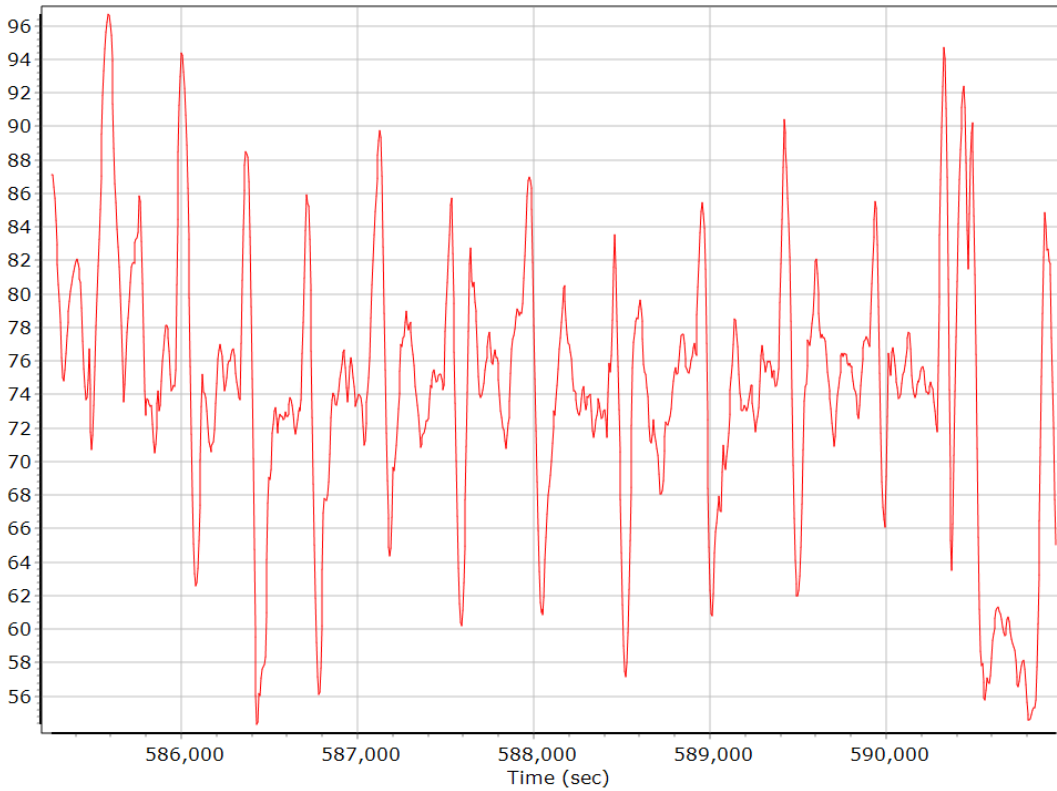
### Down Velocity



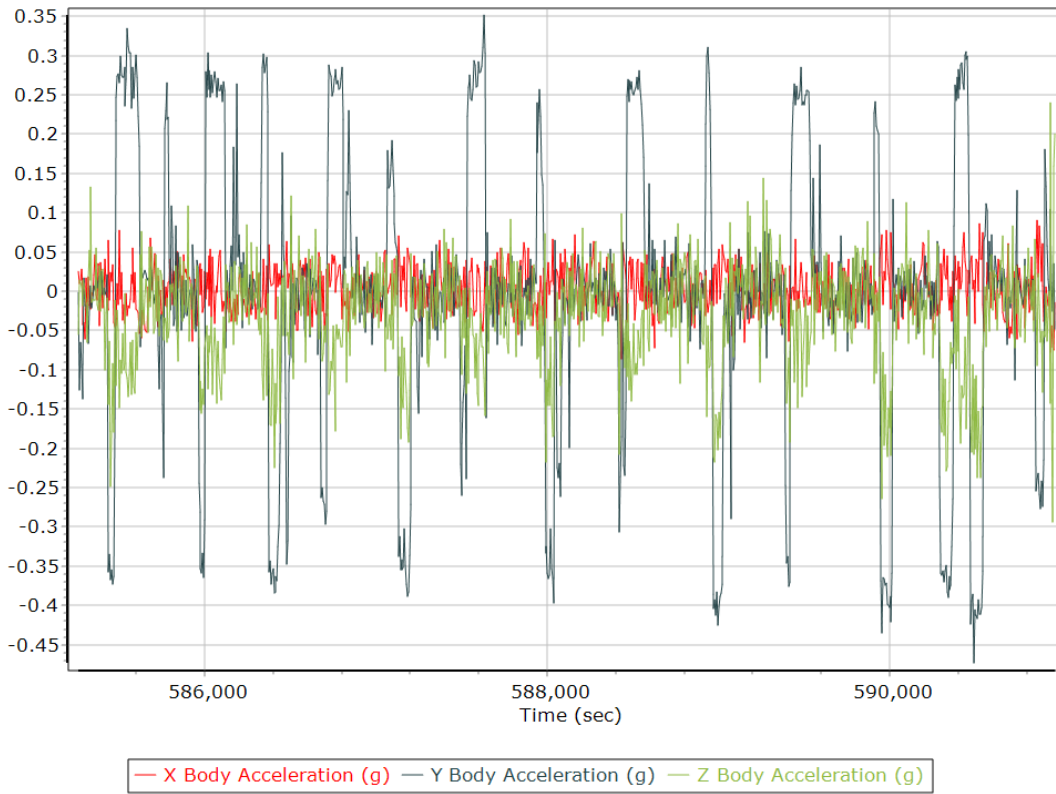
## Total Speed



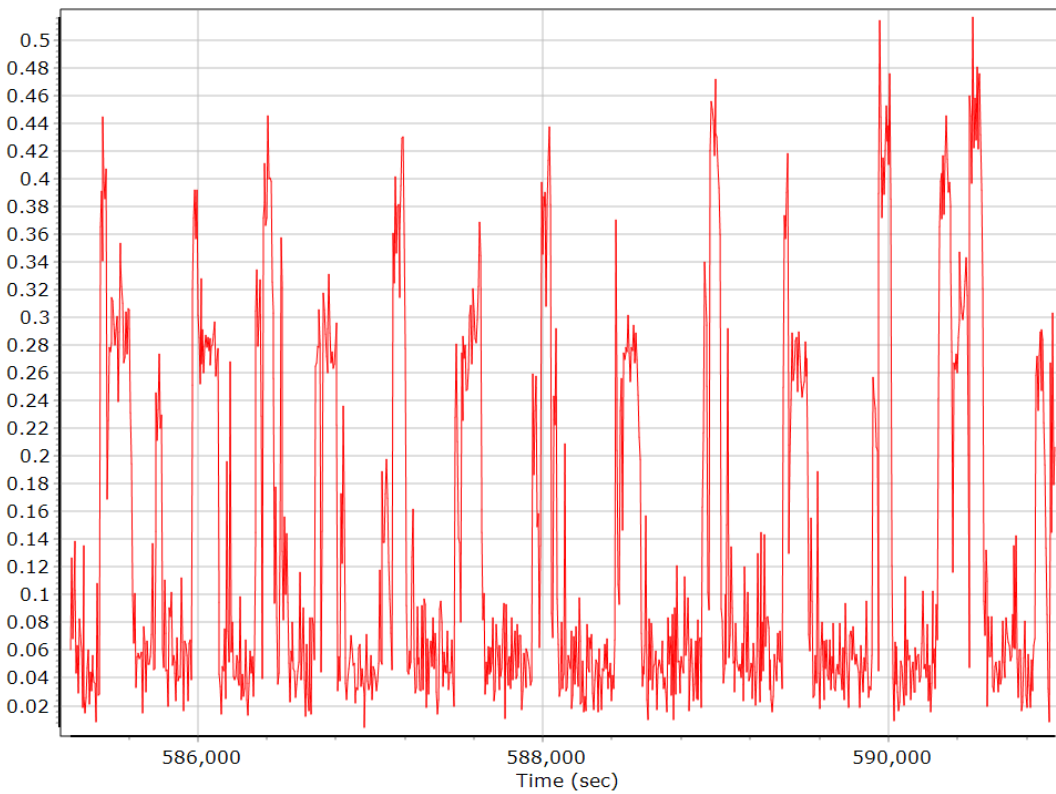
## Ground Speed



## Body Acceleration



## Total Body Acceleration



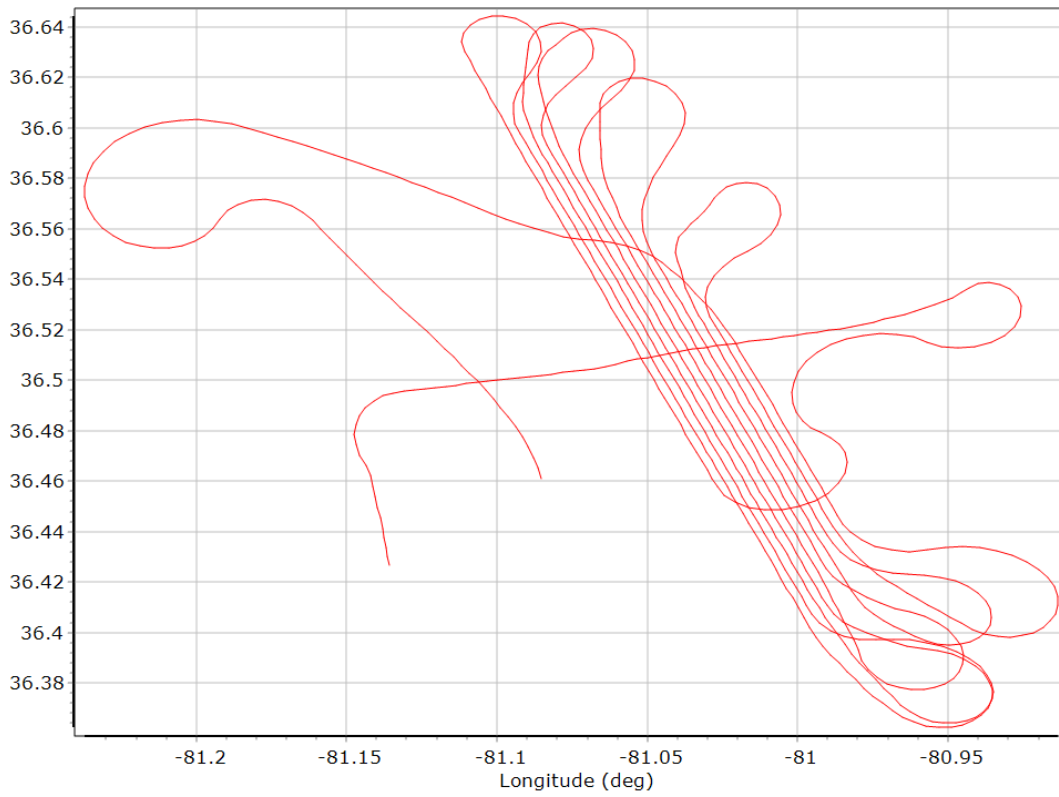
## Body Angular Rate



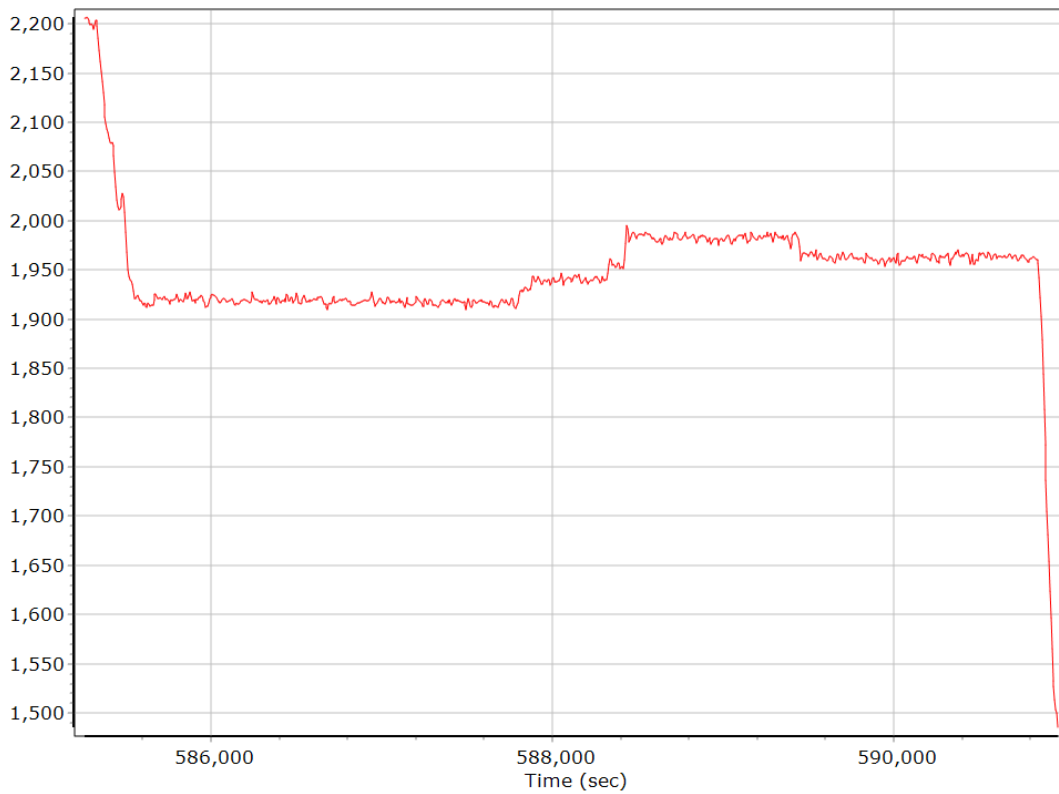


## Forward Processed Trajectory Information

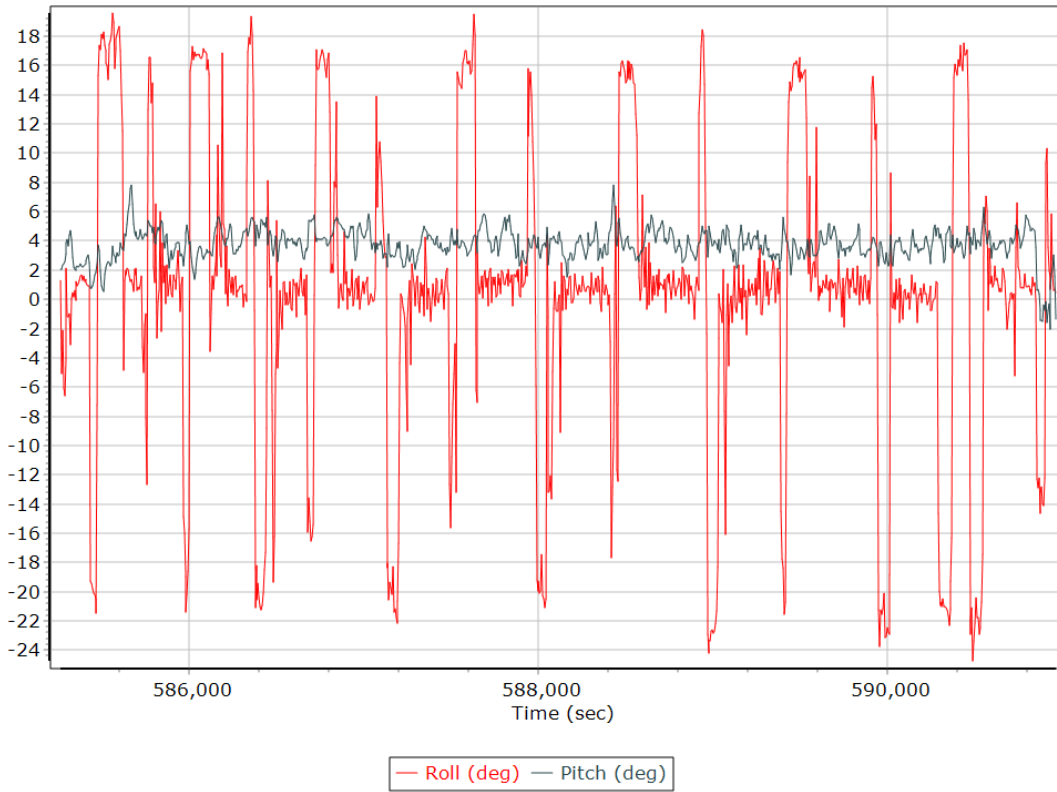
### Top View



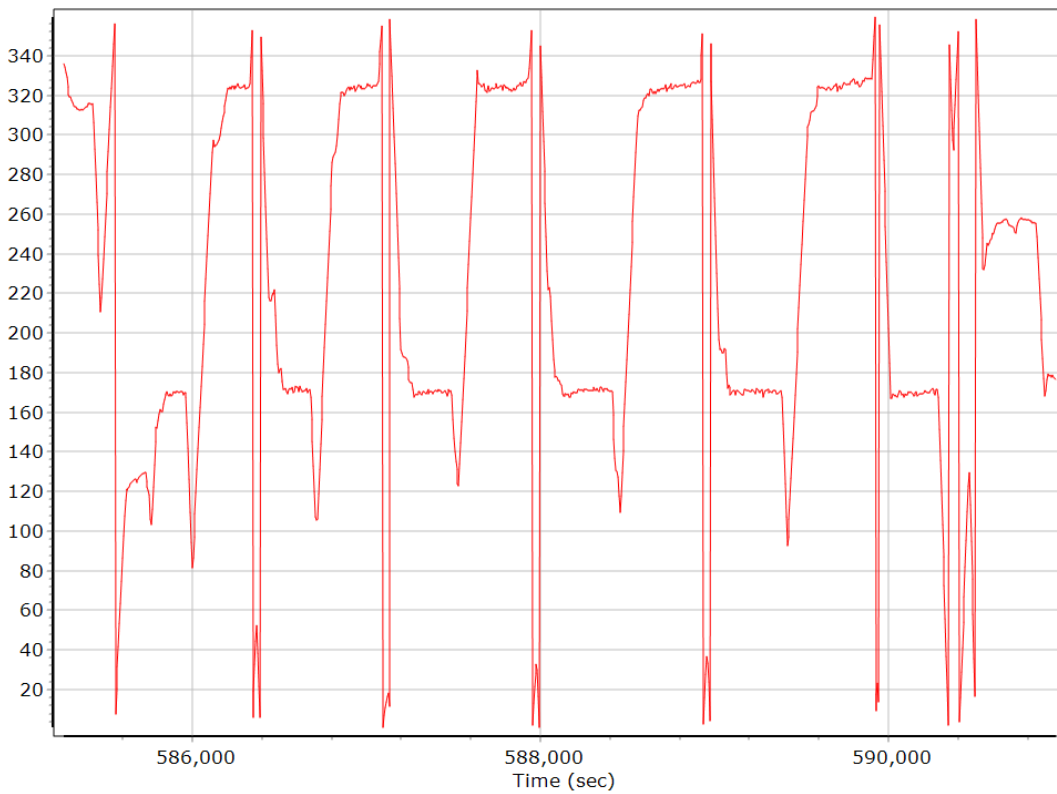
### Altitude



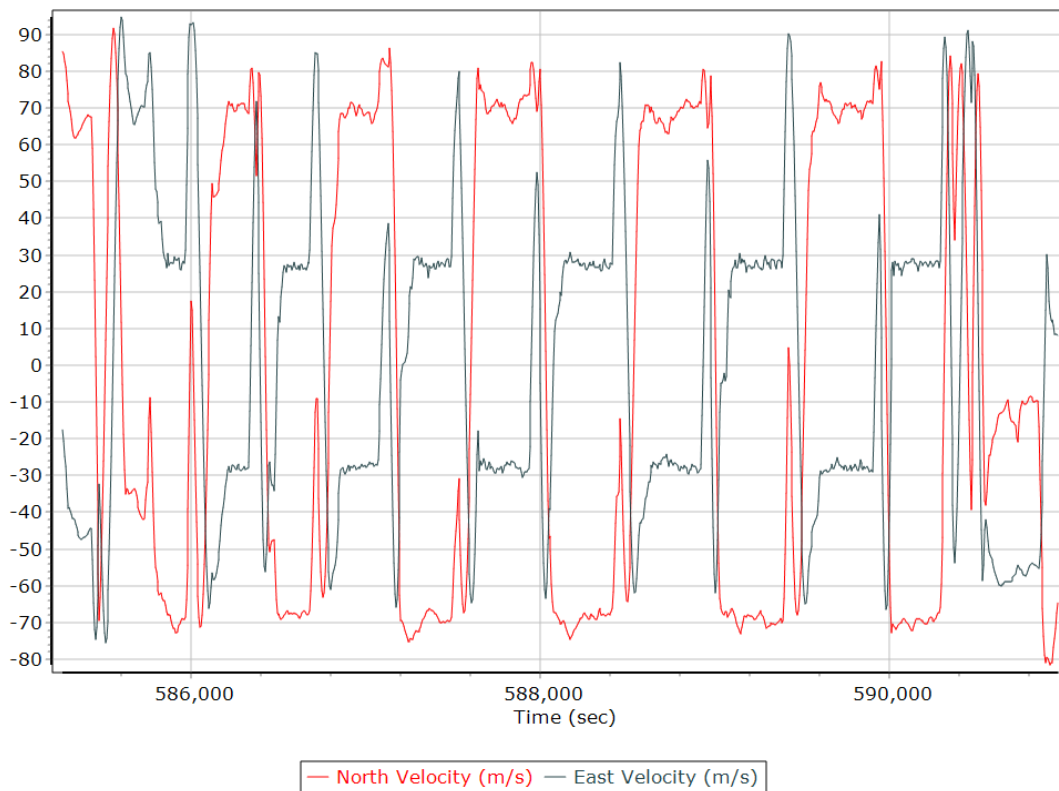
## Roll/Pitch



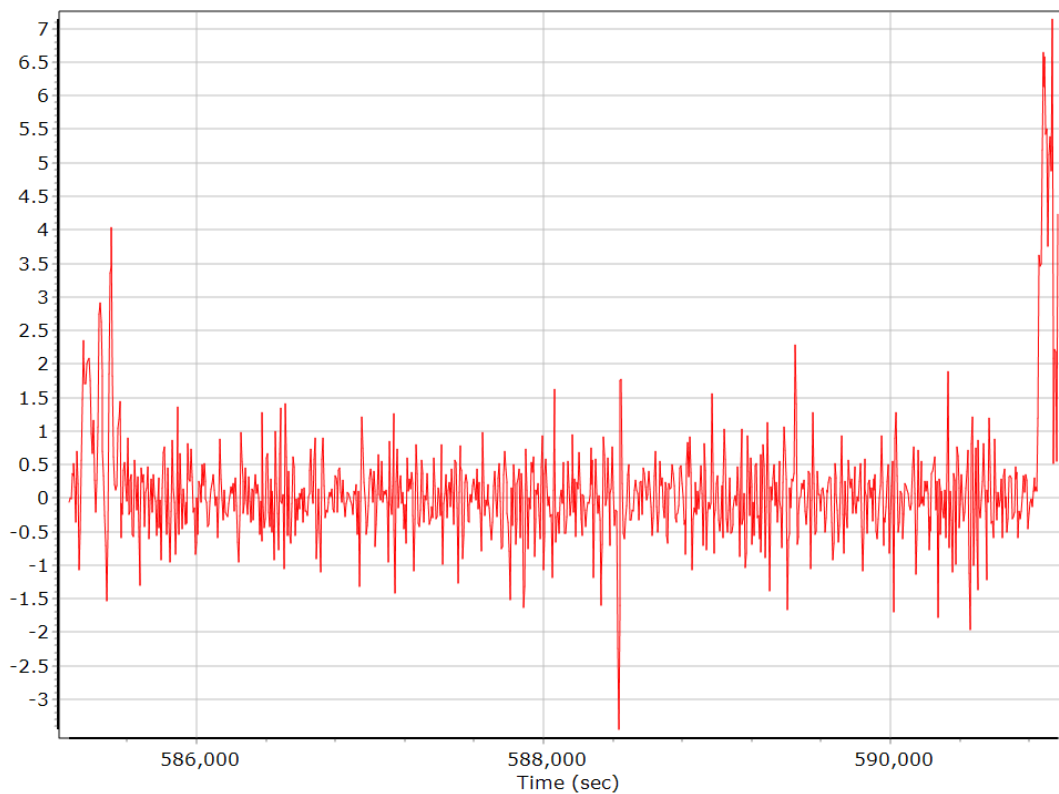
## Heading



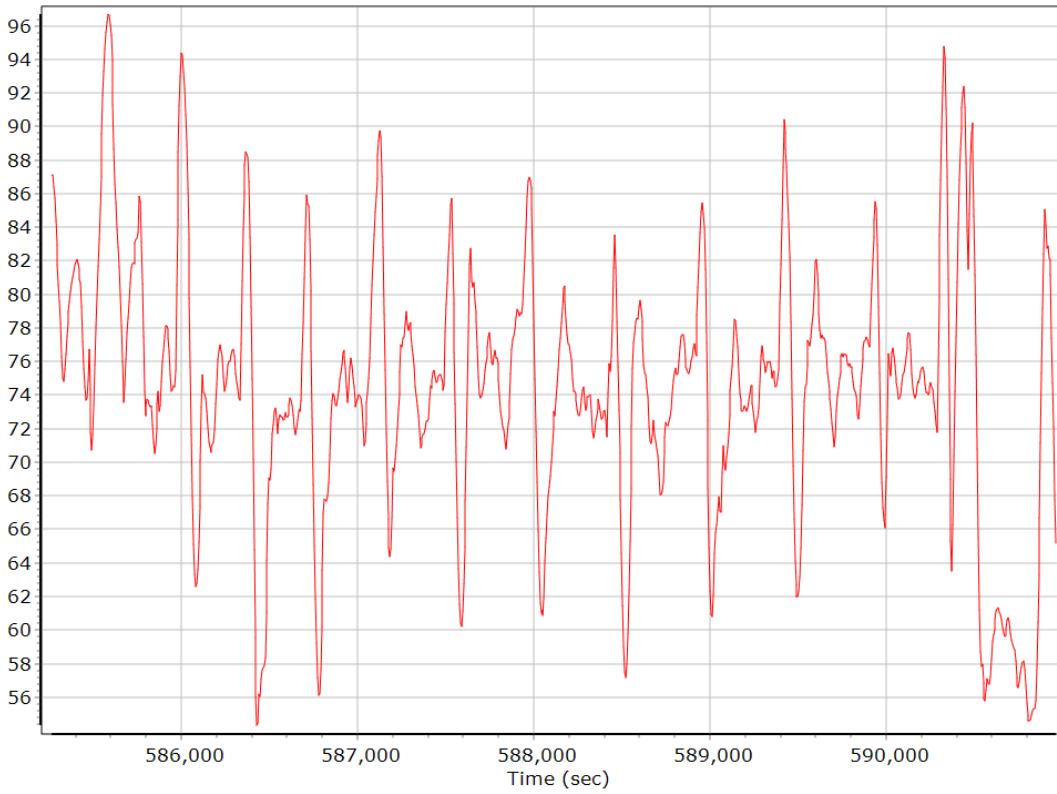
### North/East Velocity



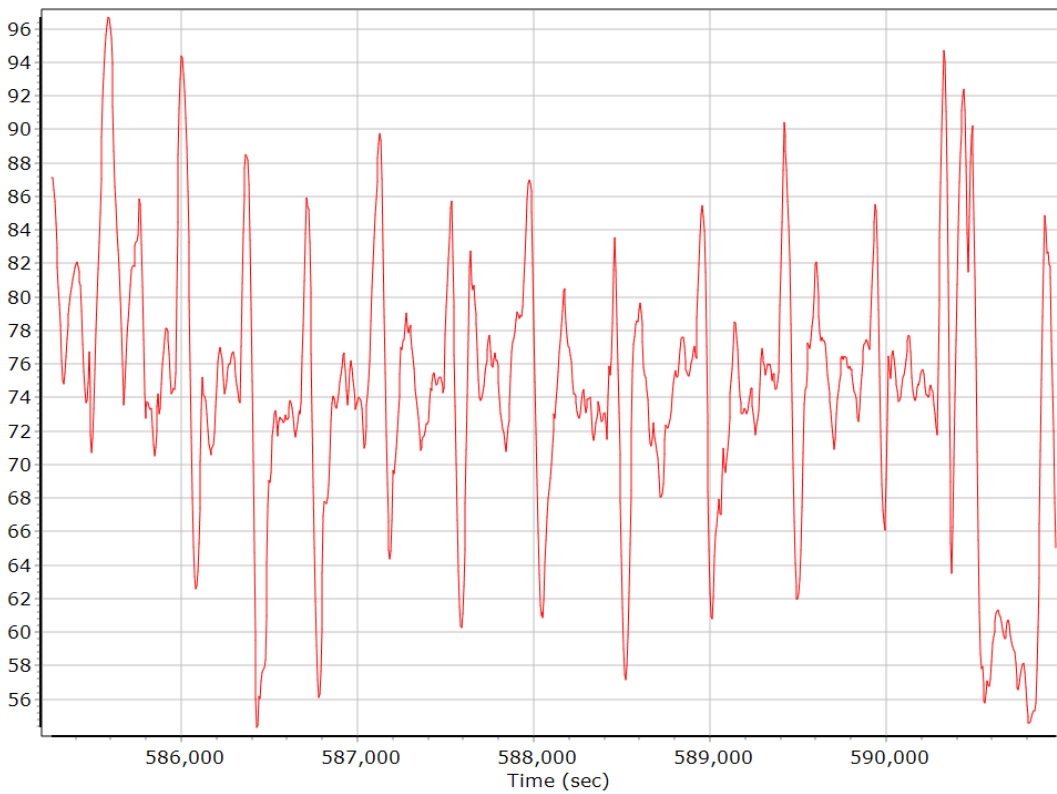
### Down Velocity



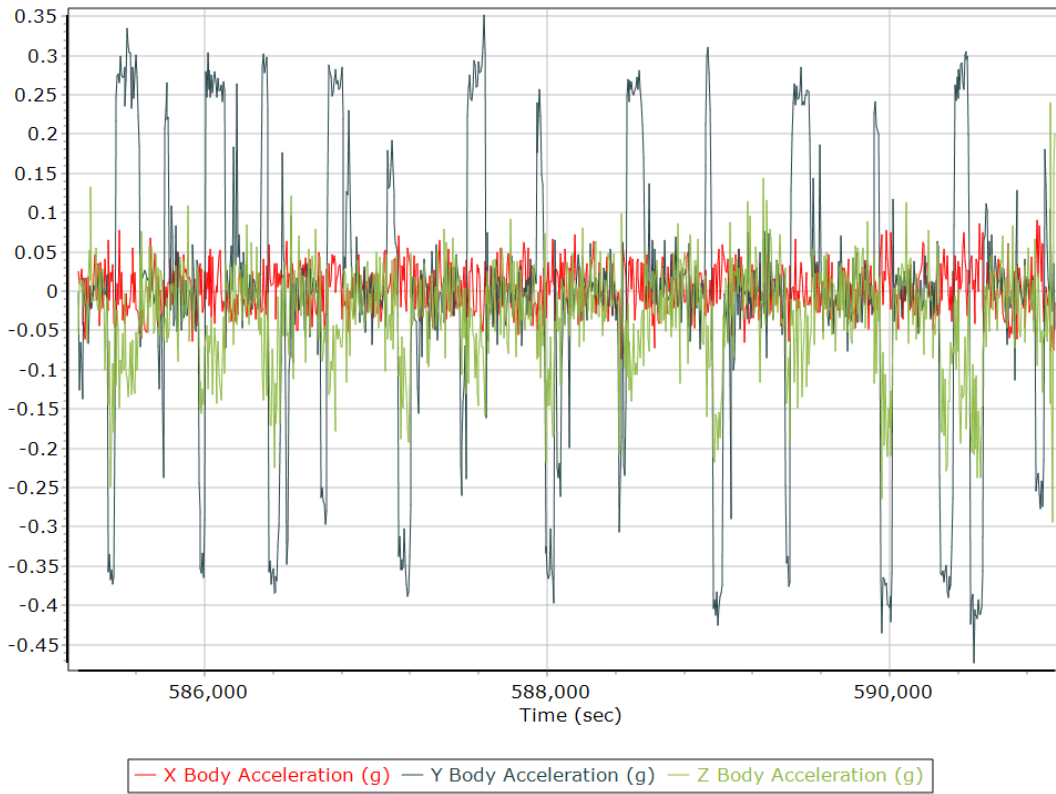
## Total Speed



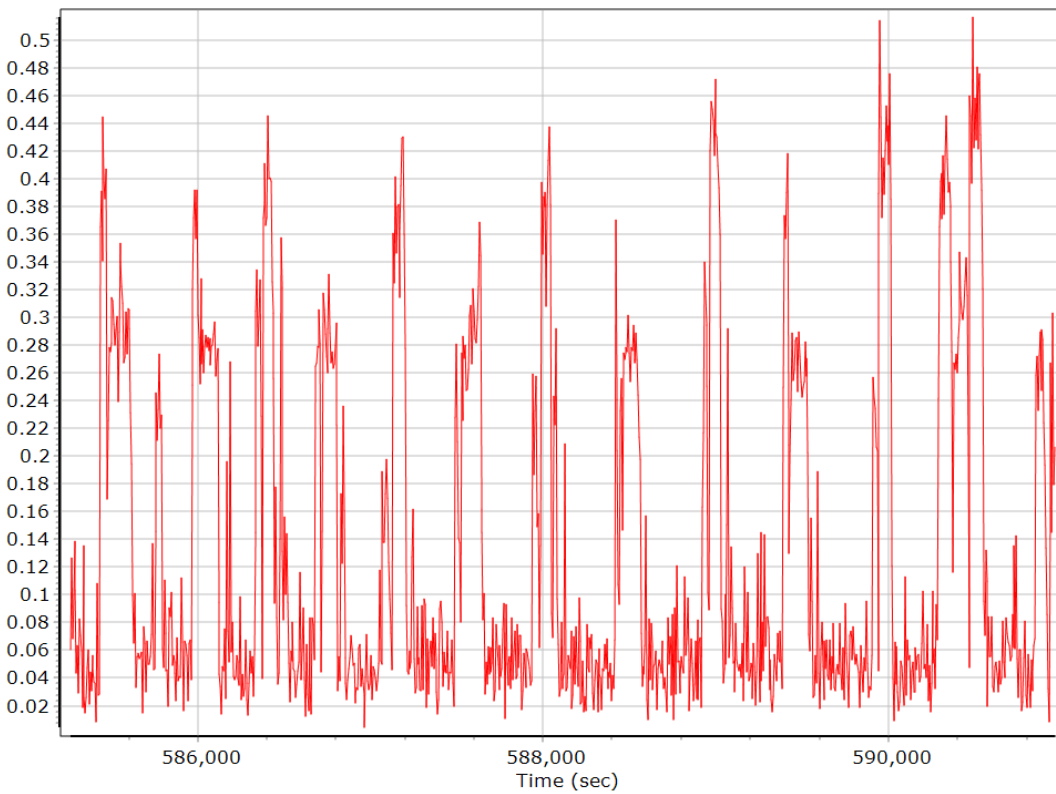
## Ground Speed



## Body Acceleration



## Total Body Acceleration



## Body Angular Rate



## Base Station Information

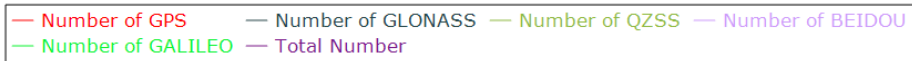
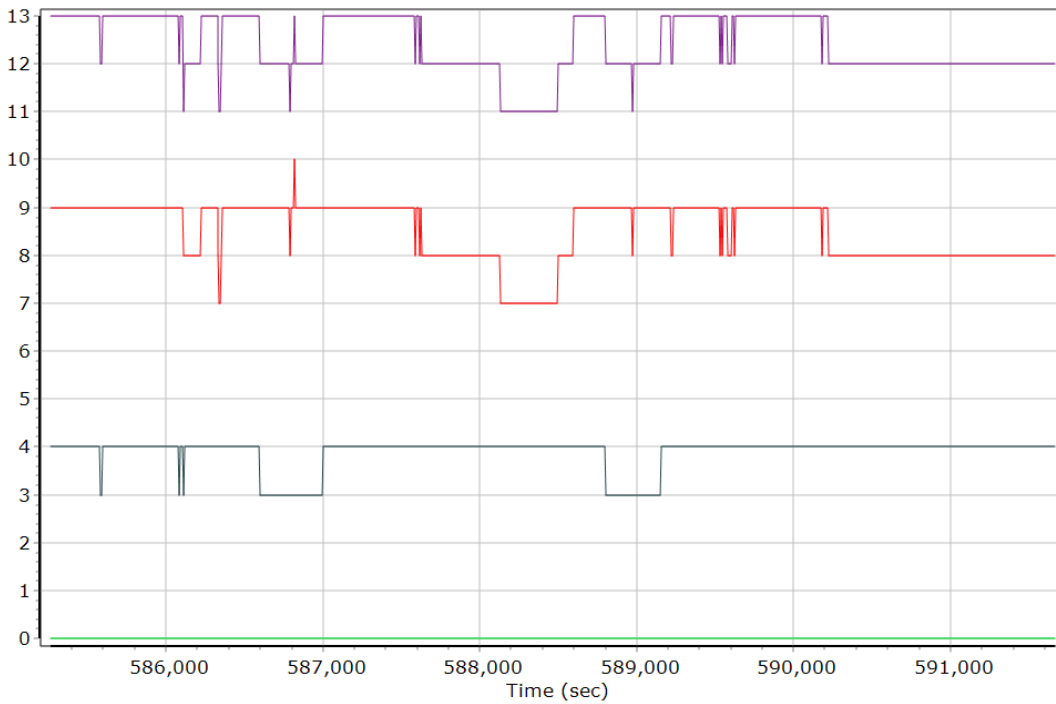
Station ID	NCSR		
Filename	ncsr3470.20o		
Start date	12/12/2020 6:00:00 PM		
End date	12/12/2020 9:00:00 PM		
Duration	03:00:00.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	5009K65826
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N36°29'51.90633"		
Longitude	W81°06'52.93276"		
Ellipsoidal height (m)	839.99250		
Frame	NAD83		
Epoch	2011		
Ellipsoid	NAD83		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

## GNSS QC

### GNSS QC Statistics

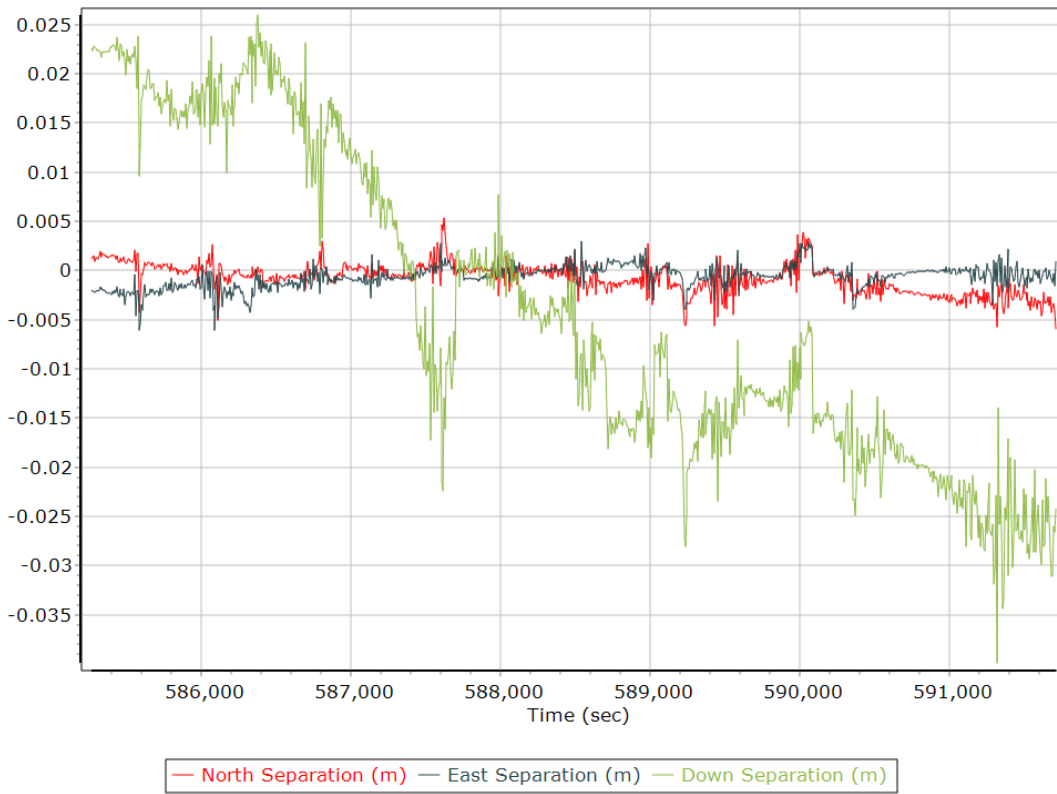
Statistics	Min	Max	Mean
Baseline length (km)	1.12	33.25	
Number of GPS SV	7	10	9
Number of GLONASS SV	0	4	4
Number of QZSS SV	0	0	0
Number of BEIDOU SV	0	0	0
Number of GALILEO SV	0	0	0
Total number of SV	10	14	13
PDOP	1.26	1.86	1.52
QC Solution Gaps	1.00	1.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	7621.00	0.00	1.00
Percentage	99.99	0.00	0.01

### Num SVs in solution

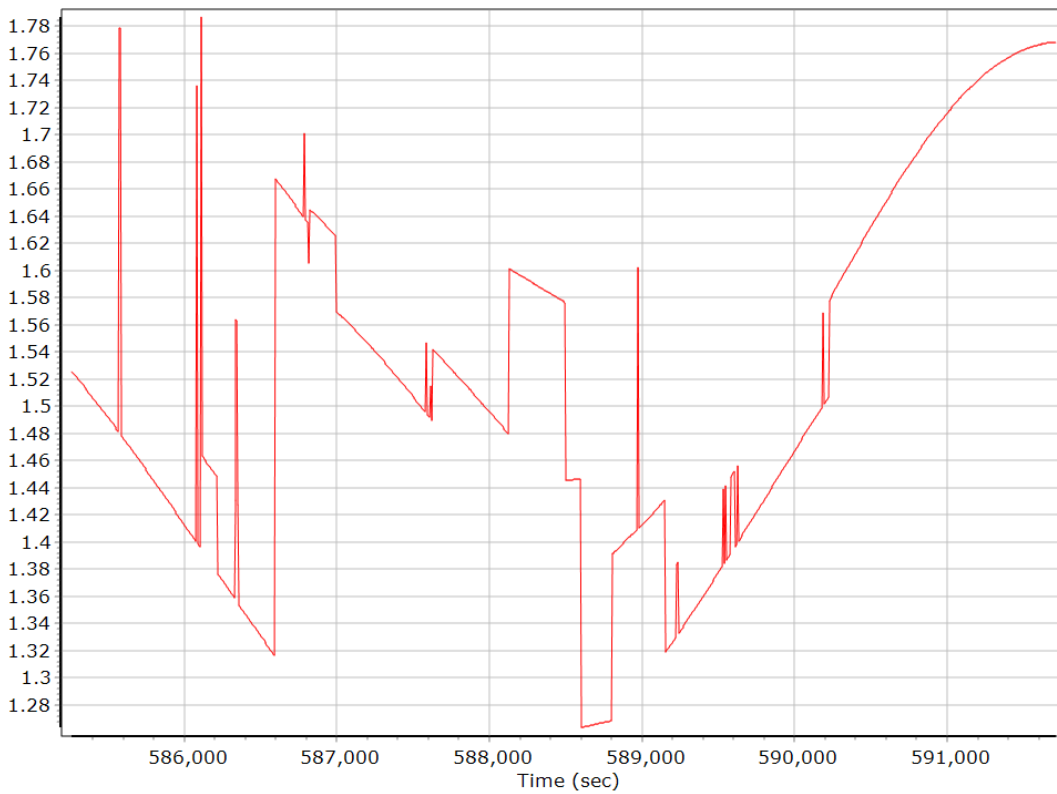




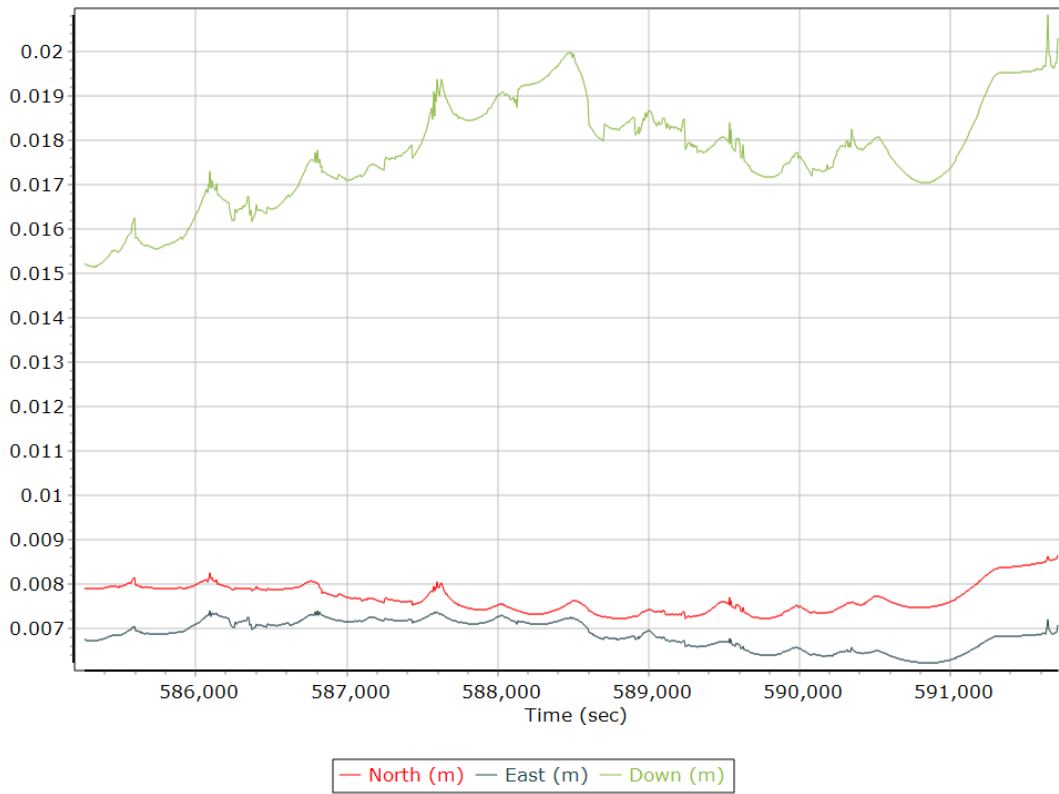
### Forward/Reverse Separation



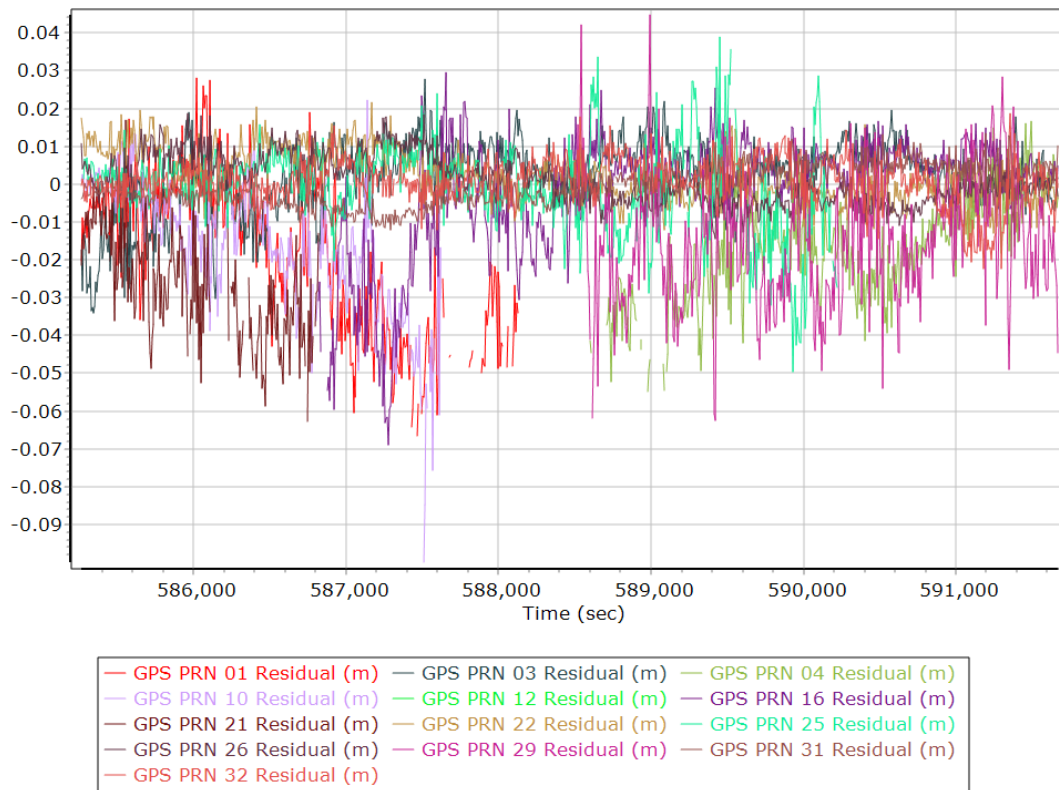
### PDOP



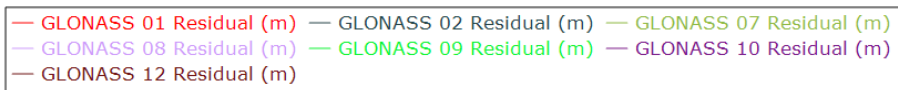
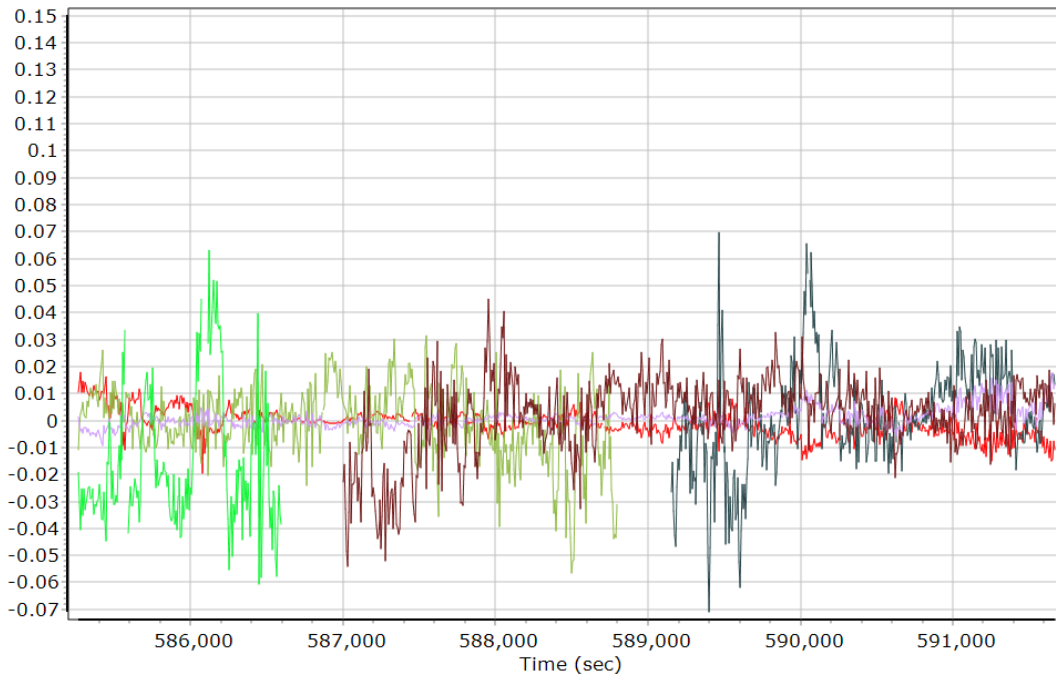
## Estimated Position Accuracy



## GPS Residuals



## GLONASS Residuals



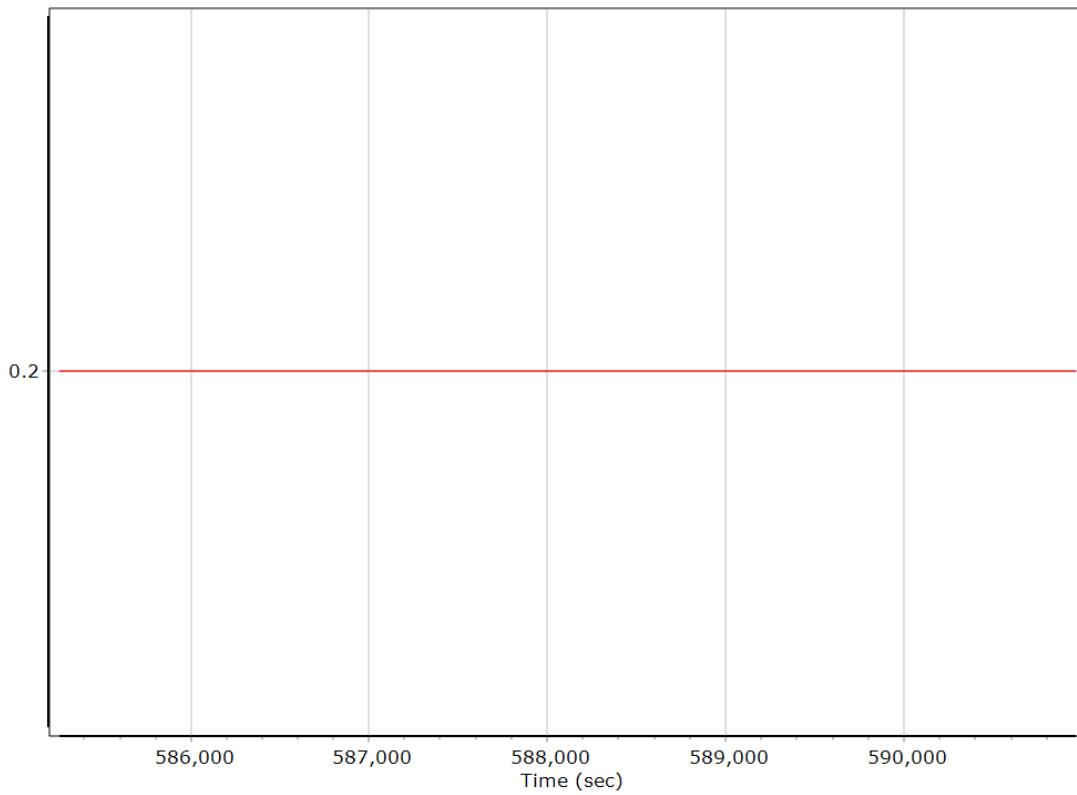
## GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion Single Base		
Stabilized mount	False		
Base station	NCSR		
Processing start time	585201.925 (12/12/2020 6:33:21 PM)		
Processing end time	590967.252 (12/12/2020 8:09:27 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference 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

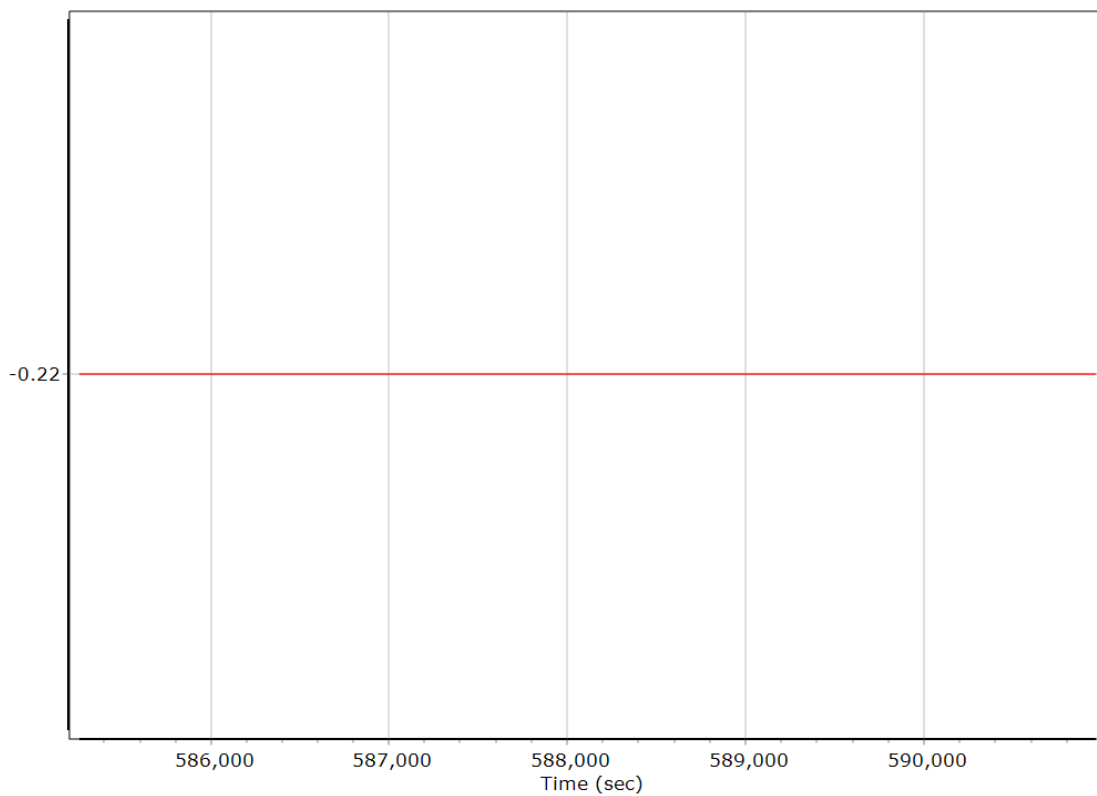
## Calibrated Installation Parameters

### Reference-Primary GNSS Lever Arm (m)

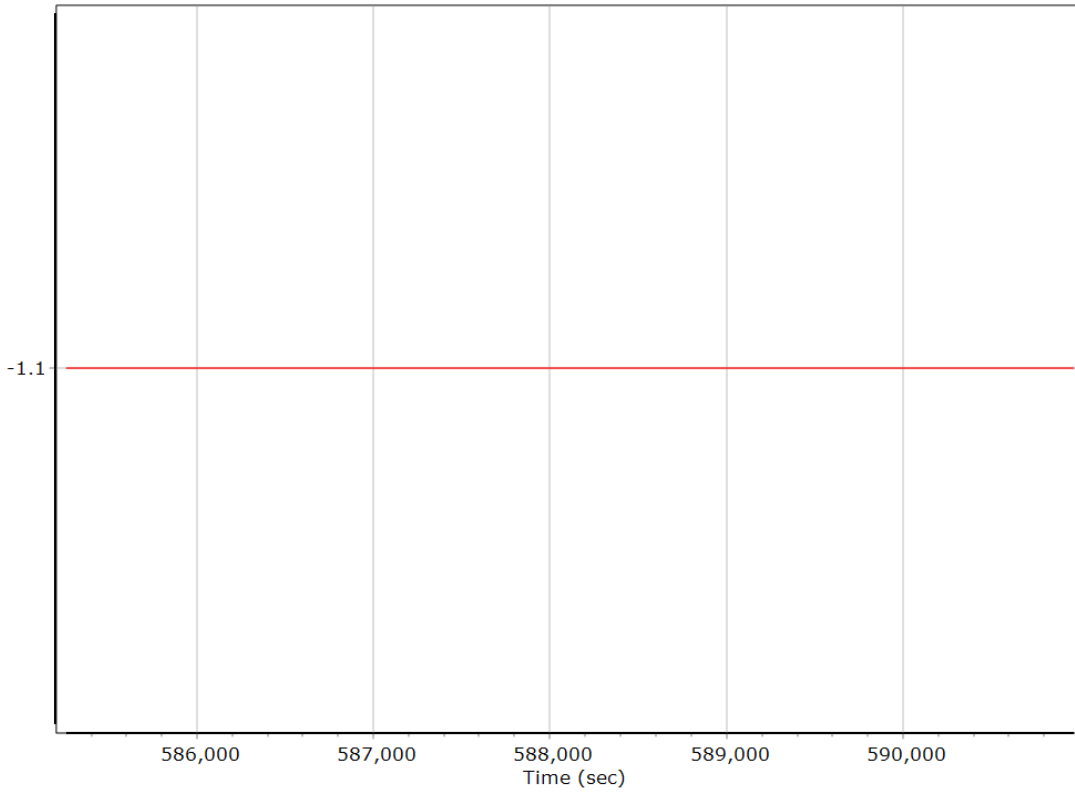
#### X Reference-Primary GNSS Lever Arm (m)



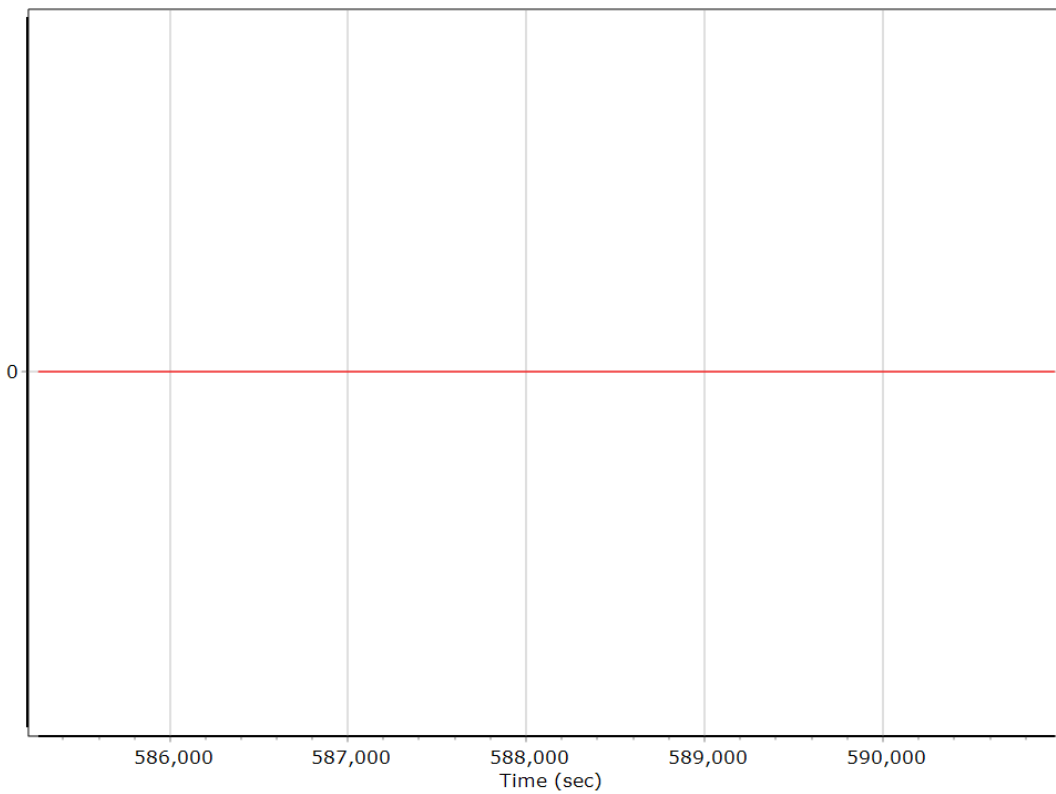
#### Y Reference-Primary GNSS Lever Arm (m)



### Z Reference-Primary GNSS Lever Arm (m)



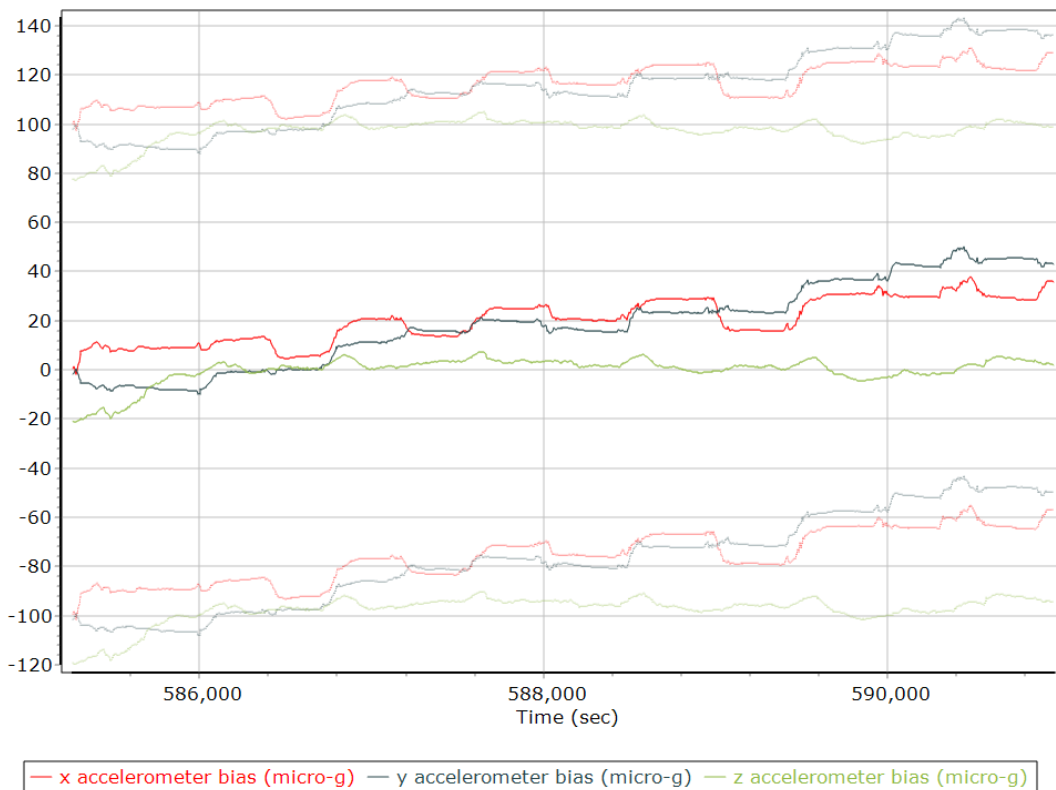
### Reference-Primary GNSS Lever Arm Figure of Merit



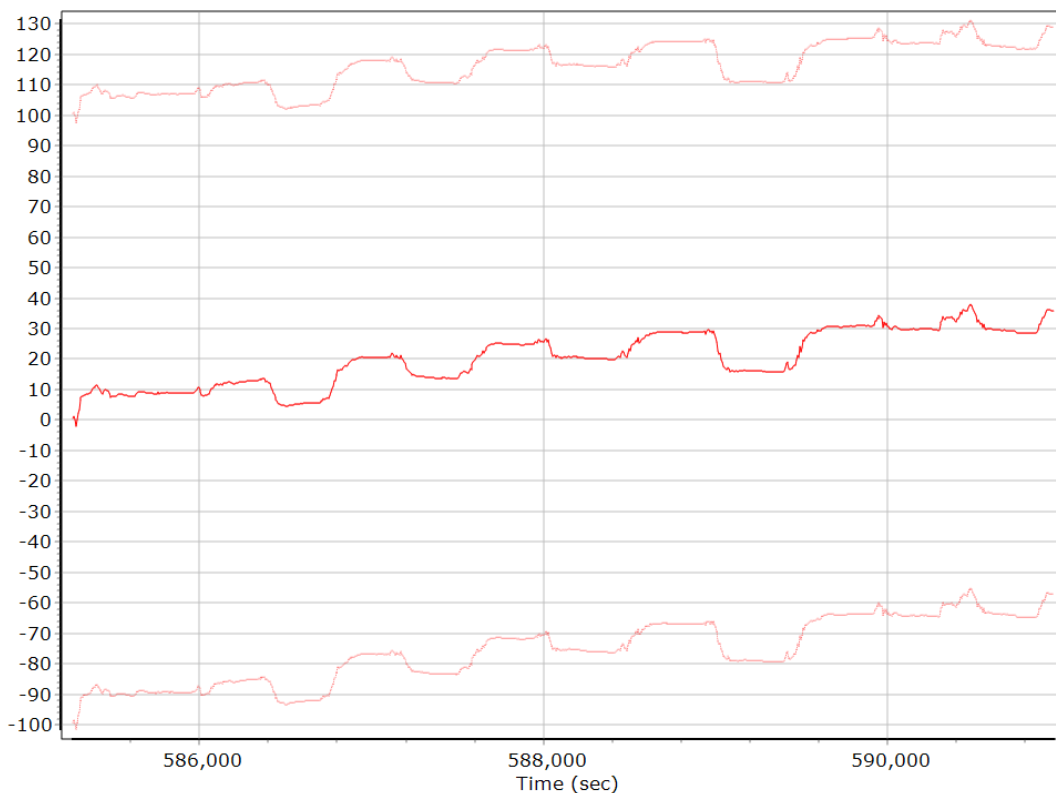
## IN-Fusion QC

### Forward Processed Estimated Errors, Reference Frame

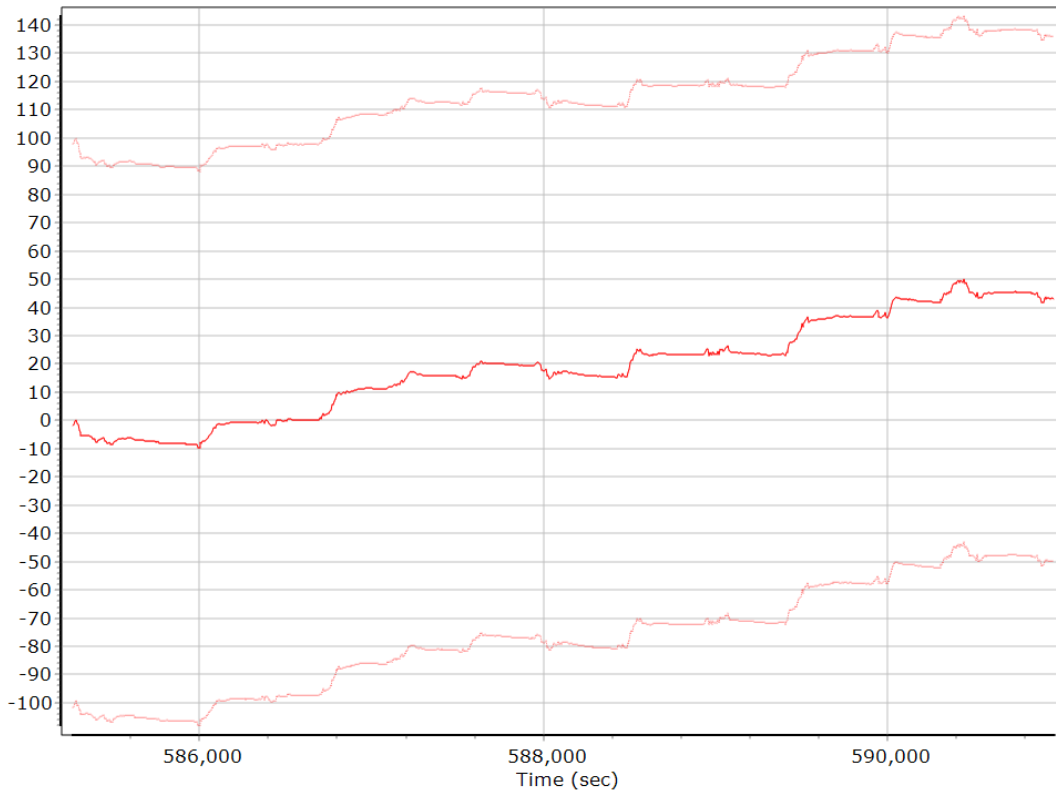
#### Accelerometer Bias (micro-g)



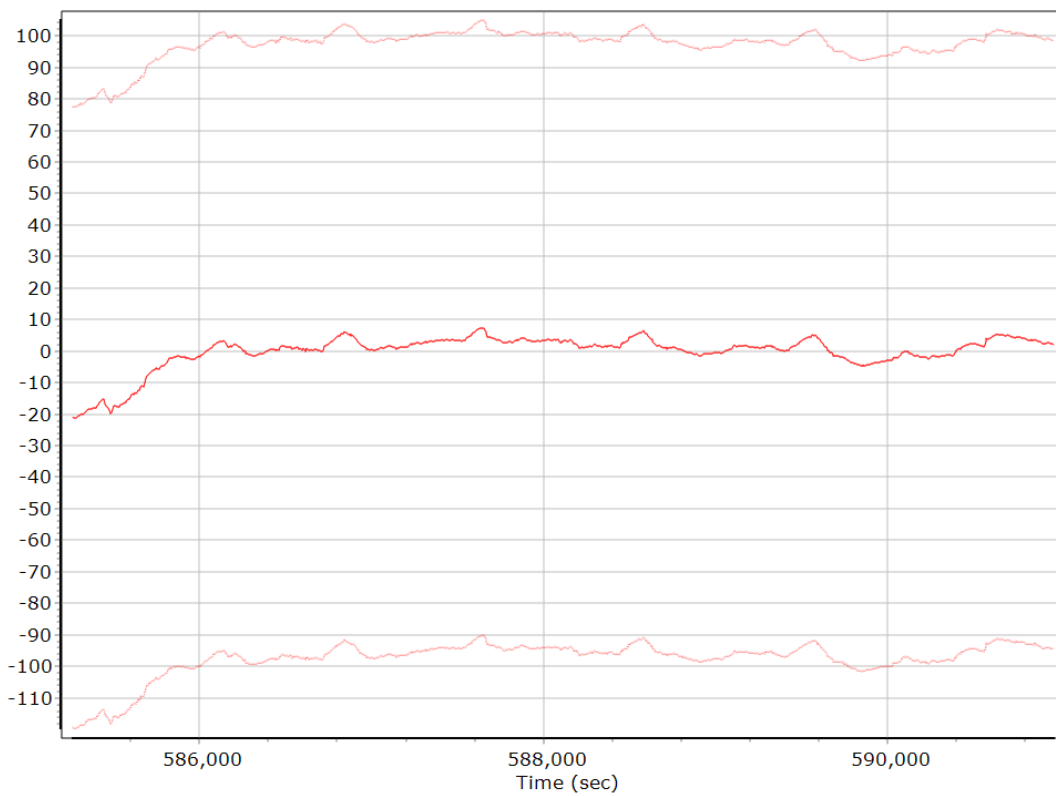
#### X Accelerometer Bias (micro-g)



### Y Accelerometer Bias (micro-g)

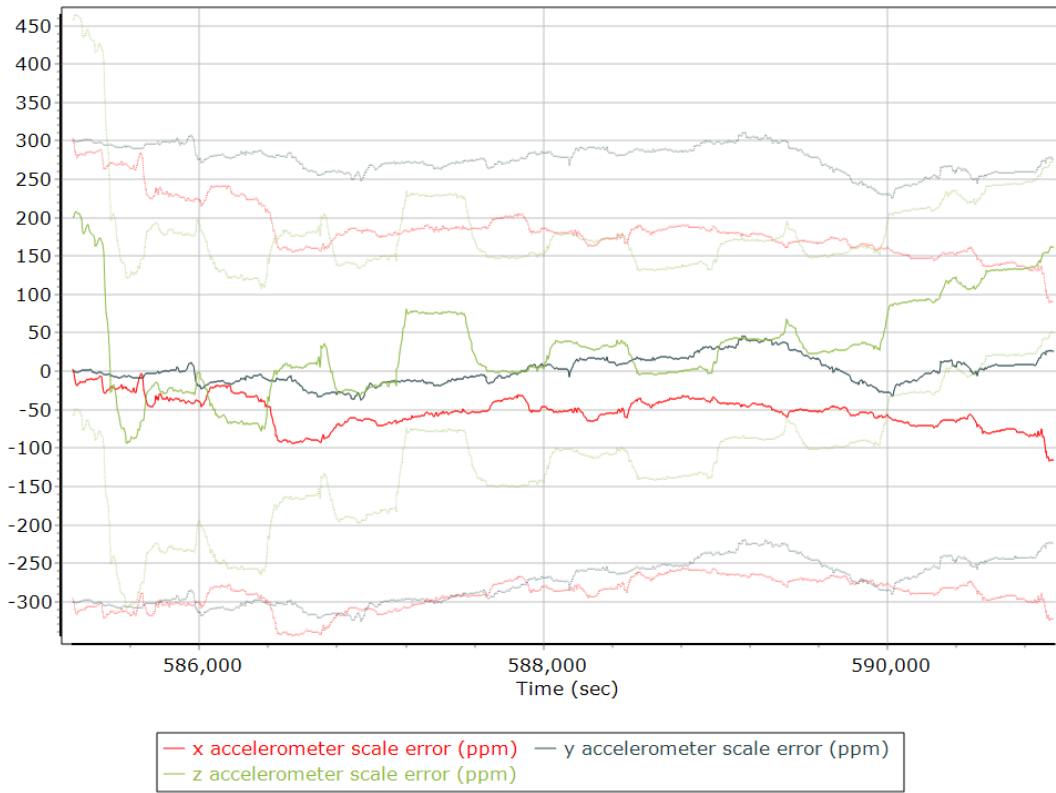


### Z Accelerometer Bias (micro-g)

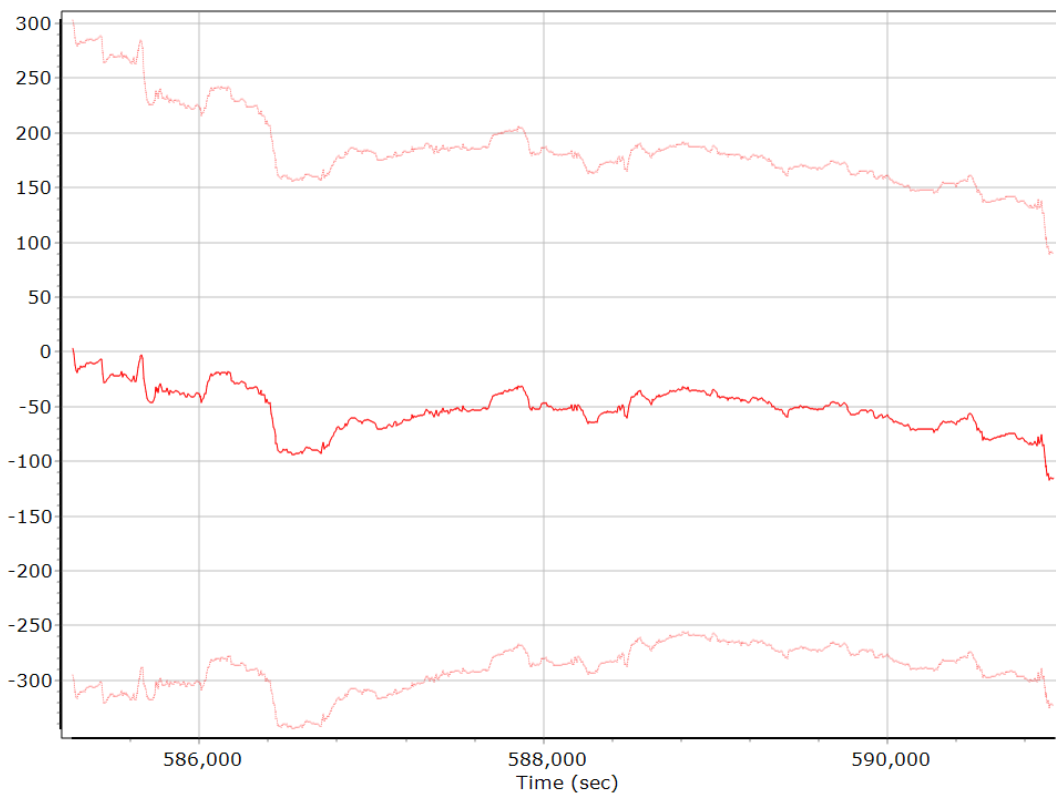




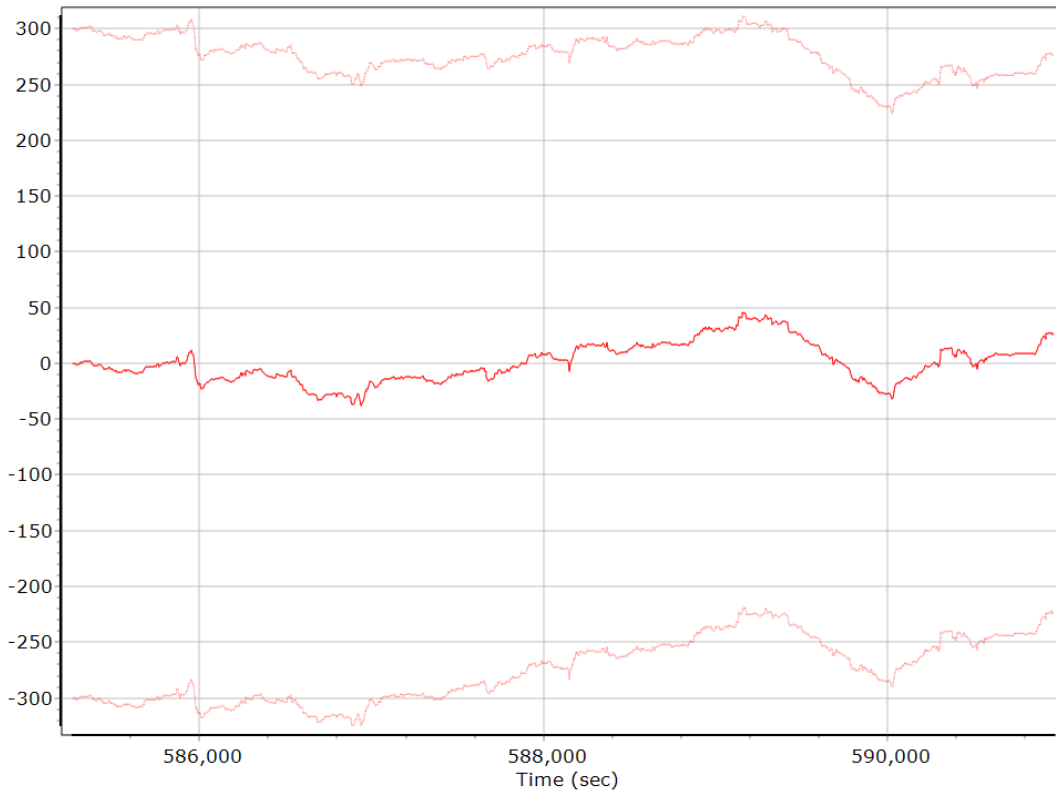
### Accelerometer Scale Error (ppm)



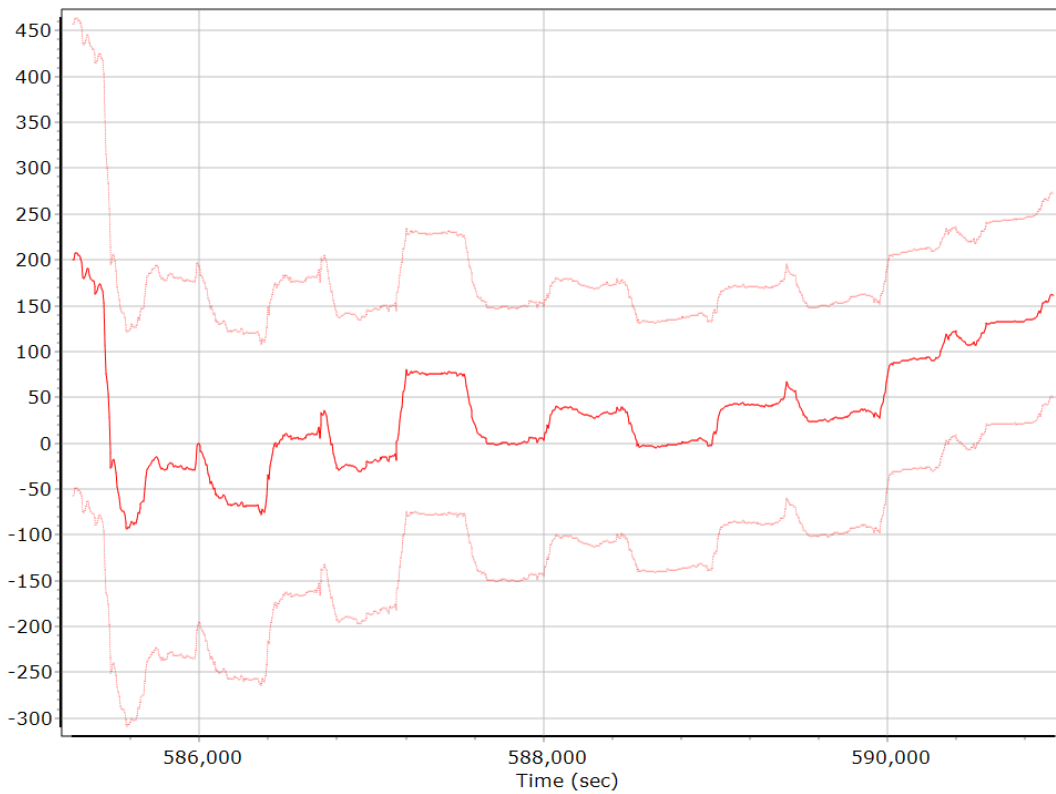
### X Accelerometer Scale Error (ppm)



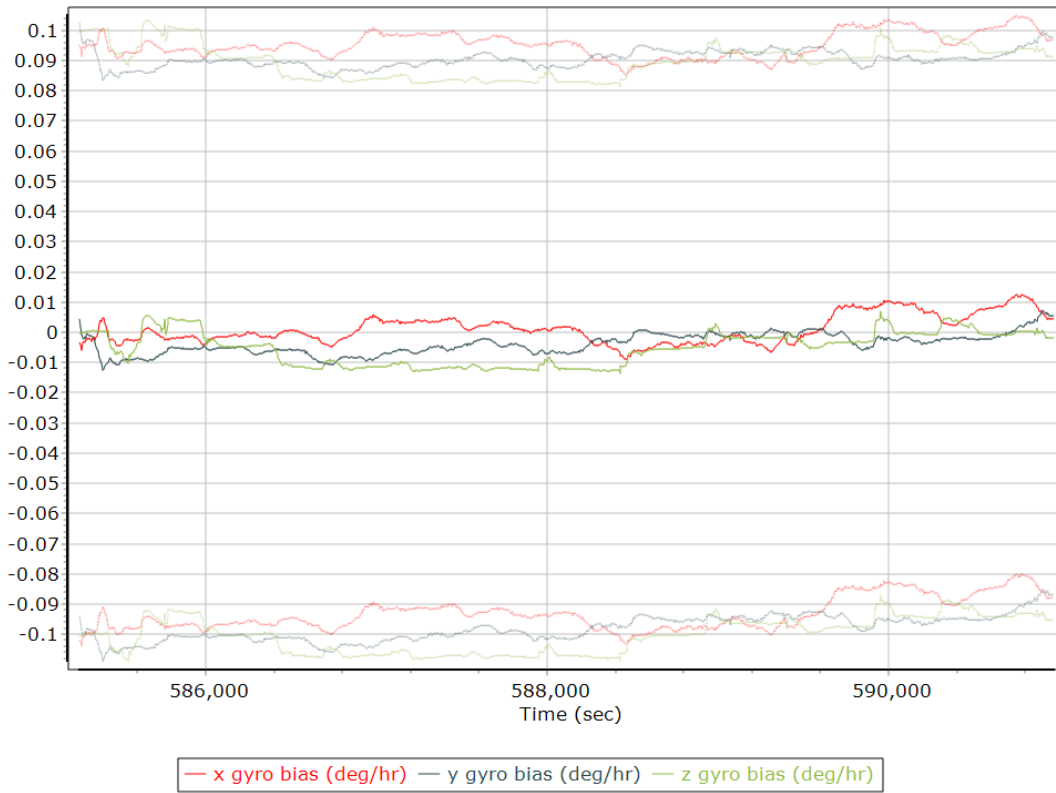
### Y Accelerometer Scale Error (ppm)



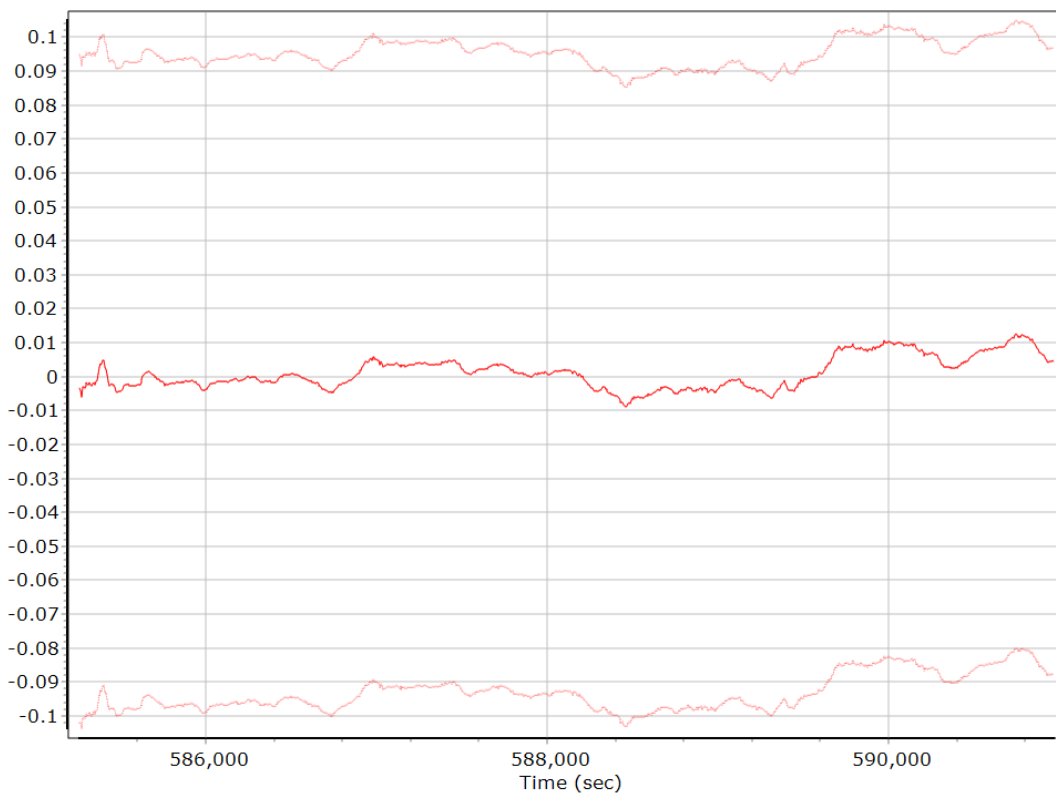
### Z Accelerometer Scale Error (ppm)



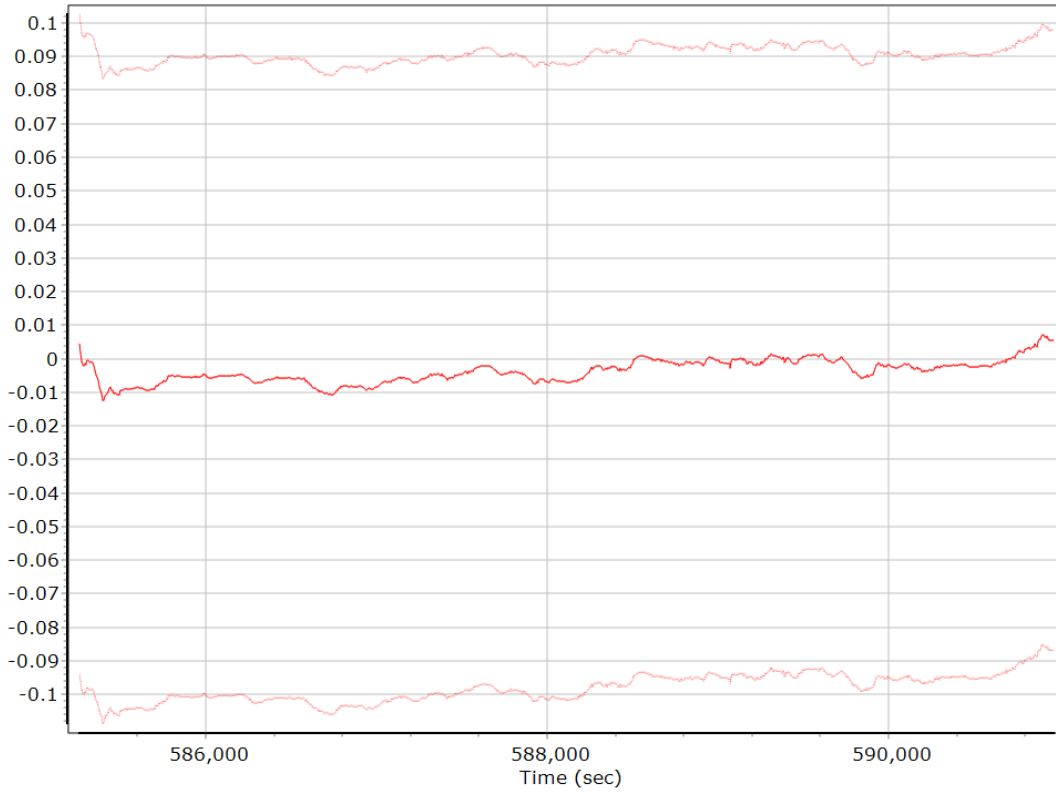
### Gyro Bias (deg/h)



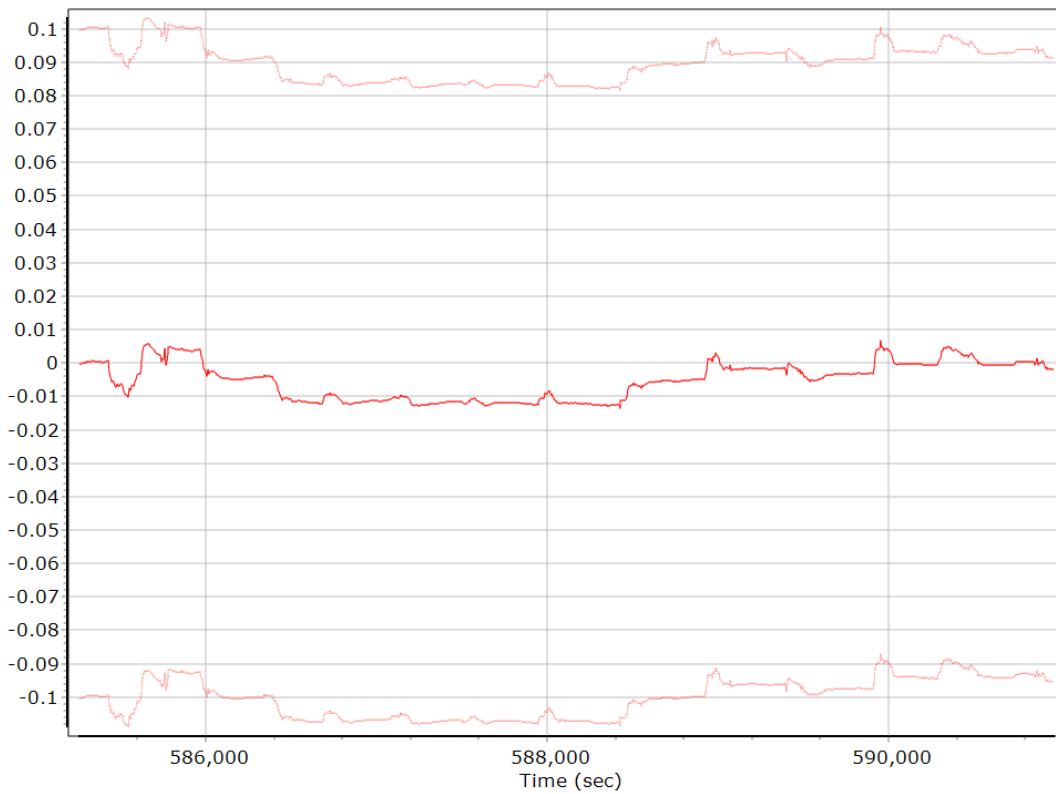
### X Gyro Bias (deg/h)



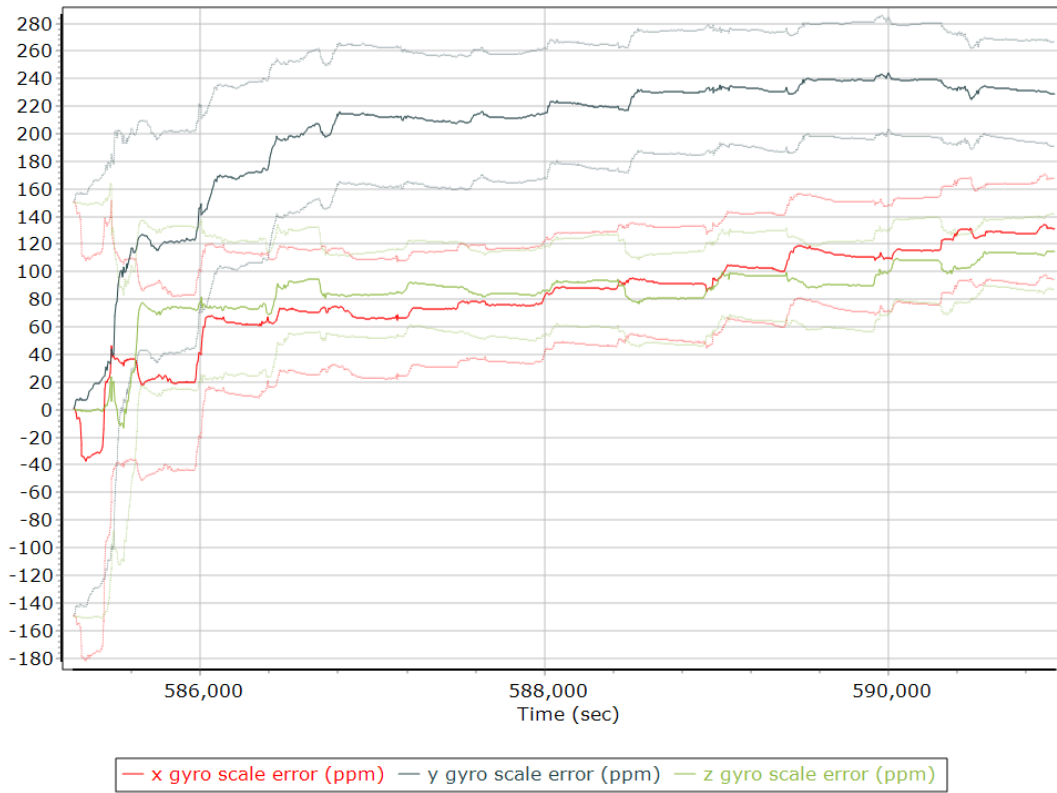
### Y Gyro Bias (deg/h)



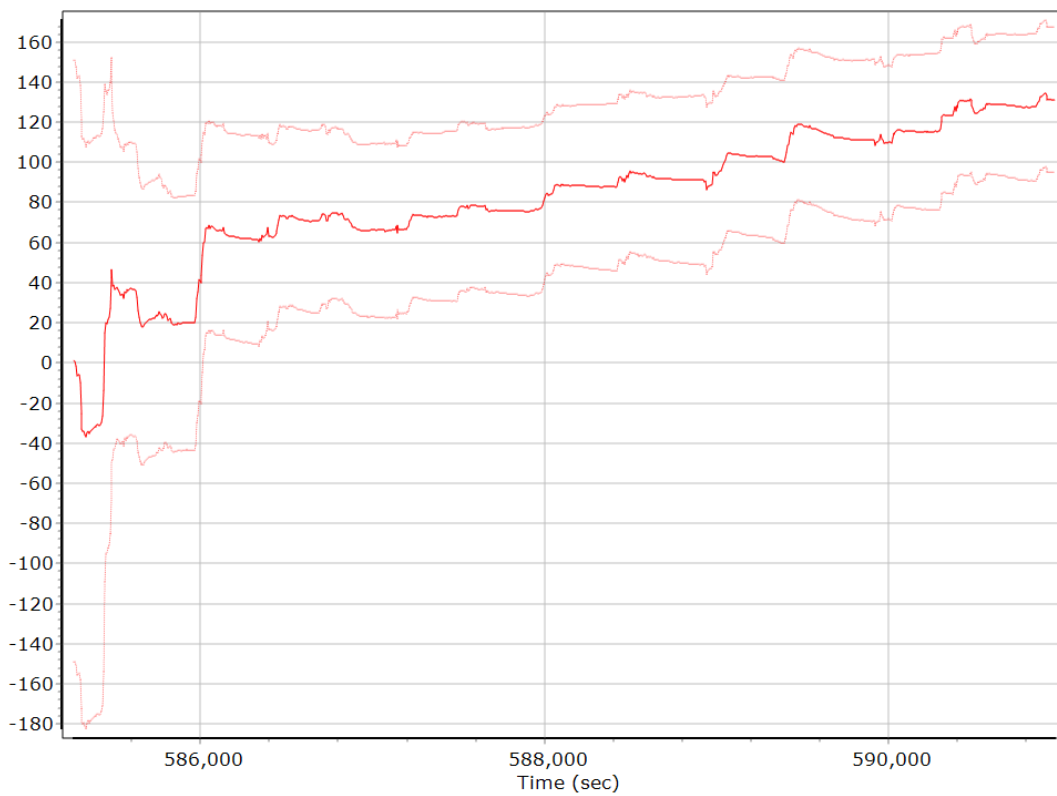
### Z Gyro Bias (deg/h)



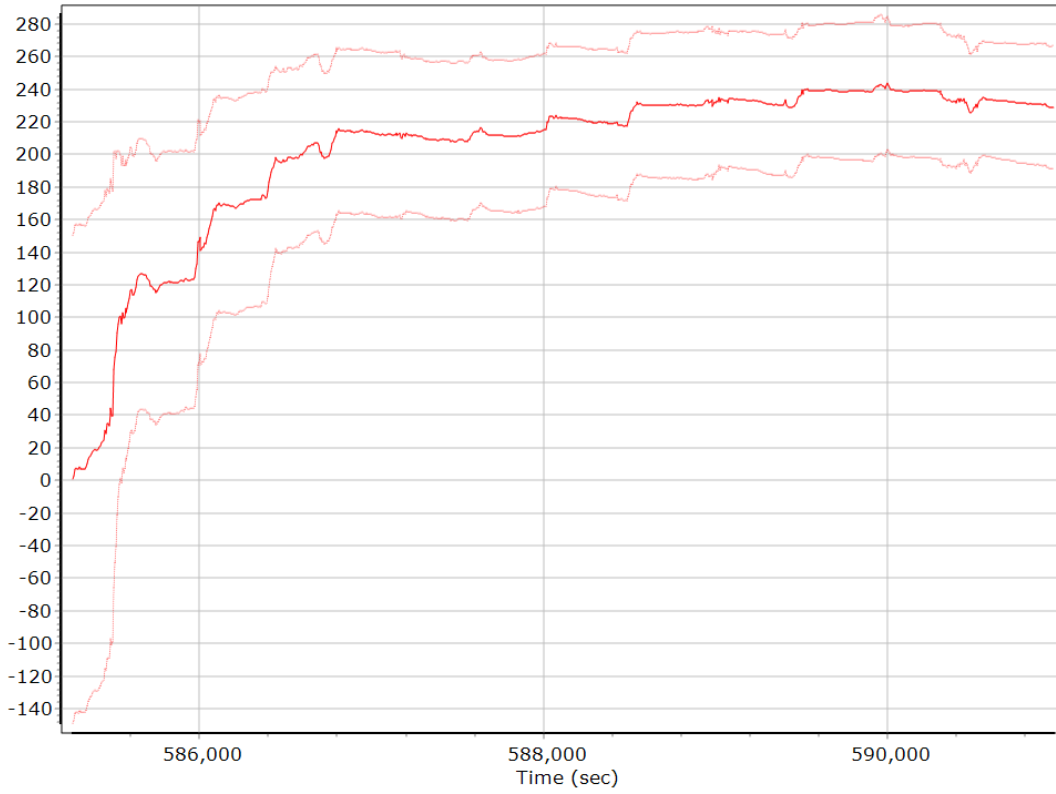
### Gyro Scale Error (ppm)



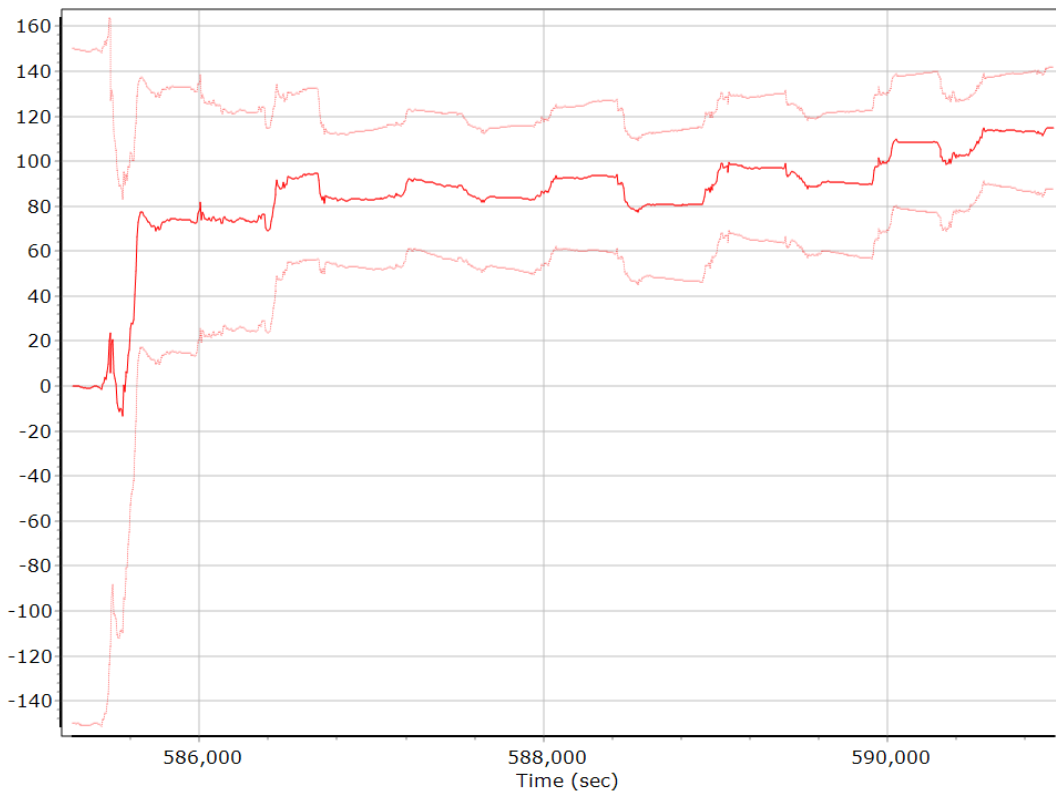
### X Gyro Scale Error (ppm)



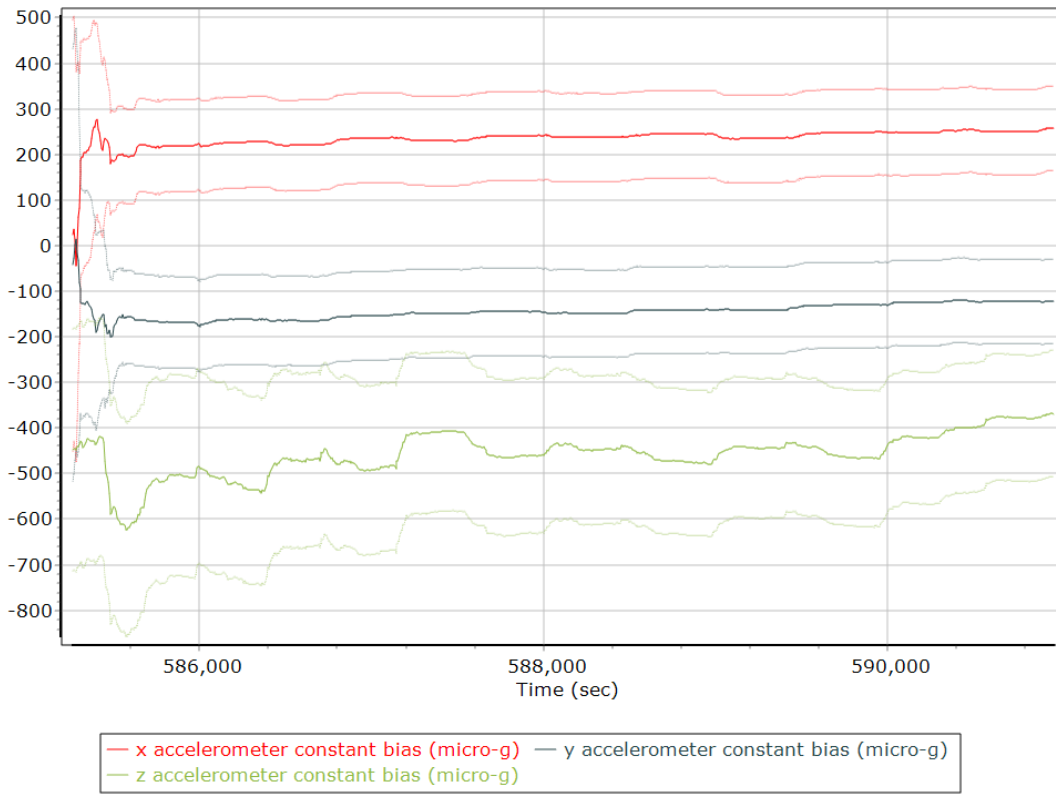
### Y Gyro Scale Error (ppm)



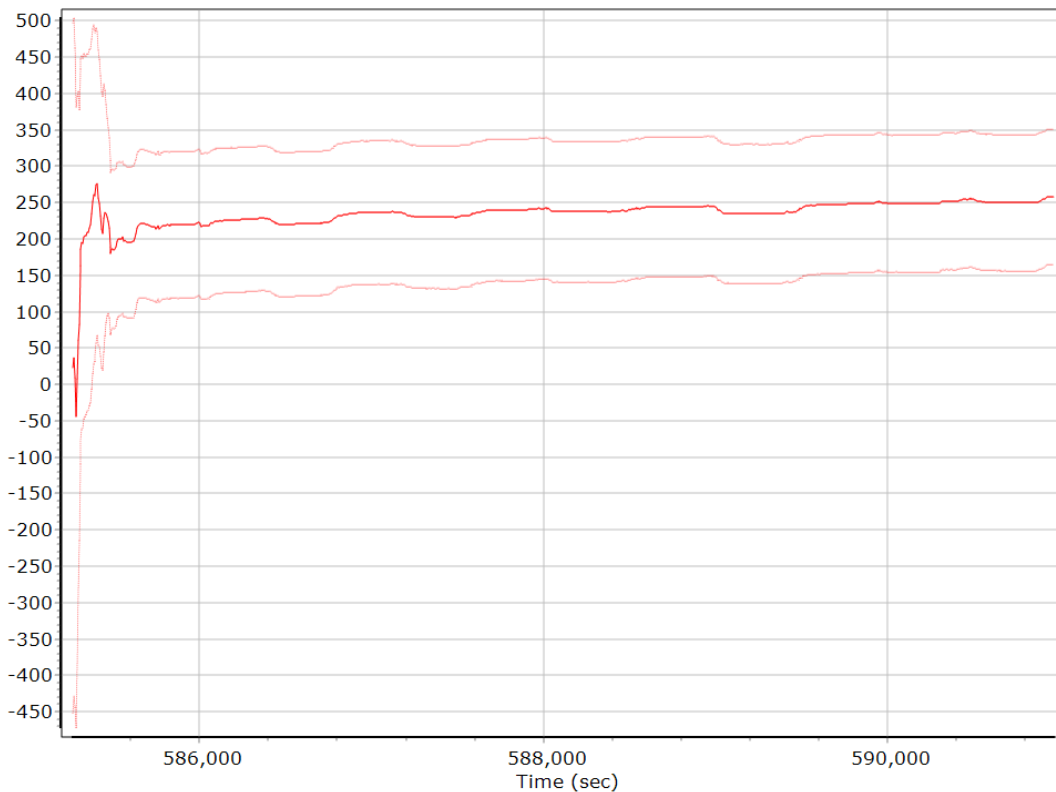
### Z Gyro Scale Error (ppm)



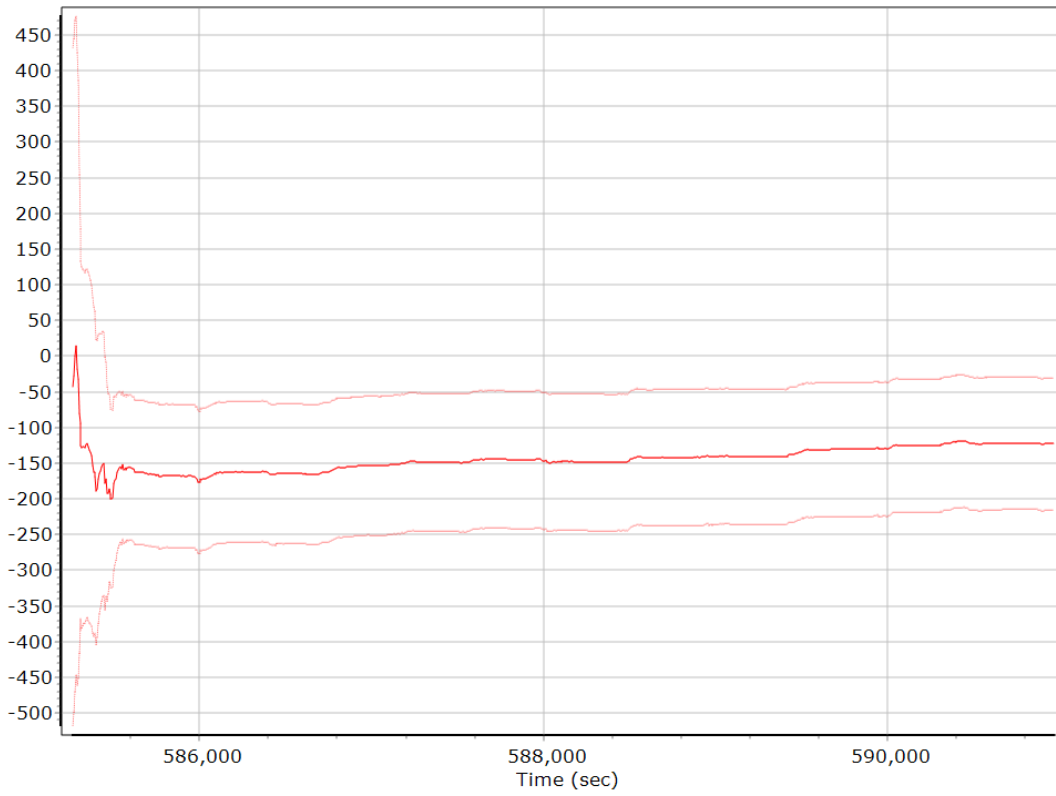
### Forward Processed Estimated Constant Errors, Reference Frame Accelerometer Bias (micro-g)



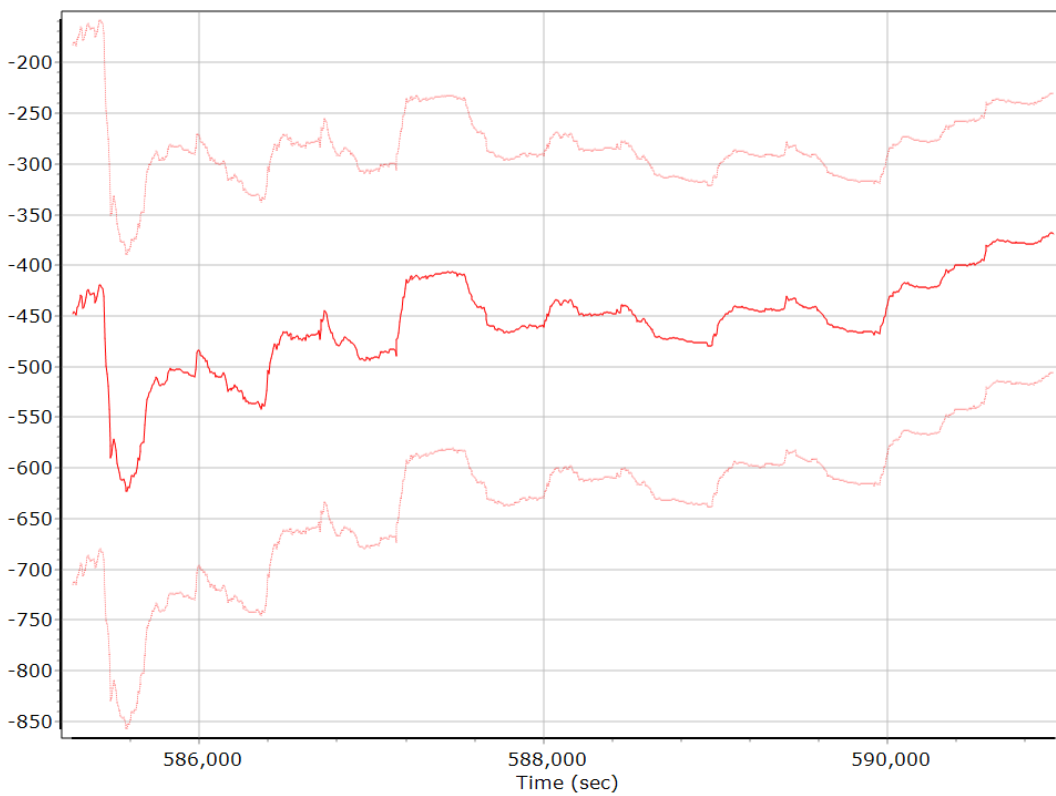
### X Accelerometer Bias (micro-g)



### Y Accelerometer Bias (micro-g)

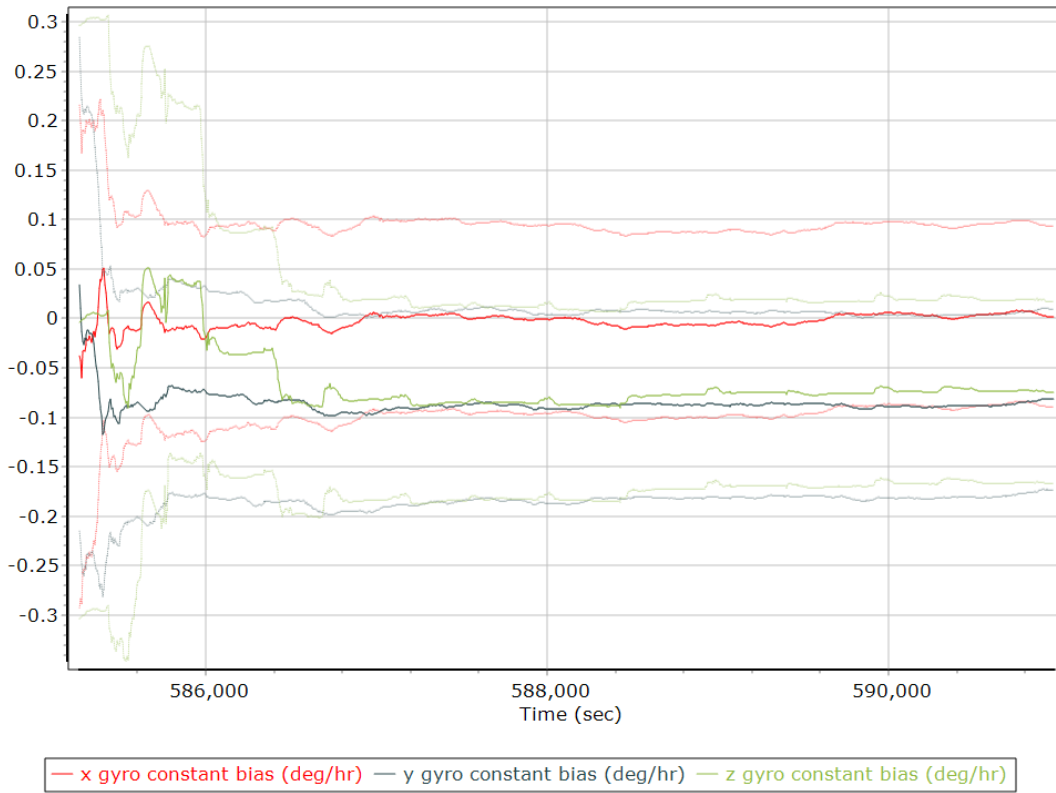


### Z Accelerometer Bias (micro-g)

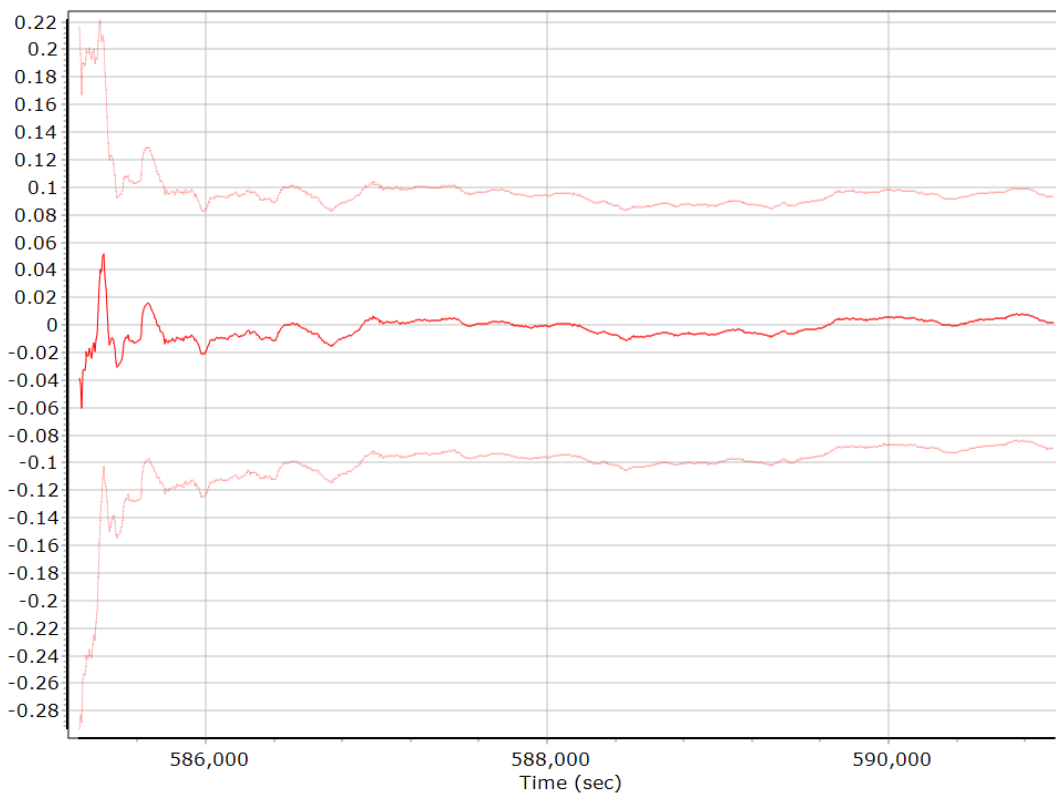




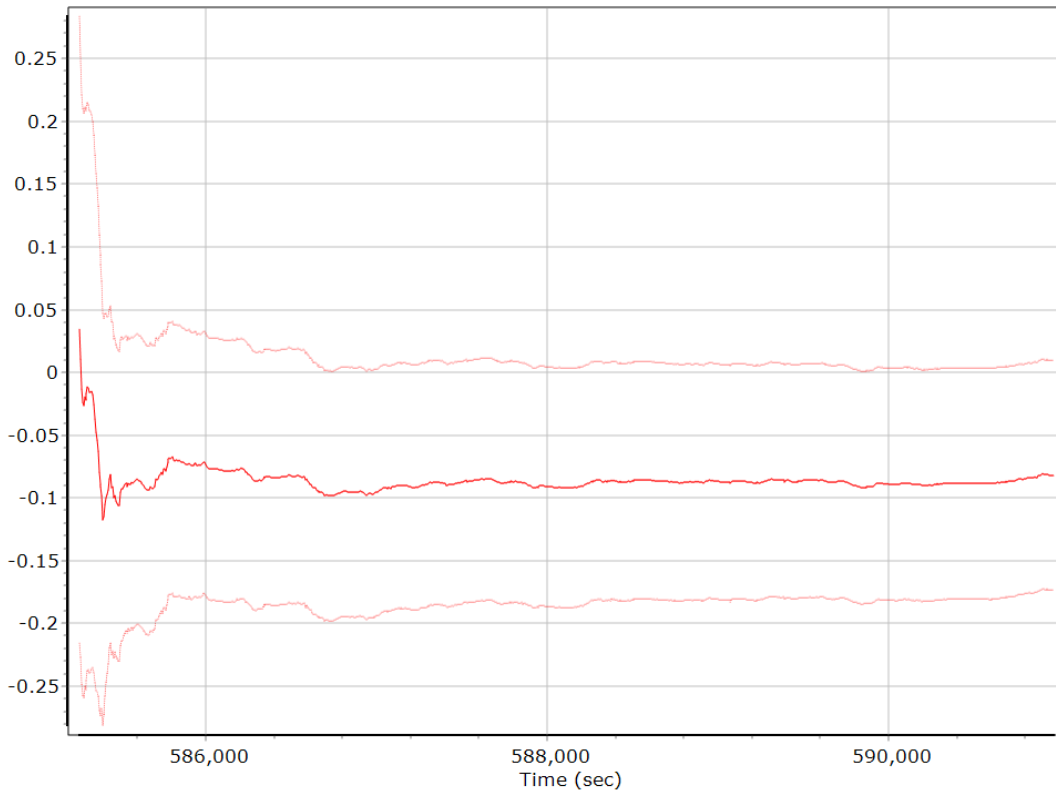
### Gyro Bias (deg/h)



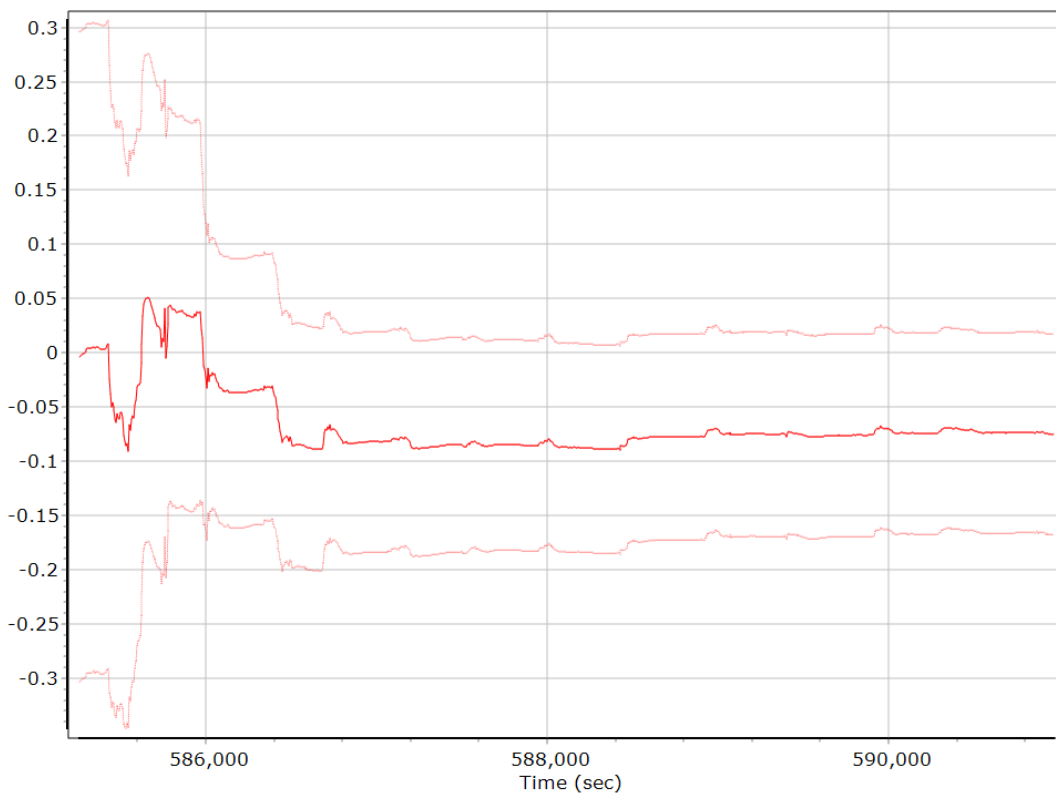
### X Gyro Bias (deg/h)



### Y Gyro Bias (deg/h)

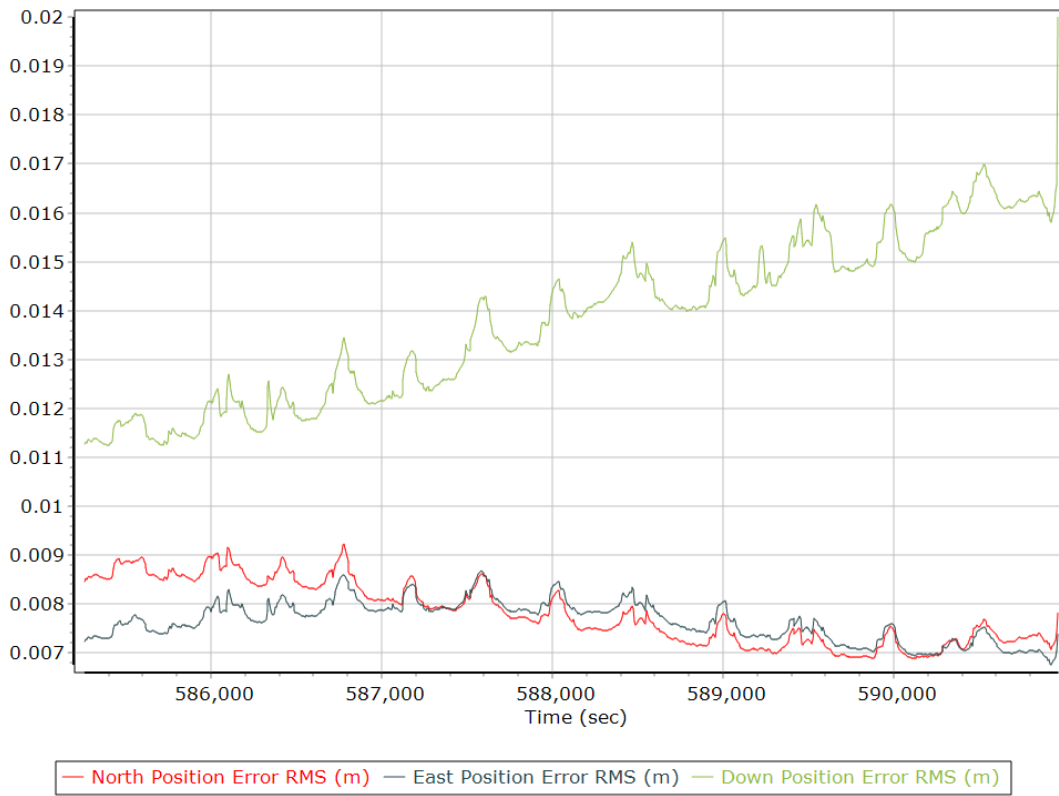


### Z Gyro Bias (deg/h)

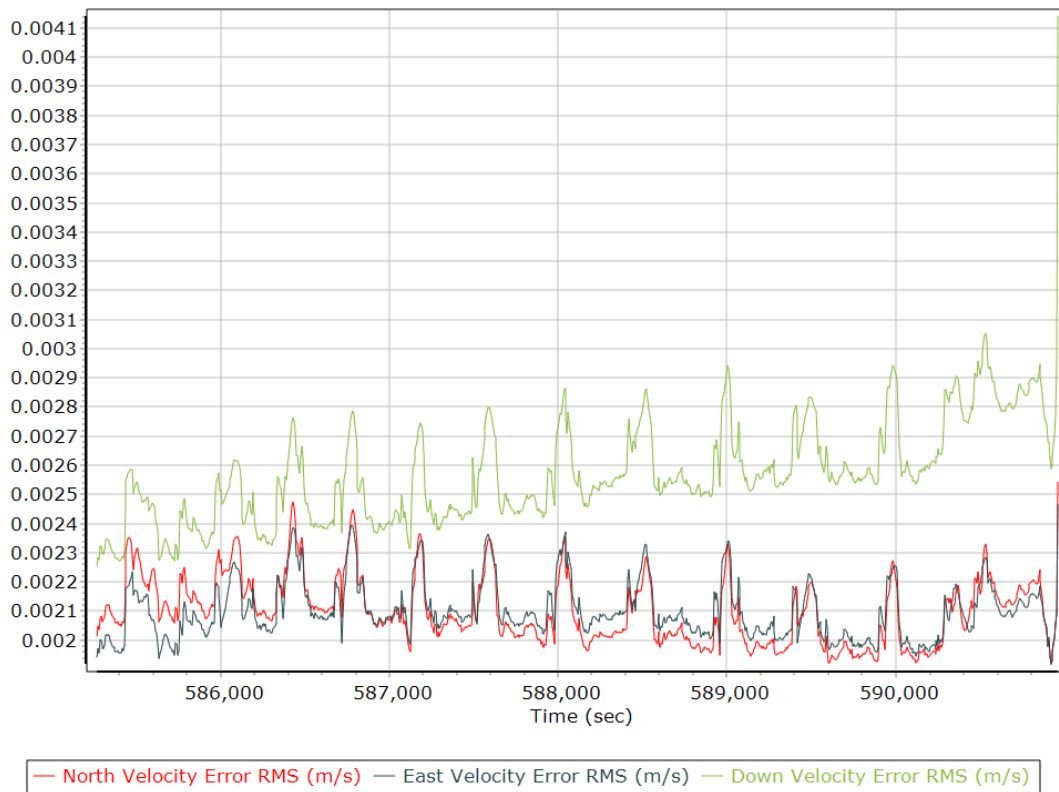


## Smoothed Performance Metrics

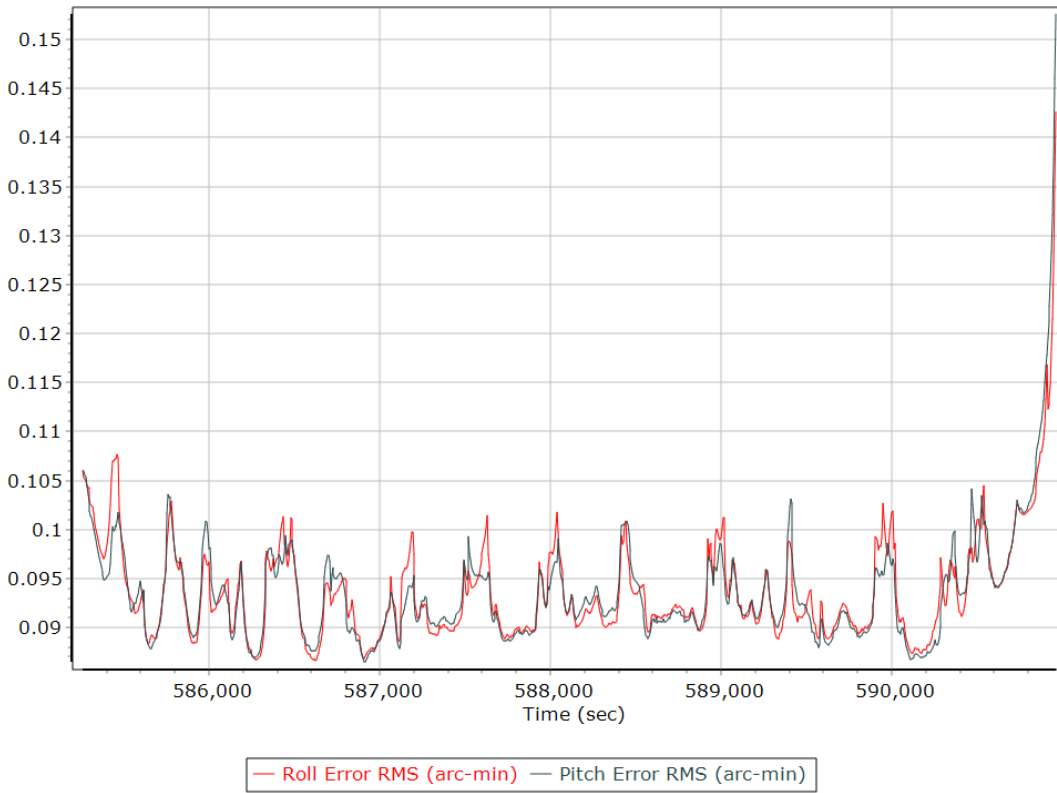
### Position Error RMS (m)



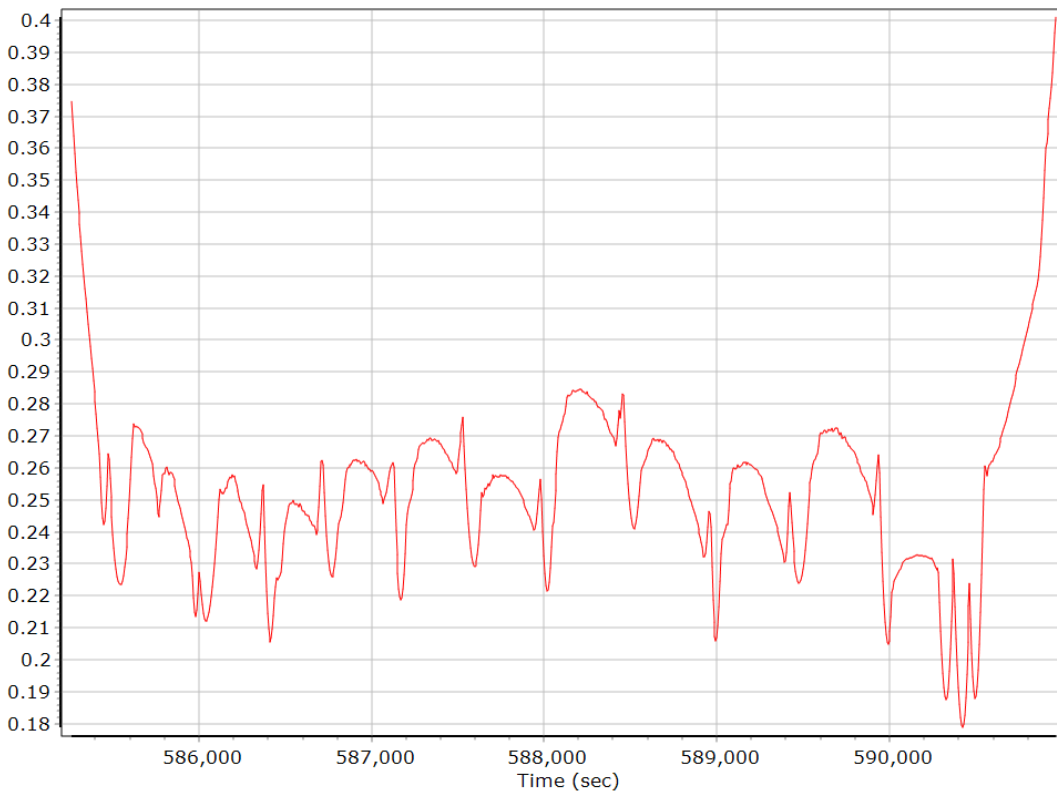
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)

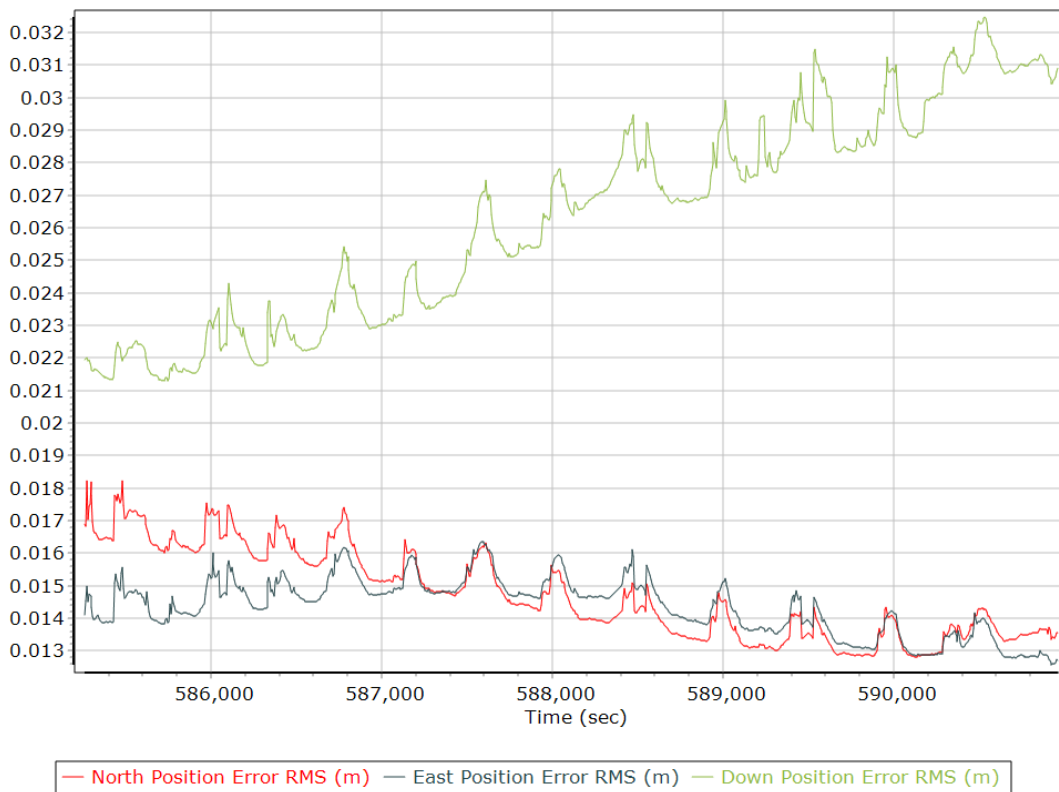


### Heading Error RMS (arc-min)

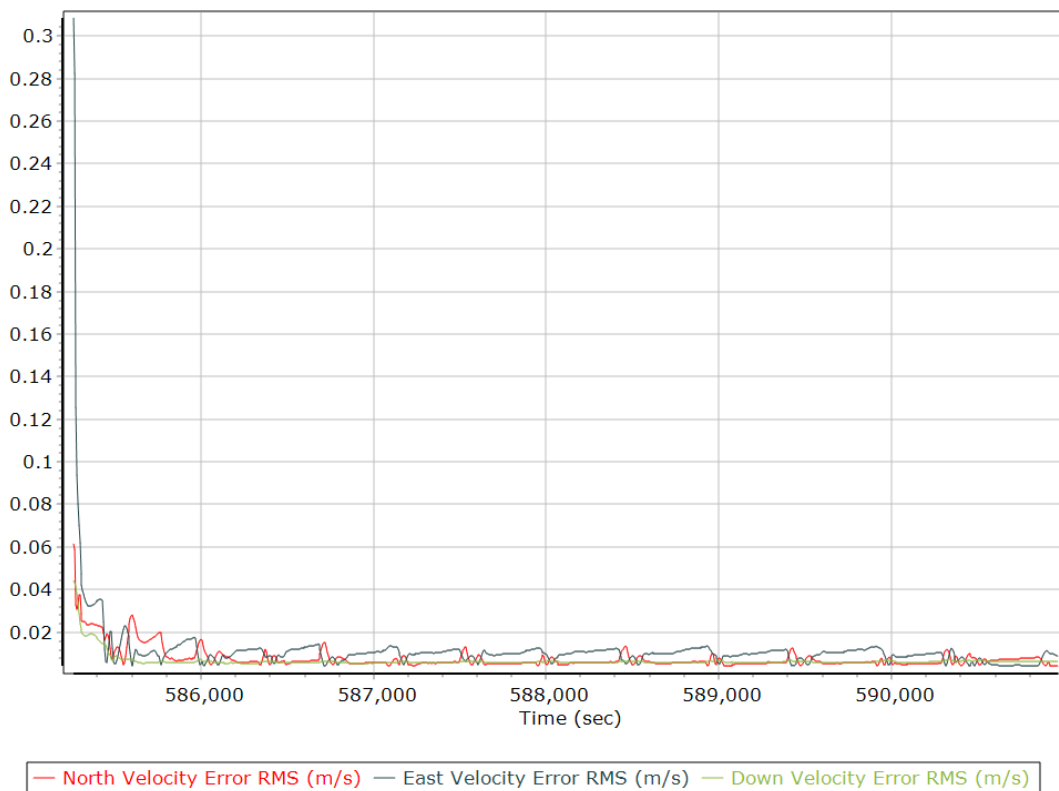


## Forward Processed Performance Metrics

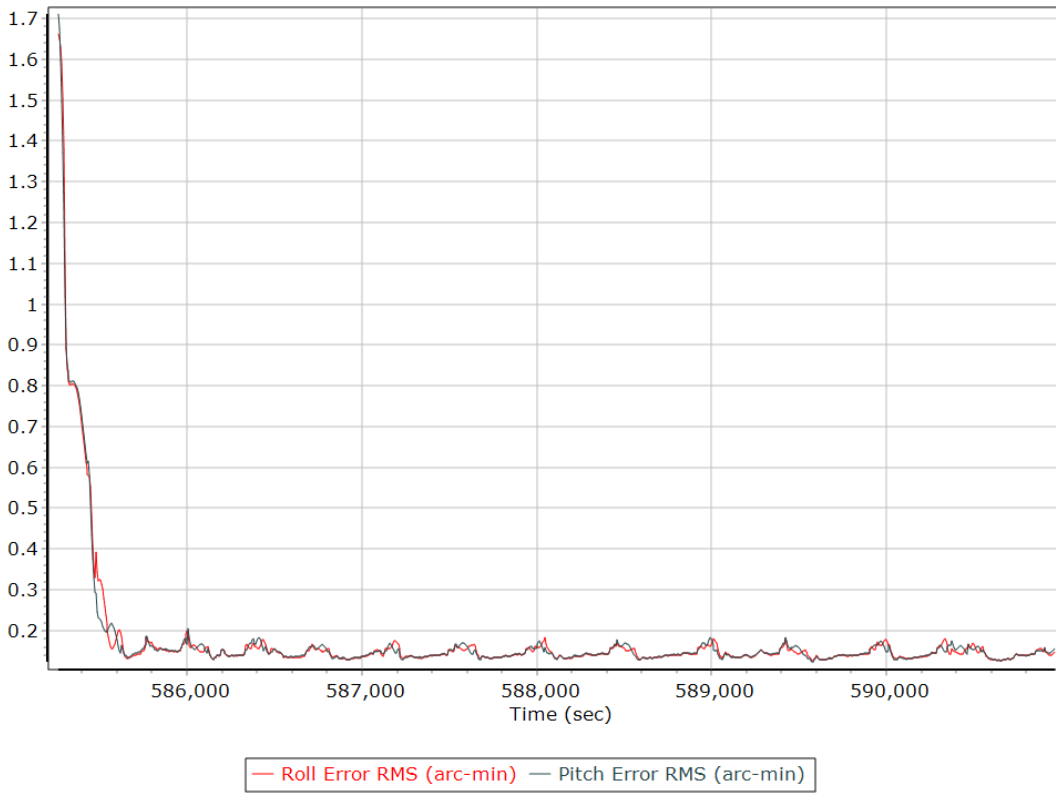
### Position Error RMS (m)



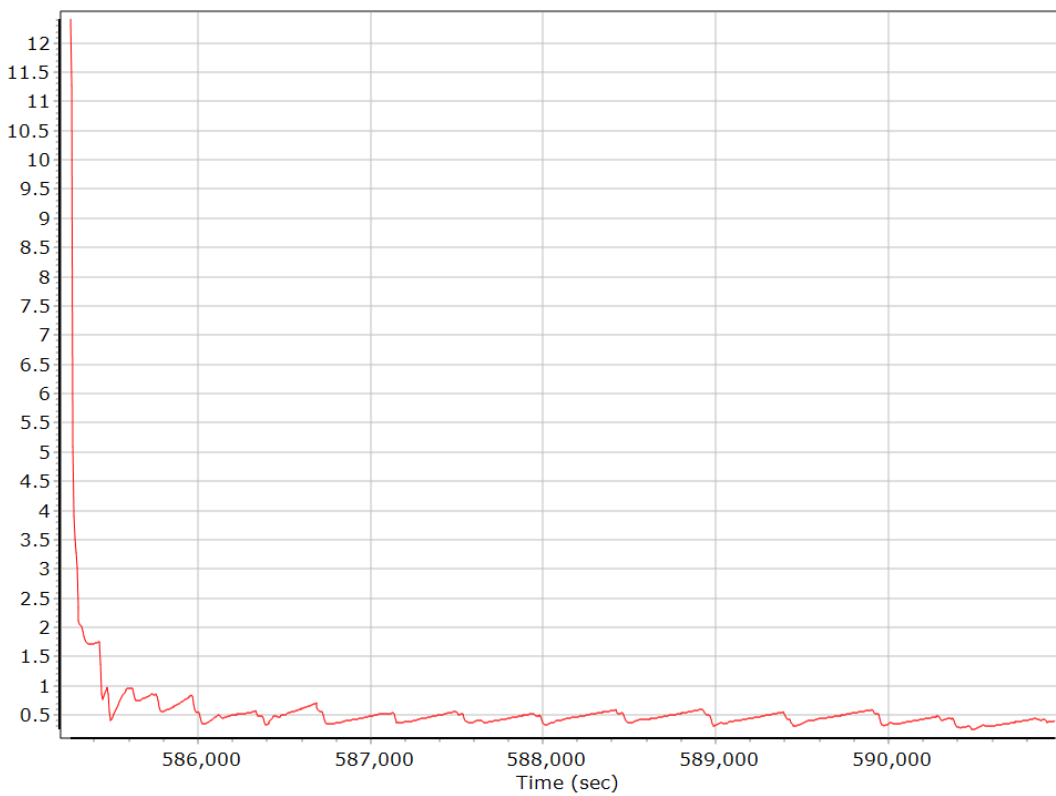
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)

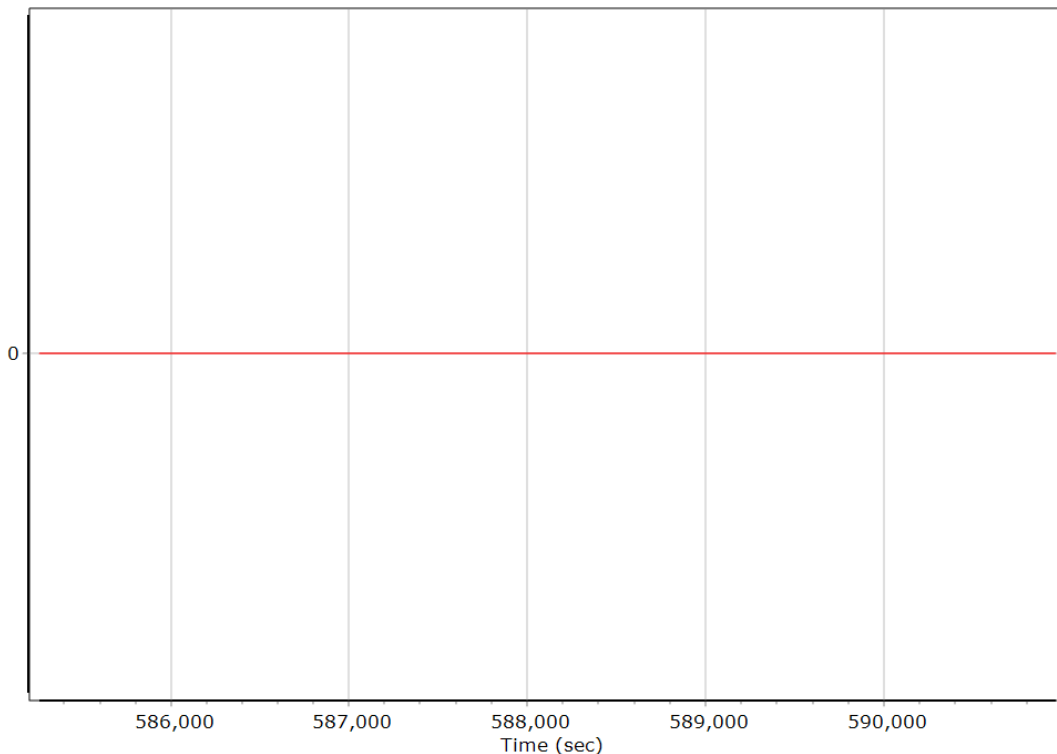


### Heading Error RMS (arc-min)



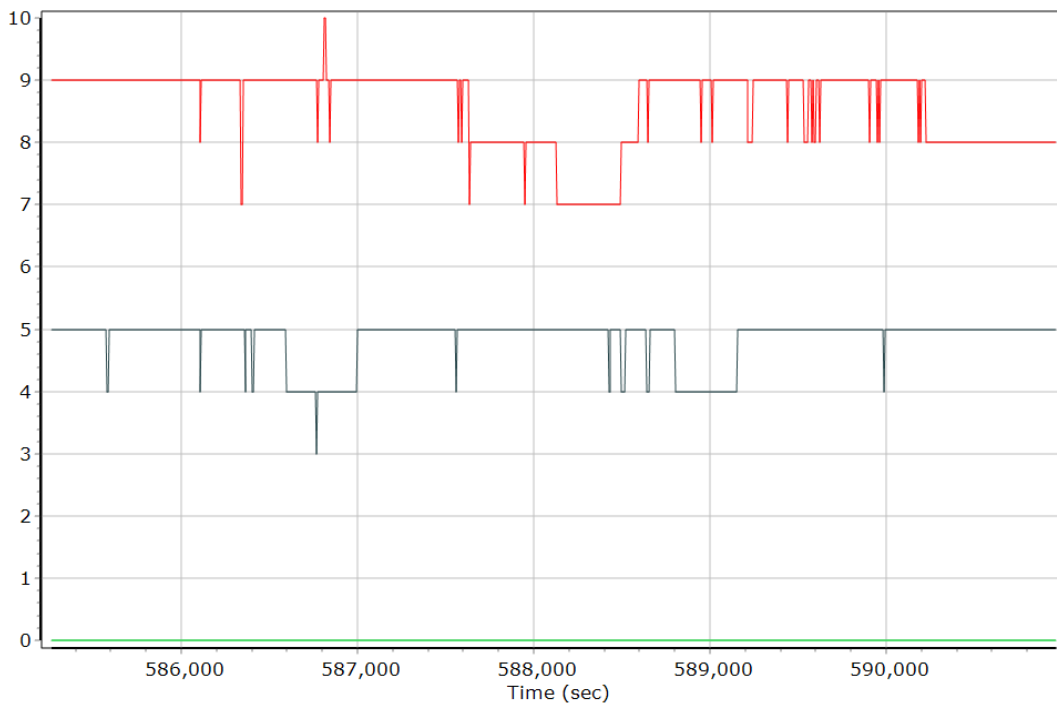
## Smoothed Solution Status

### Processing Mode



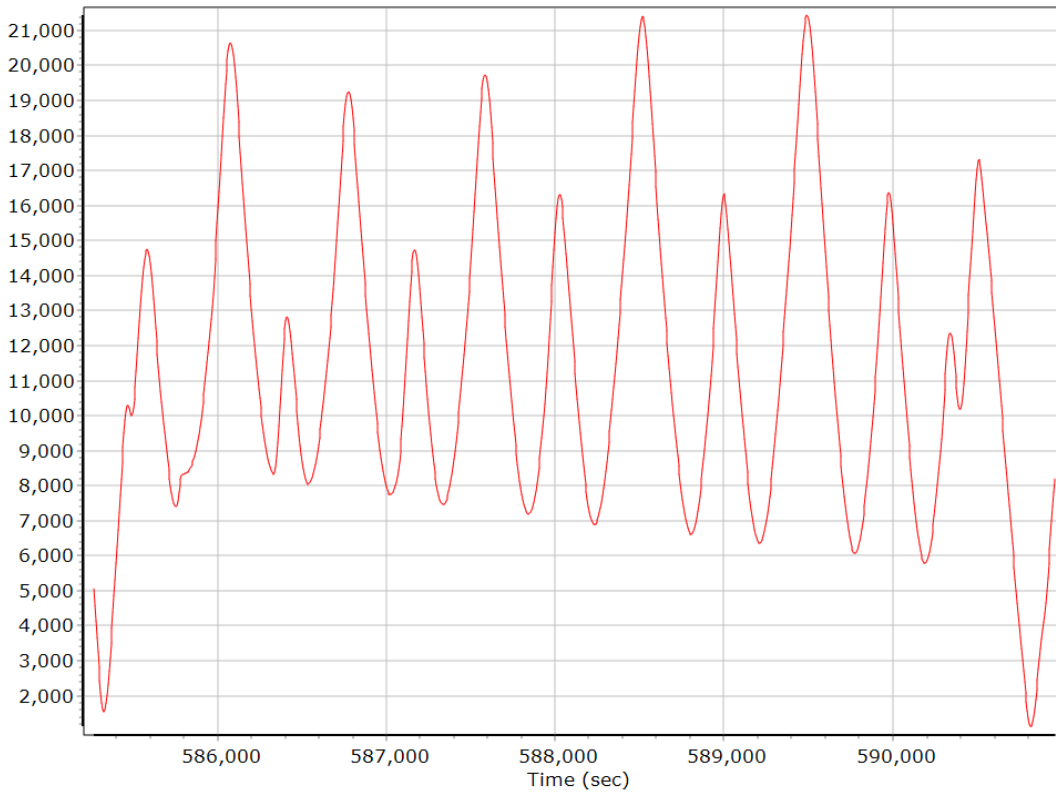
0 = Fixed NL, 1 = Fixed WL, 2 = Float, 3 = DGNSS, 4 = RTCM, 5 = IAPPP, 6 = C/A, 7 = GNSS Nav, 8 = DR

### Number of Satellites



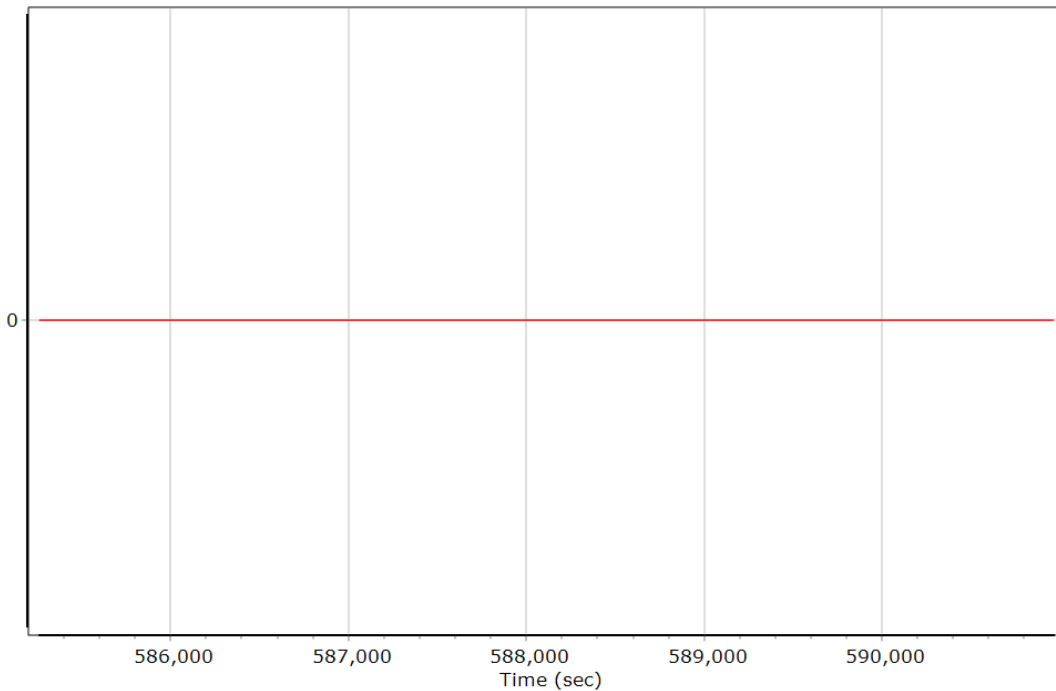
— Number of GPS Satellites   
 — Number of GLONASS Satellites   
 — Number of QZSS Satellites  
— Number of BEIDOU Satellites   
 — Number of GALILEO Satellites

### Baseline Length



### Forward Processed Solution Status

#### Processing Mode

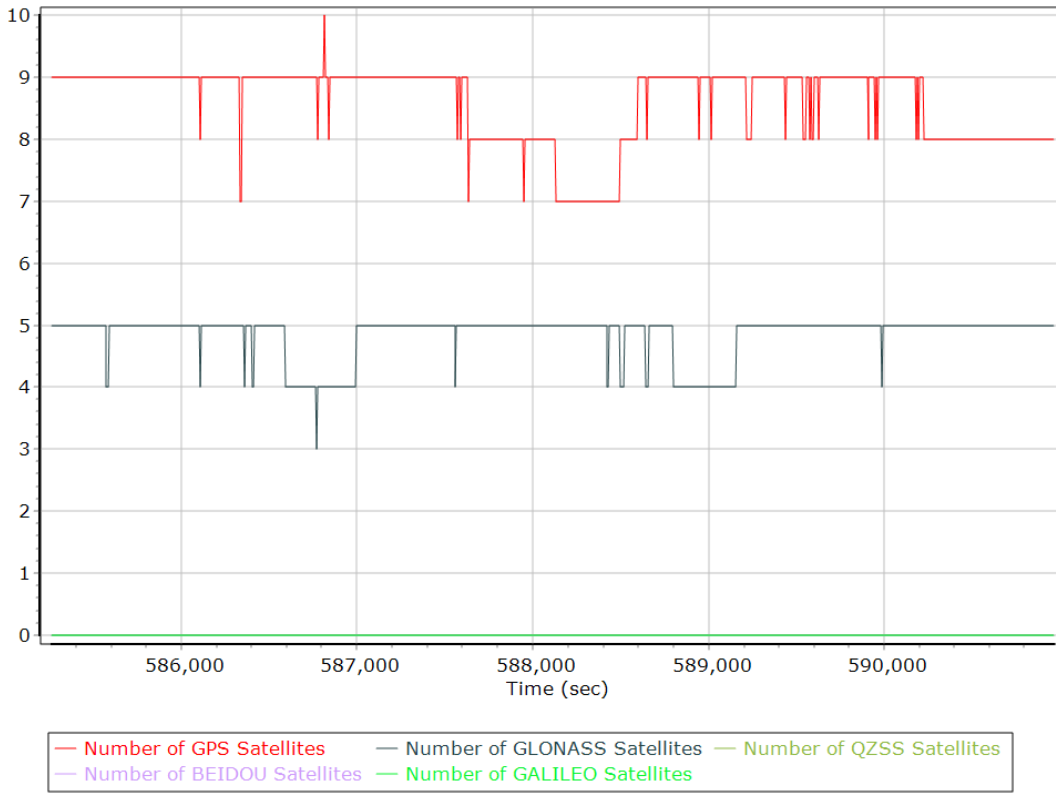


Forward  Reverse

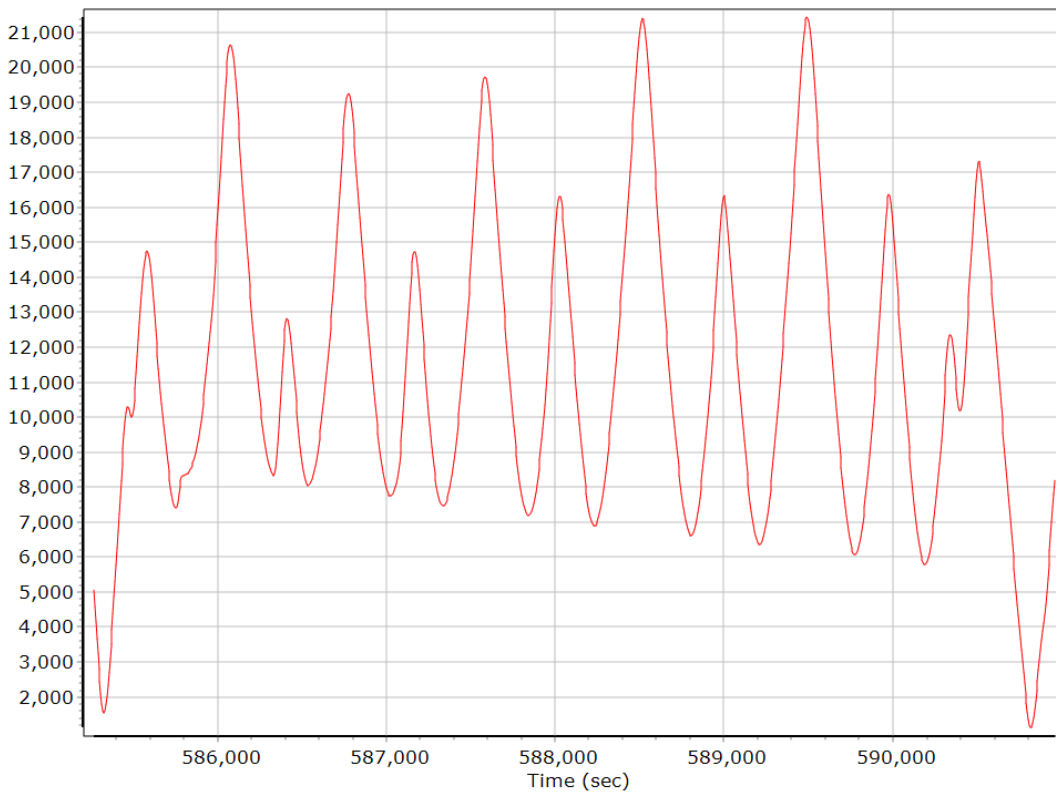
0 = Fixed NL, 1 = Fixed WL, 2 = Float, 3 = DGNSS, 4 = RTCM, 5 = IAPPP, 6 = C/A, 7 = GNSS Nav, 8 = DR



### Number of Satellites



### Baseline Length



## SBET IAKAR Separation



## General Information

### Mission Information

Project name	201212B
Processing date	2020-12-14 15:14:18
Mission date	2020-12-13 18:48:18
Mission duration	03:22:27.815
Processing mode	IN-Fusion Single Base
GPS Station	NCSR

### Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N9450
IMU type	57
Receiver type	BD982
Antenna type	AV39

## Project File List

### Rover Data Files

File name	File type
201213B.500	POS Data
201213B.501	POS Data
201213B.502	POS Data
201213B.503	POS Data
201213B.504	POS Data
201213B.505	POS Data
201213B.506	POS Data
201213B.507	POS Data
201213B.508	POS Data
201213B.509	POS Data
201213B.510	POS Data
201213B.511	POS Data
201213B.512	POS Data
201213B.513	POS Data
201213B.514	POS Data
201213B.515	POS Data
201213B.516	POS Data
201213B.517	POS Data
201213B.518	POS Data
201213B.519	POS Data
201213B.520	POS Data

### Input Files

File Name	File Type
Ephm3480.20g	GLONASS Broadcast Ephemeris
Ephm3480.20n	GPS Broadcast Ephemeris
ncsr3480.20o	GNSS SingleBase

### Output Files

Filename	File type
sbet_201113B.out	SBET Trajectory File

## Rover Data Summary

First raw data file	201213B.500		
Last raw data file	201213B.520		
Start GPS week	2136		
Start time	67697.146 (12/13/2020 6:48:17 PM)		
End time	81856.433 (12/13/2020 10:44:16 PM)		
Start of fine alignment	68850.642 (12/13/2020 7:07:30 PM)		
Available subsystems	Primary GNSS, IMU		
POS Event Input	None		
Correction data	None		
<b>IMU Installation Lever Arms &amp; Mounting Angles</b>			
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference to Primary GNSS lever arm std dev (m)	-1.000		
Aircraft to Reference mounting angles (deg)	0.000	0.000	0.000

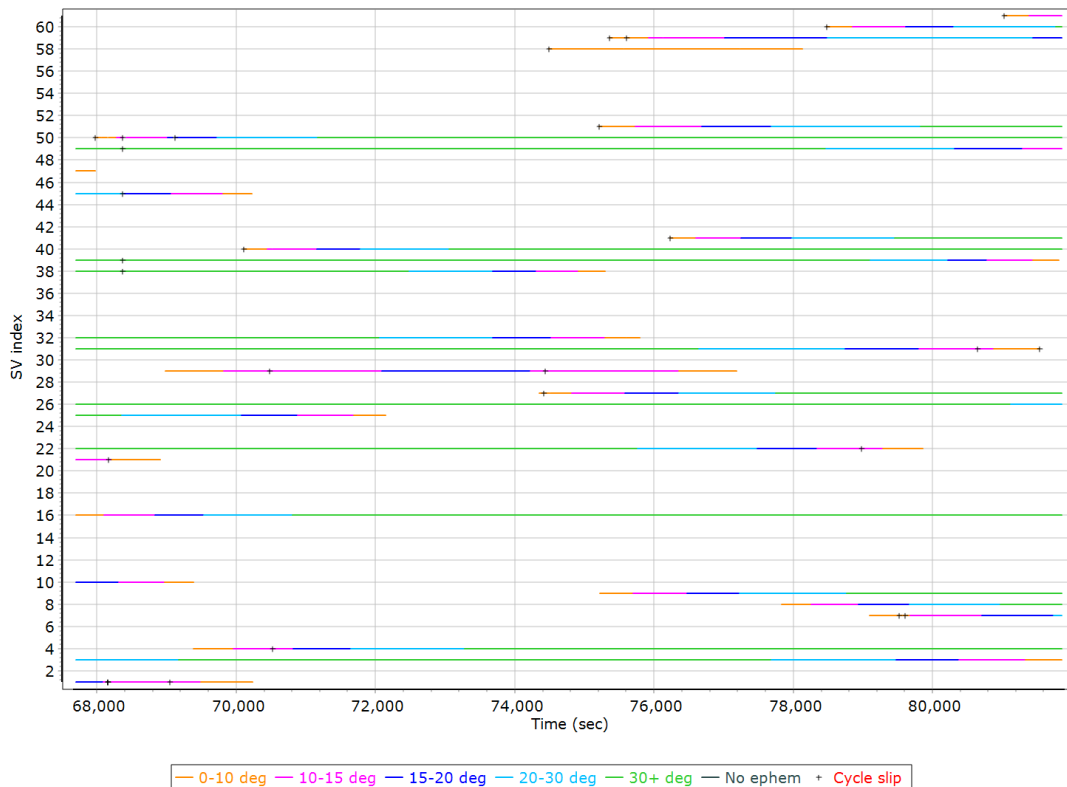
## Rover Data QC

### Raw IMU Import QC Summary

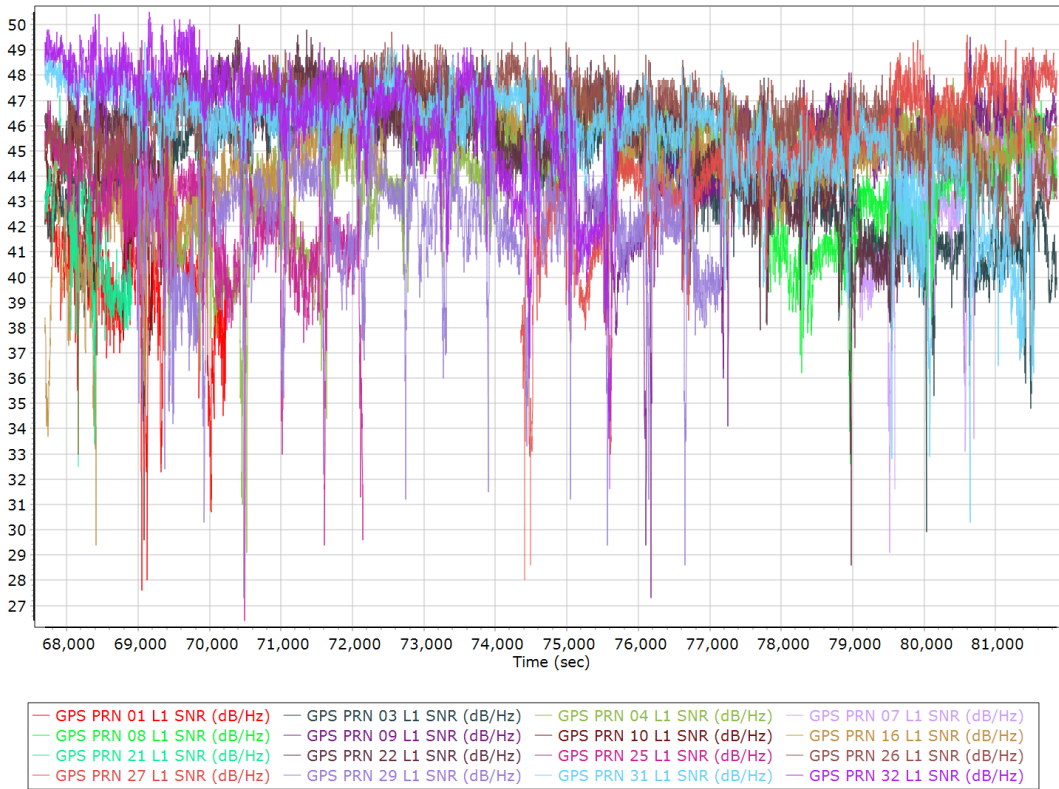
IMU data input file	imu_Mission 1.dat
IMU data check log file	imudt_201113B.log
IMU Records Processed	2831245
Termination Status	Normal
IMU Anomalies	0

## Primary Observables & Satellite Data

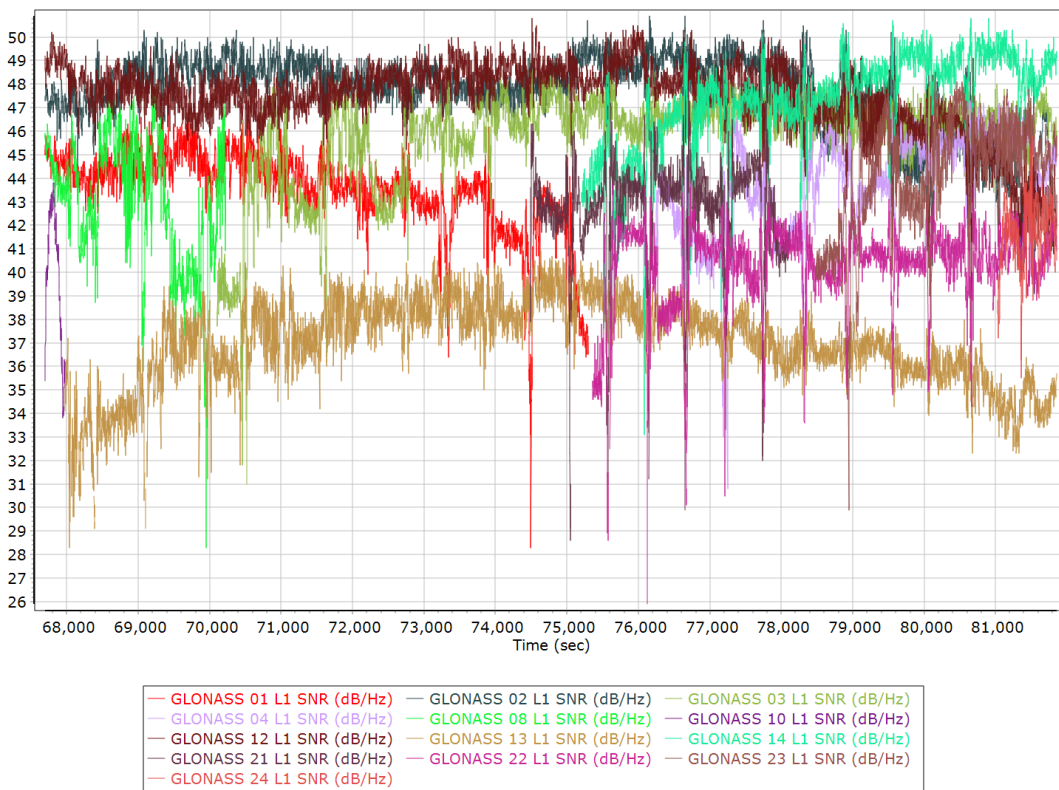
### GPS/GLONASS L1 Satellite Lock/Elevation



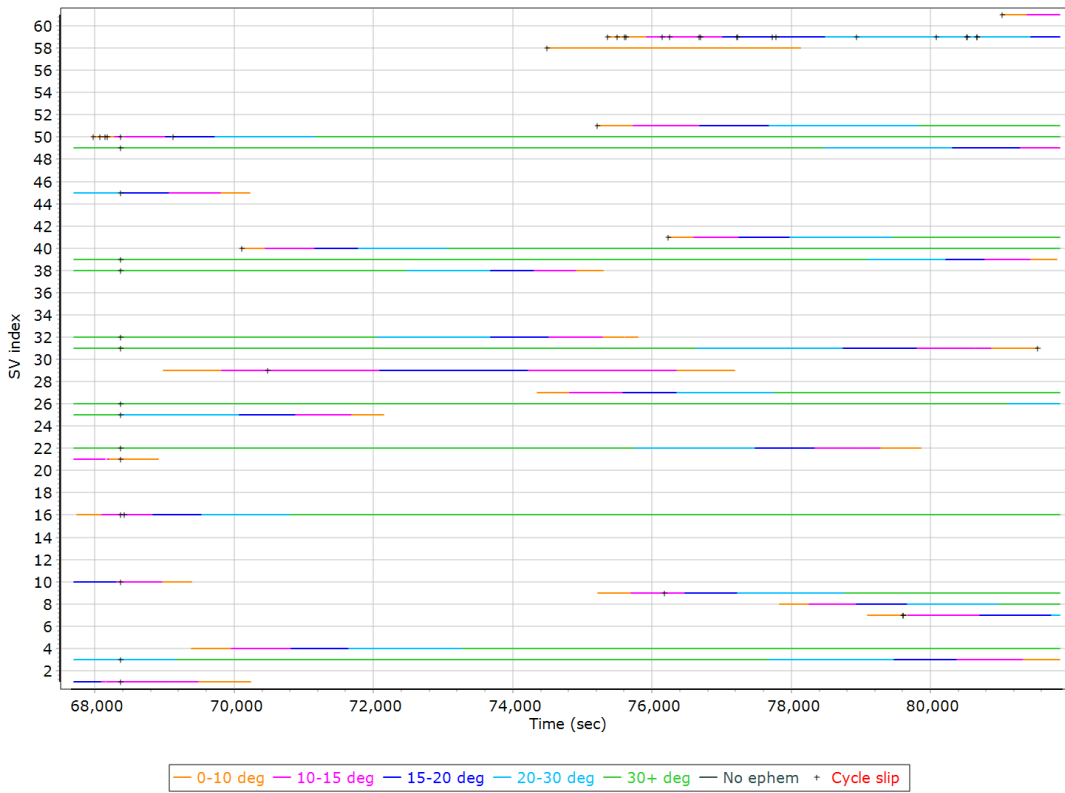
### GPS L1 SNR



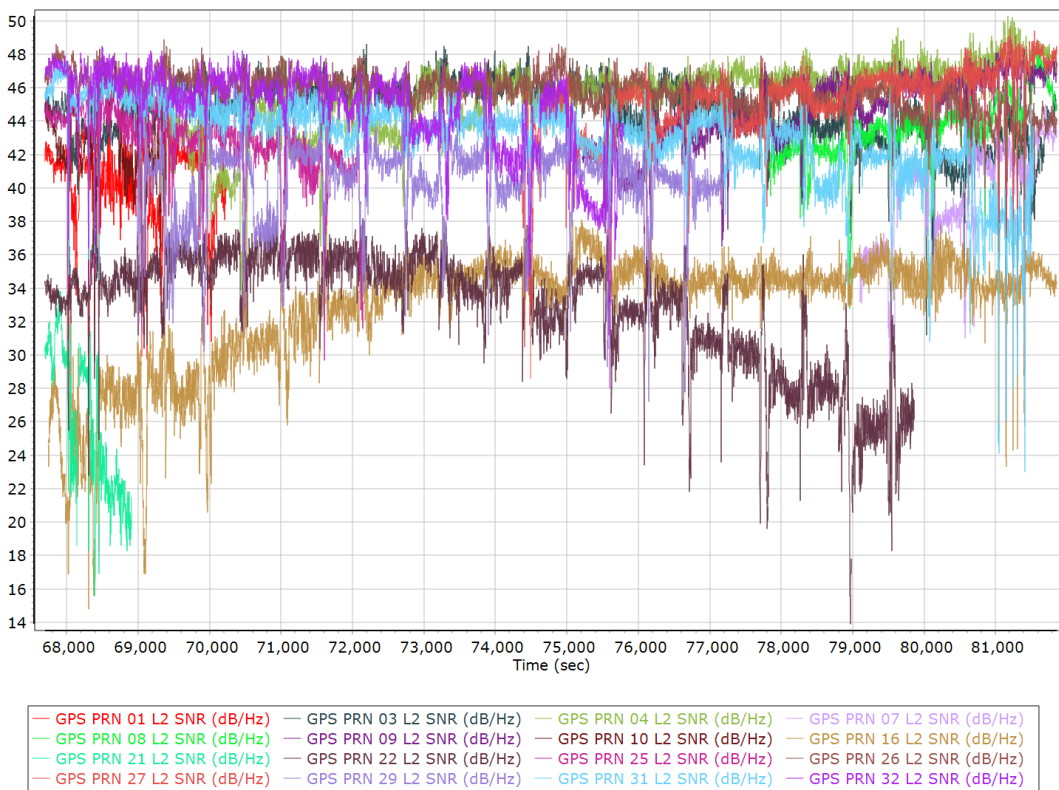
### GLONASS L1 SNR



### GPS/GLONASS L2 Satellite Lock/Elevation

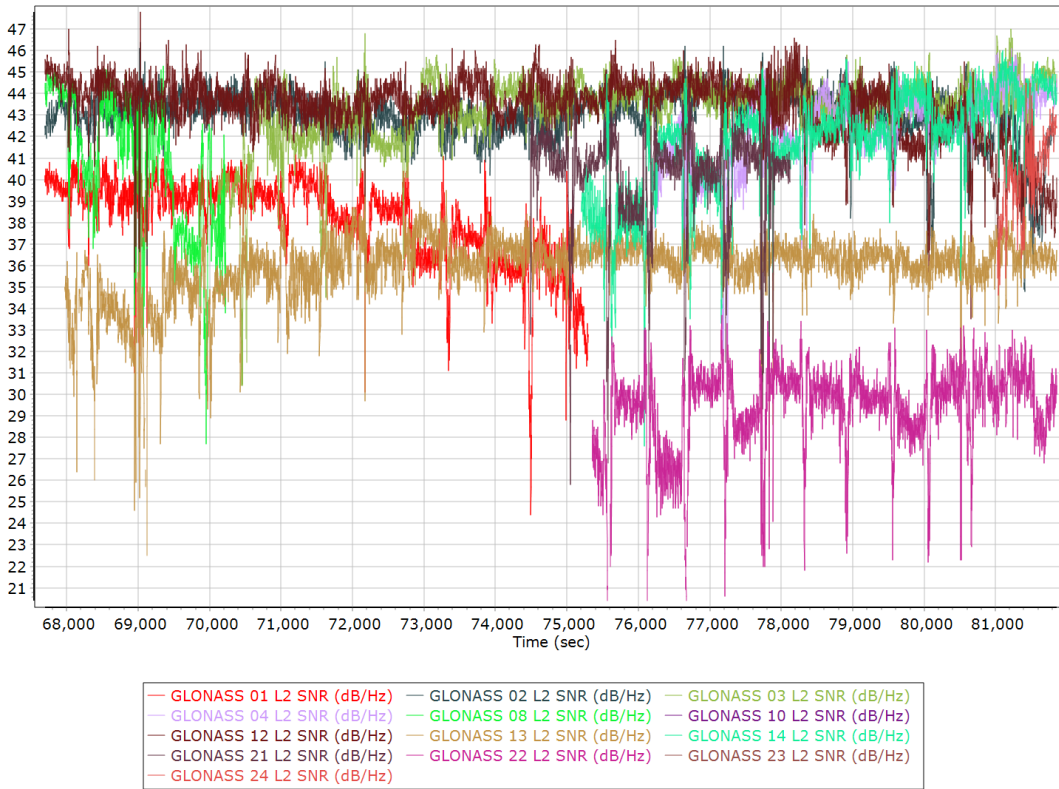


### GPS L2 SNR

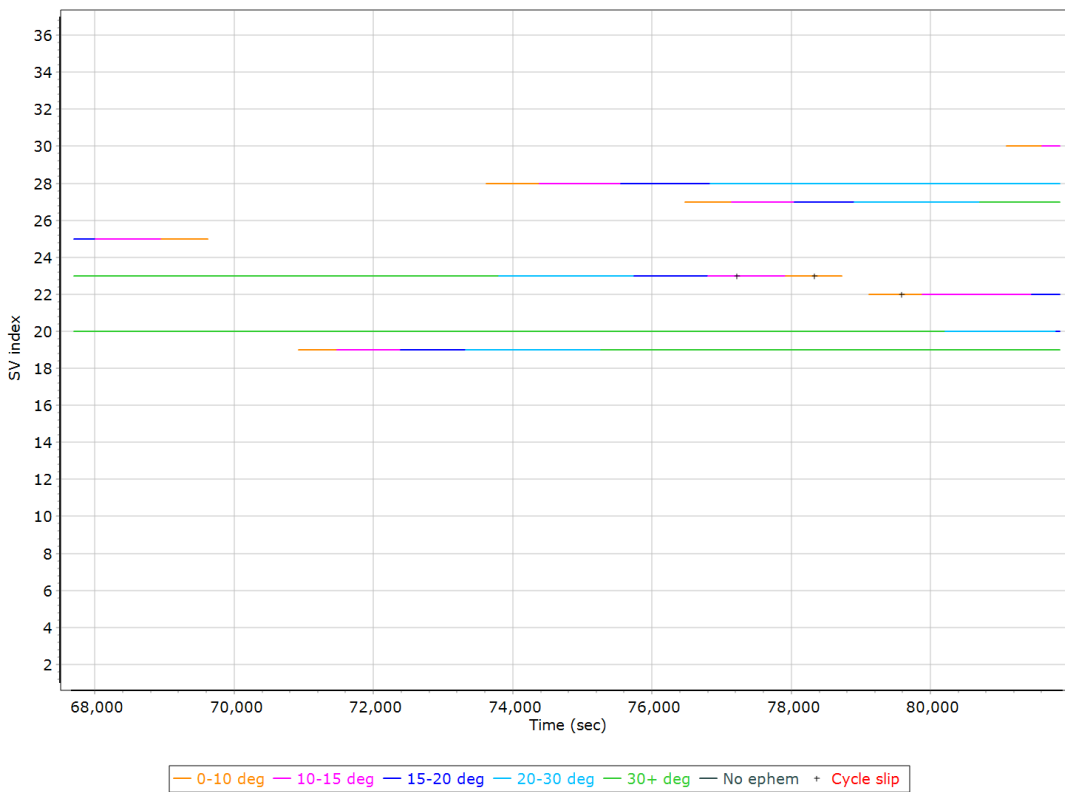




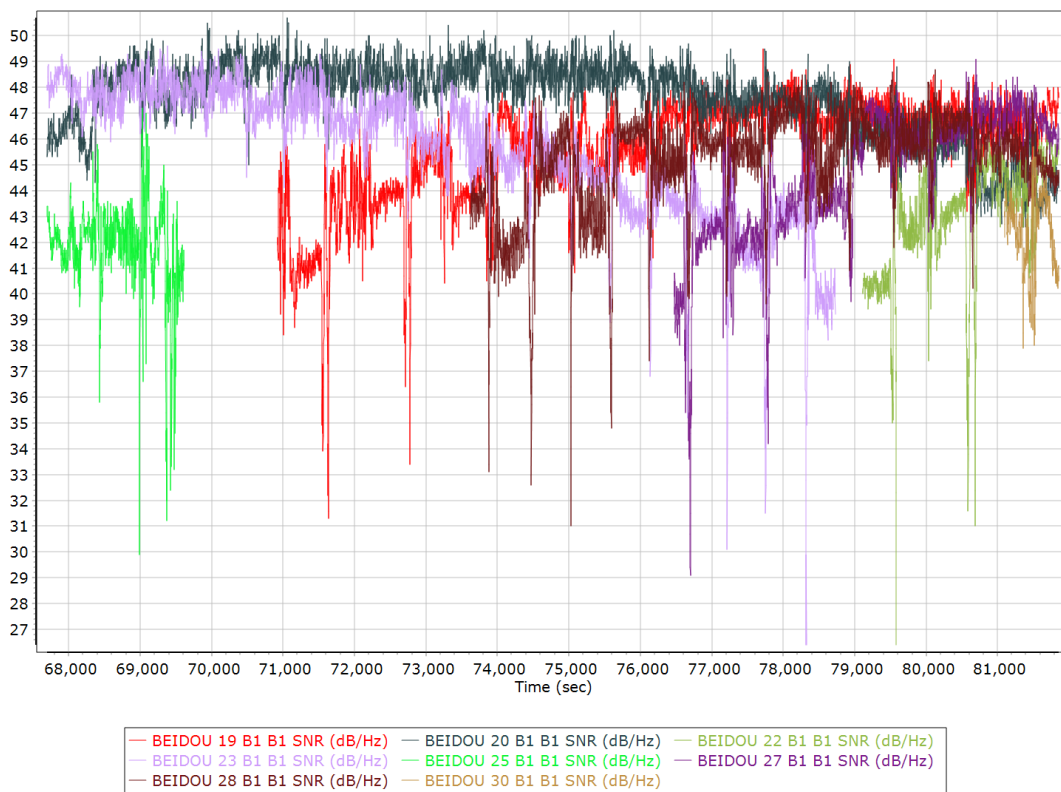
### GLONASS L2 SNR



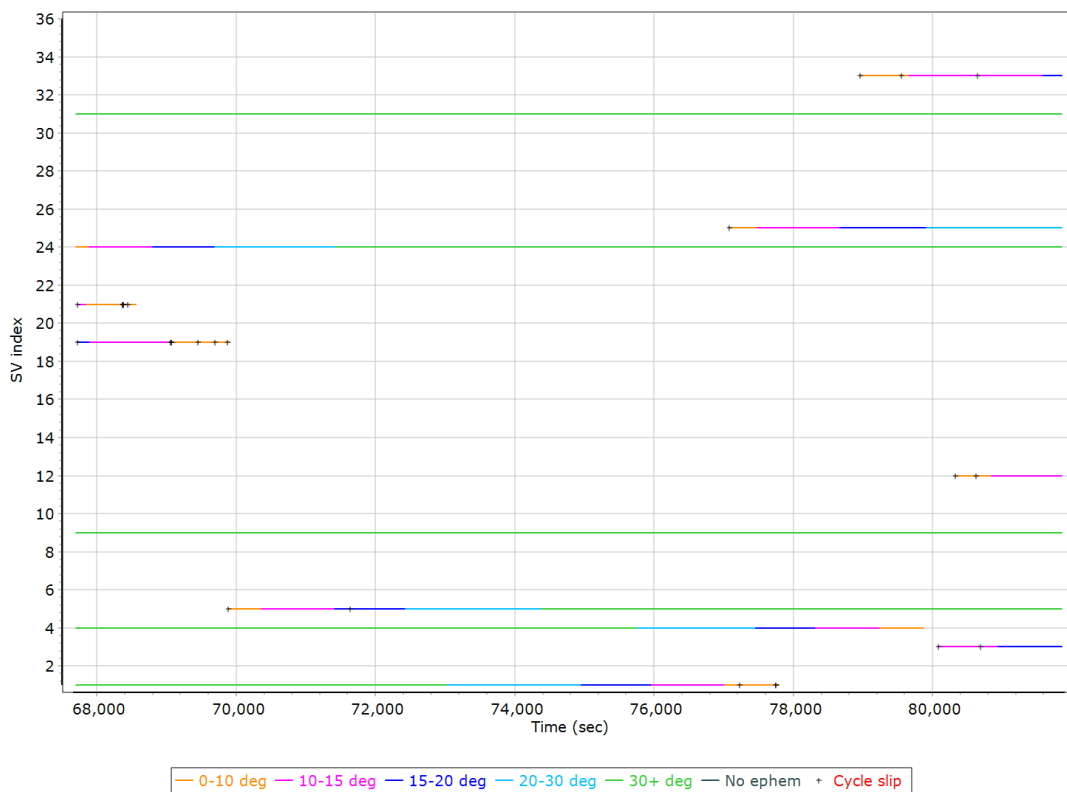
### BEIDOU Satellite Lock/Elevation



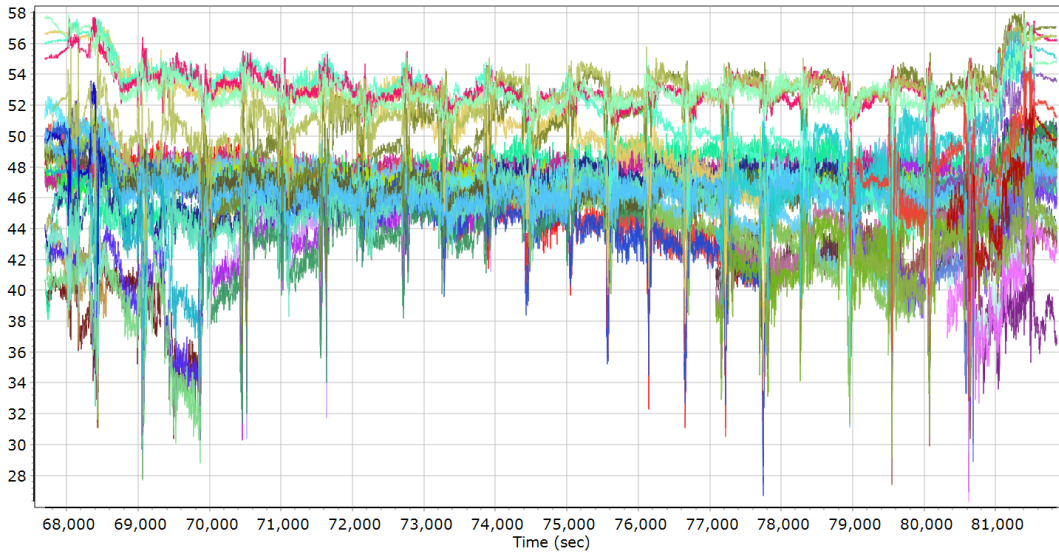
### BEIDOU SNR



### GALILEO Satellite Lock/Elevation



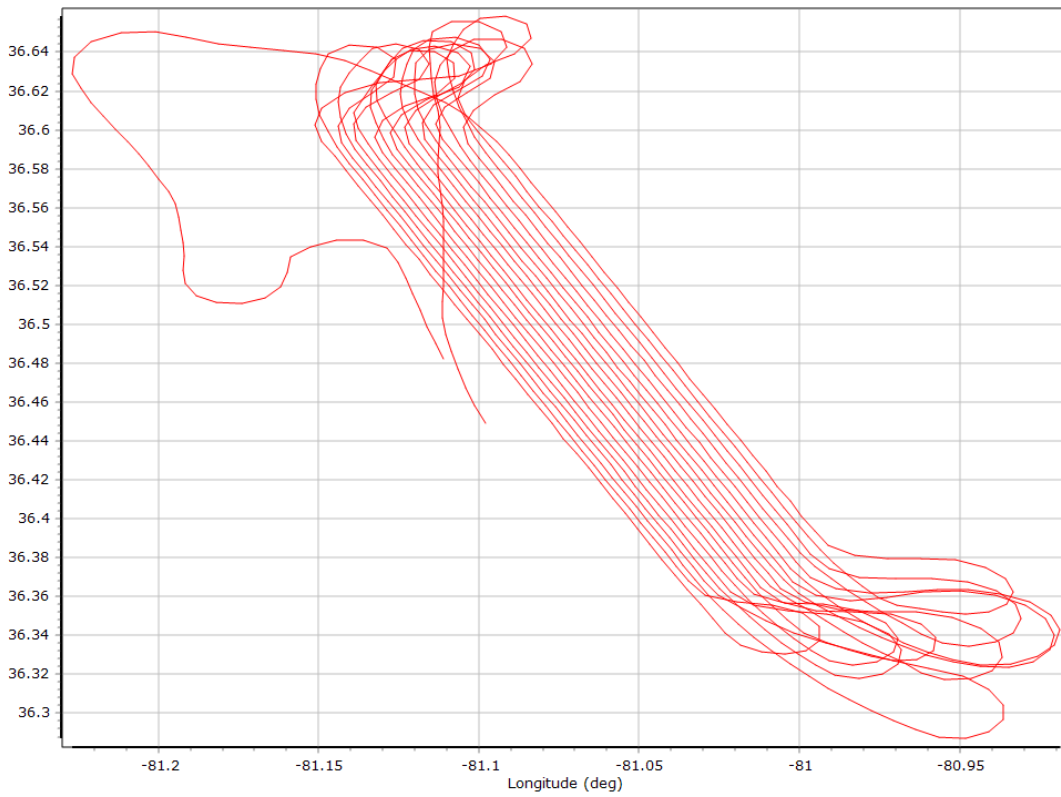
## GALILEO SNR



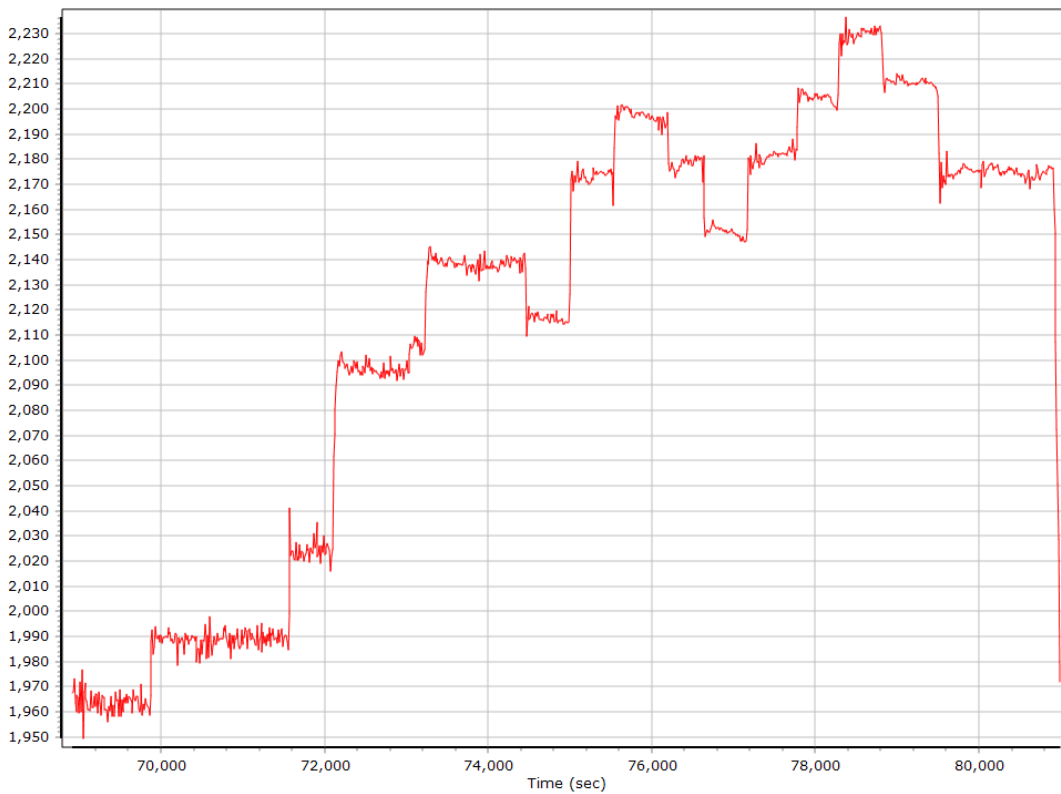
— GALILEO 01 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 04 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 19 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 21 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 24 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 25 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 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 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

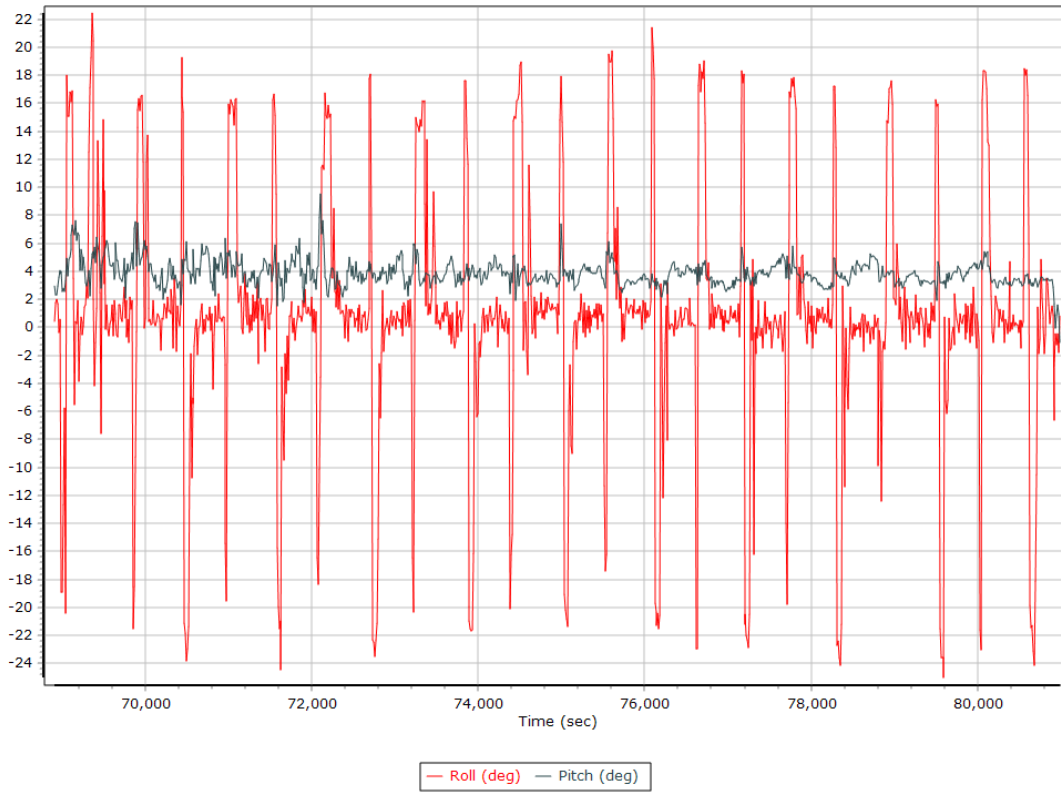
### Top View



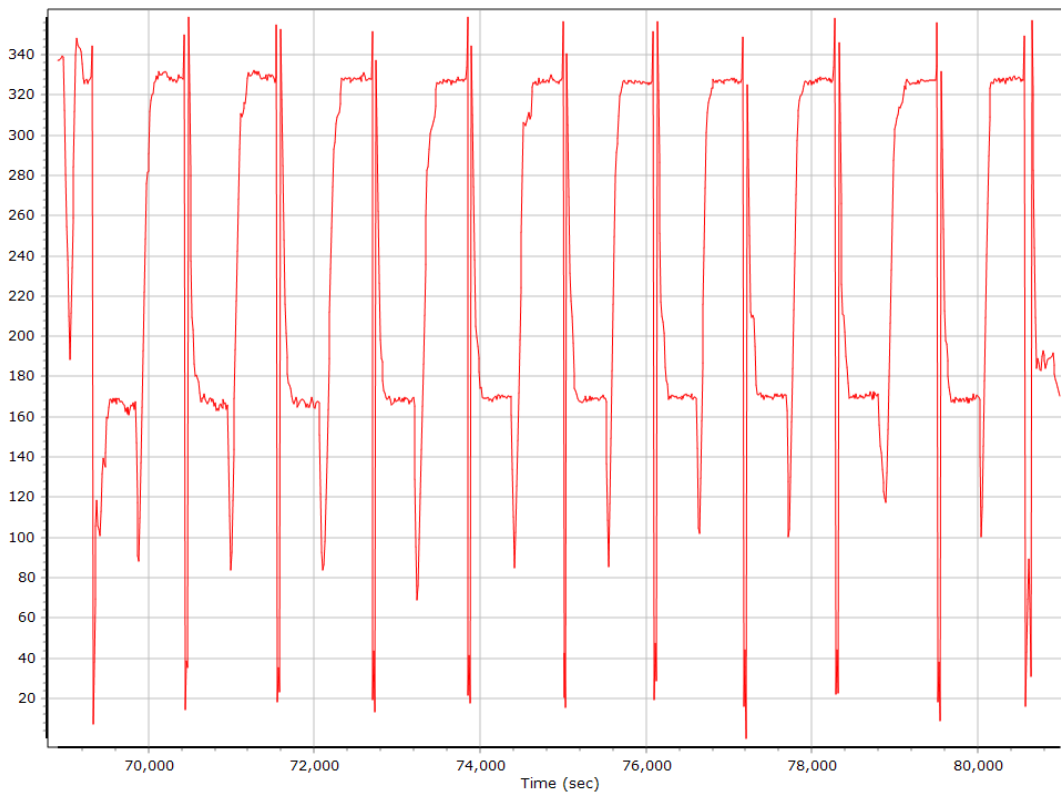
### Altitude



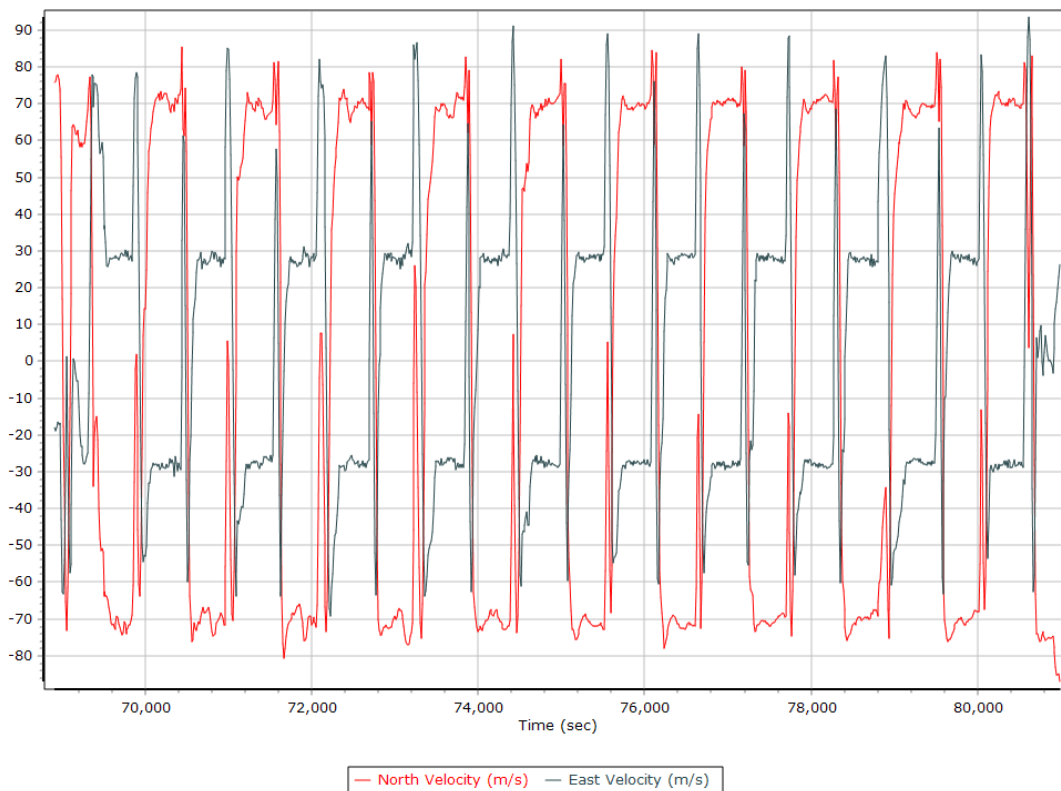
## Roll/Pitch



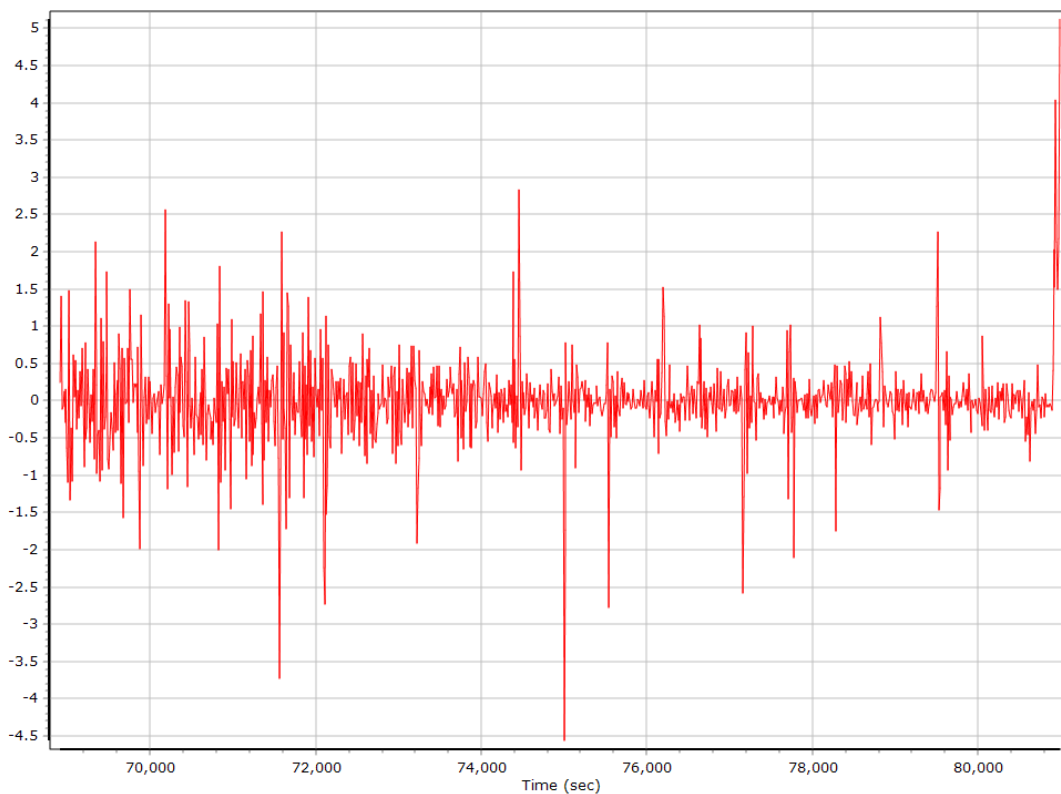
## Heading



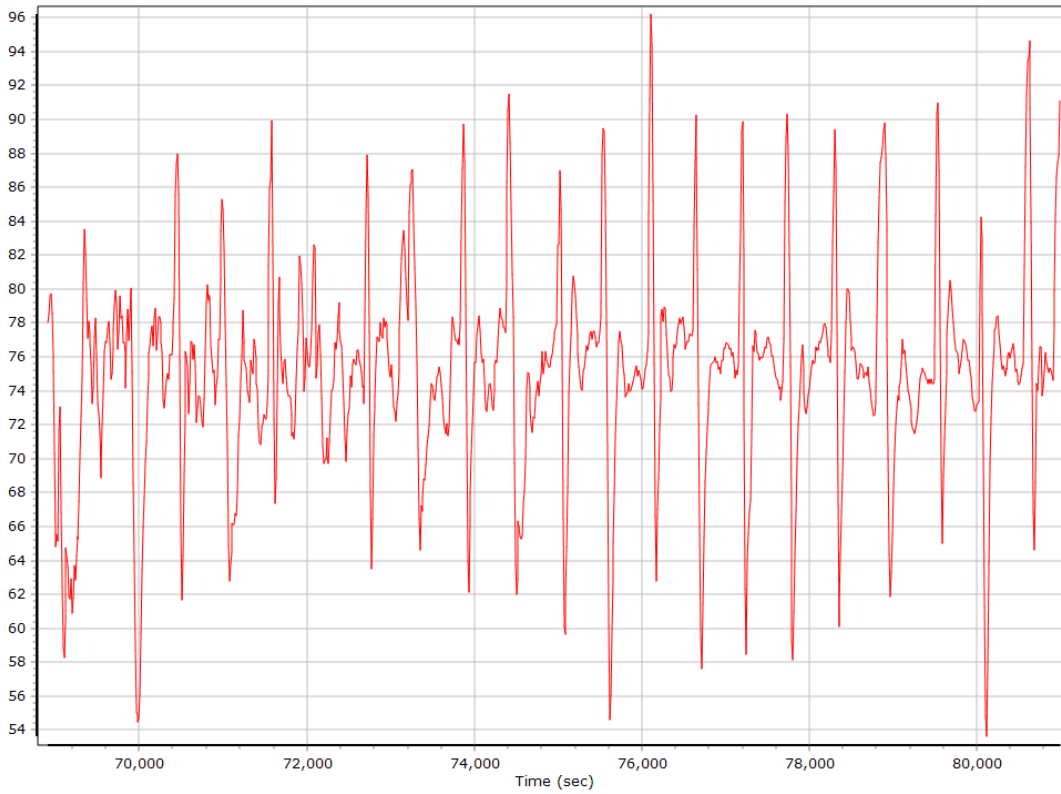
### North/East Velocity



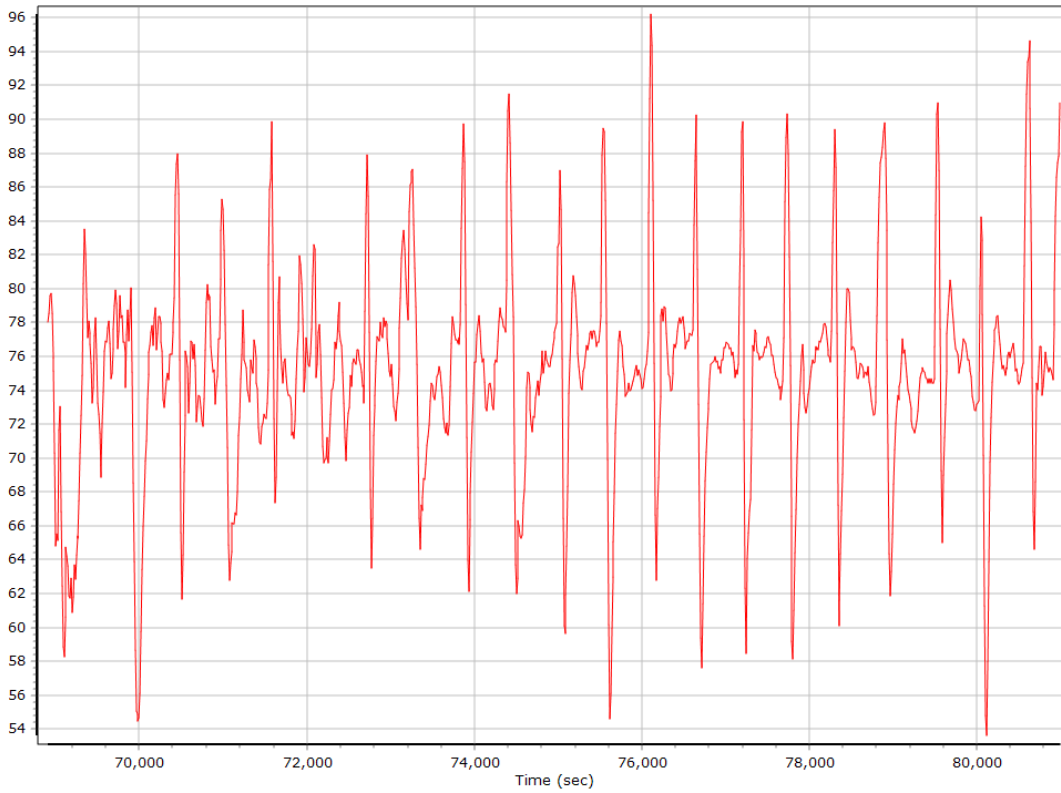
### Down Velocity



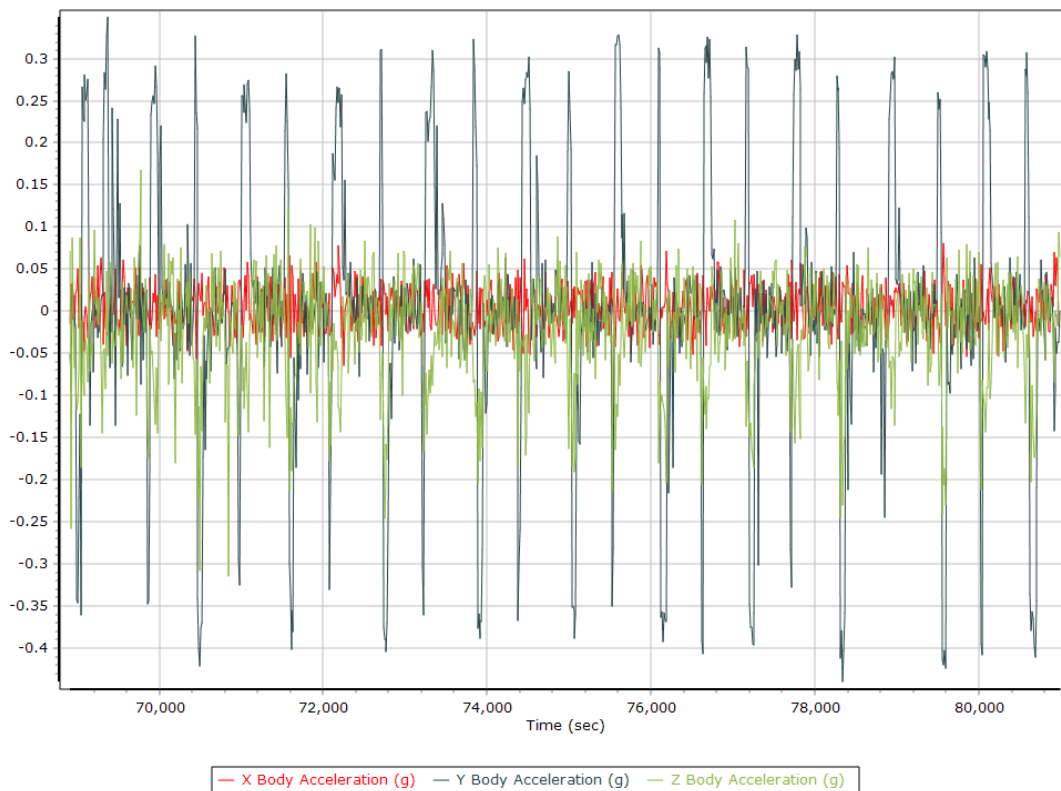
## Total Speed



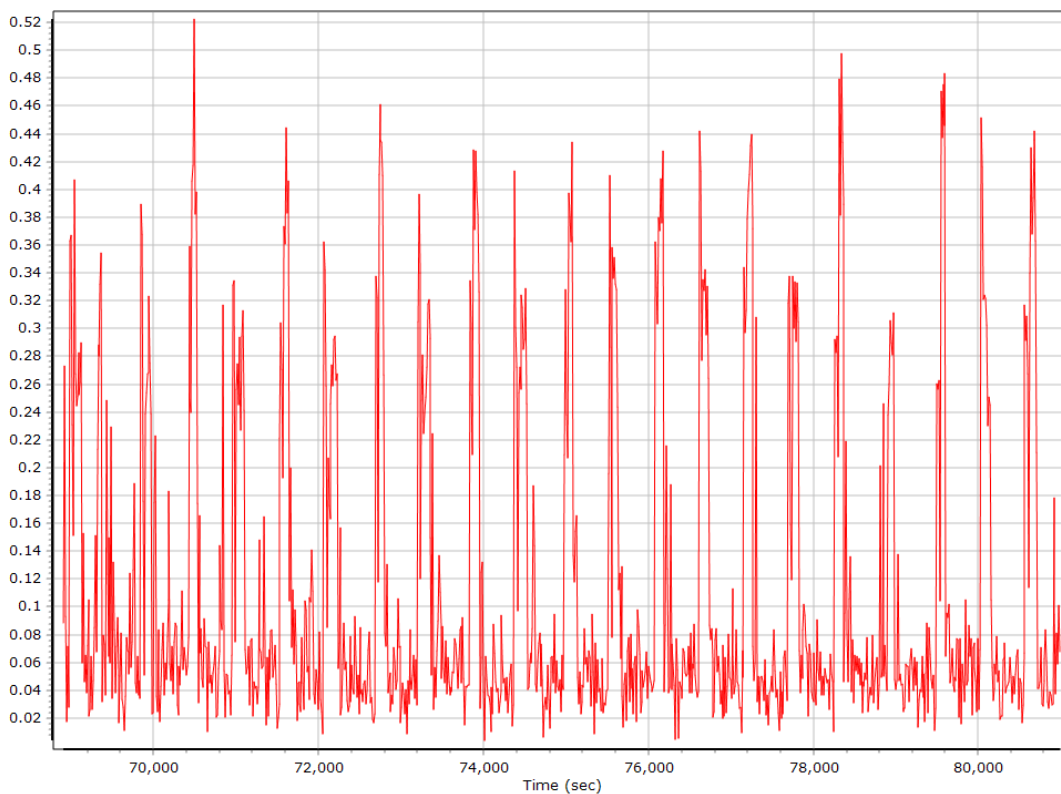
## Ground Speed



## Body Acceleration



## Total Body Acceleration



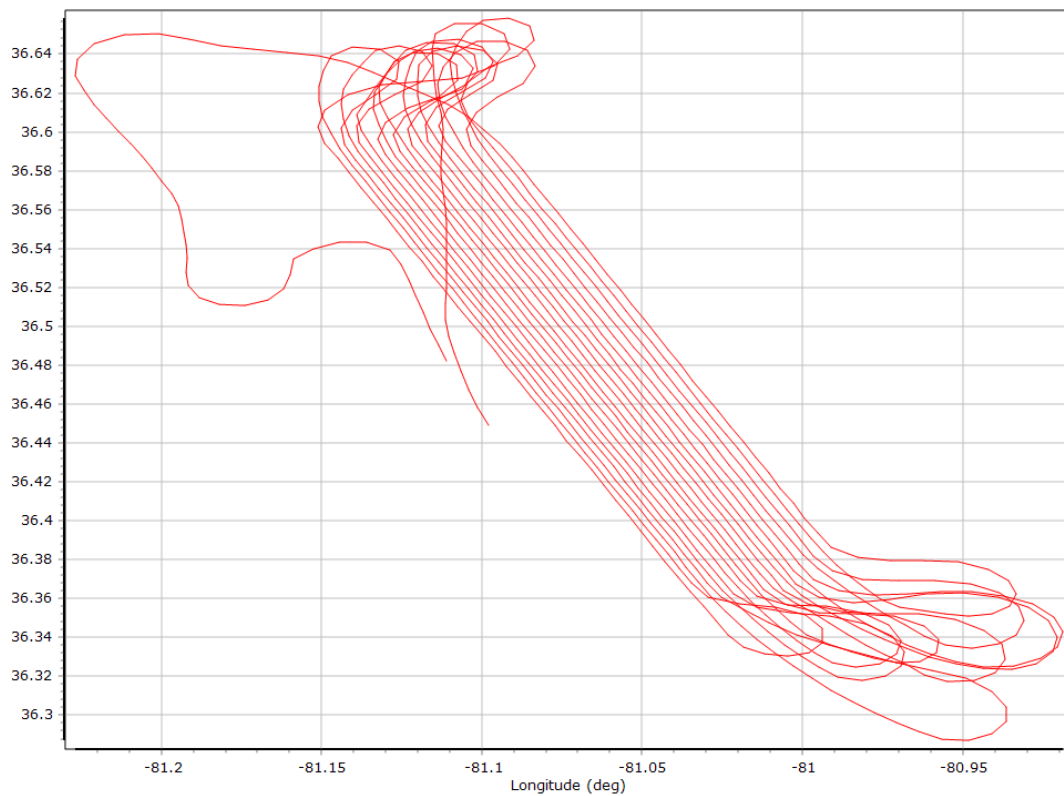


## Body Angular Rate

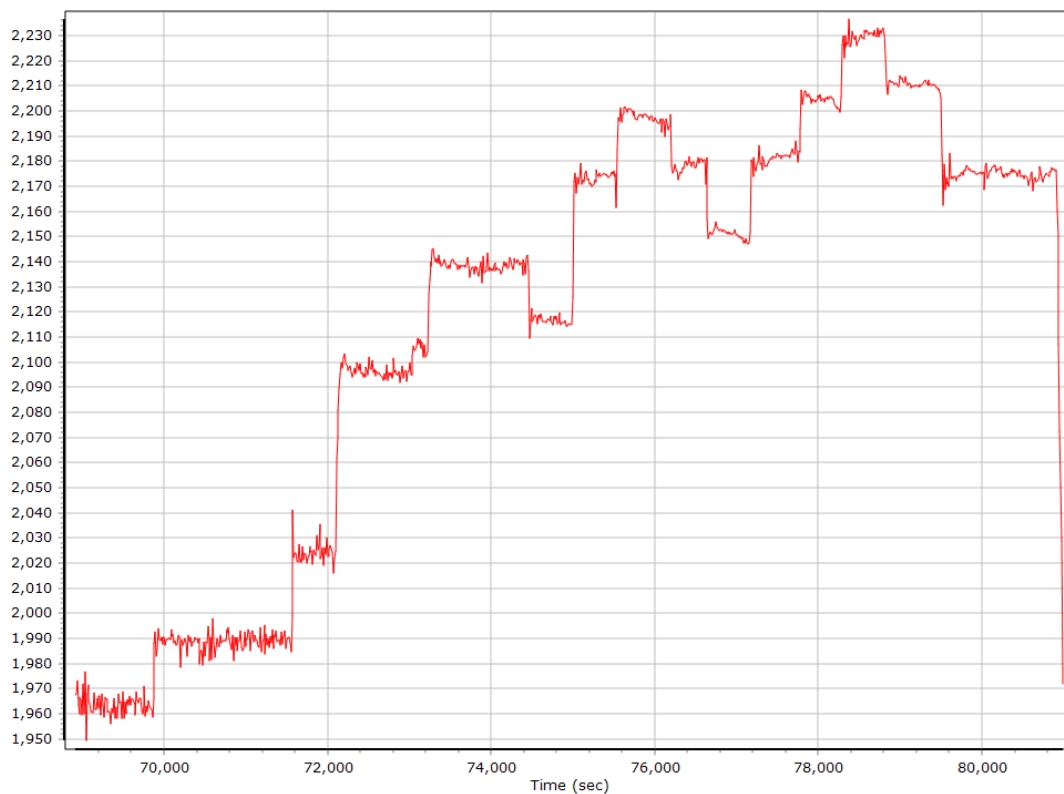


## Forward Processed Trajectory Information

### Top View



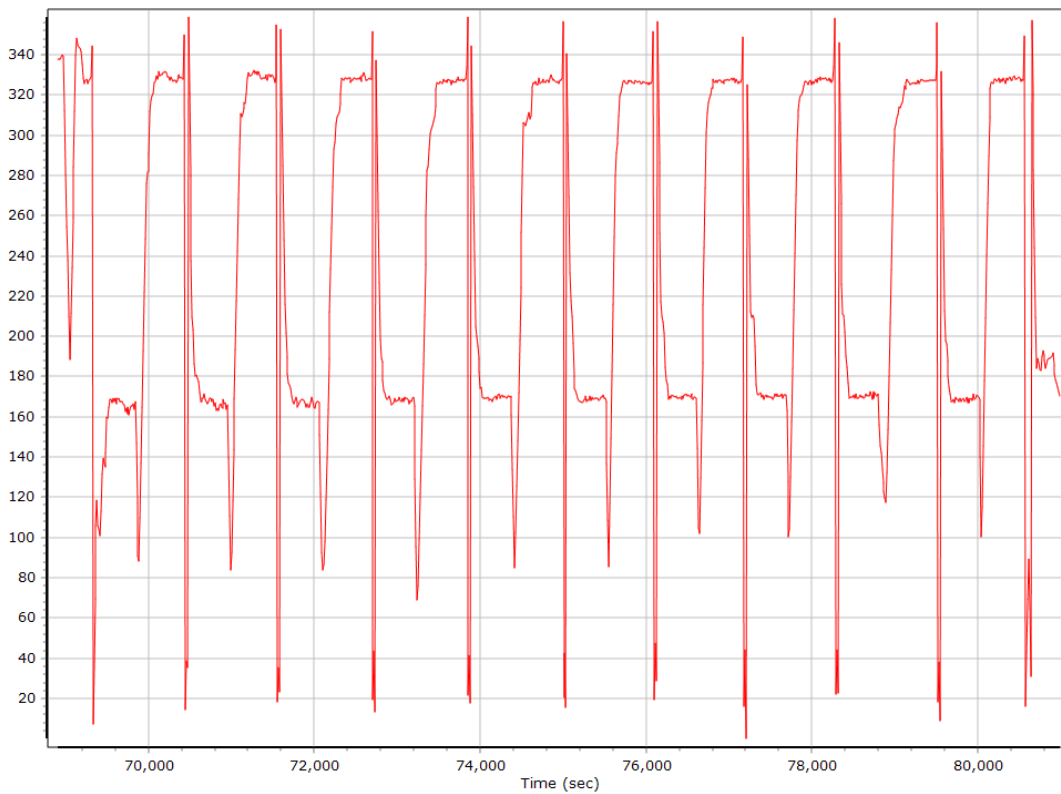
### Altitude



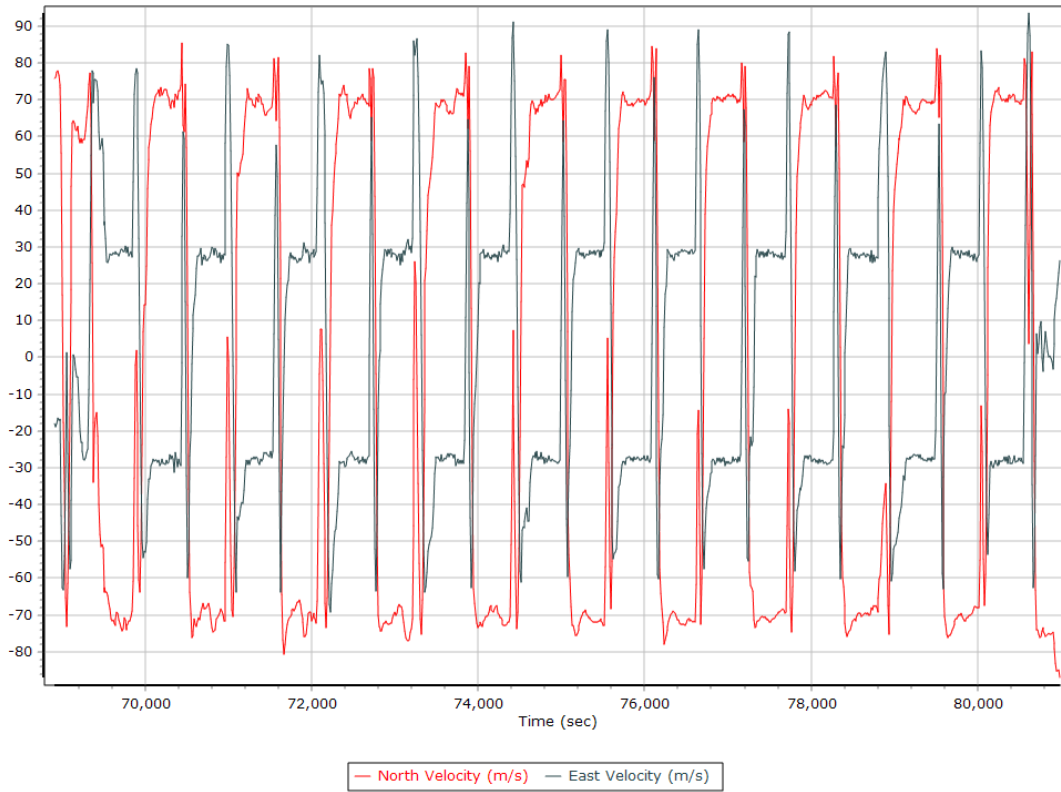
## Roll/Pitch



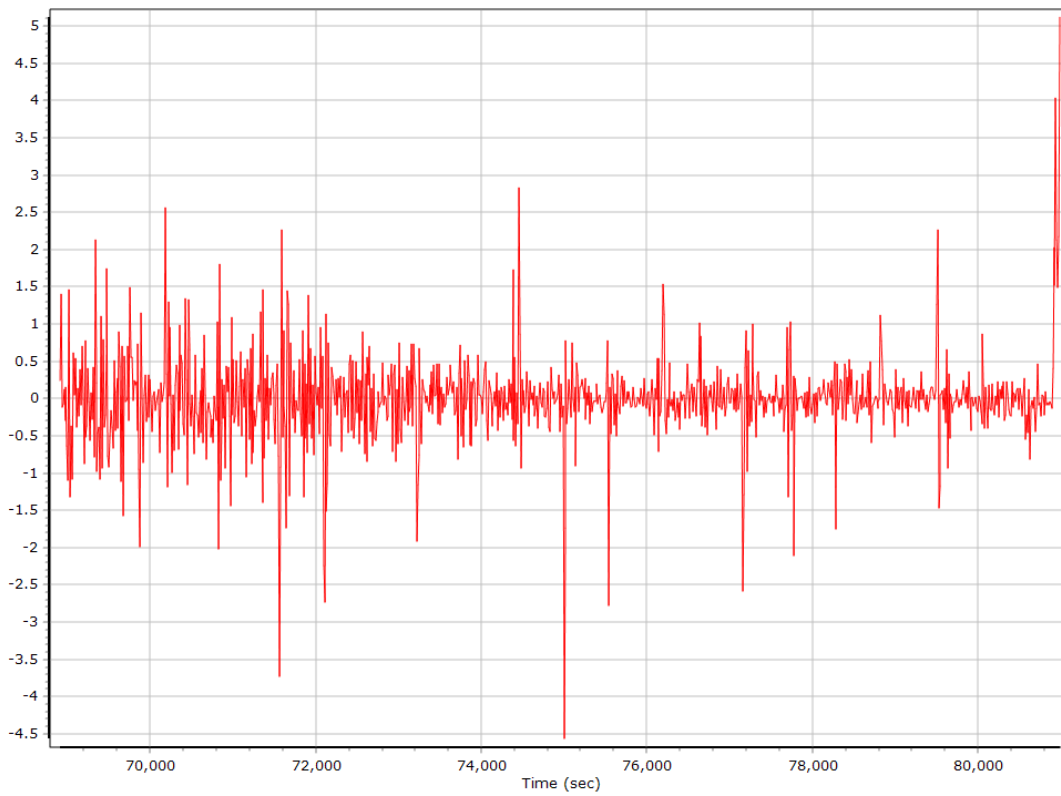
## Heading



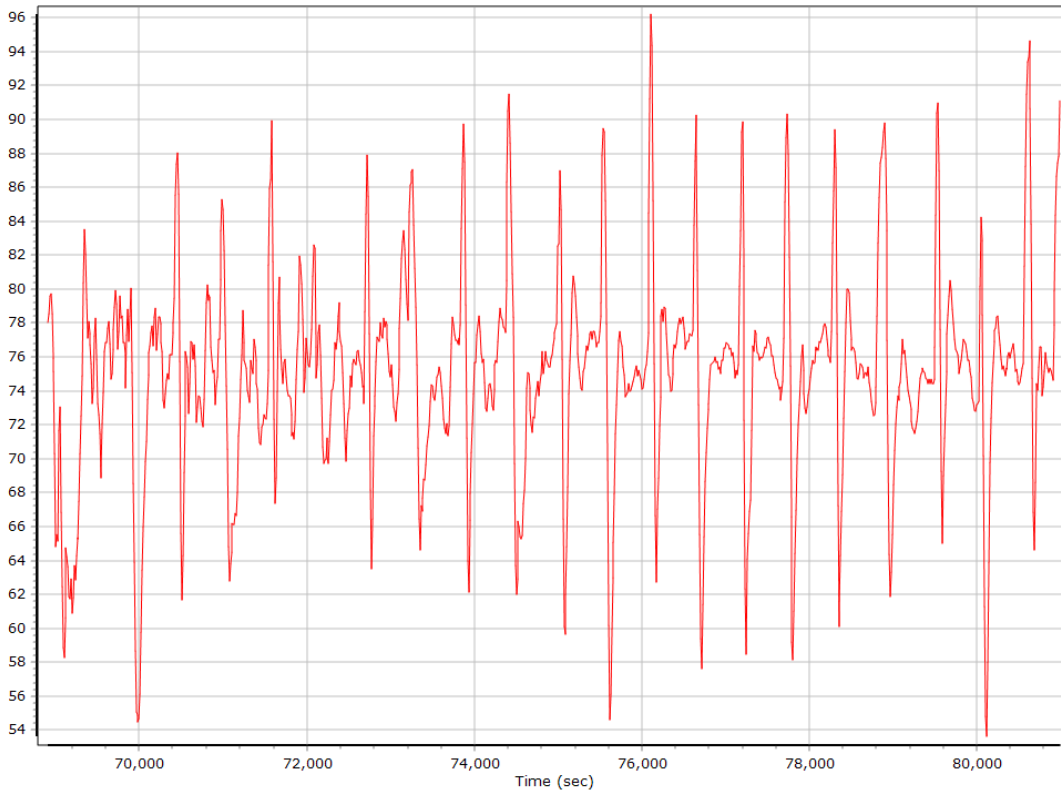
## North/East Velocity



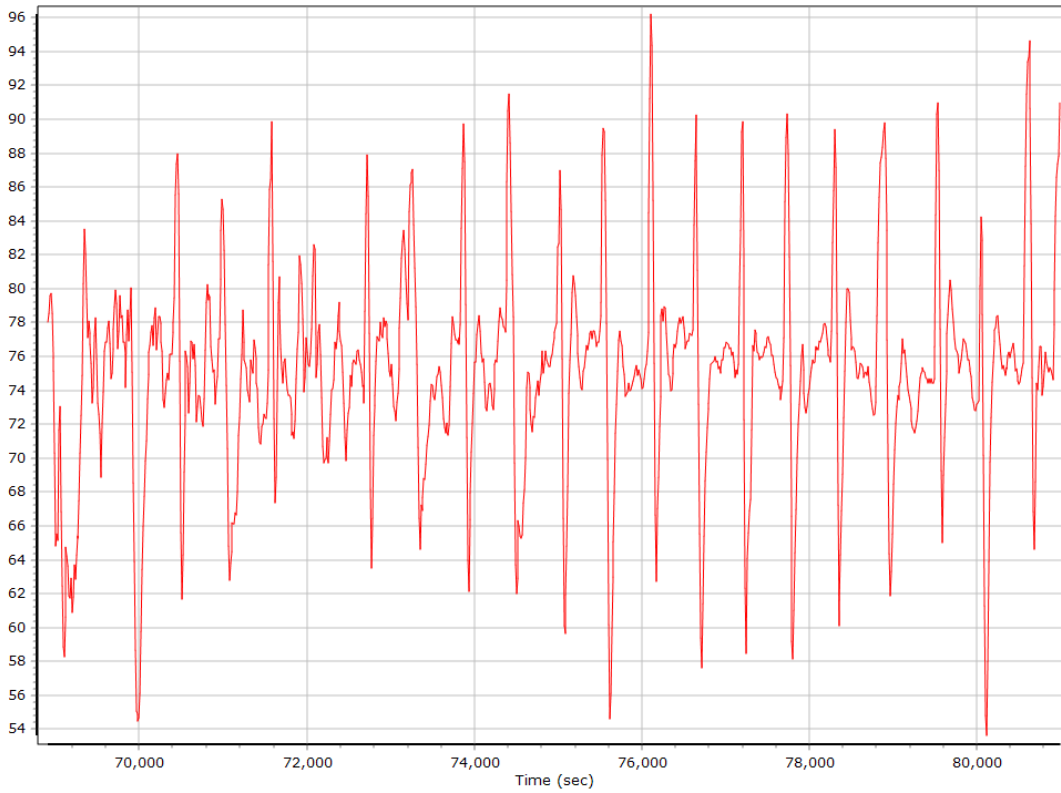
## Down Velocity



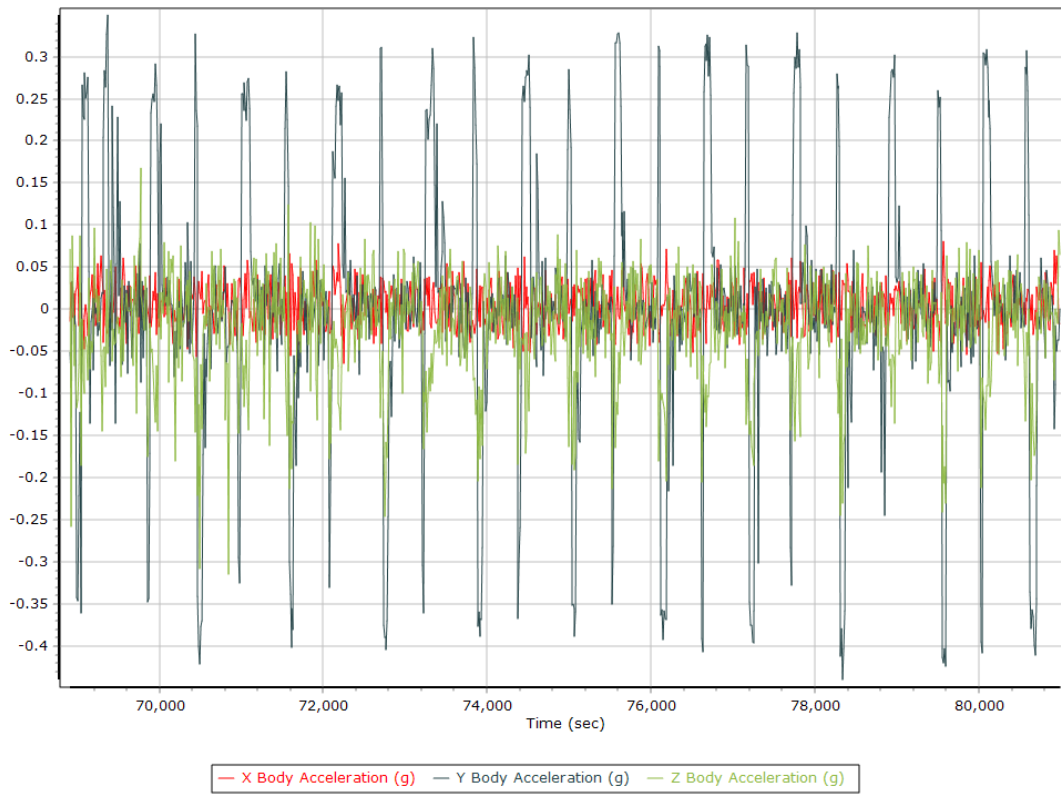
## Total Speed



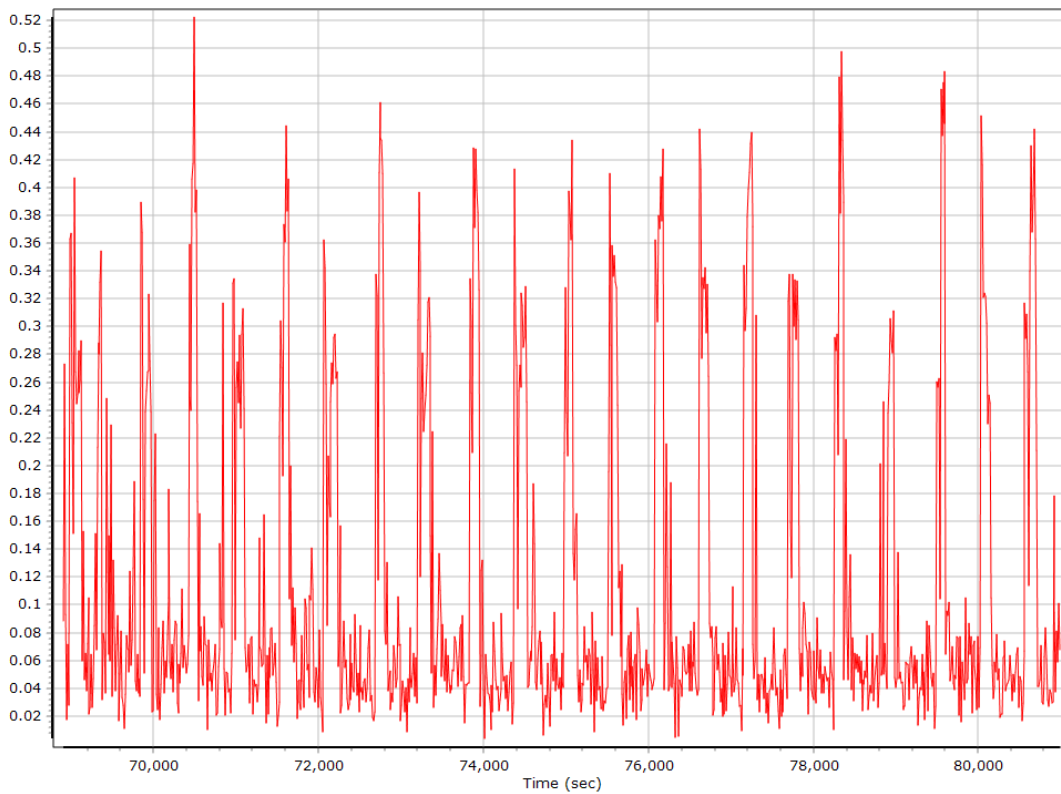
## Ground Speed



## Body Acceleration



## Total Body Acceleration



## Body Angular Rate



## Base Station Information

Station ID	NCSR		
Filename	ncsr3480.20o		
Start date	12/13/2020 7:00:00 PM		
End date	12/14/2020 12:00:00 AM		
Duration	05:00:00.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	5009K65826
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	N36°29'51.90633"		
Longitude	W81°06'52.93276"		
Ellipsoidal height (m)	839.99250		
Frame	NAD83		
Epoch	2011		
Ellipsoid	NAD83		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

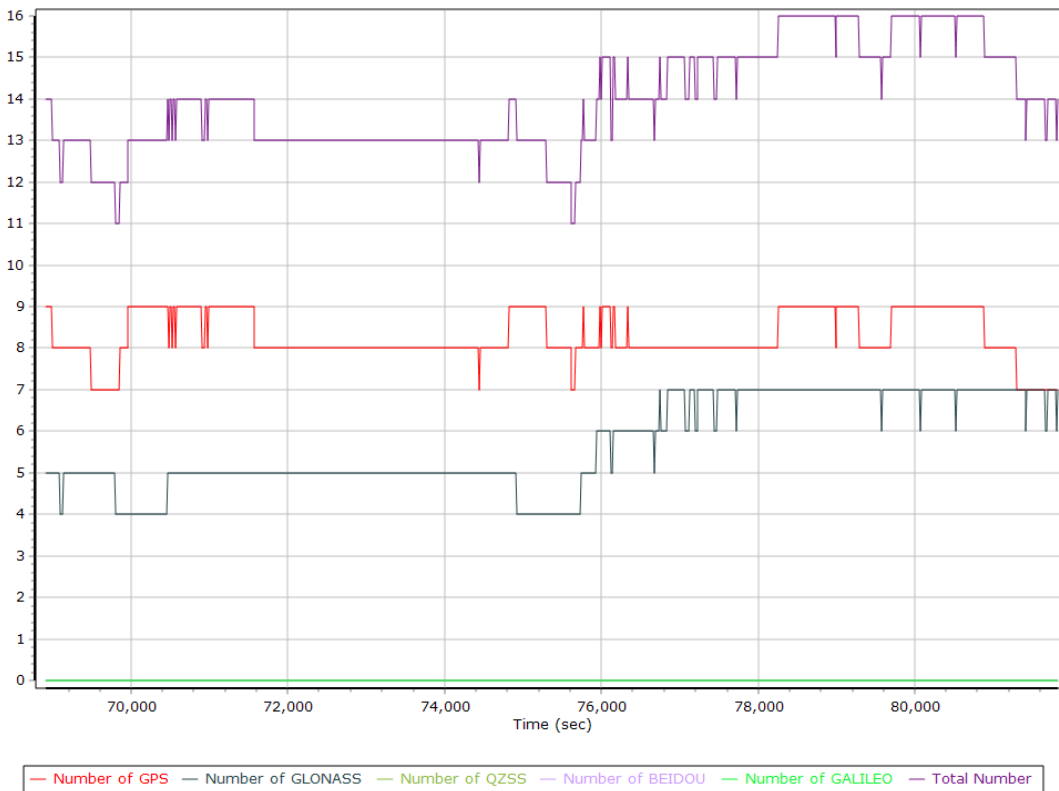


## GNSS QC

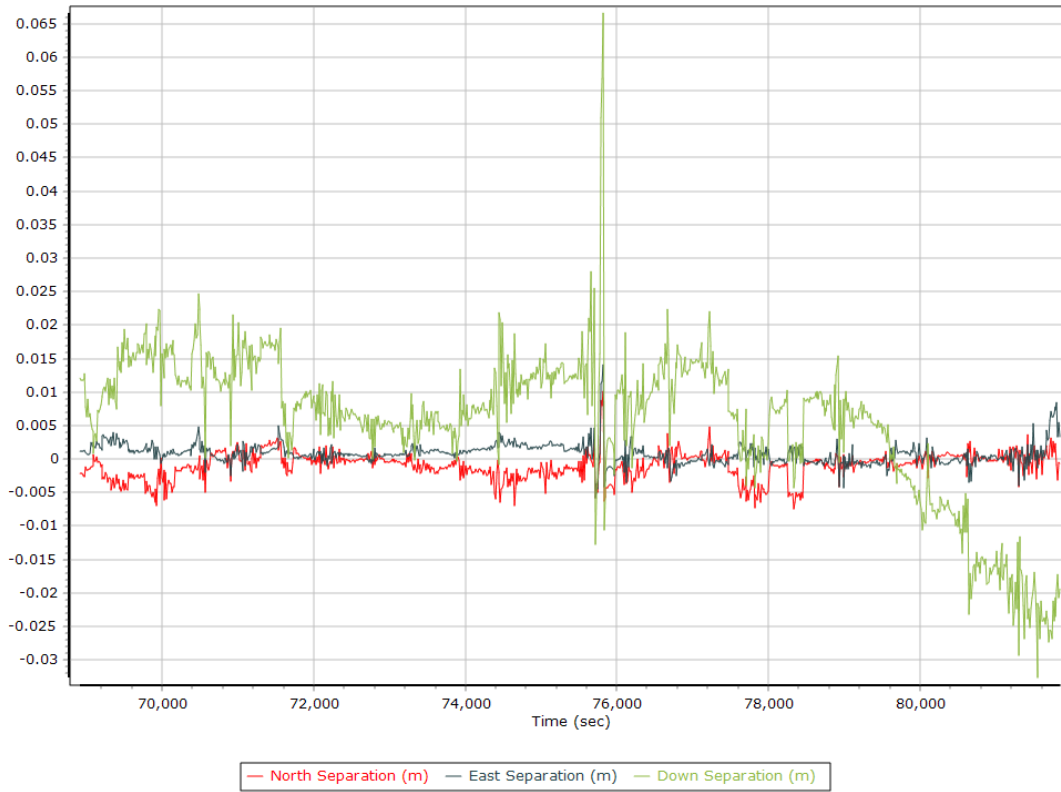
### GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	1.14	32.47	
Number of GPS SV	7	9	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	0	0	0
Total number of SV	11	16	14
PDOP	1.17	2.08	1.41
QC Solution Gaps	0.00	0.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	13424.00	0.00	0.00
Percentage	100.00	0.00	0.00

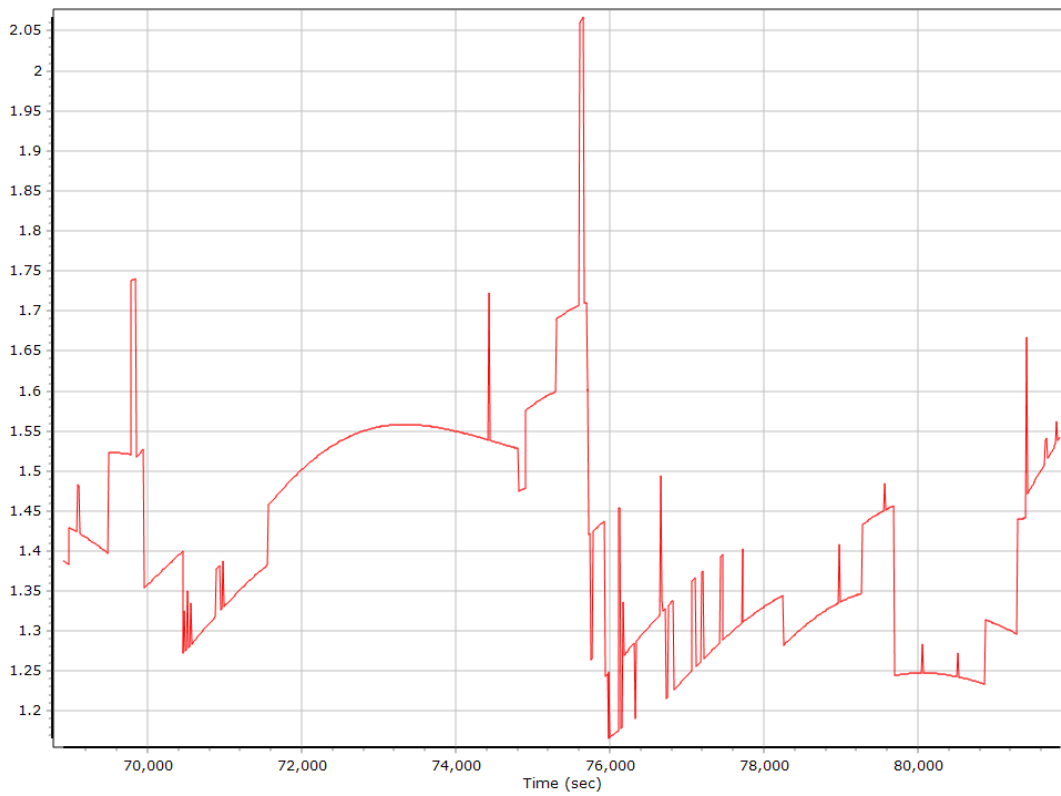
### Num SVs in solution



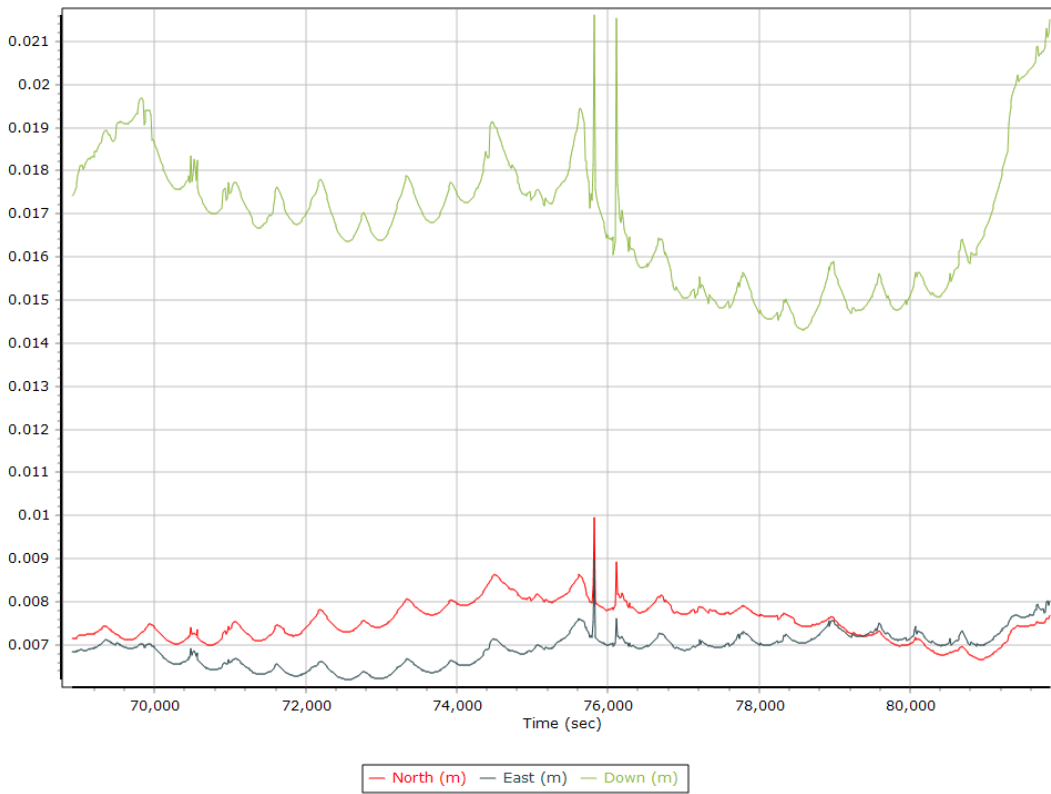
## Forward/Reverse Separation



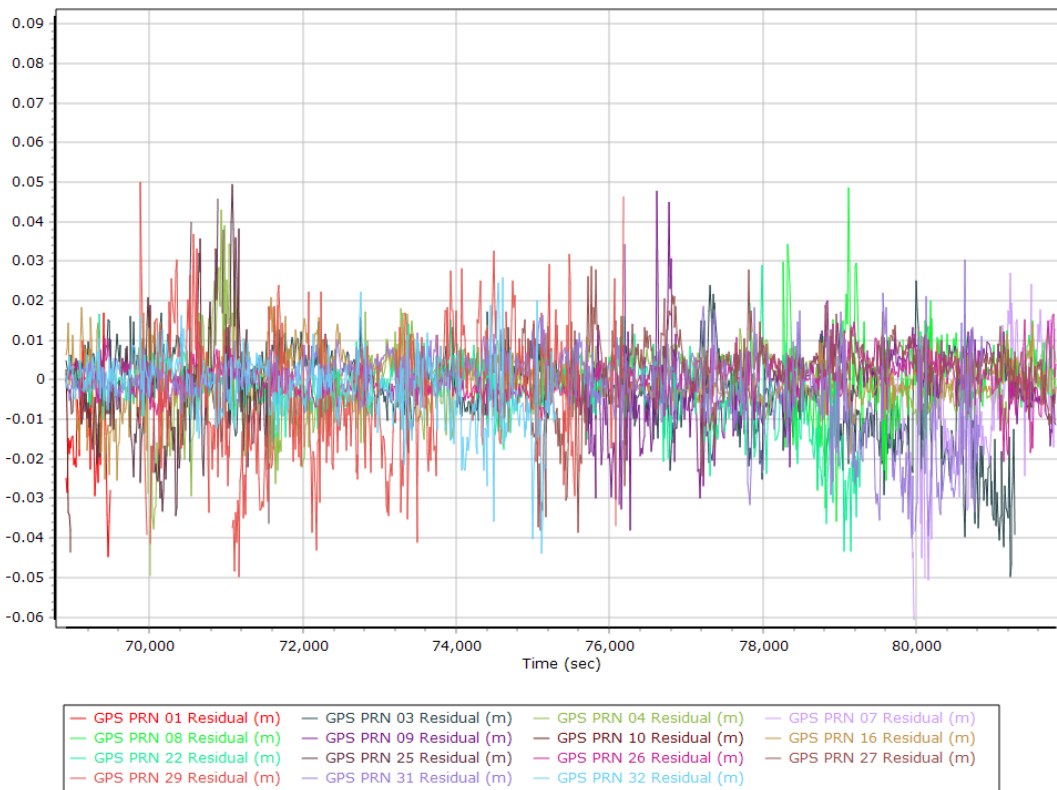
## PDOP



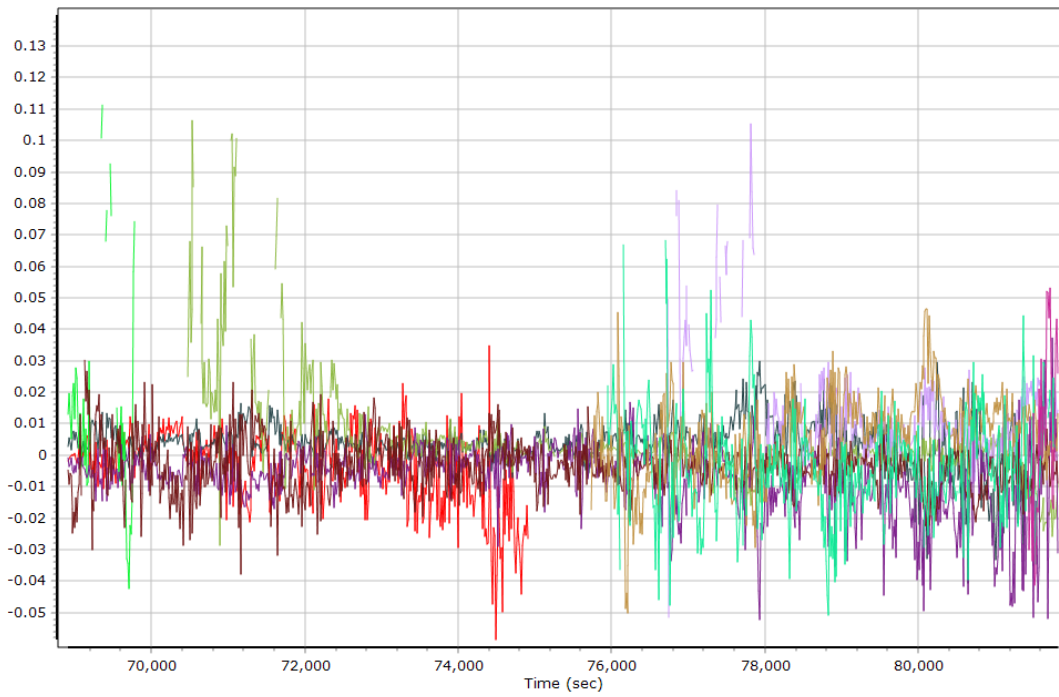
### Estimated Position Accuracy



### GPS Residuals



## GLONASS Residuals



- |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|
| GLONASS 01 Residual (m) | GLONASS 02 Residual (m) | GLONASS 03 Residual (m) | GLONASS 04 Residual (m) |
| GLONASS 08 Residual (m) | GLONASS 12 Residual (m) | GLONASS 13 Residual (m) | GLONASS 14 Residual (m) |
| GLONASS 22 Residual (m) | GLONASS 23 Residual (m) | GLONASS 24 Residual (m) |                         |

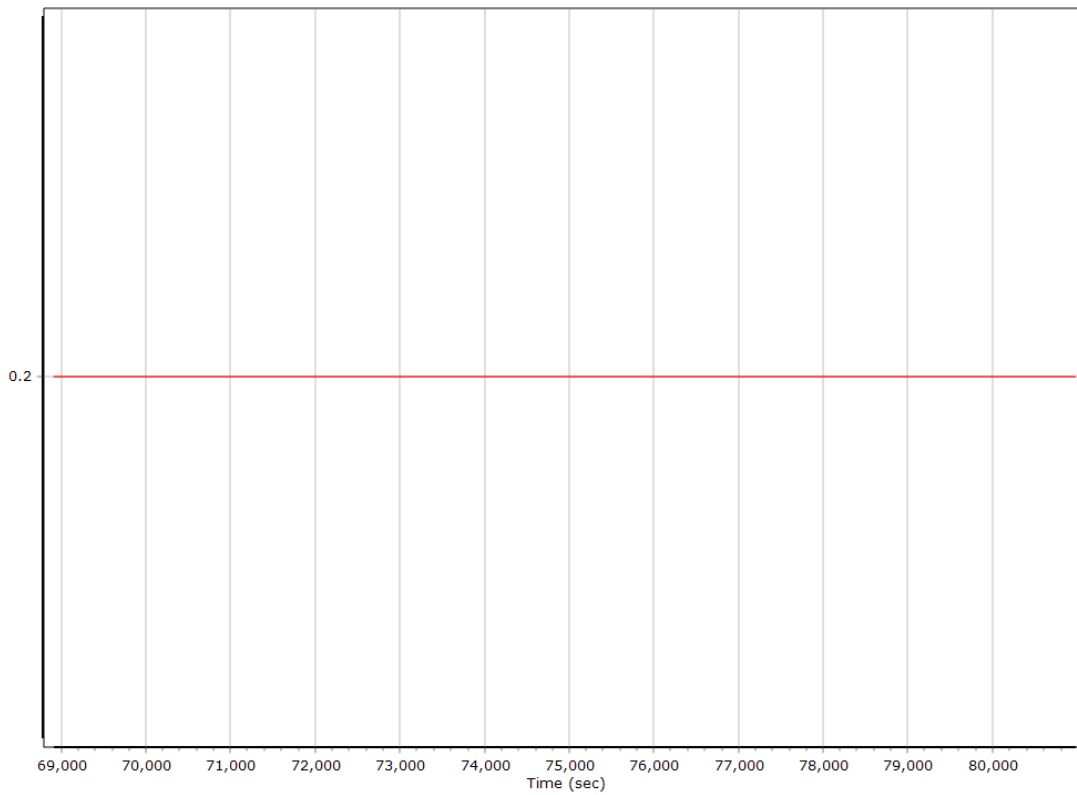
## GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion Single Base		
Stabilized mount	False		
Base station	NCSR		
Processing start time	68850.417 (12/13/2020 7:07:30 PM)		
Processing end time	80998.232 (12/13/2020 10:29:58 PM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference 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

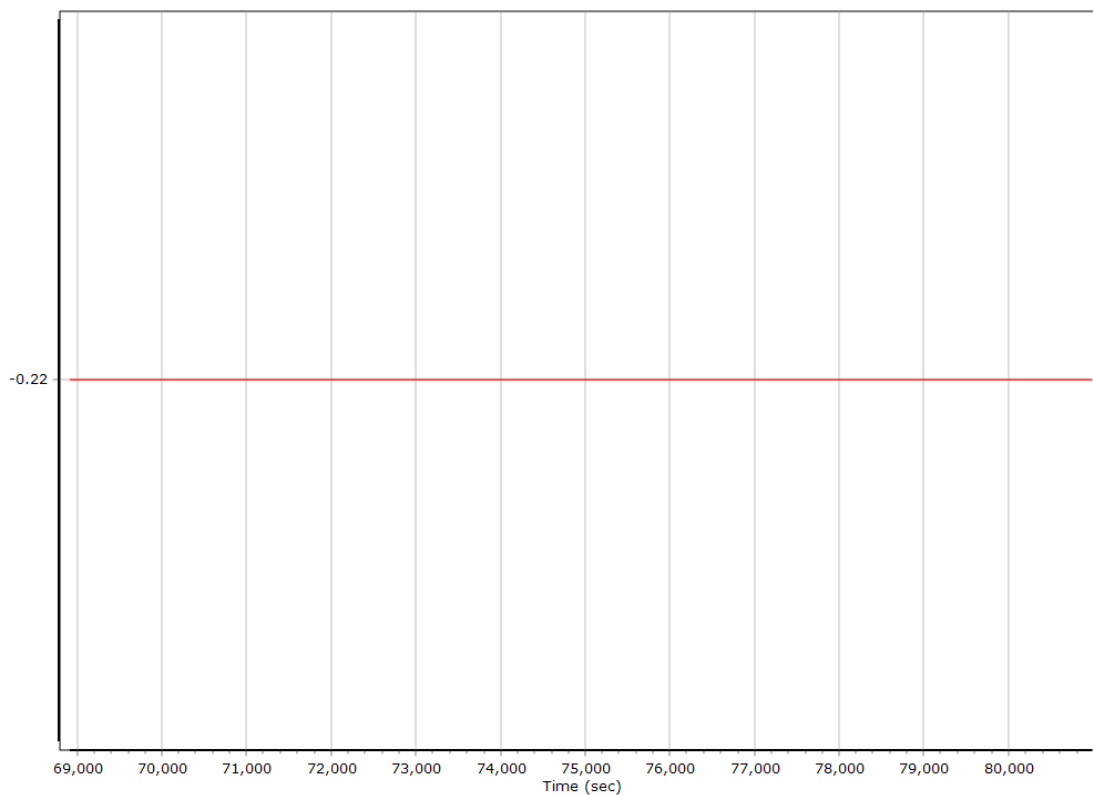
## Calibrated Installation Parameters

### Reference-Primary GNSS Lever Arm (m)

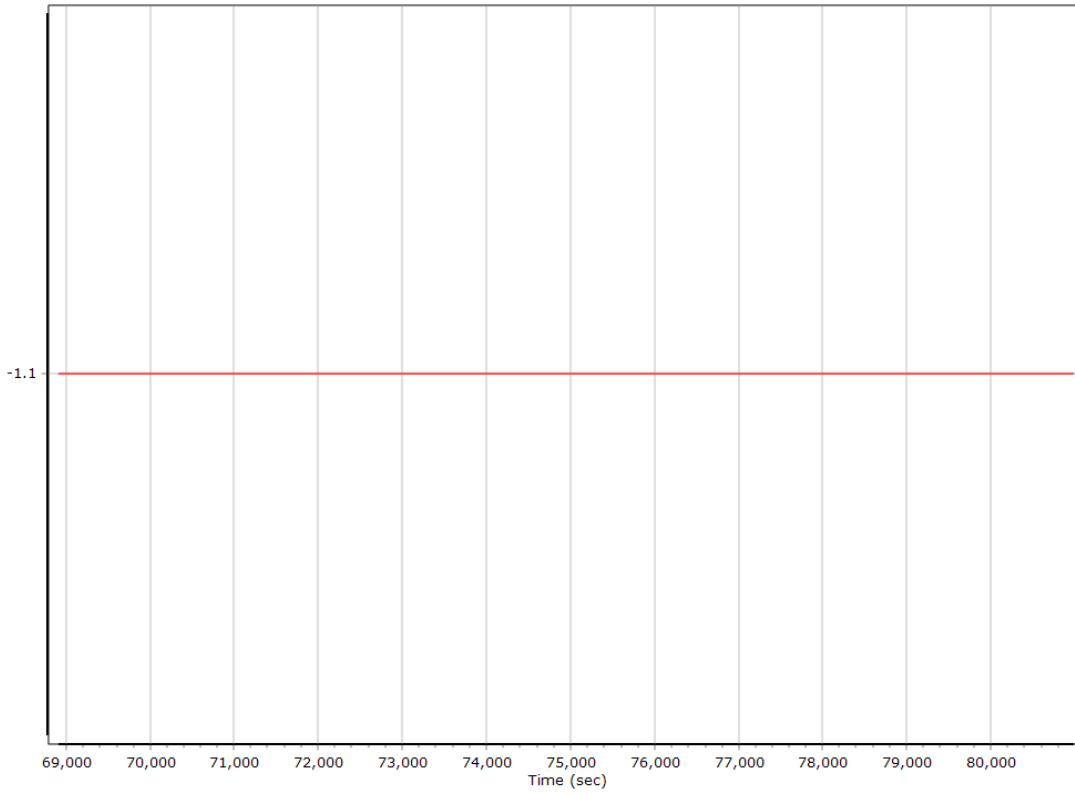
#### X Reference-Primary GNSS Lever Arm (m)



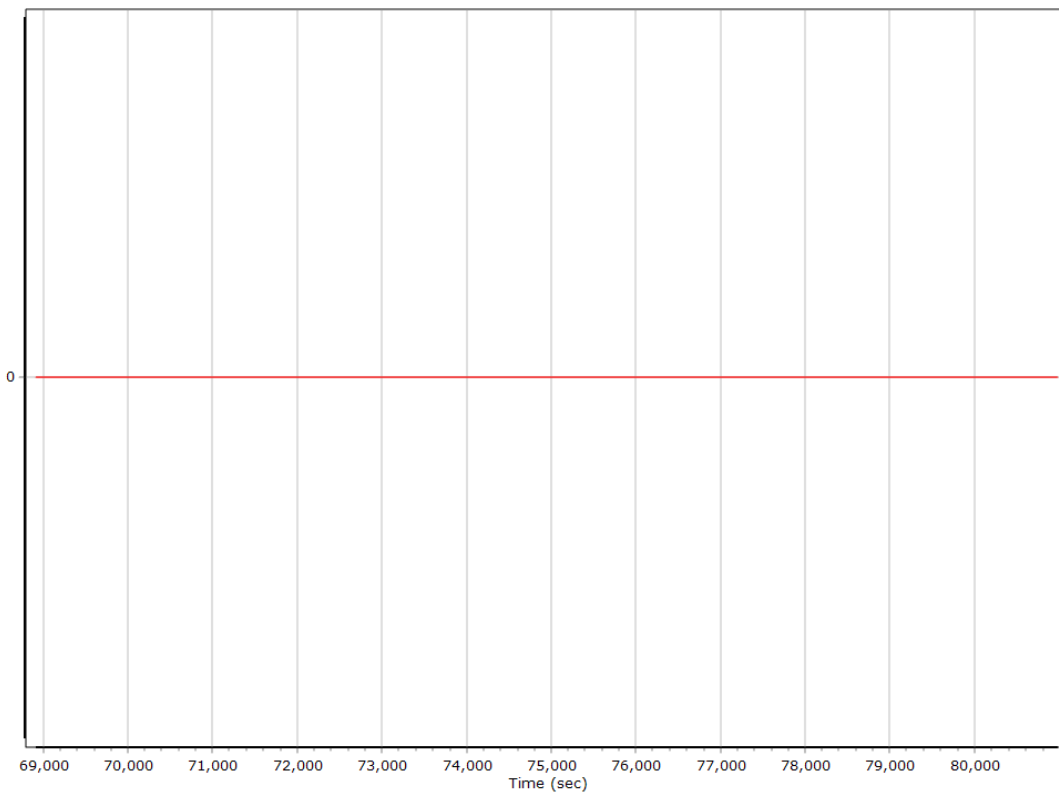
#### Y Reference-Primary GNSS Lever Arm (m)



### Z Reference-Primary GNSS Lever Arm (m)



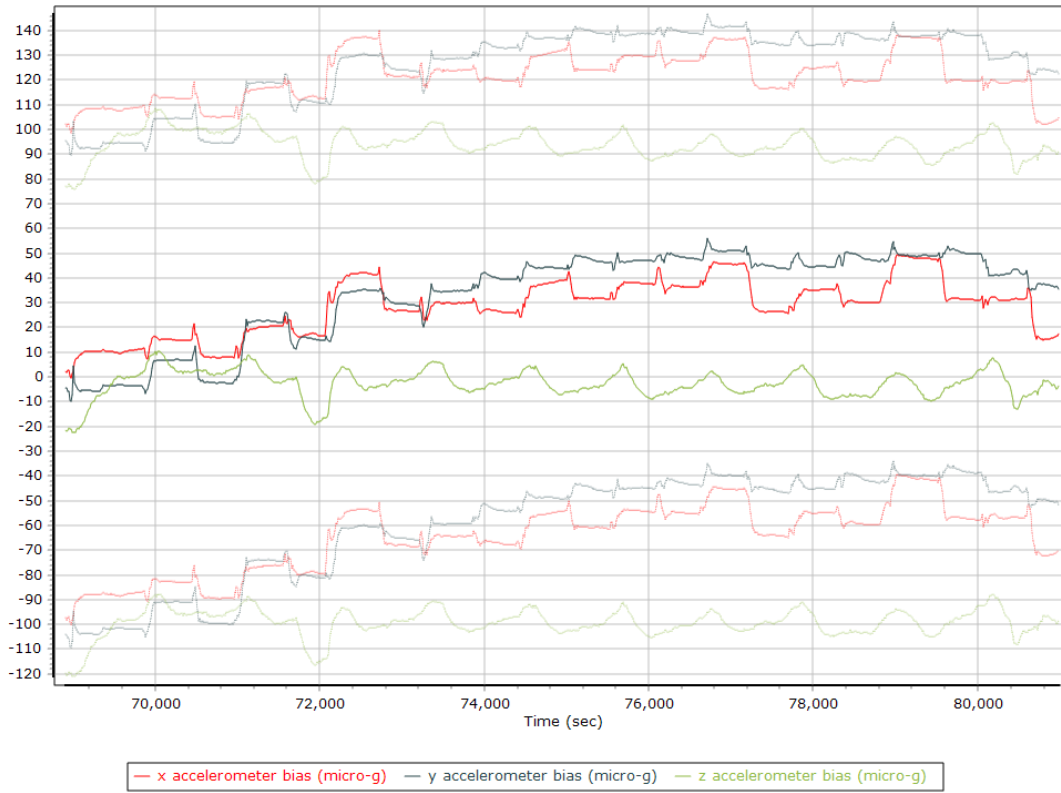
### Reference-Primary GNSS Lever Arm Figure of Merit



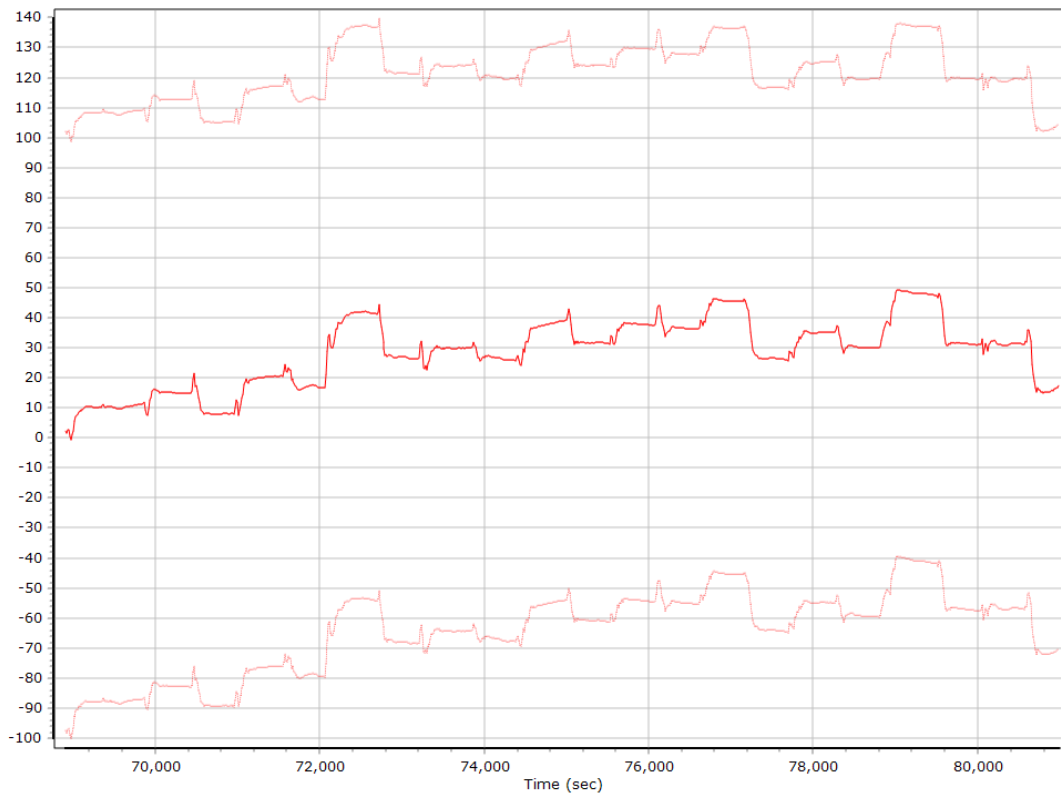
## IN-Fusion QC

### Forward Processed Estimated Errors, Reference Frame

#### Accelerometer Bias (micro-g)

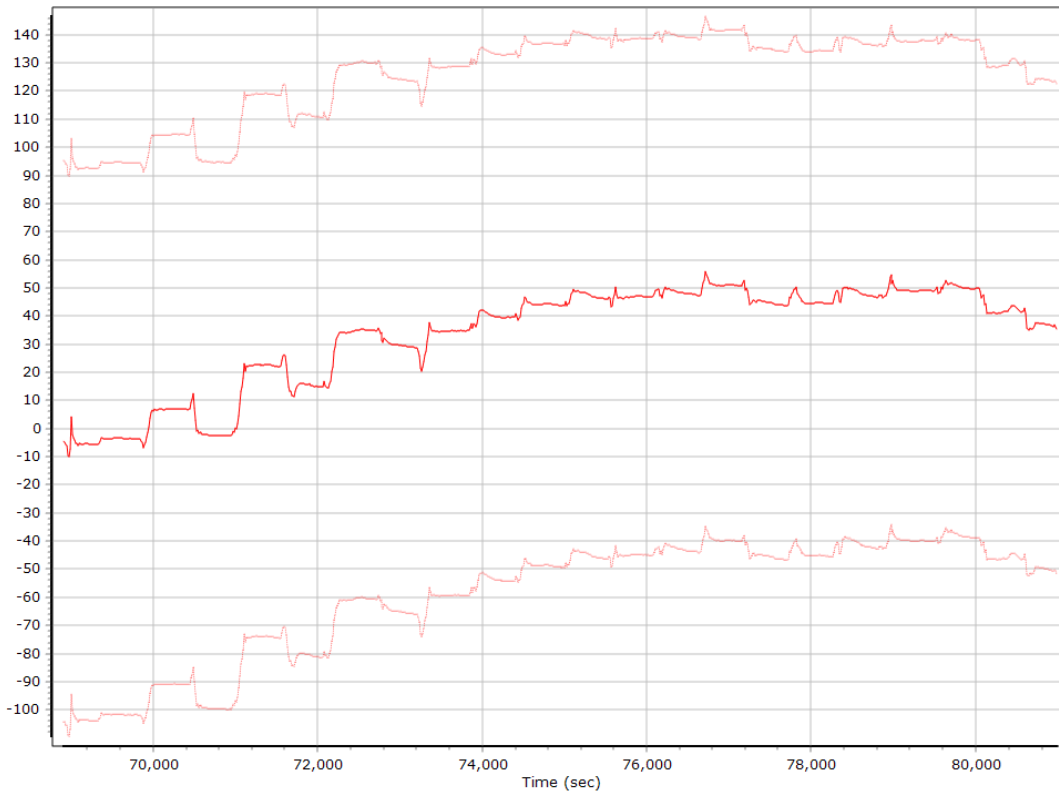


#### X Accelerometer Bias (micro-g)

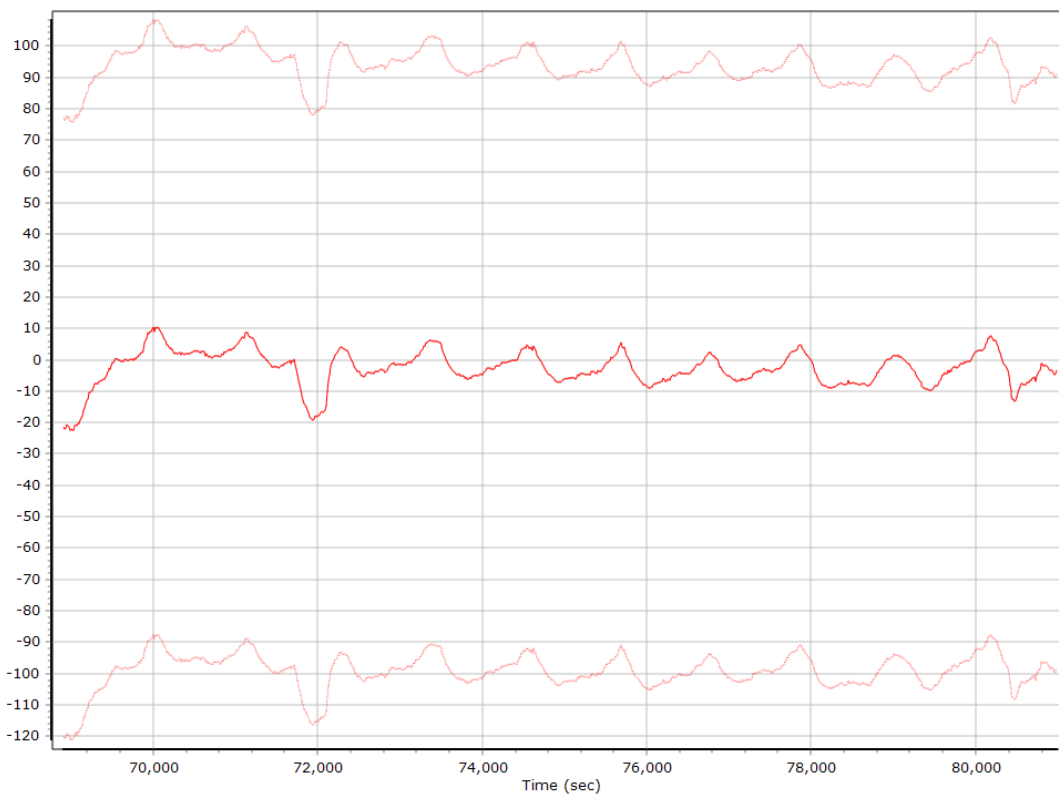




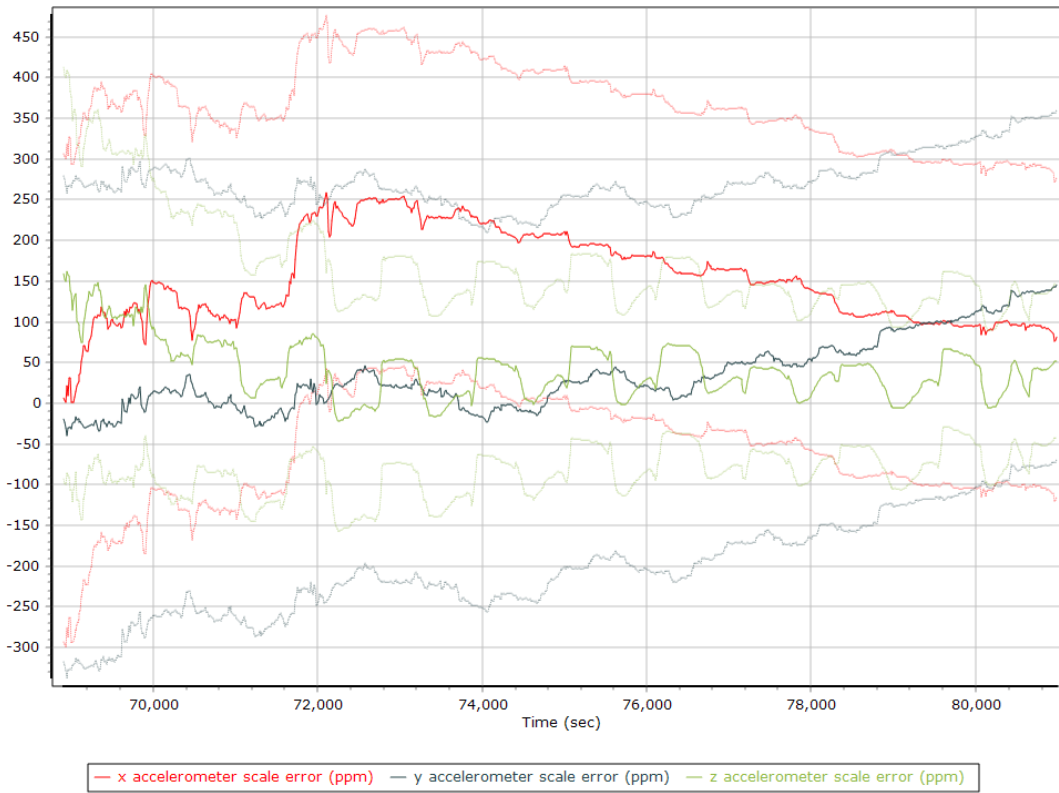
### Y Accelerometer Bias (micro-g)



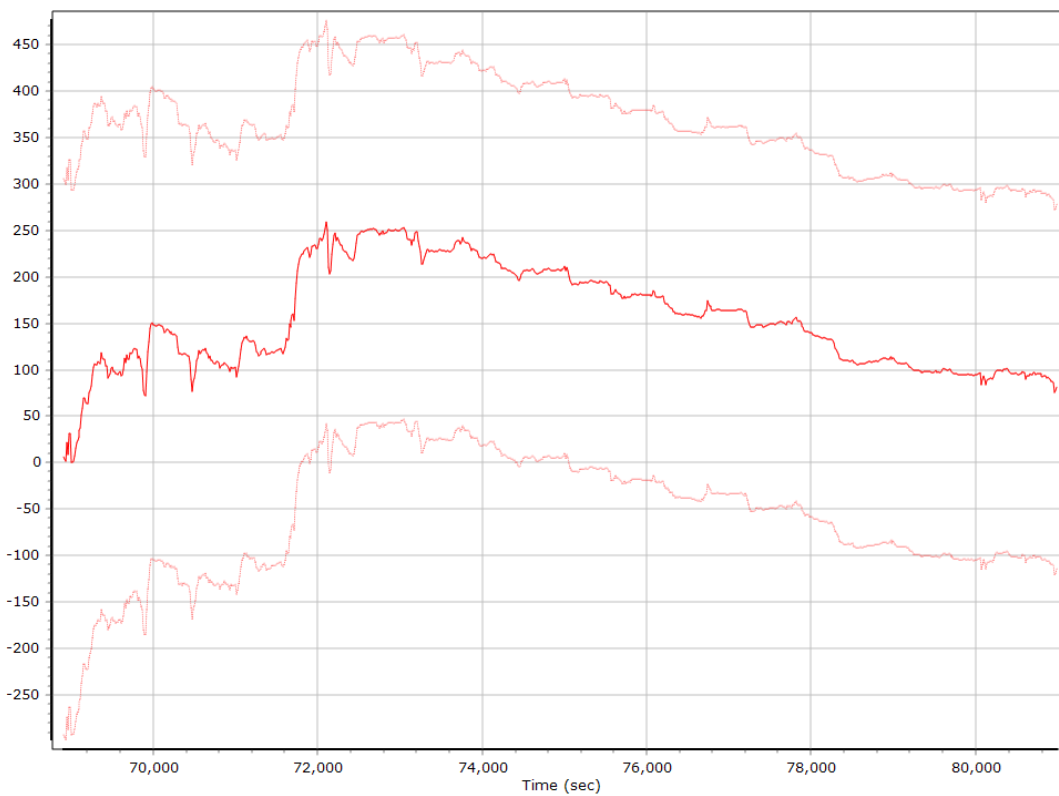
### Z Accelerometer Bias (micro-g)



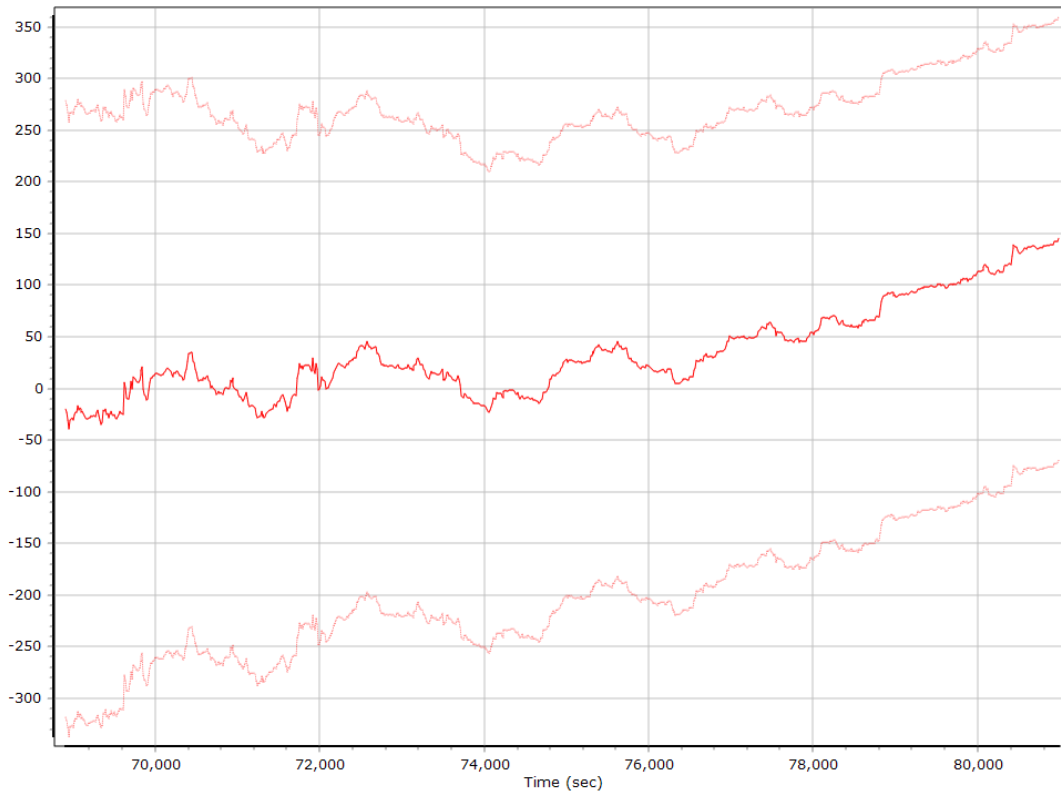
### Accelerometer Scale Error (ppm)



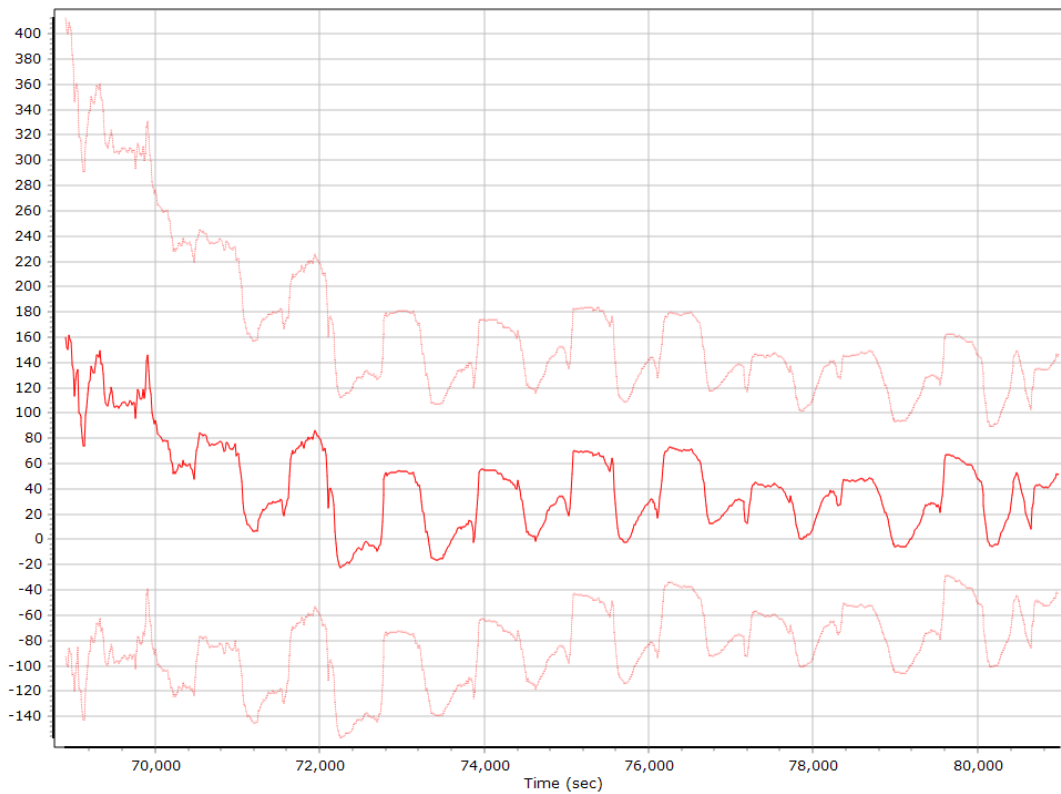
### X Accelerometer Scale Error (ppm)



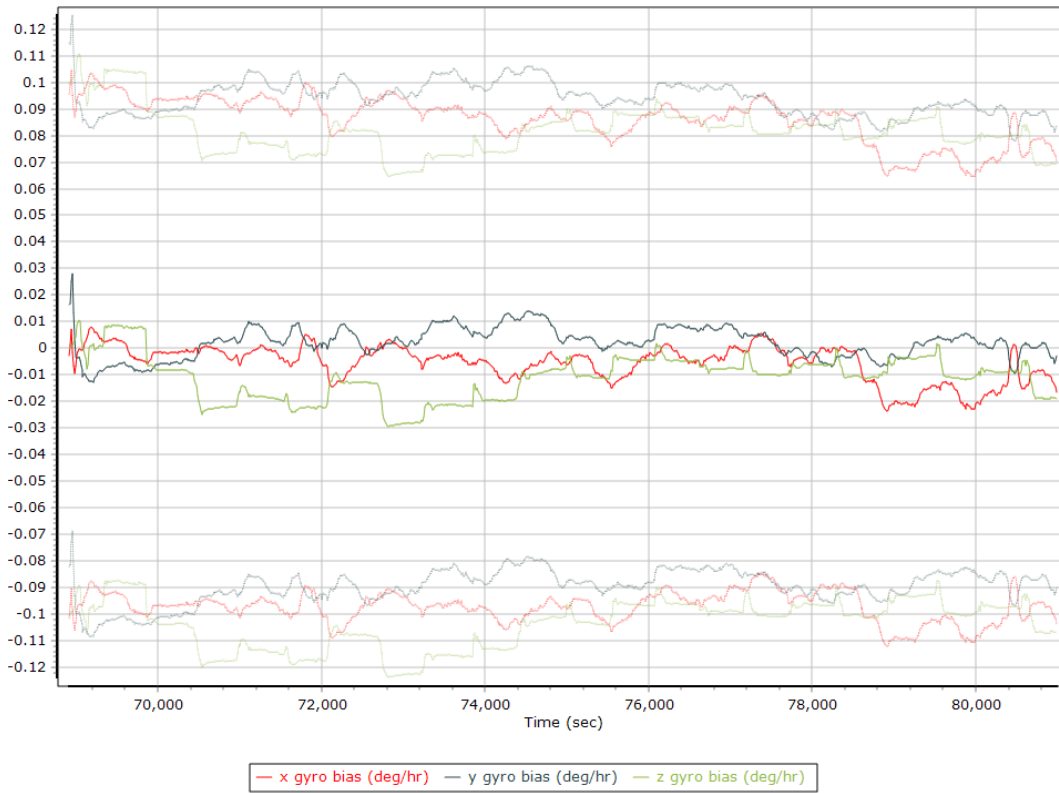
### Y Accelerometer Scale Error (ppm)



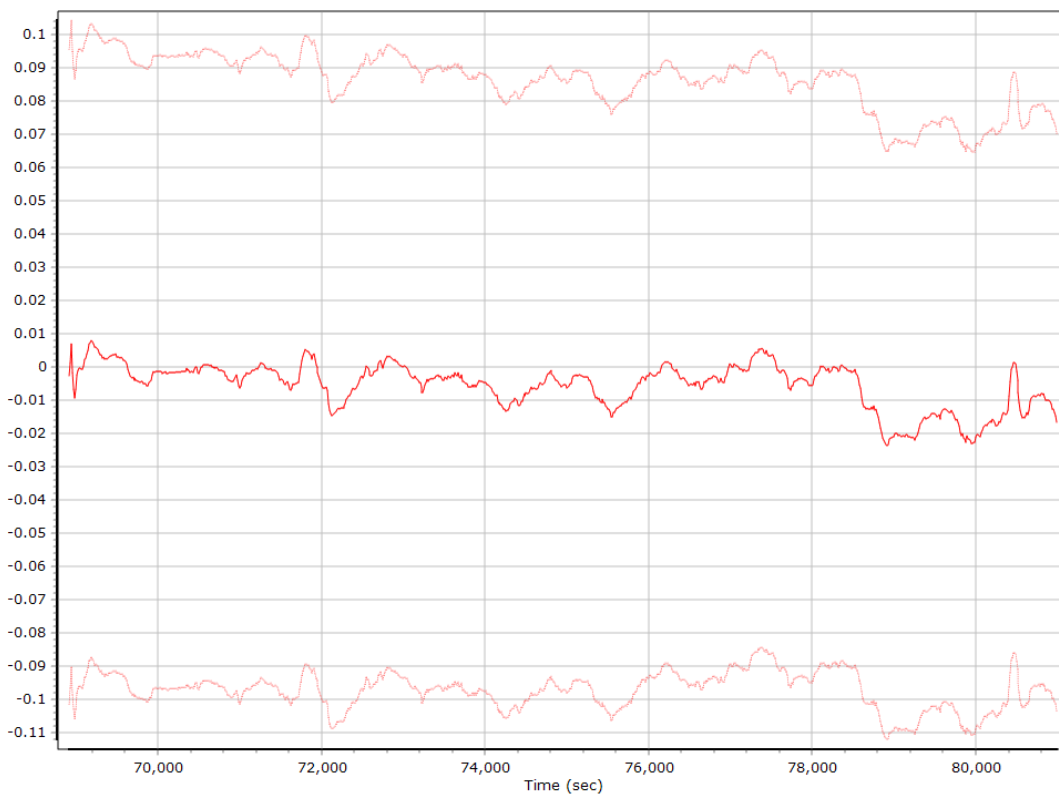
### Z Accelerometer Scale Error (ppm)



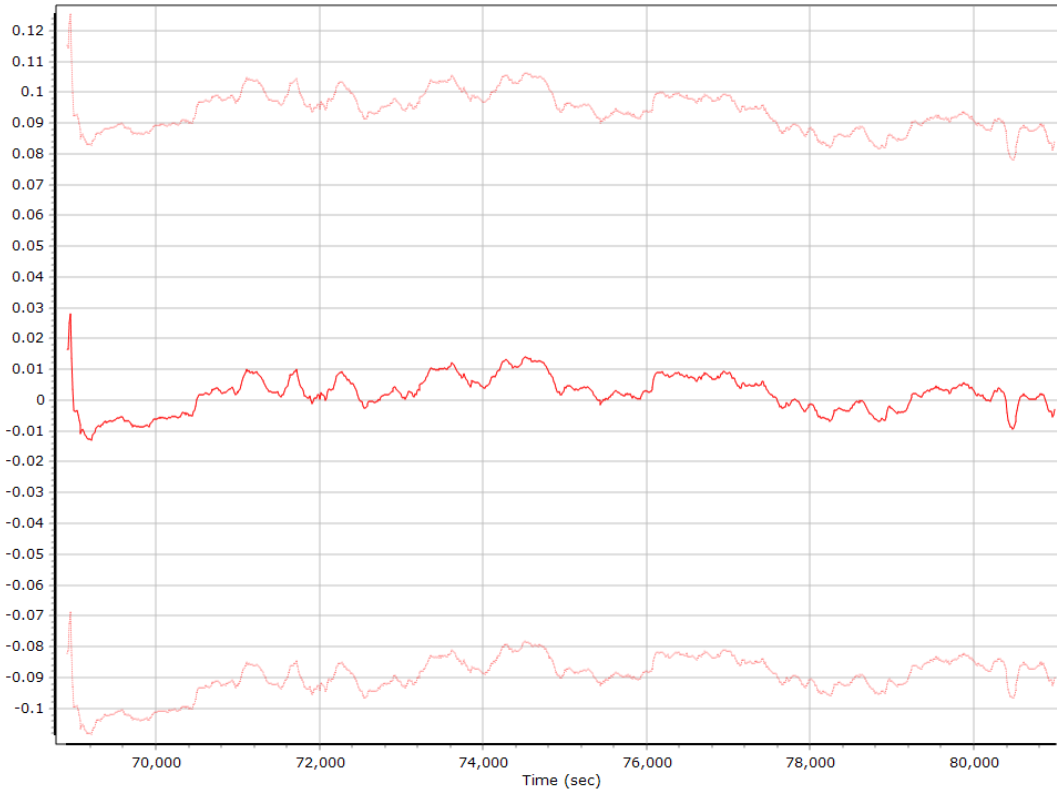
### Gyro Bias (deg/h)



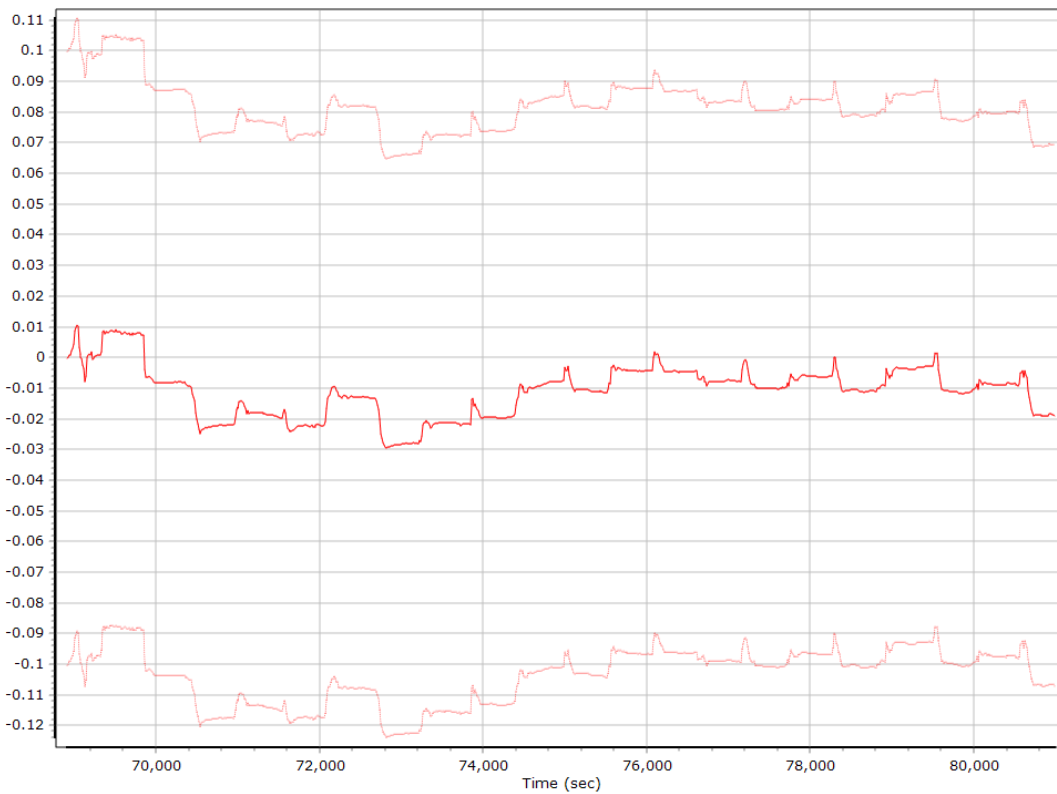
### X Gyro Bias (deg/h)



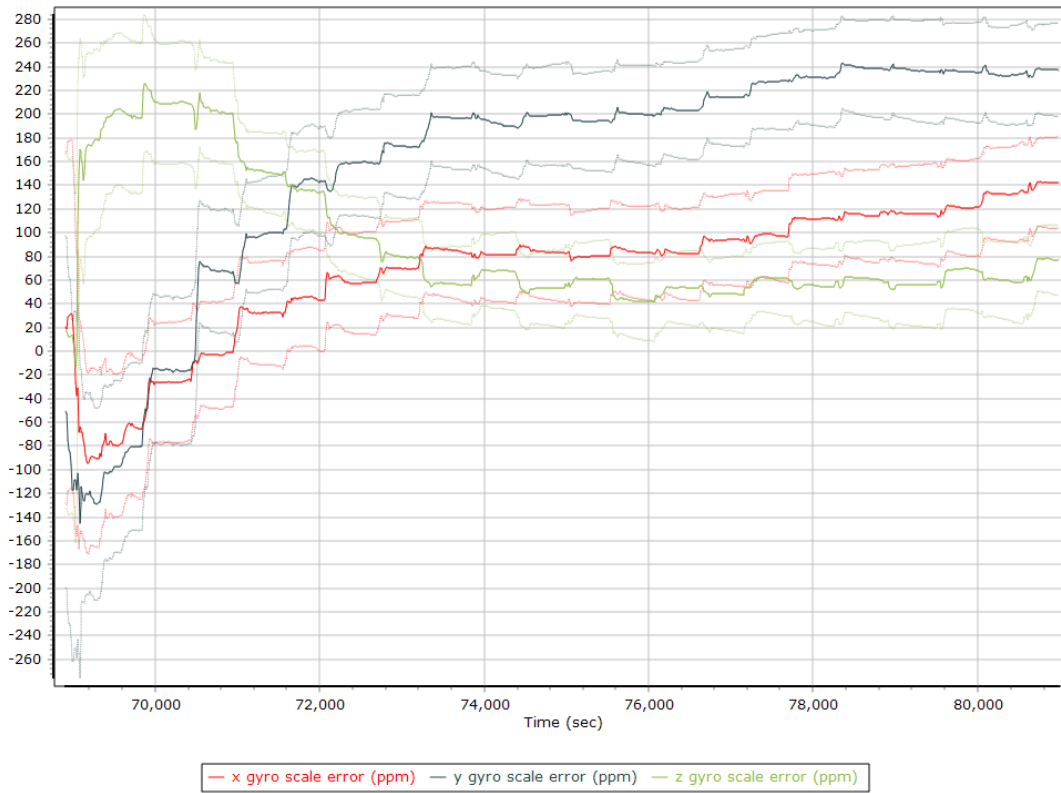
### Y Gyro Bias (deg/h)



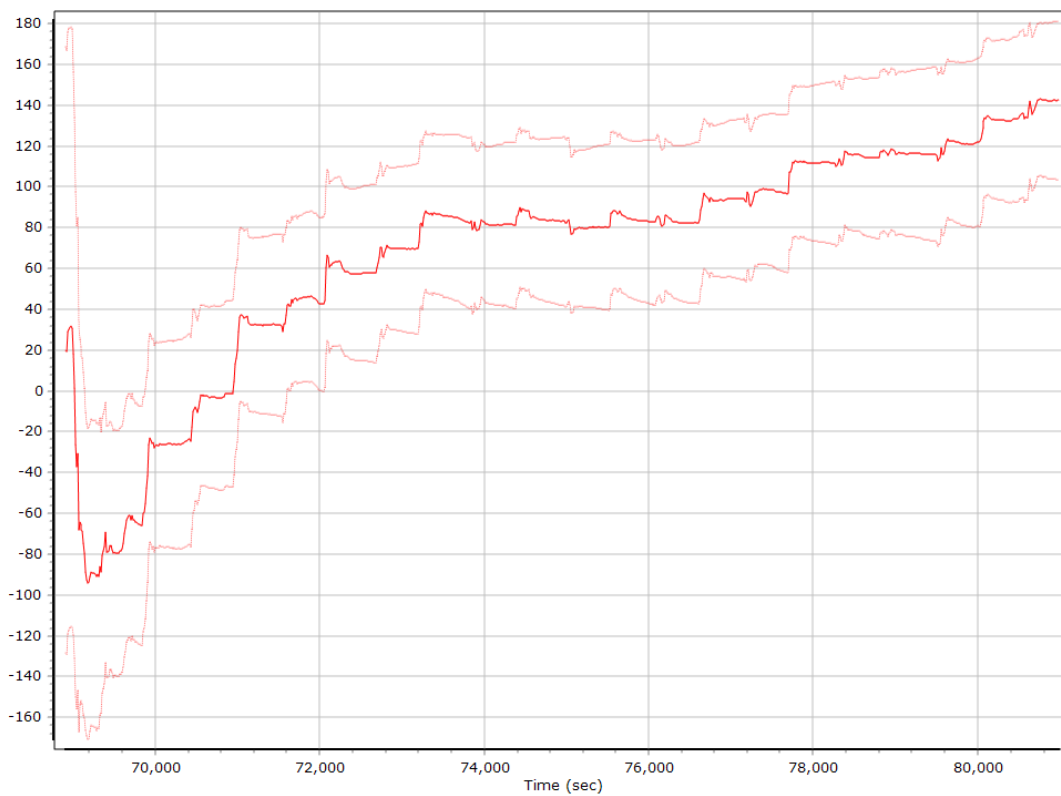
### Z Gyro Bias (deg/h)



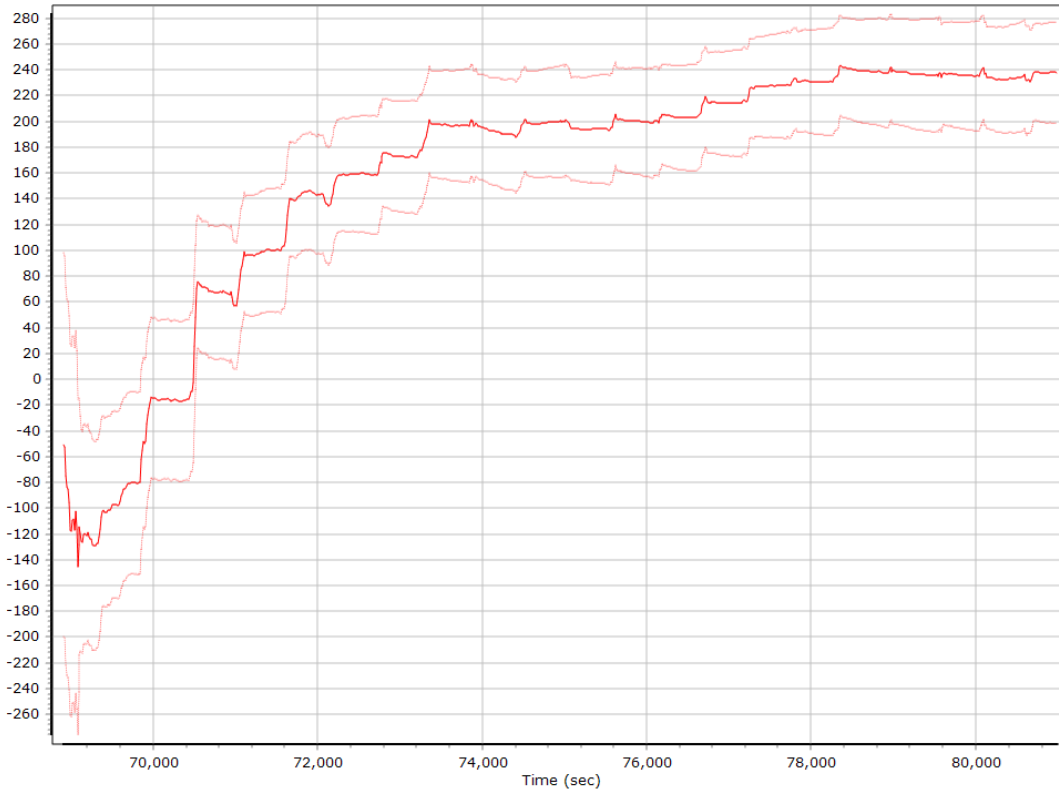
### Gyro Scale Error (ppm)



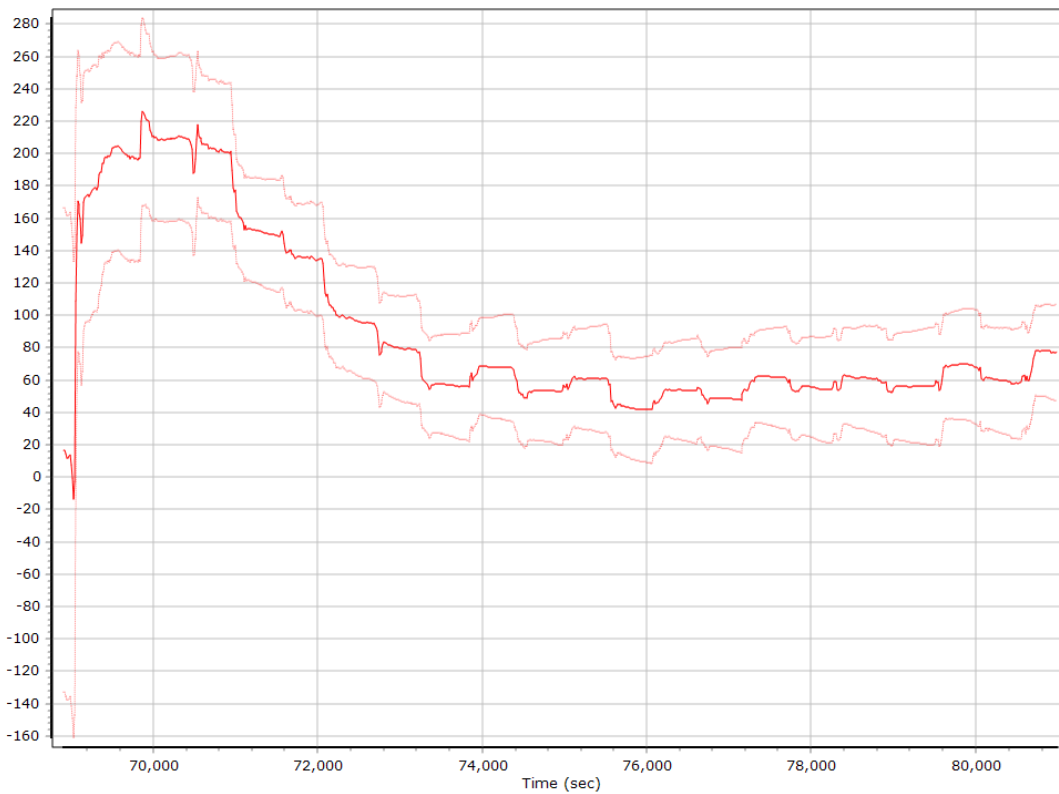
### X Gyro Scale Error (ppm)



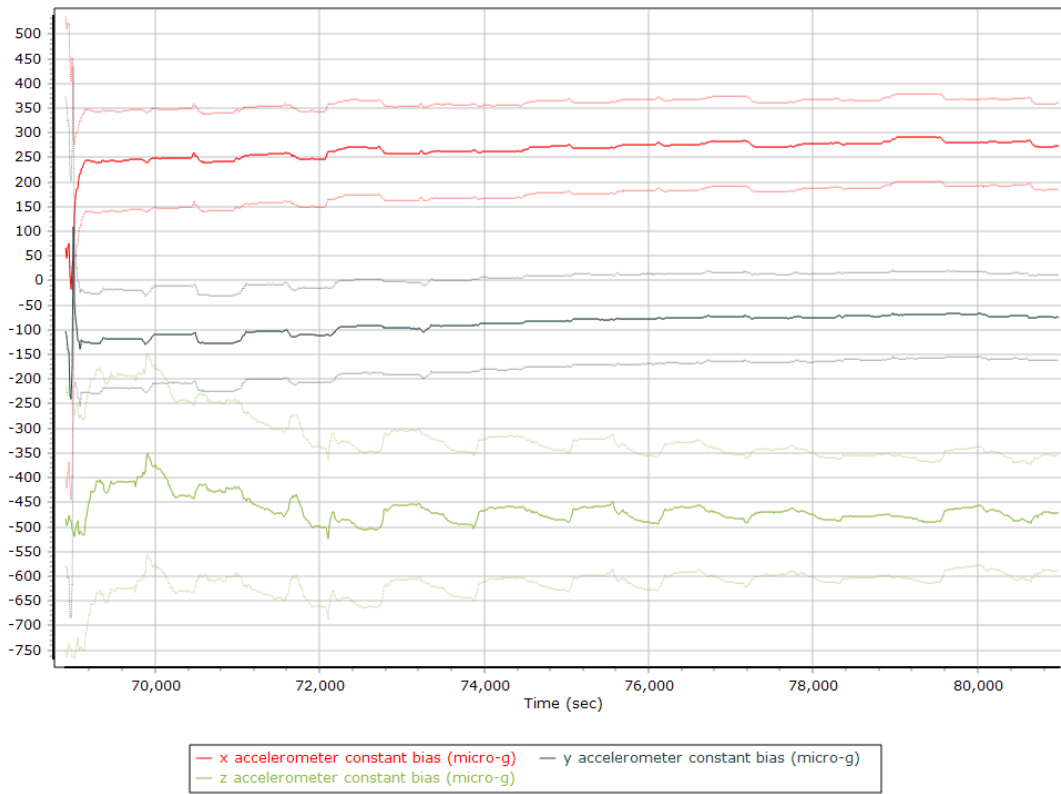
### Y Gyro Scale Error (ppm)



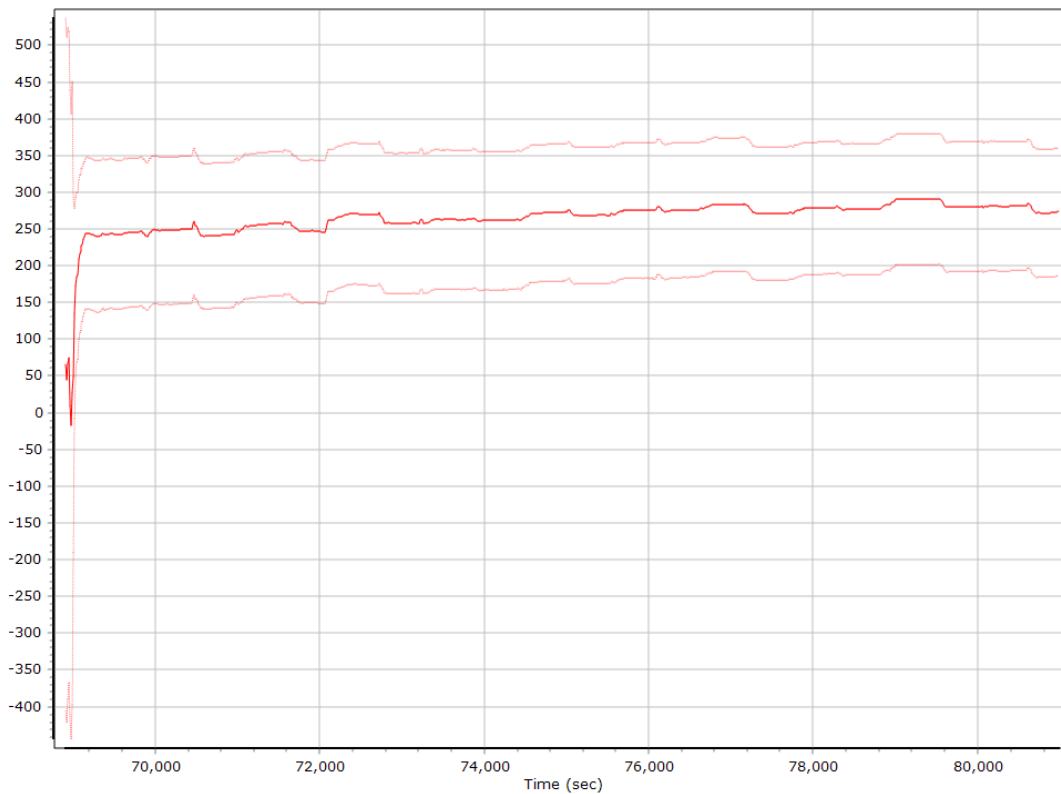
### Z Gyro Scale Error (ppm)



### Forward Processed Estimated Constant Errors, Reference Frame Accelerometer Bias (micro-g)

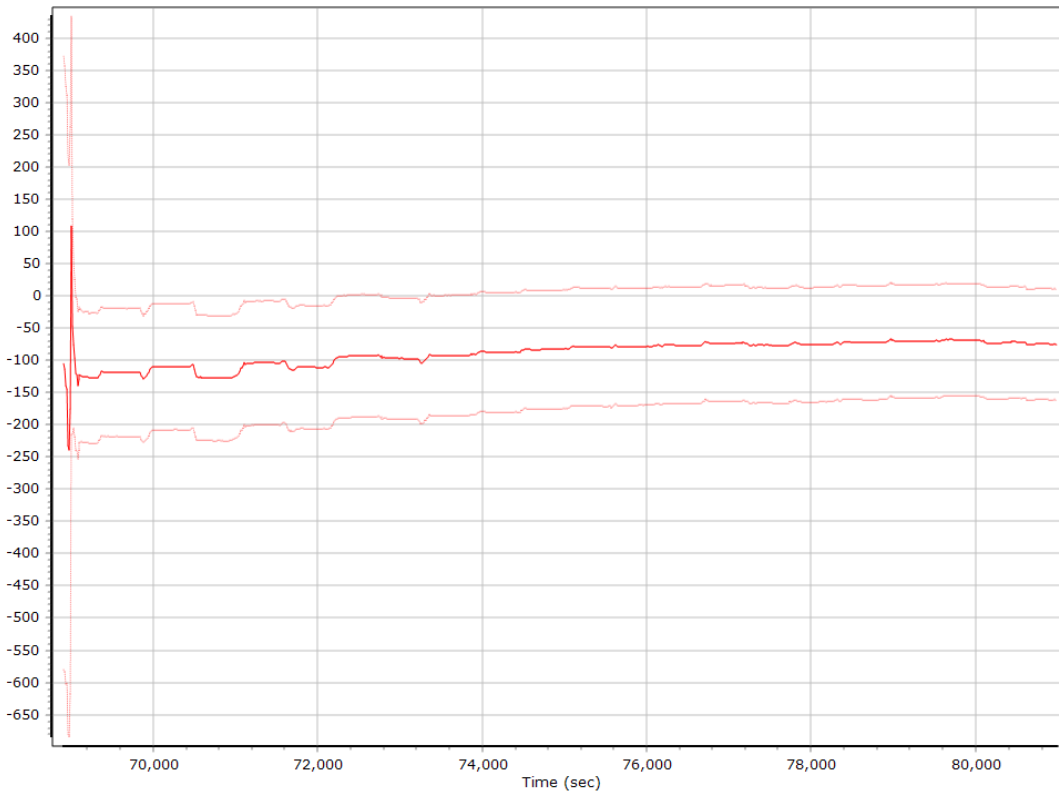


### X Accelerometer Bias (micro-g)

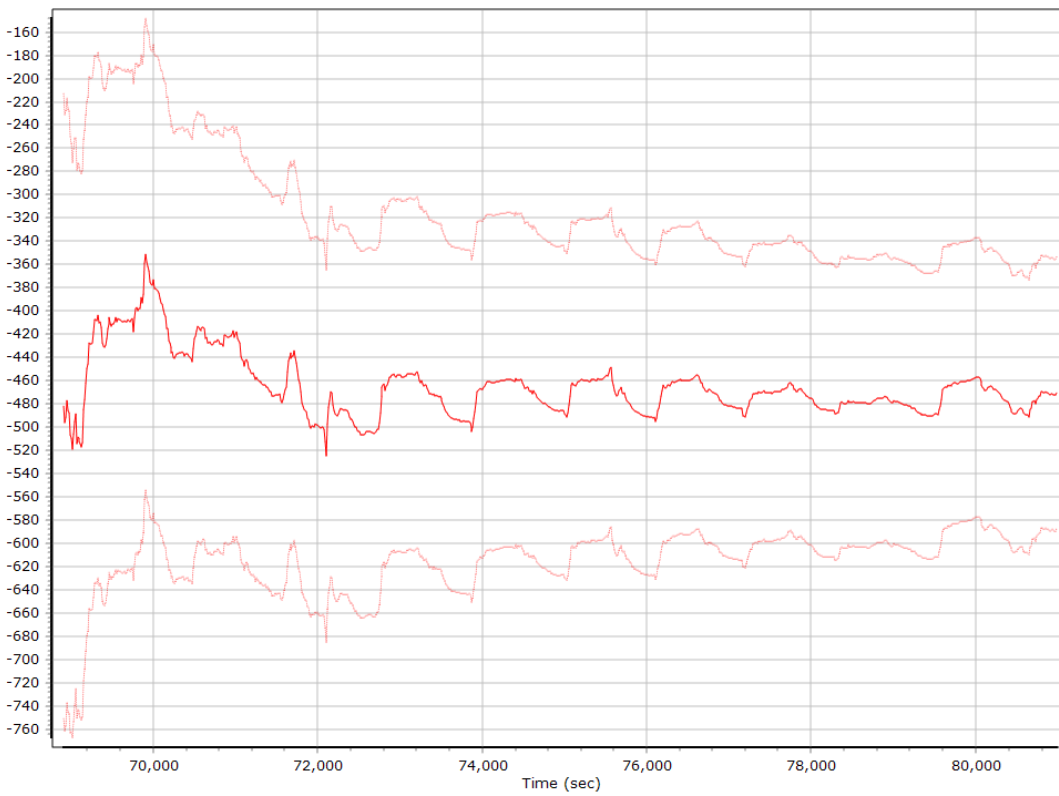




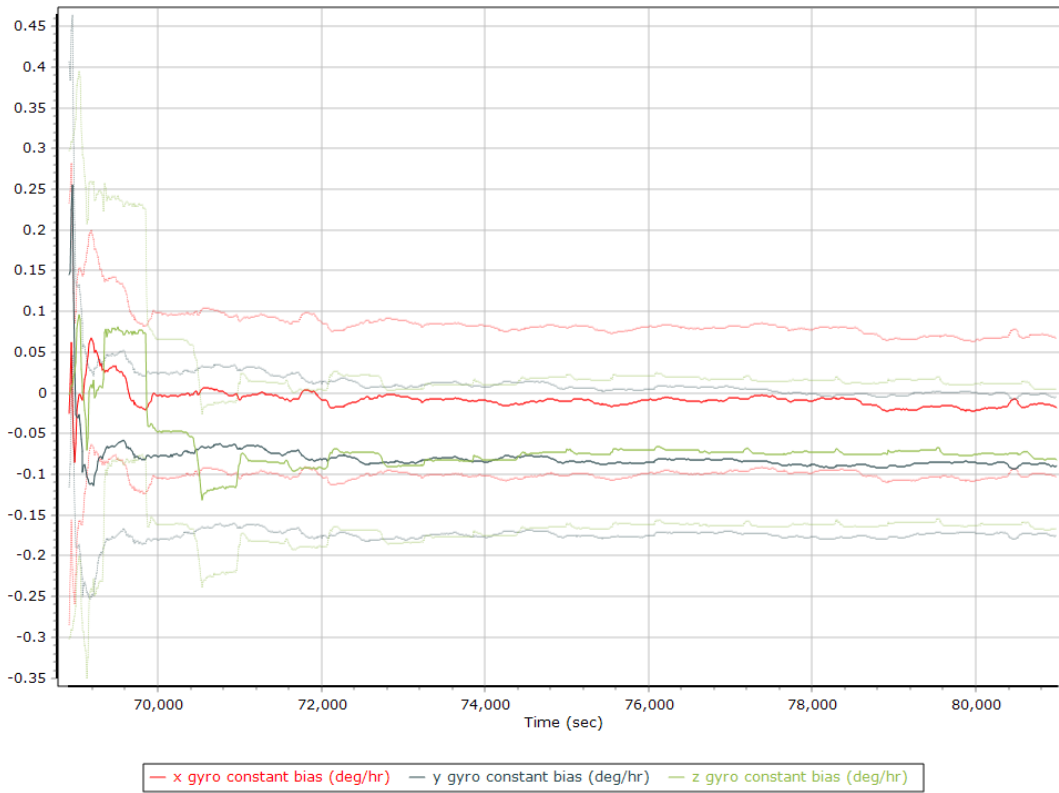
### Y Accelerometer Bias (micro-g)



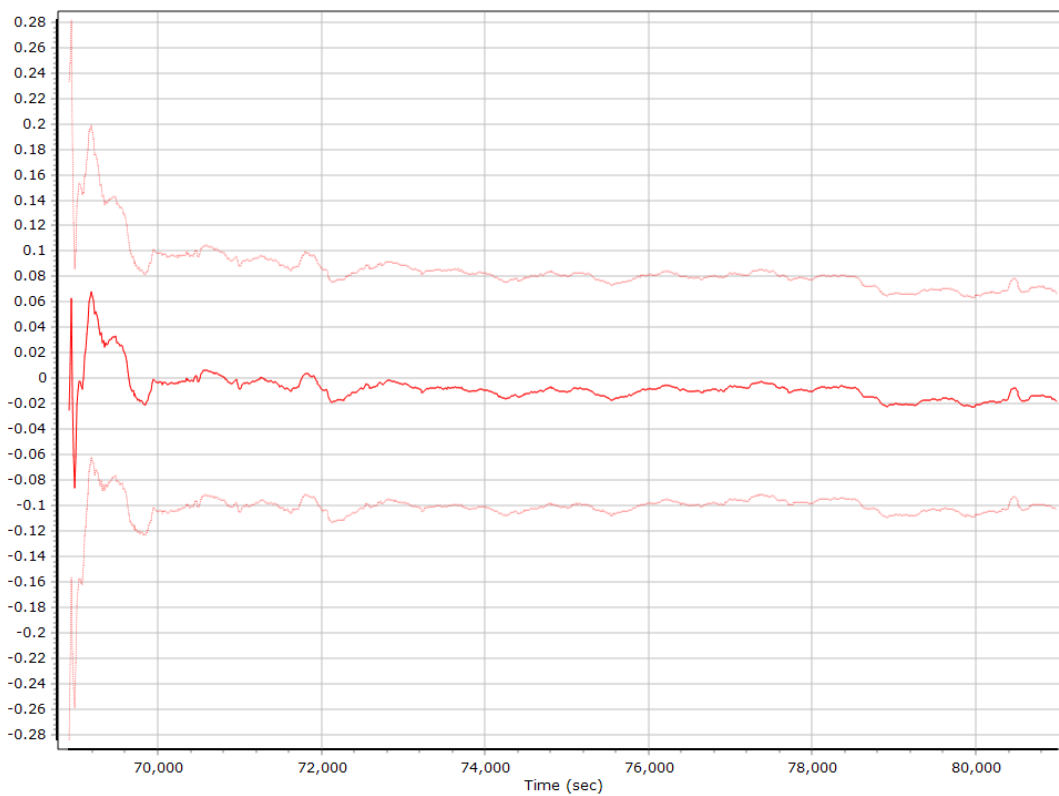
### Z Accelerometer Bias (micro-g)



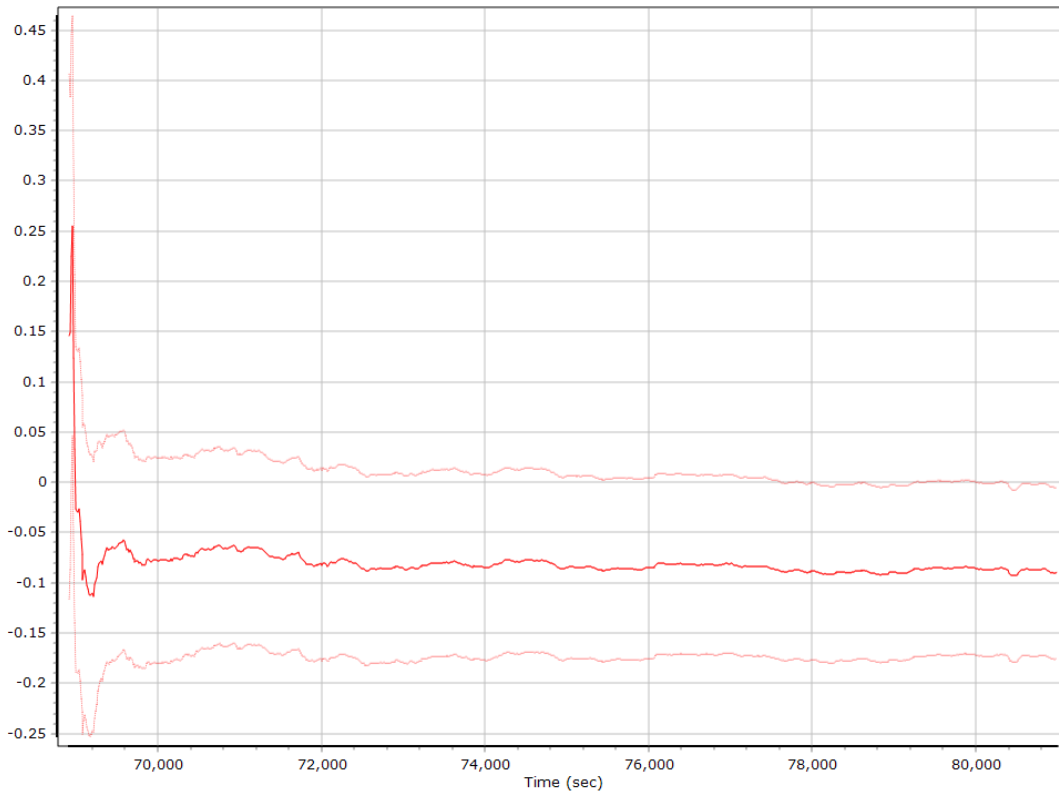
### Gyro Bias (deg/h)



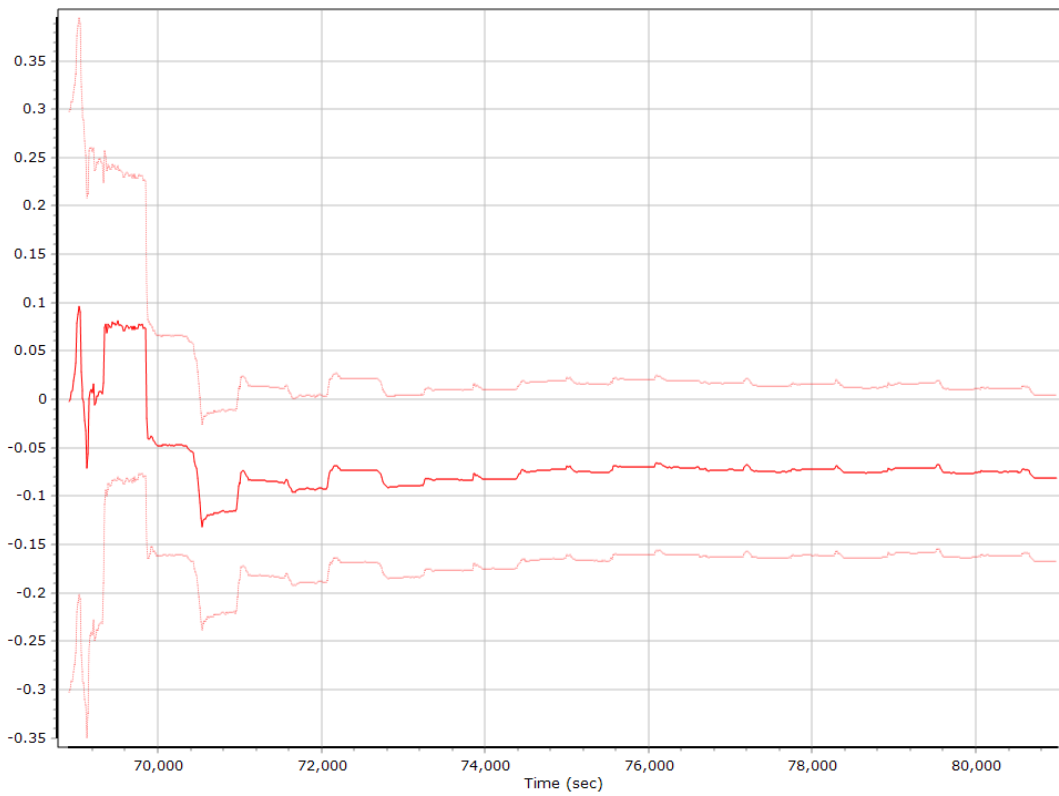
### X Gyro Bias (deg/h)



### Y Gyro Bias (deg/h)

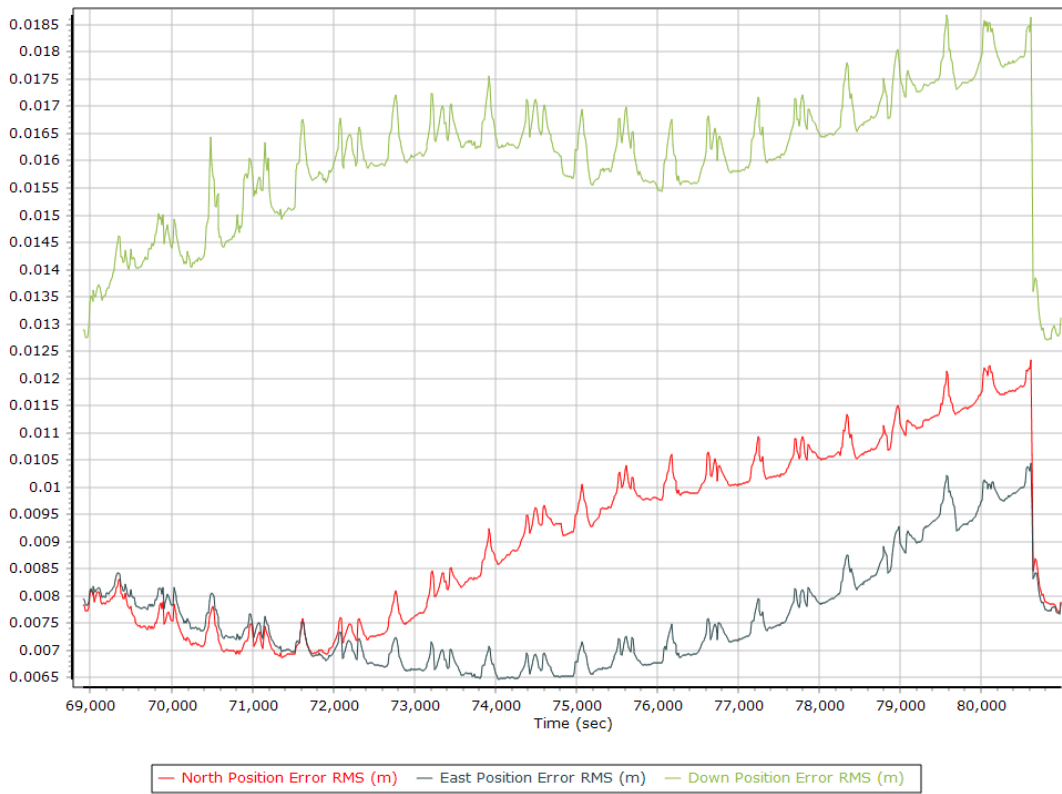


### Z Gyro Bias (deg/h)

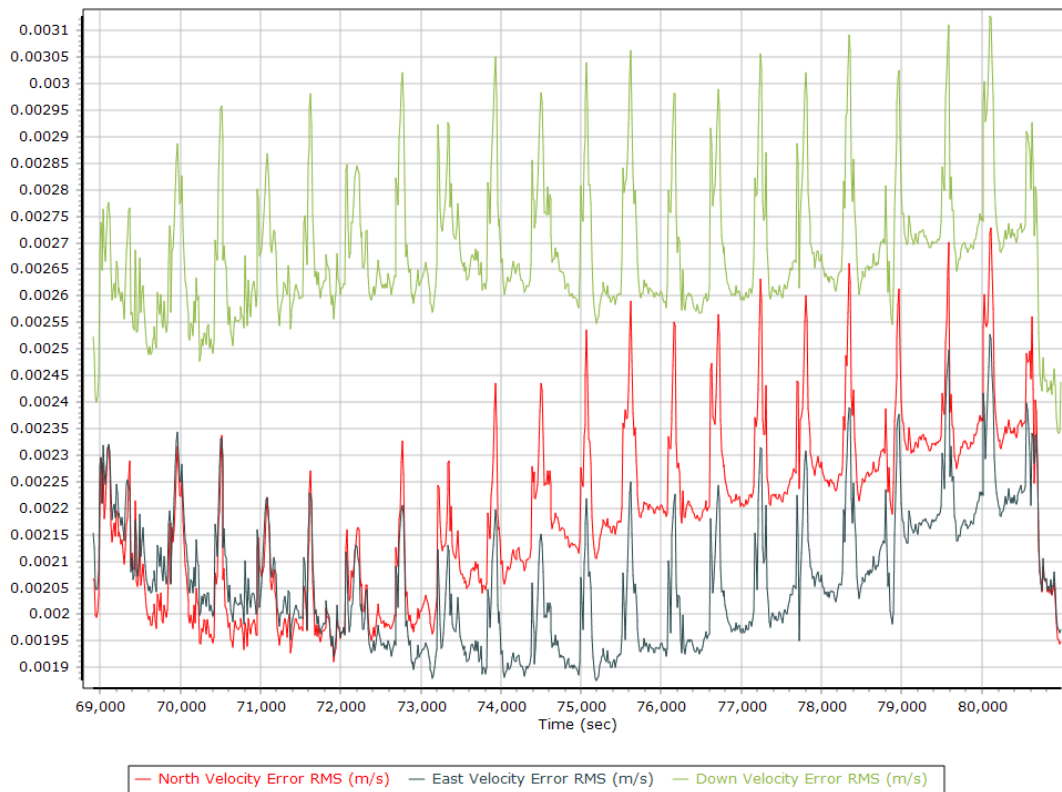


## Smoothed Performance Metrics

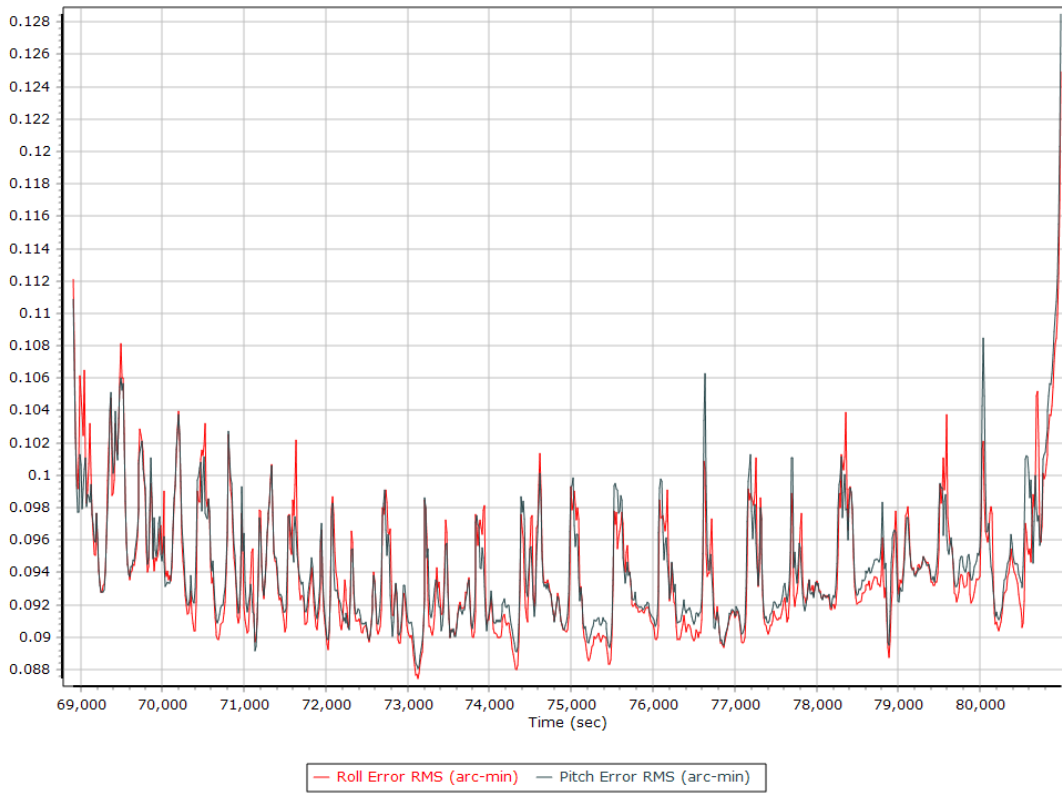
### Position Error RMS (m)



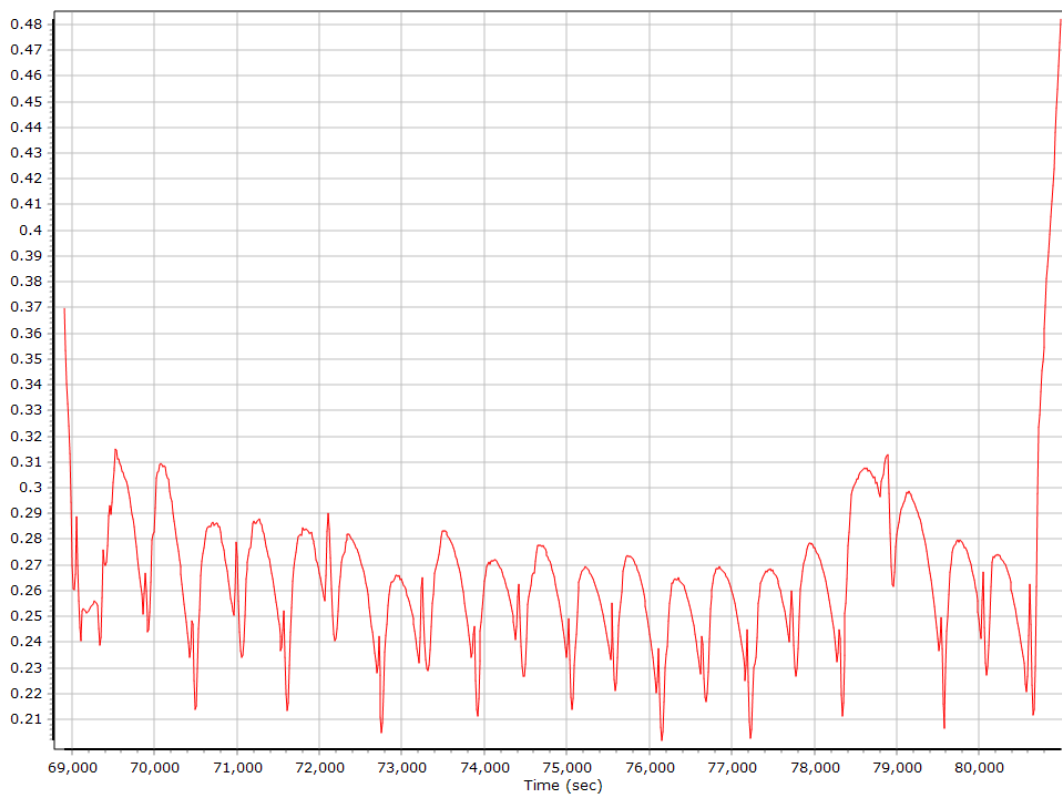
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)

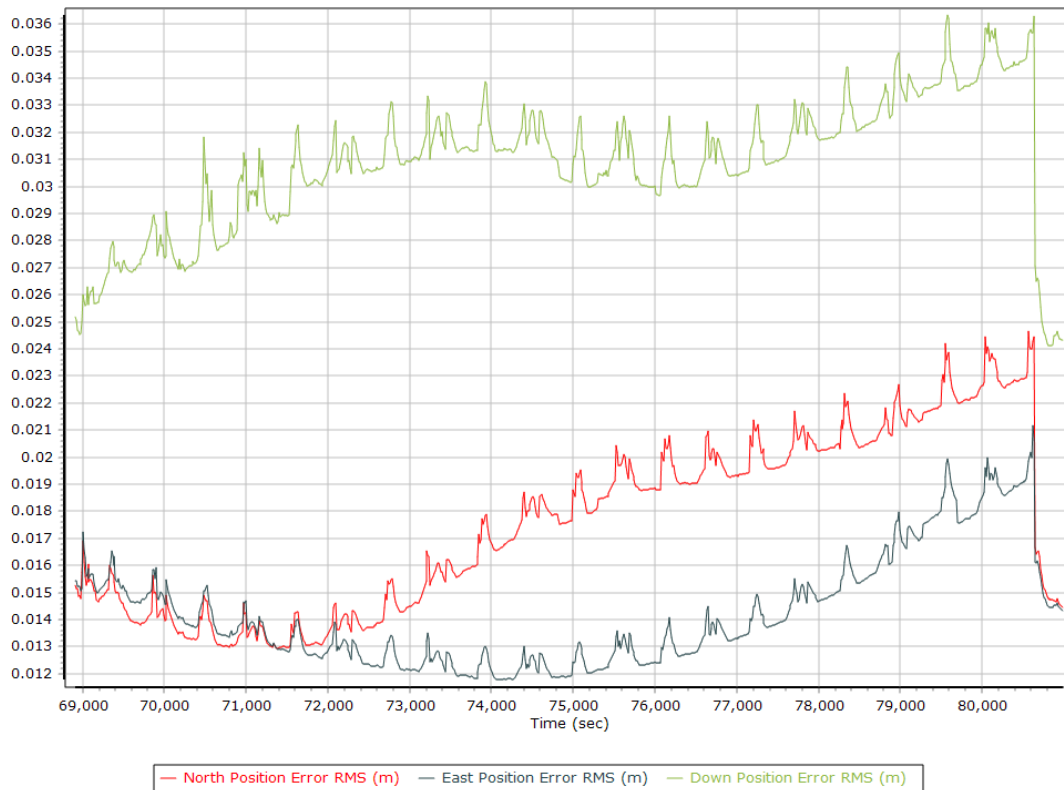


### Heading Error RMS (arc-min)

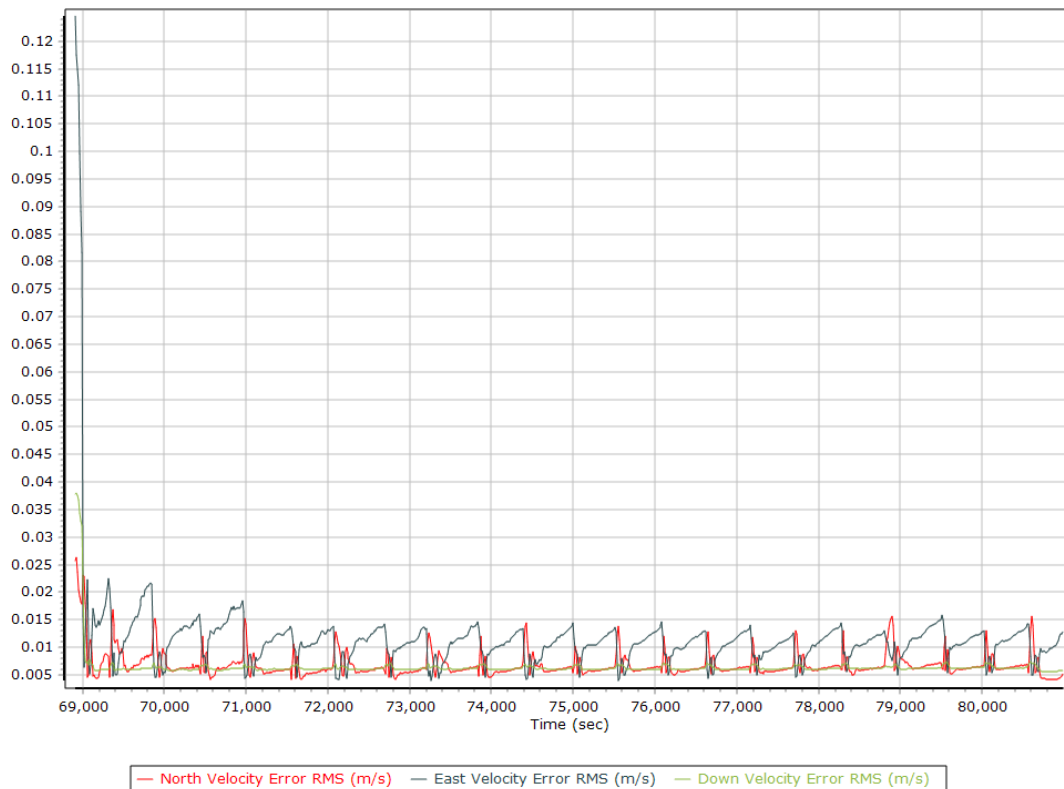


## Forward Processed Performance Metrics

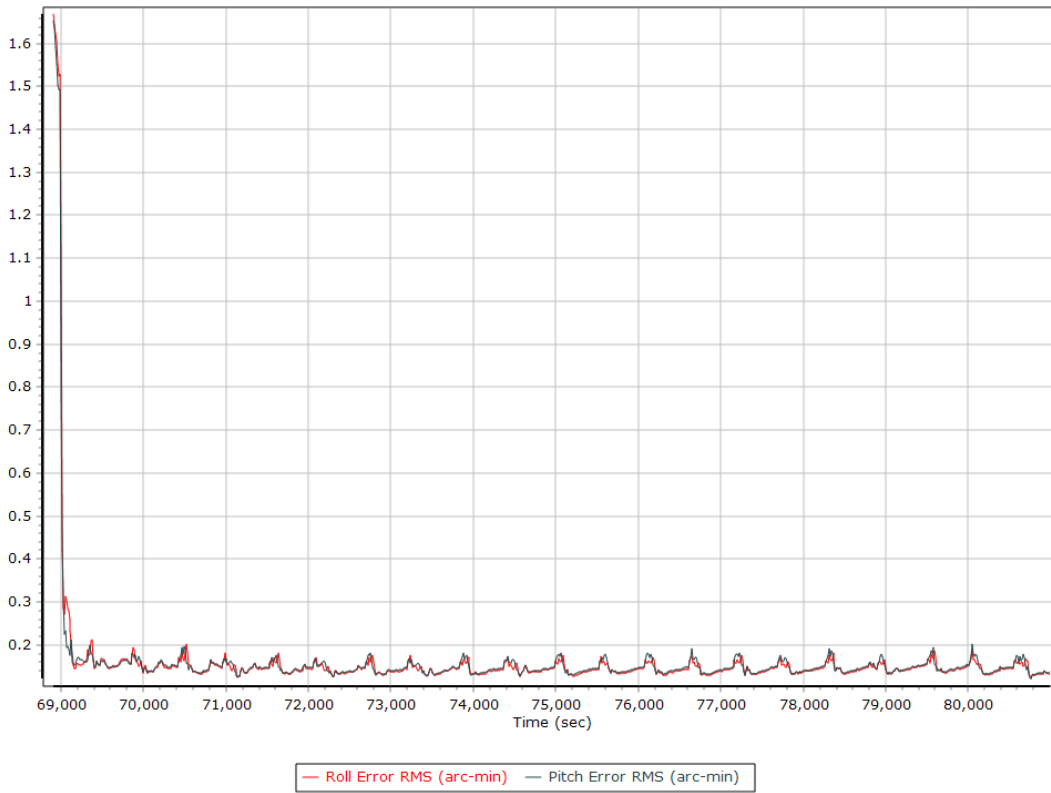
### Position Error RMS (m)



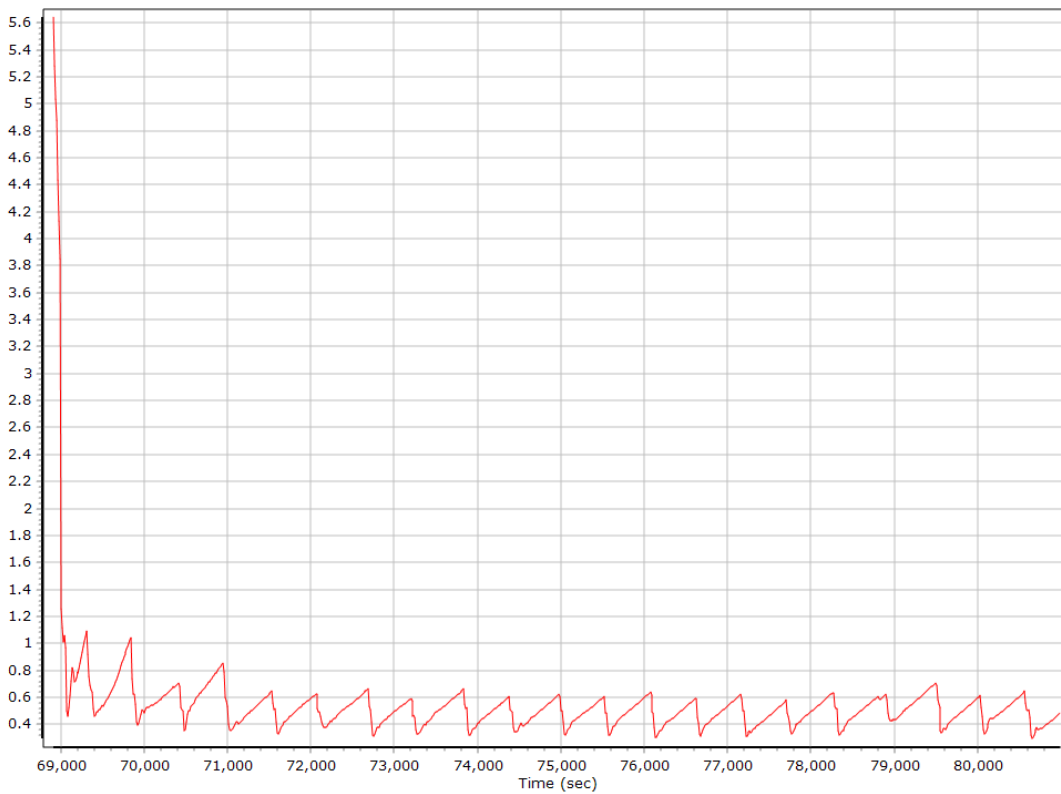
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)

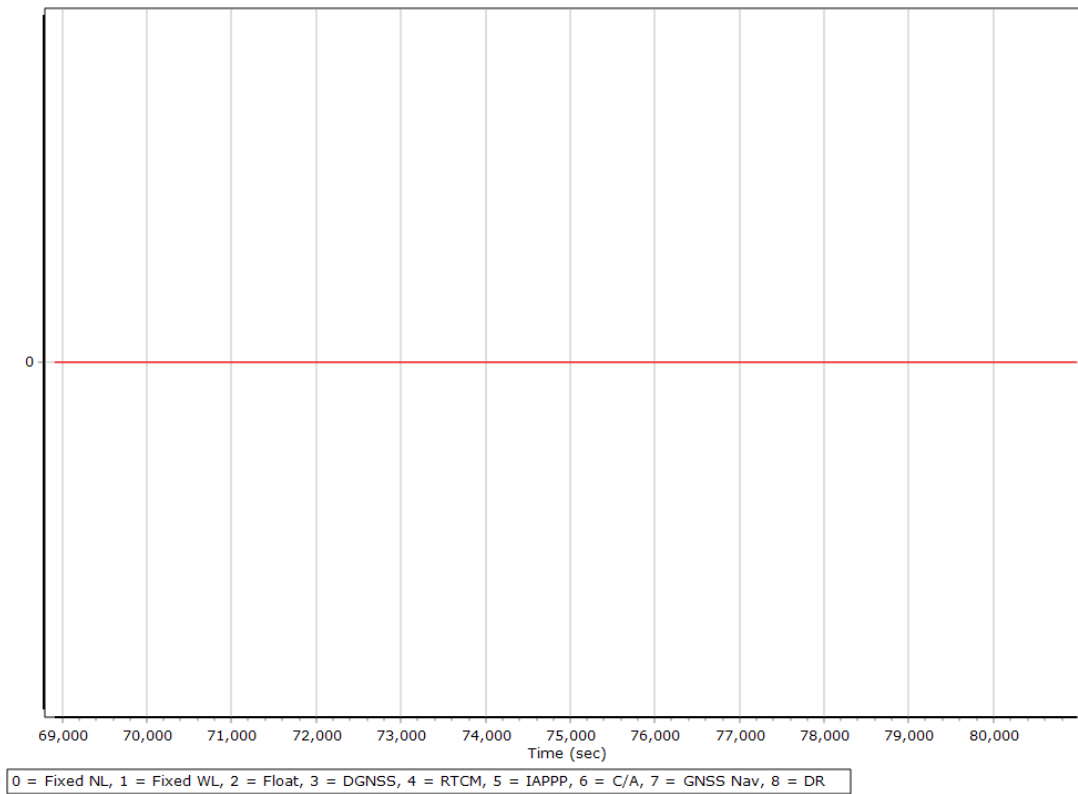


### Heading Error RMS (arc-min)

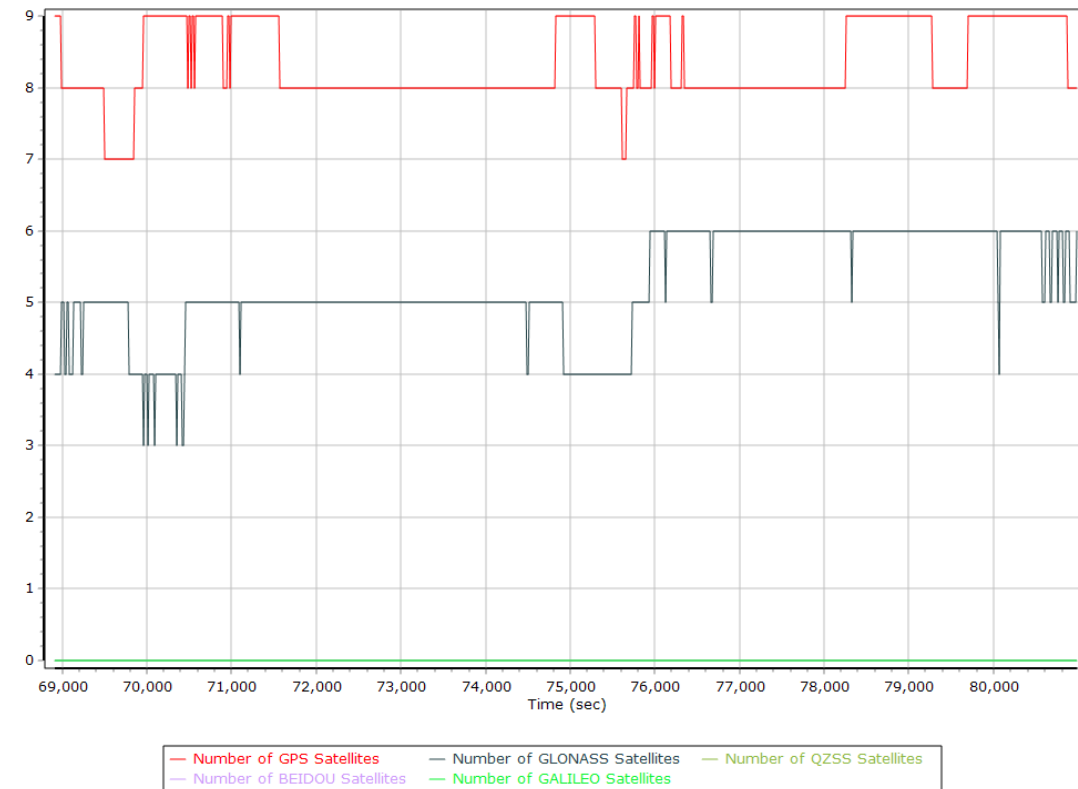


## Smoothed Solution Status

### Processing Mode

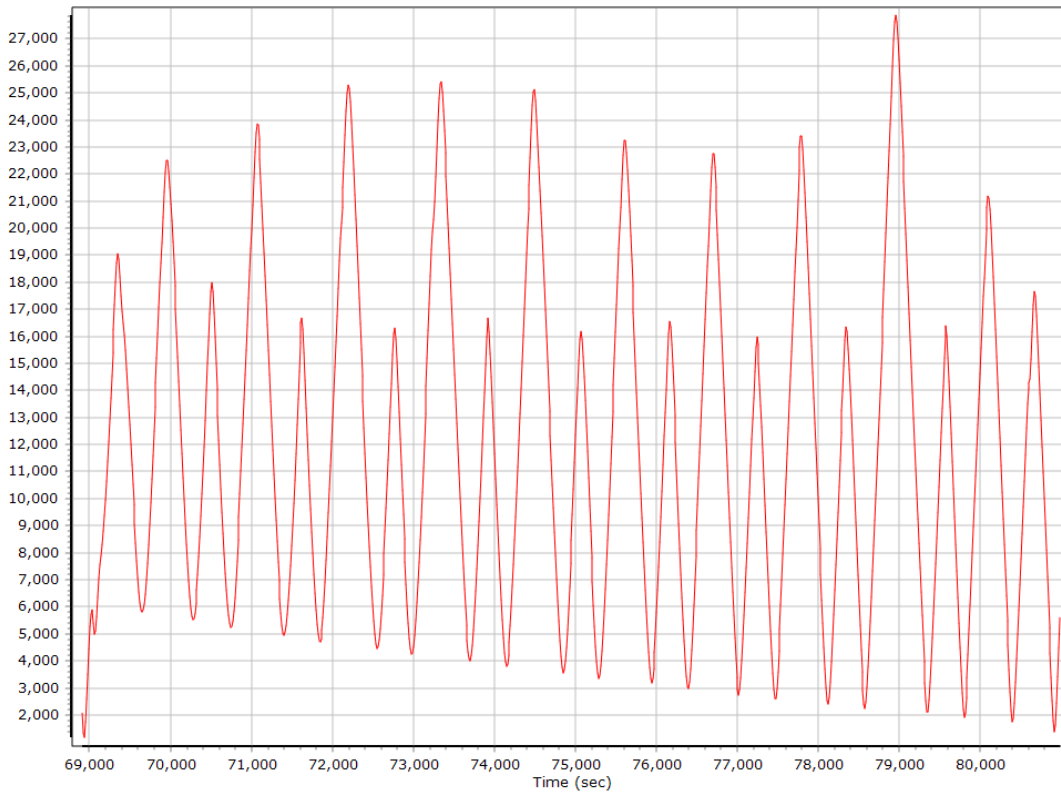


### Number of Satellites



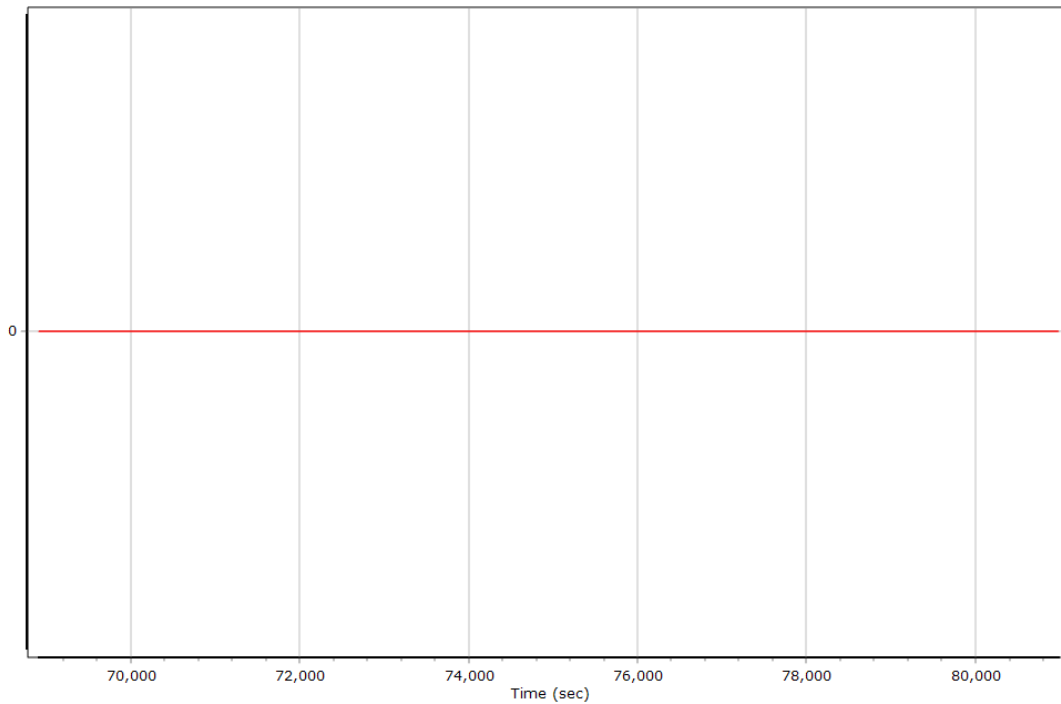


### Baseline Length



### Forward Processed Solution Status

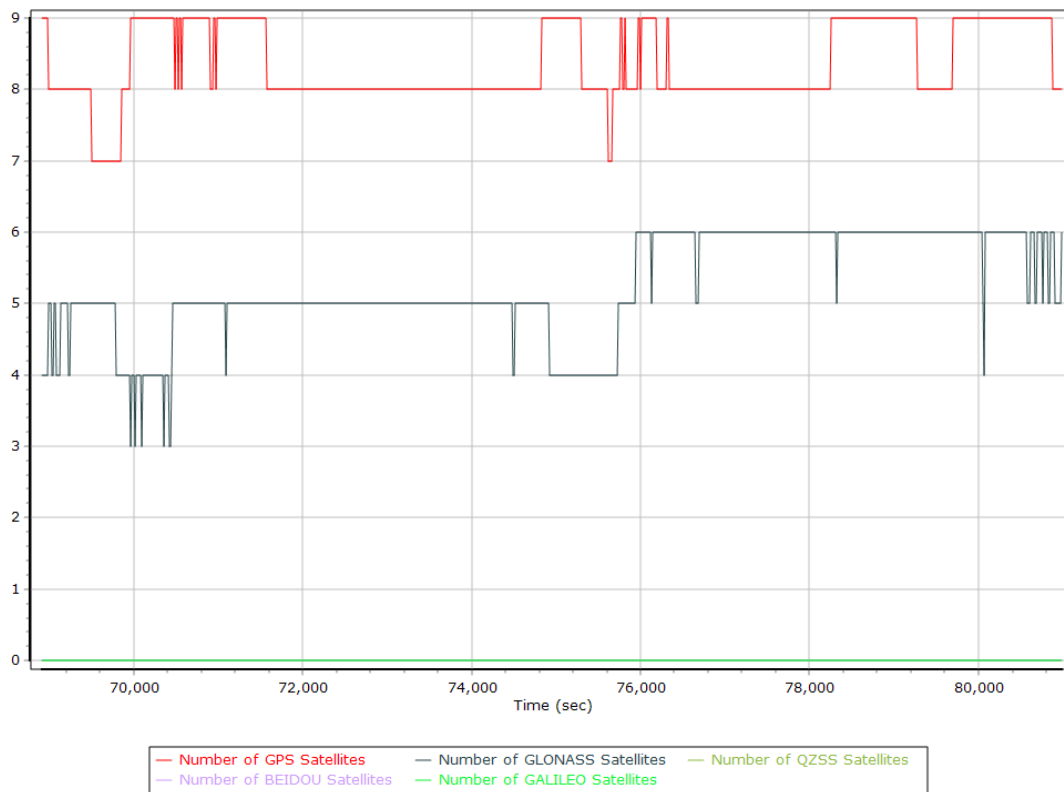
#### Processing Mode



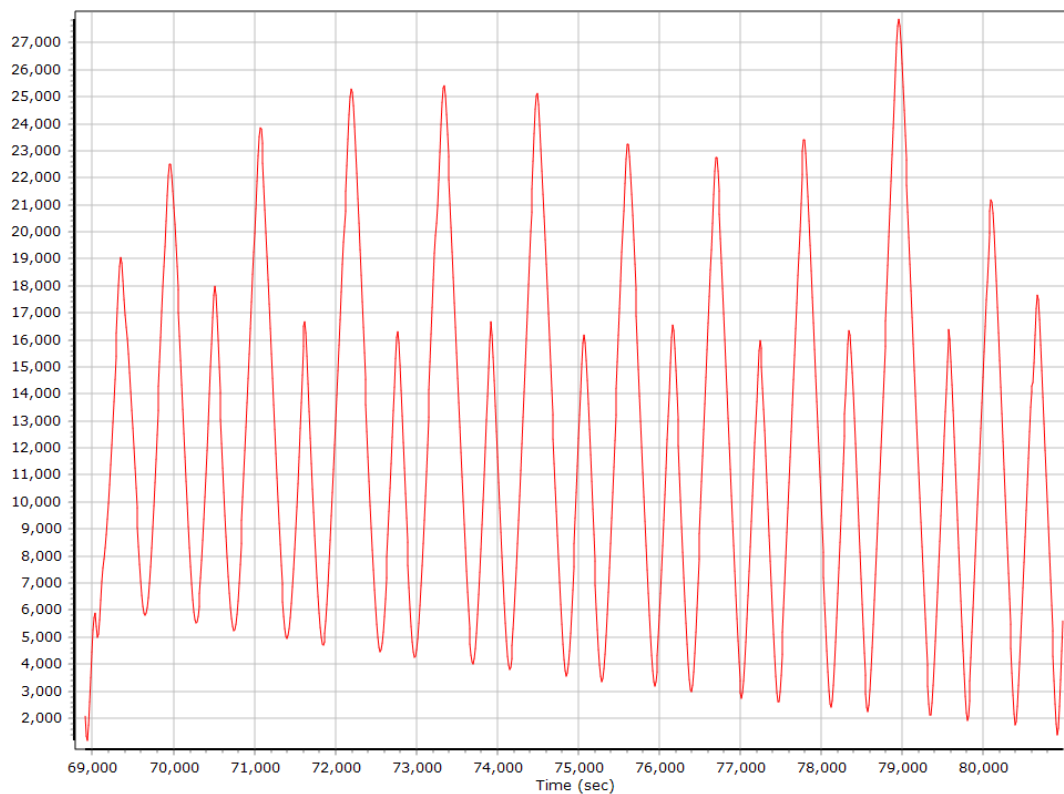
Forward  Reverse

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

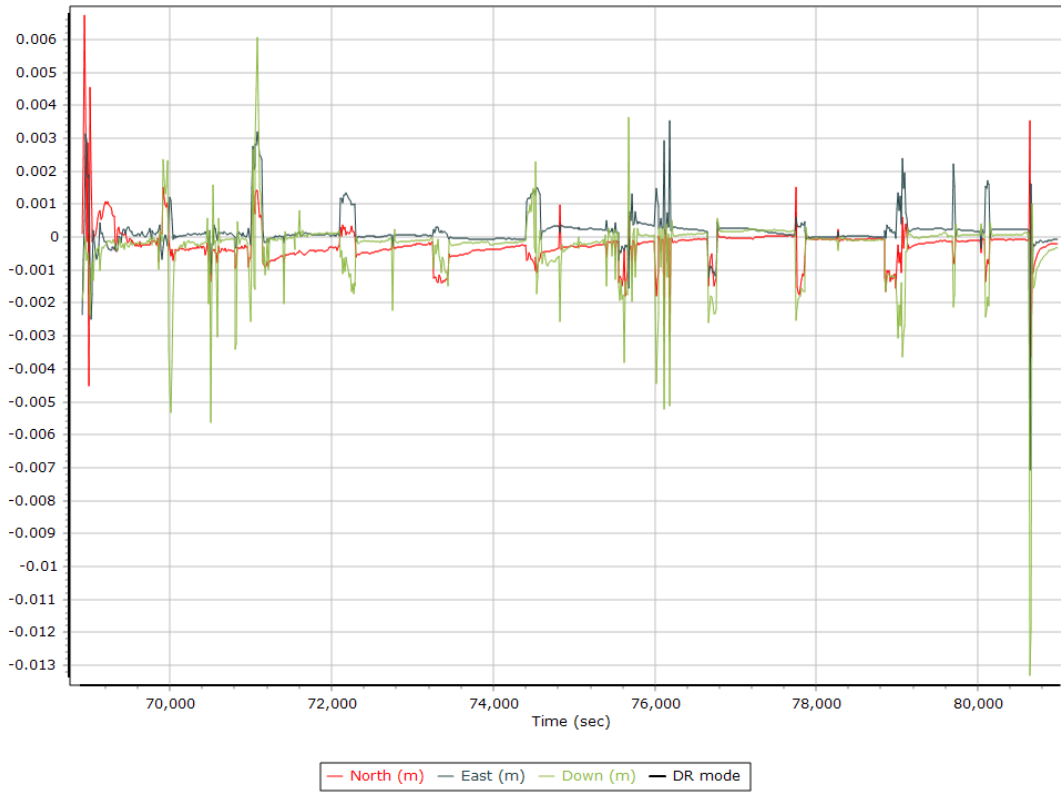
### Number of Satellites



### Baseline Length



## SBET IAKAR Separation



## General Information

### Mission Information

Project name	201213C
Processing date	2020-12-14 15:56:35
Mission date	2020-12-13 23:15:47
Mission duration	04:22:43.000
Processing mode	IN-Fusion Single Base
GPS Station	NCSR

### Rover Hardware Information

Product	POS AV 610 VER6 HW2.5-12
Serial number	S/N9450
IMU type	57
Receiver type	BD982
Antenna type	AV39

## Project File List

### Rover Data Files

File name	File type
201213C.521	POS Data
201213C.522	POS Data
201213C.523	POS Data
201213C.524	POS Data
201213C.525	POS Data
201213C.526	POS Data
201213C.527	POS Data
201213C.528	POS Data
201213C.529	POS Data
201213C.530	POS Data
201213C.531	POS Data
201213C.532	POS Data
201213C.533	POS Data
201213C.534	POS Data
201213C.535	POS Data
201213C.536	POS Data
201213C.537	POS Data
201213C.538	POS Data
201213C.539	POS Data
201213C.540	POS Data
201213C.541	POS Data
201213C.542	POS Data
201213C.543	POS Data
201213C.544	POS Data
201213C.545	POS Data
201213C.546	POS Data
201213C.547	POS Data
201213C.548	POS Data

### Input Files

File Name	File Type
Ephm3480.20g	GLONASS Broadcast Ephemeris
Ephm3480.20n	GPS Broadcast Ephemeris
Ephm3490.20g	GLONASS Broadcast Ephemeris
Ephm3490.20n	GPS Broadcast Ephemeris
ncsr3480.20o	GNSS SingleBase

### Output Files

Filename	File type
sbet_201213C.out	SBET Trajectory File

## Rover Data Summary

First raw data file	201213C.521		
Last raw data file	201213C.548		
Start GPS week	2136		
Start time	83746.714 (12/13/2020 11:15:46 PM)		
End time	102081.005 (12/14/2020 4:21:21 AM)		
Start of fine alignment	85337.293 (12/13/2020 11:42:17 PM)		
Available subsystems	Primary GNSS, IMU		
POS Event Input	None		
Correction data	None		
<b>IMU Installation Lever Arms &amp; Mounting Angles</b>			
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference 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

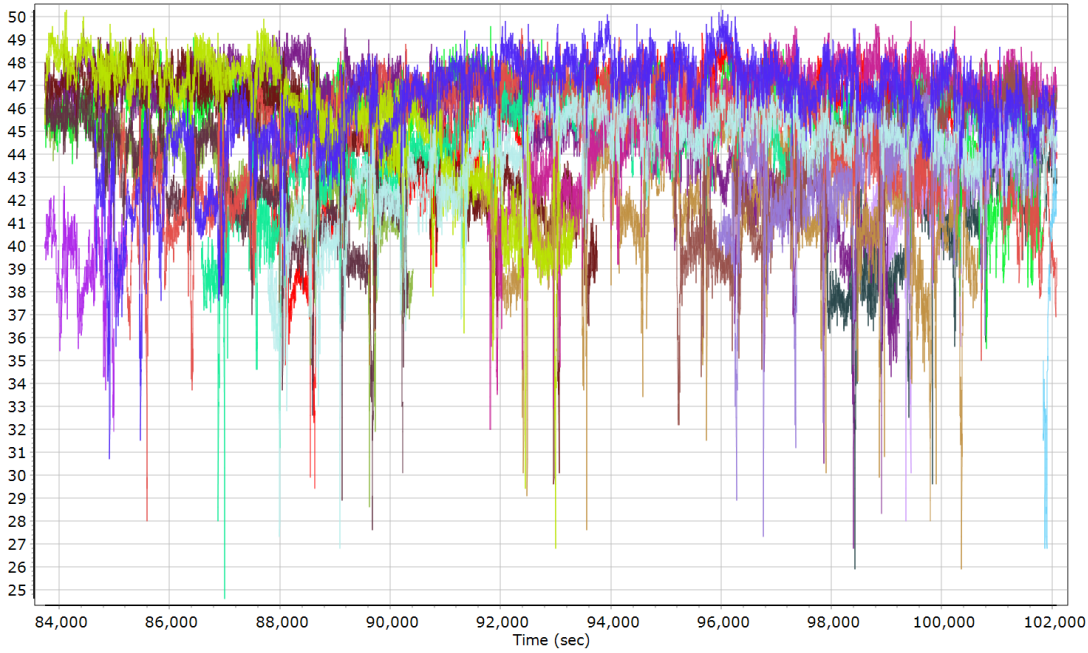
IMU data input file	imu_201213C.dat
IMU data check log file	imudt_201213C.log
IMU Records Processed	3666875
Termination Status	Normal
IMU Anomalies	0

## Primary Observables & Satellite Data

### GPS/GLONASS L1 Satellite Lock/Elevation

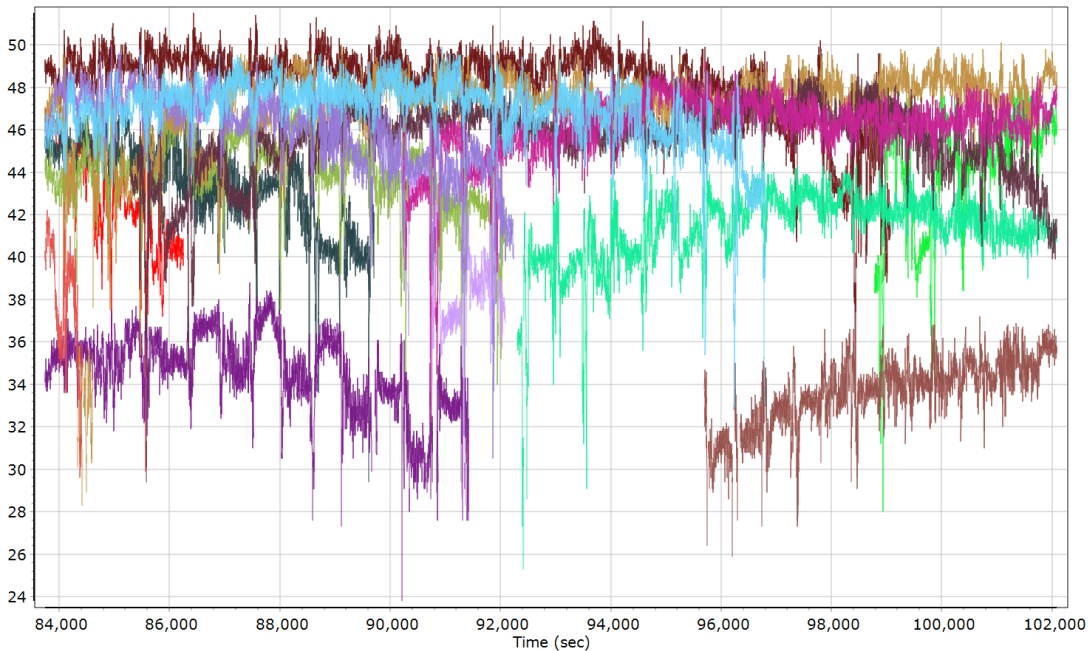


### GPS L1 SNR



- |                           |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|---------------------------|
| GPS PRN 01 L1 SNR (dB/Hz) | GPS PRN 03 L1 SNR (dB/Hz) | GPS PRN 04 L1 SNR (dB/Hz) | GPS PRN 06 L1 SNR (dB/Hz) |
| GPS PRN 07 L1 SNR (dB/Hz) | GPS PRN 08 L1 SNR (dB/Hz) | GPS PRN 09 L1 SNR (dB/Hz) | GPS PRN 13 L1 SNR (dB/Hz) |
| GPS PRN 14 L1 SNR (dB/Hz) | GPS PRN 16 L1 SNR (dB/Hz) | GPS PRN 17 L1 SNR (dB/Hz) | GPS PRN 19 L1 SNR (dB/Hz) |
| GPS PRN 21 L1 SNR (dB/Hz) | GPS PRN 22 L1 SNR (dB/Hz) | GPS PRN 24 L1 SNR (dB/Hz) | GPS PRN 26 L1 SNR (dB/Hz) |
| GPS PRN 27 L1 SNR (dB/Hz) | GPS PRN 28 L1 SNR (dB/Hz) | GPS PRN 30 L1 SNR (dB/Hz) |                           |

### GLONASS L1 SNR



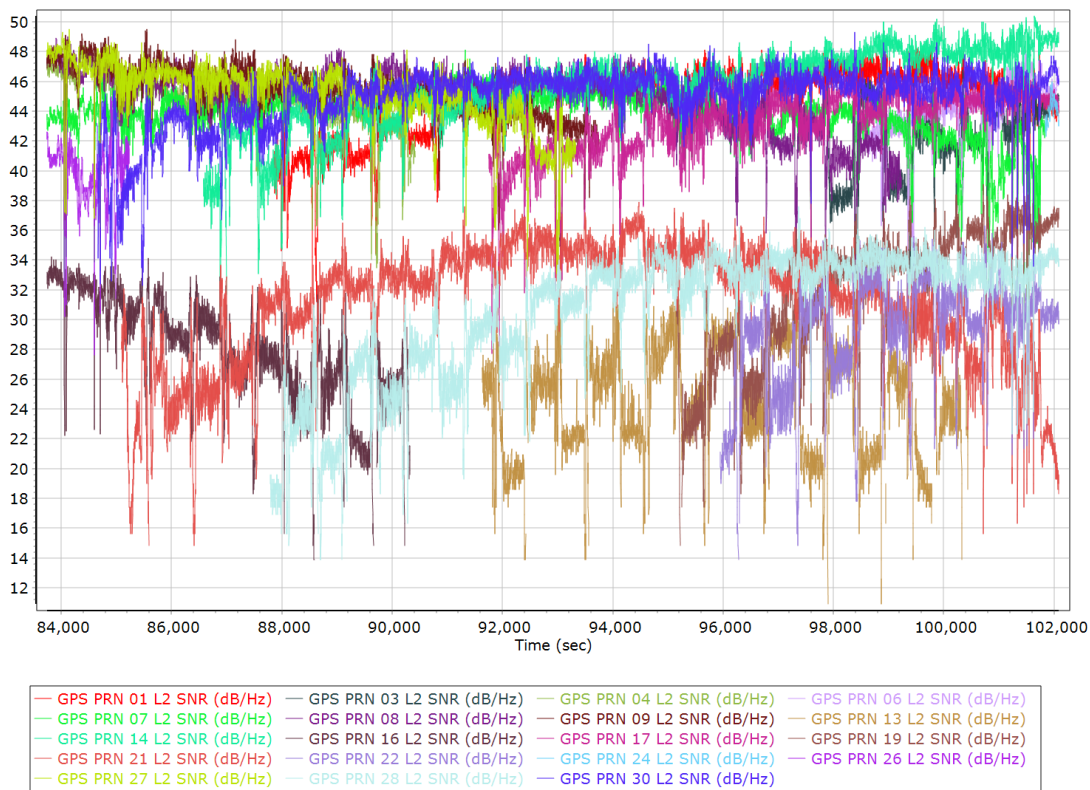
- |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| GLONASS 03 L1 SNR (dB/Hz) | GLONASS 04 L1 SNR (dB/Hz) | GLONASS 05 L1 SNR (dB/Hz) |
| GLONASS 06 L1 SNR (dB/Hz) | GLONASS 09 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 17 L1 SNR (dB/Hz) | GLONASS 18 L1 SNR (dB/Hz) | GLONASS 19 L1 SNR (dB/Hz) |
| GLONASS 22 L1 SNR (dB/Hz) | GLONASS 23 L1 SNR (dB/Hz) | GLONASS 24 L1 SNR (dB/Hz) |



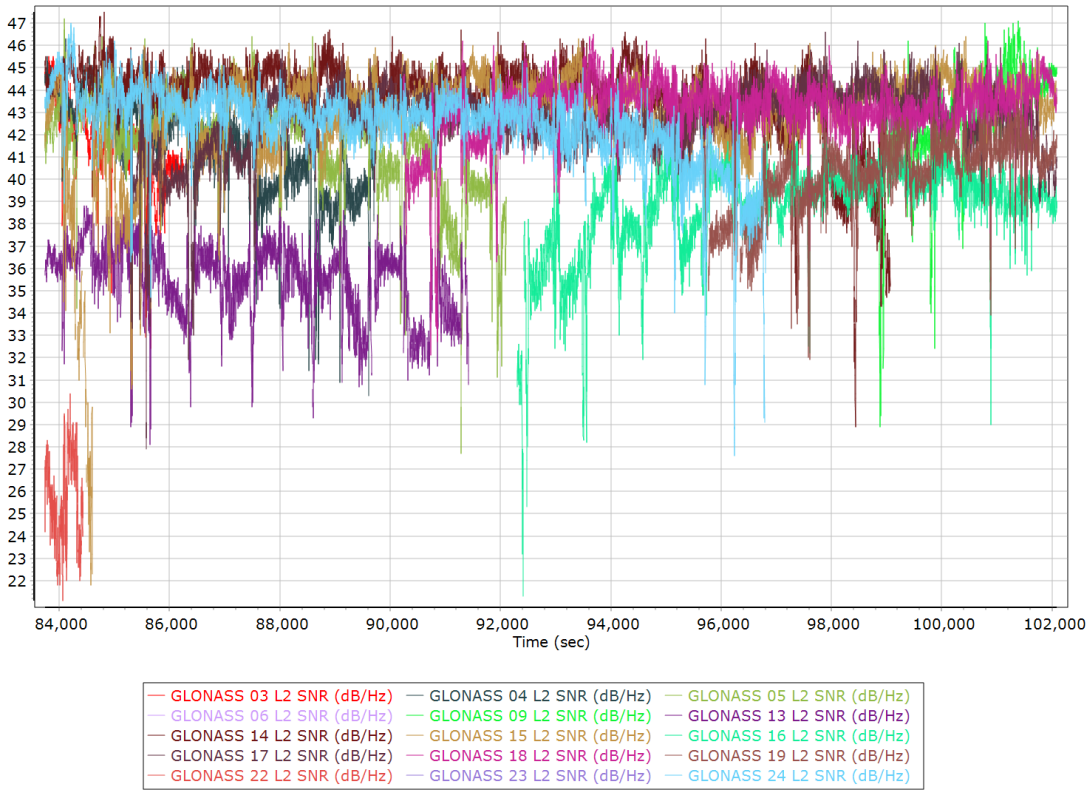
### GPS/GLONASS L2 Satellite Lock/Elevation



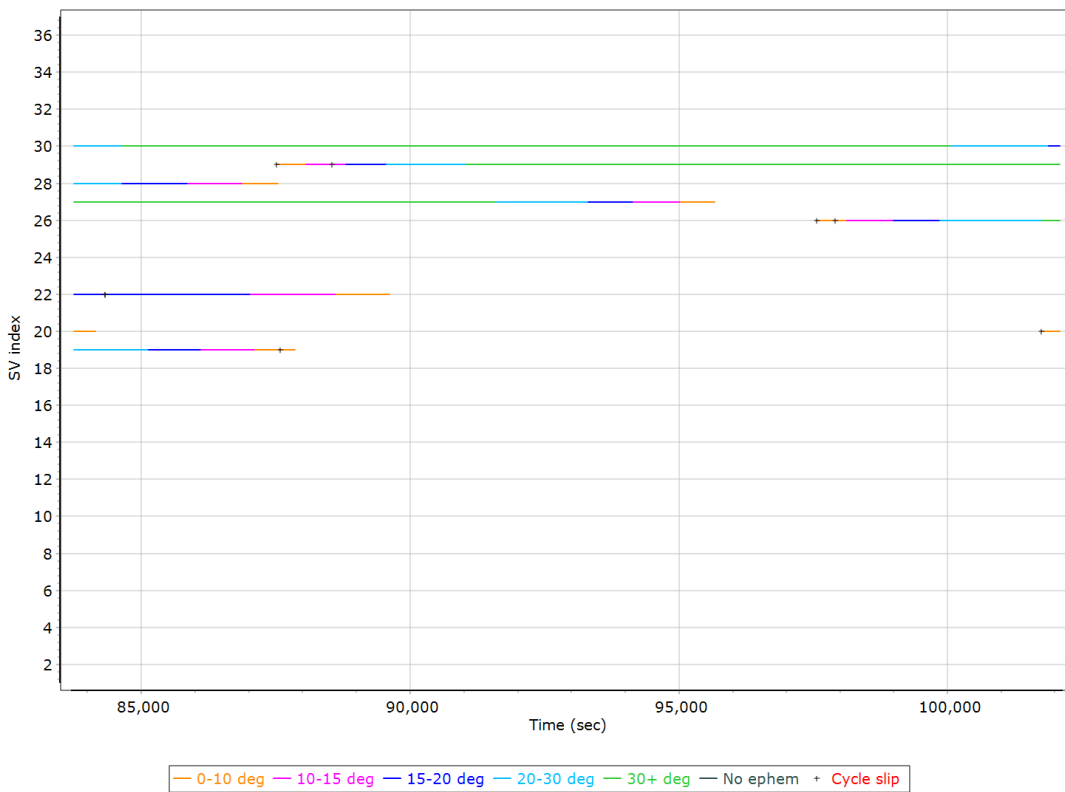
### GPS L2 SNR



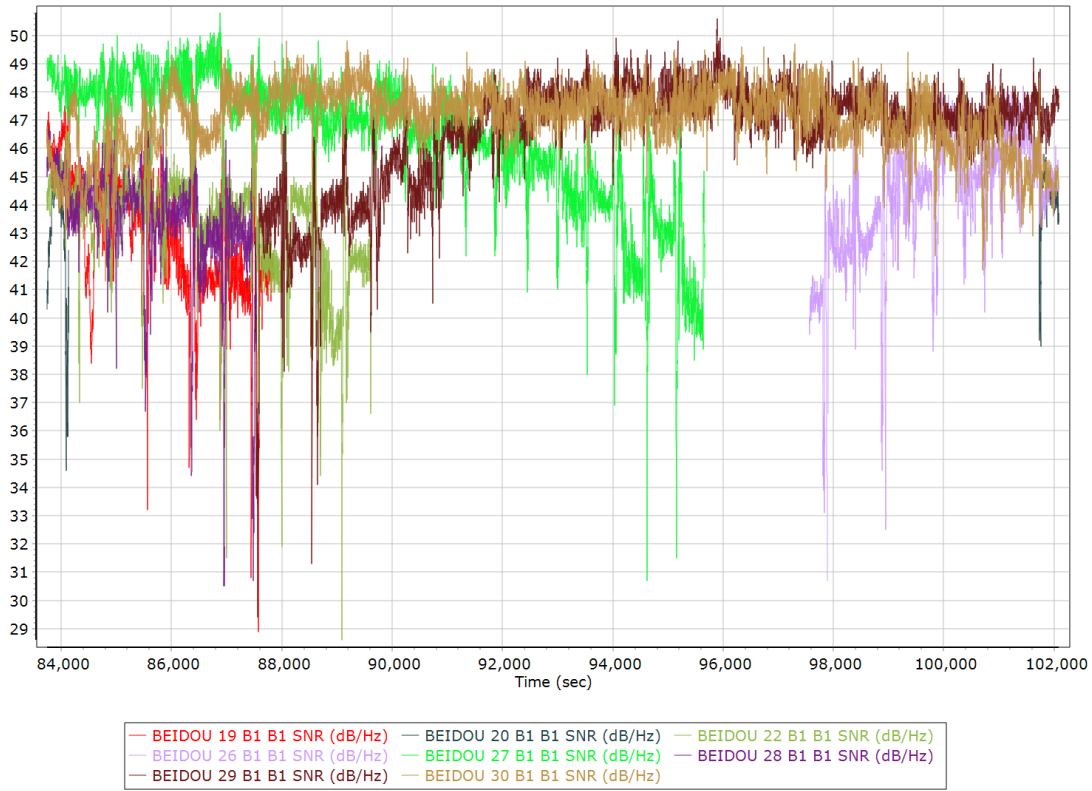
### GLONASS L2 SNR



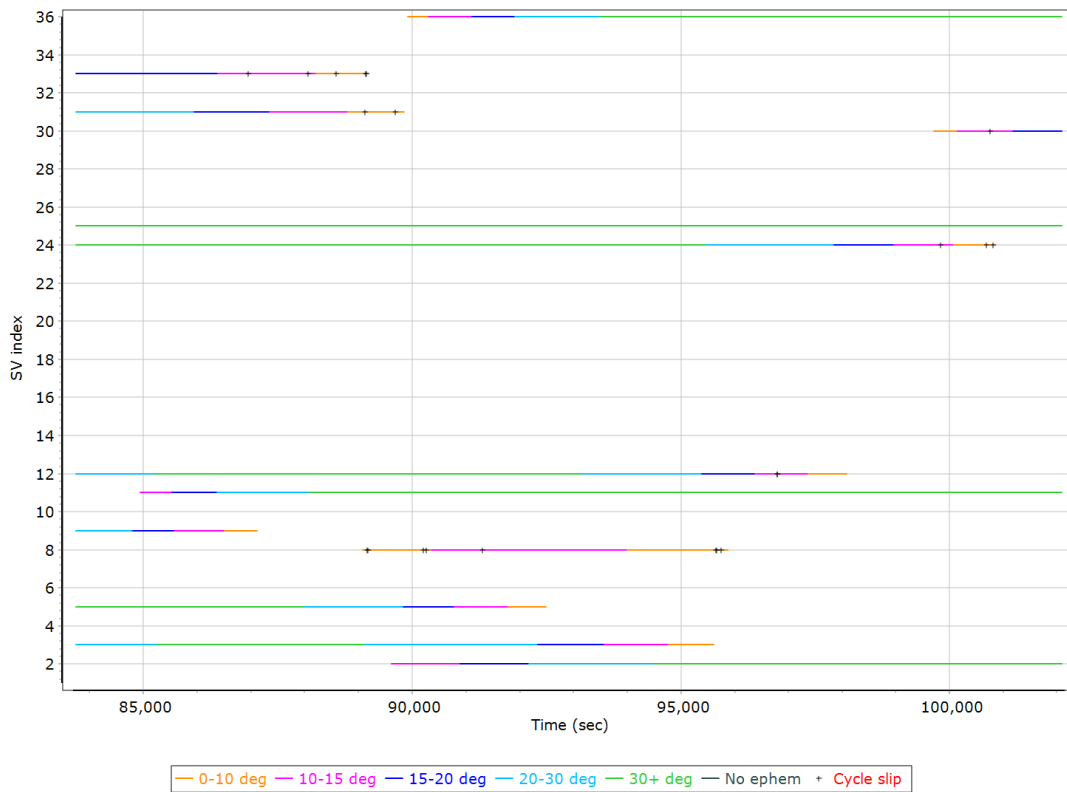
### BEIDOU Satellite Lock/Elevation



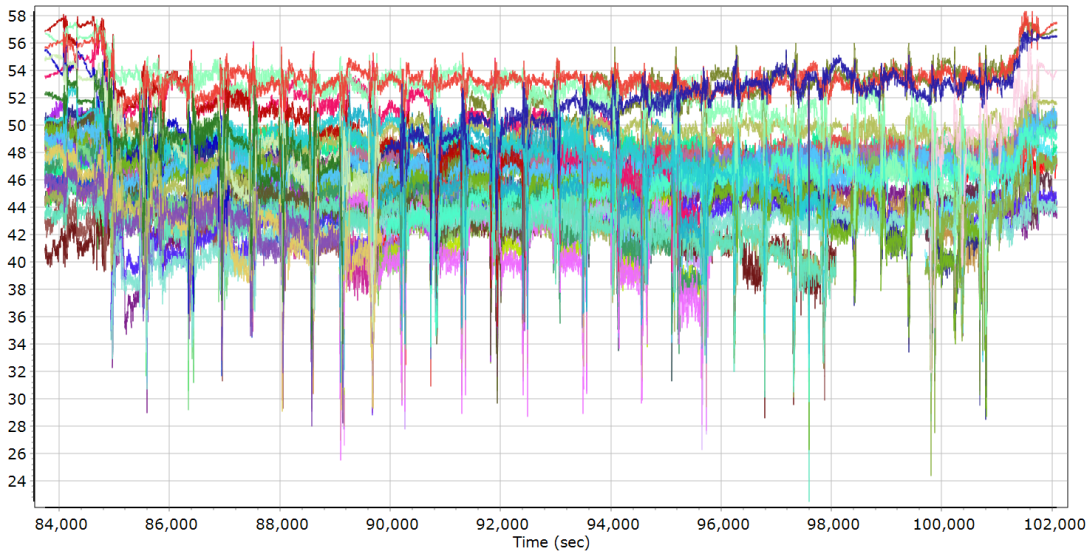
### BEIDOU SNR



### GALILEO Satellite Lock/Elevation



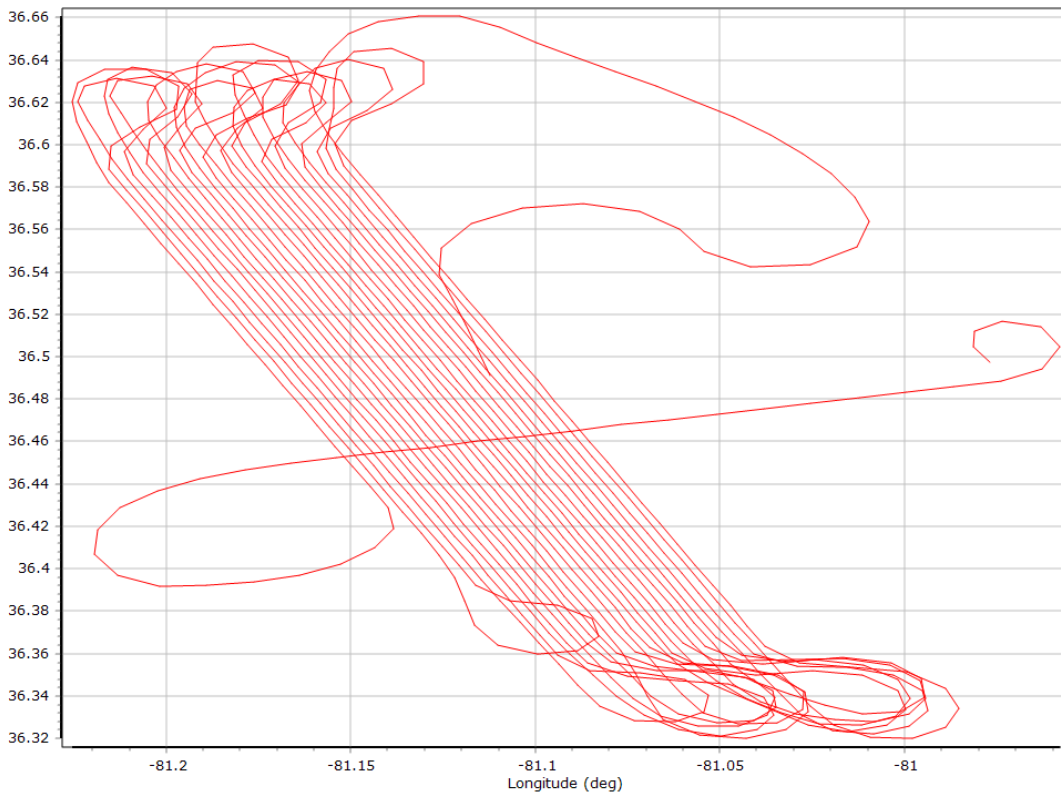
## GALILEO SNR



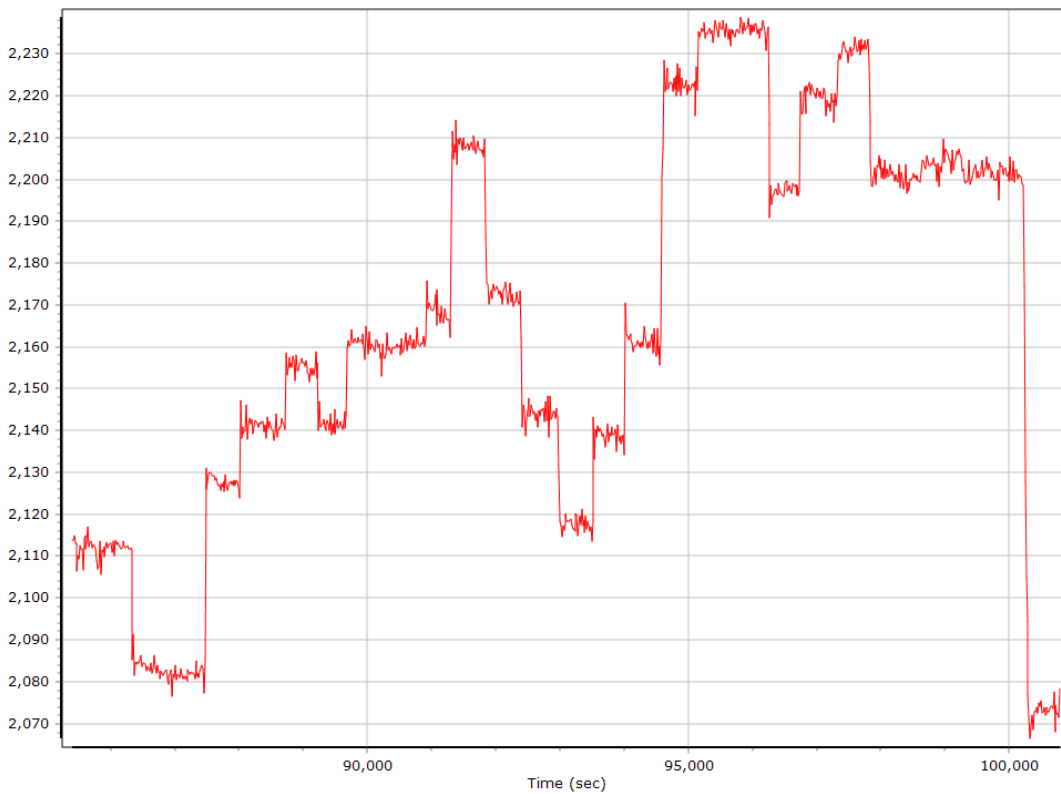
— GALILEO 02 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 03 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 05 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 08 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 09 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— GALILEO 11 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)
— GALILEO 12 L1 BOC_1_1_DP_MBOC SNR (dB/Hz)	— 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 33 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)

## Smoothed Trajectory Information

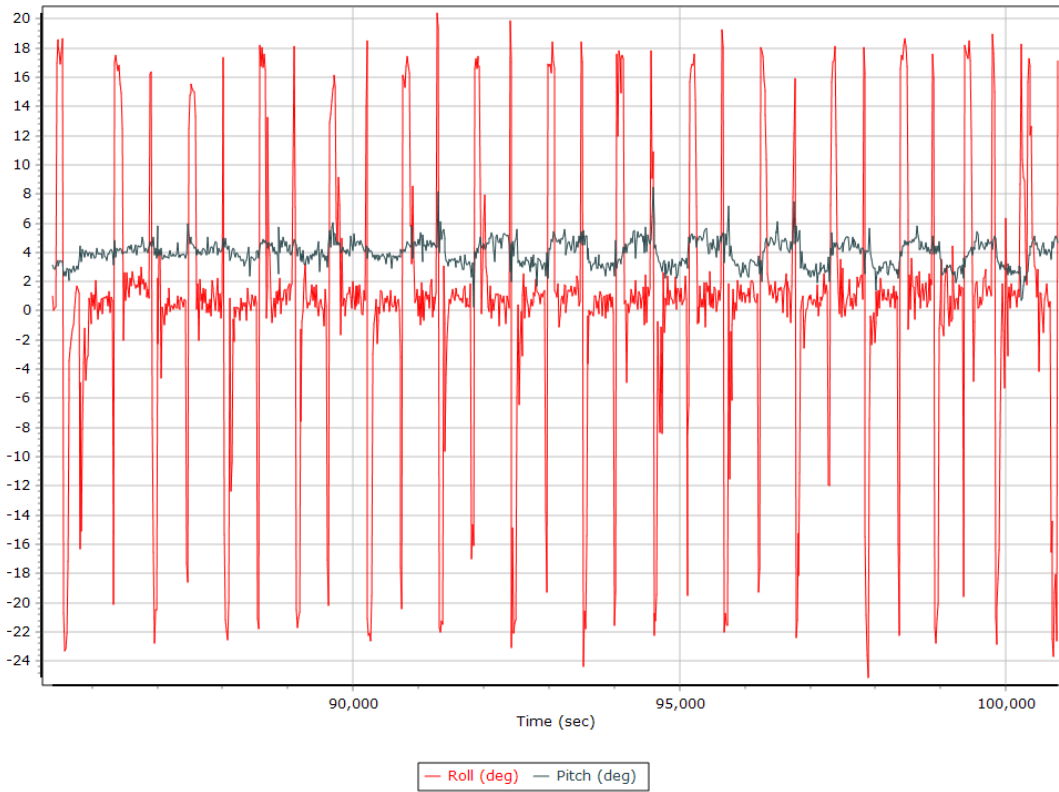
### Top View



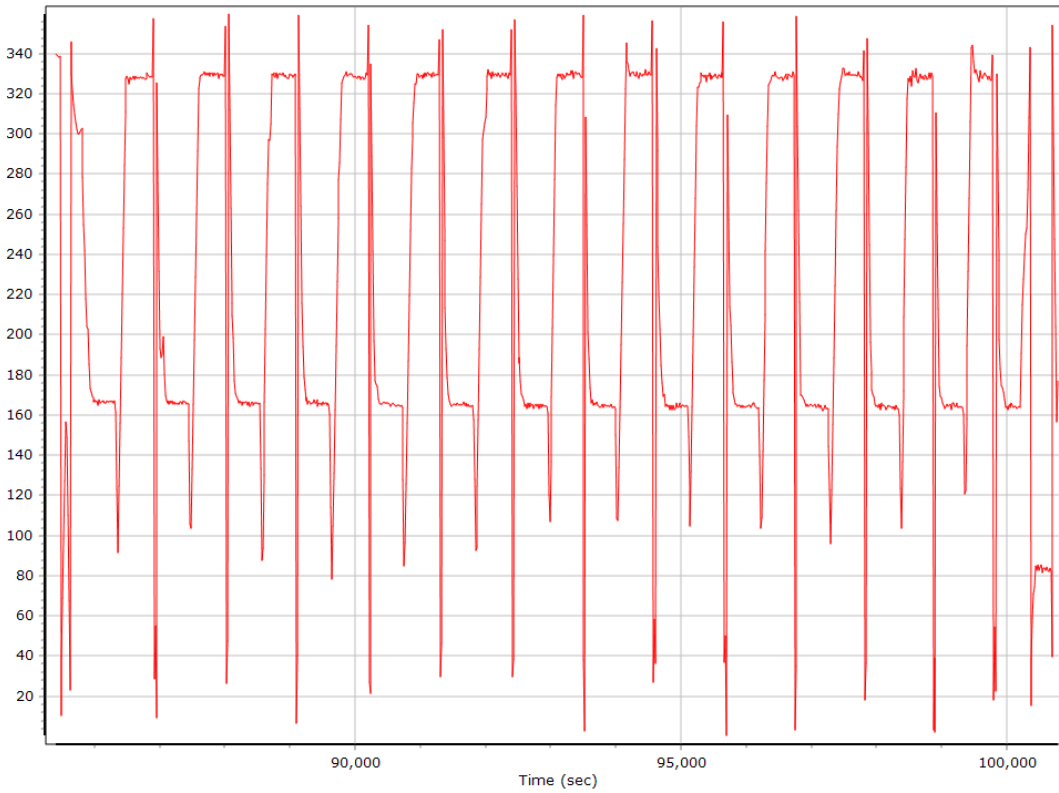
### Altitude



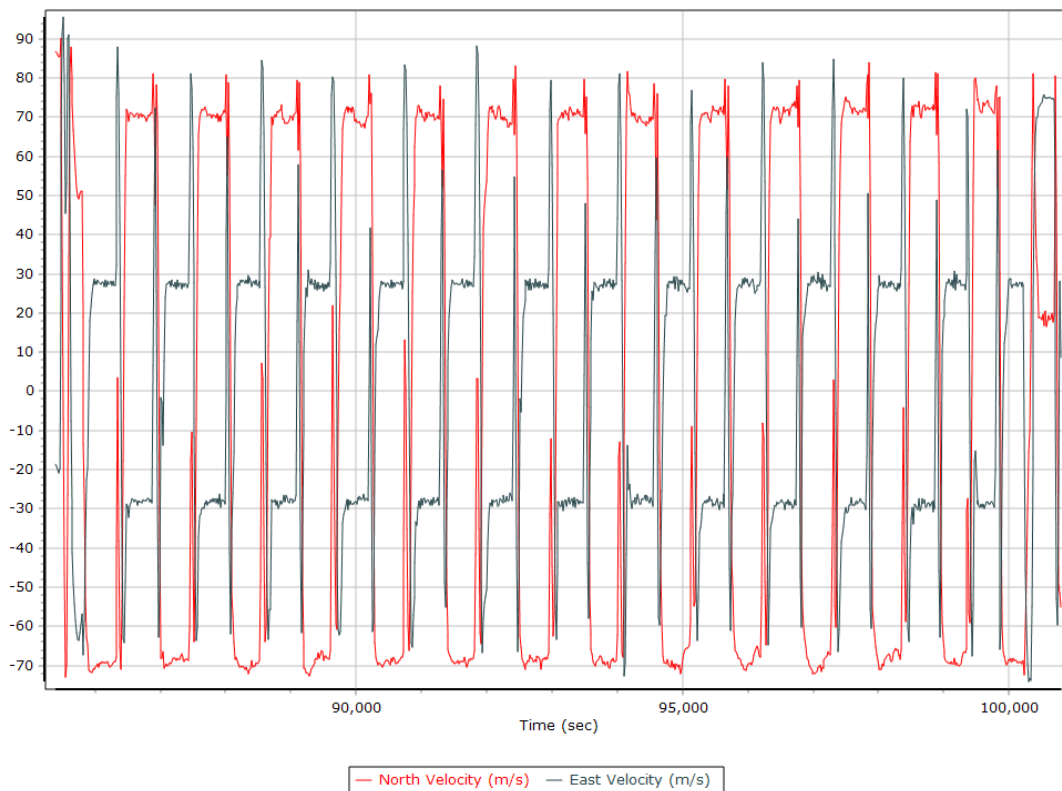
## Roll/Pitch



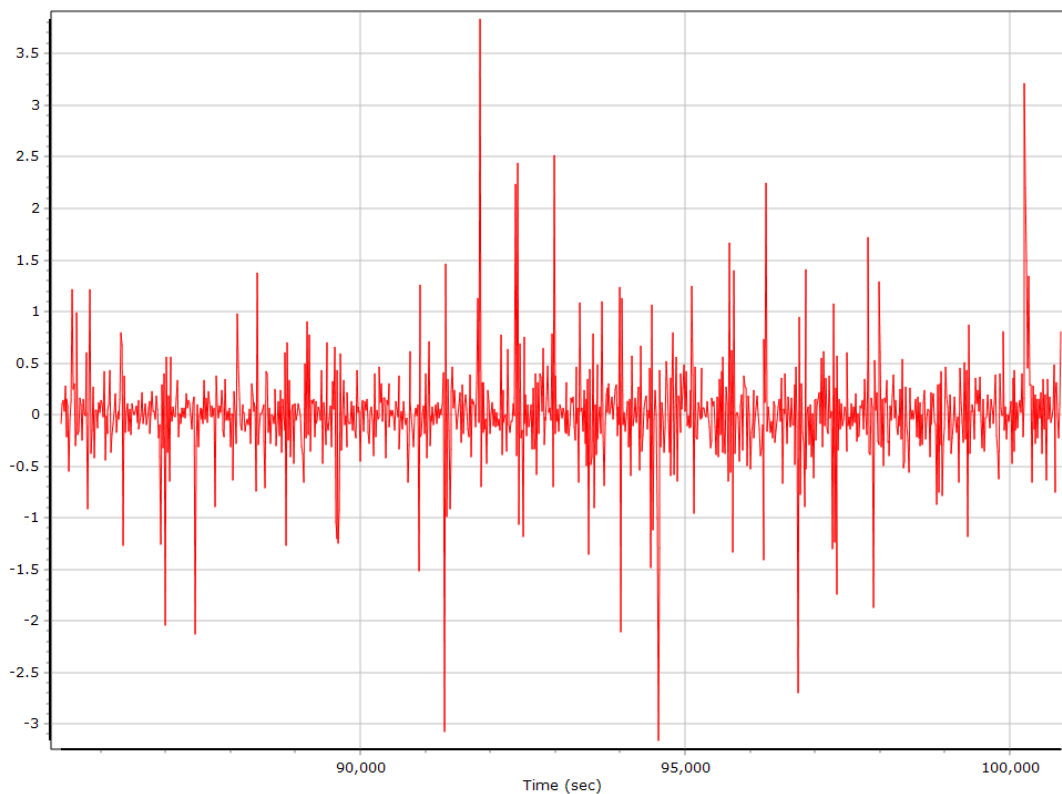
## Heading



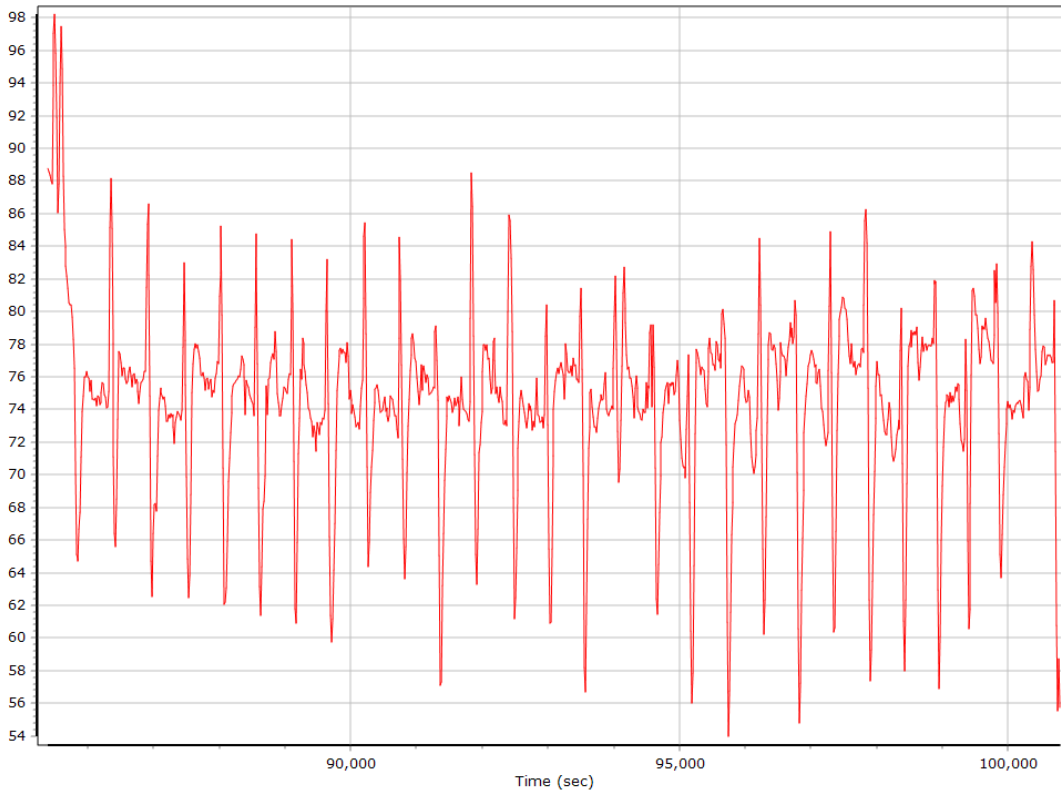
### North/East Velocity



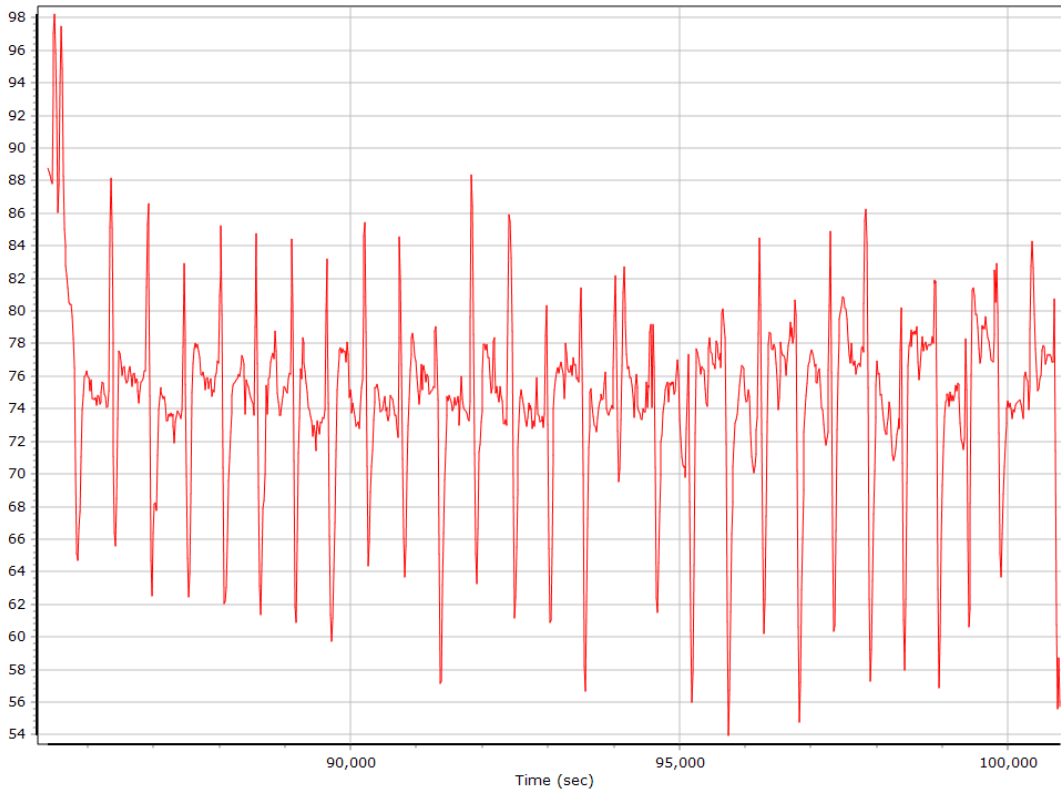
### Down Velocity



## Total Speed

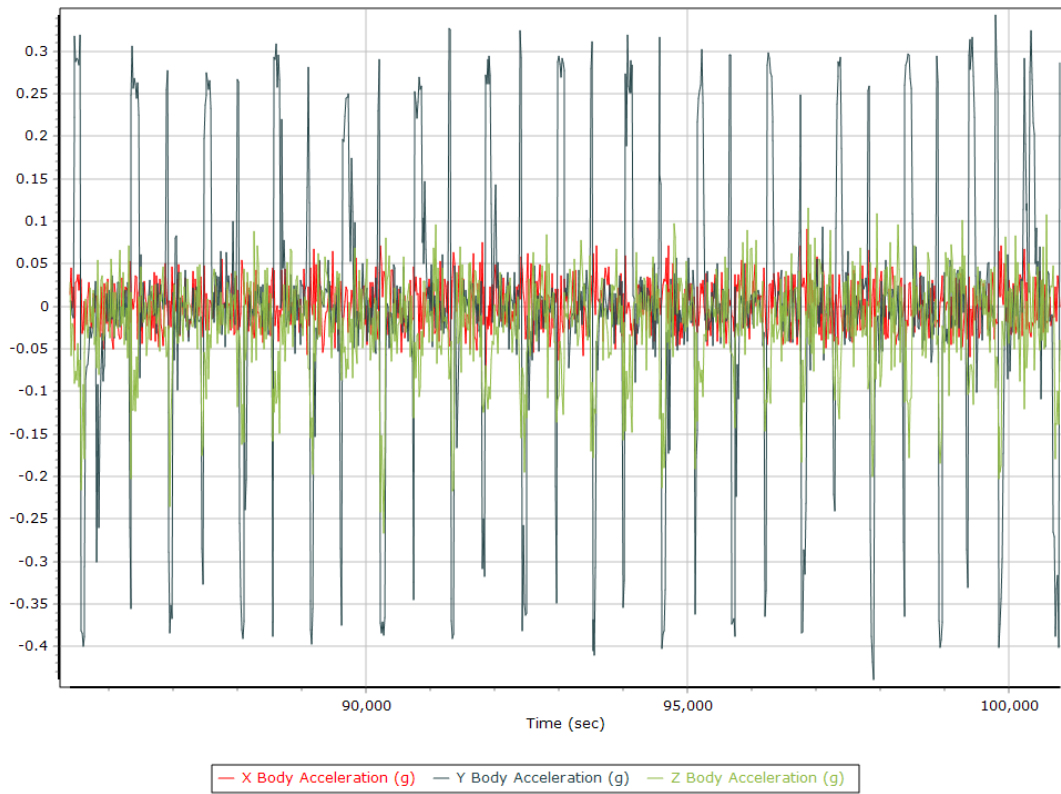


## Ground Speed

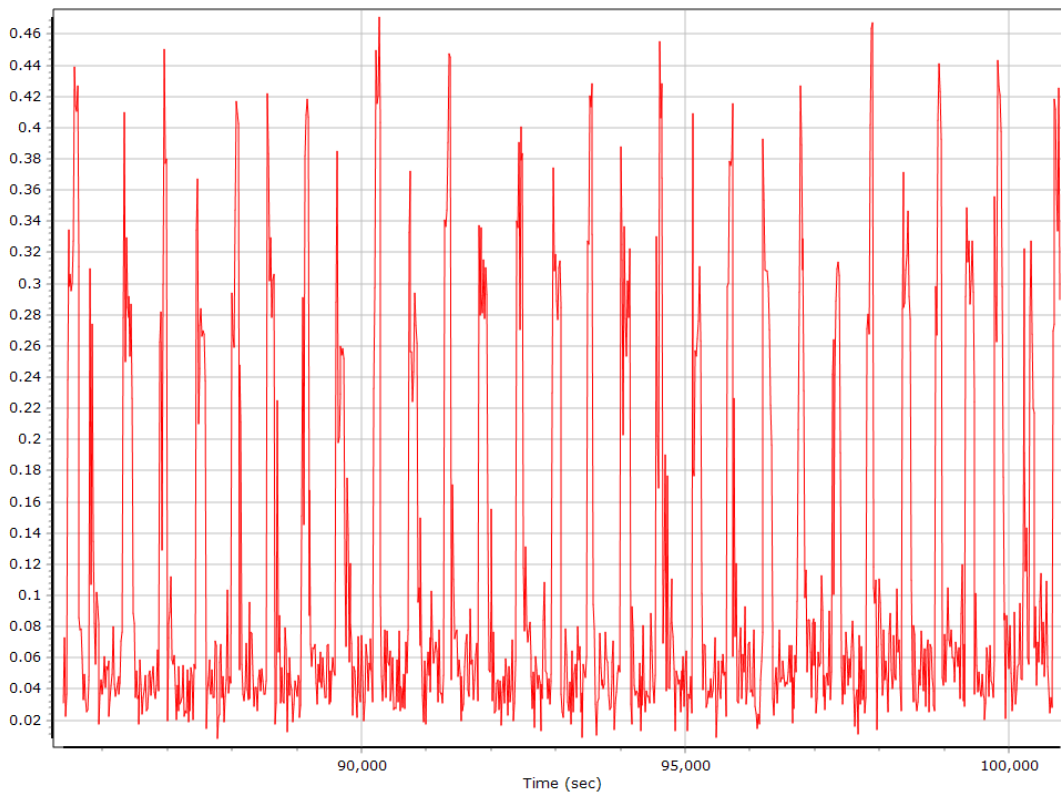




## Body Acceleration



## Total Body Acceleration

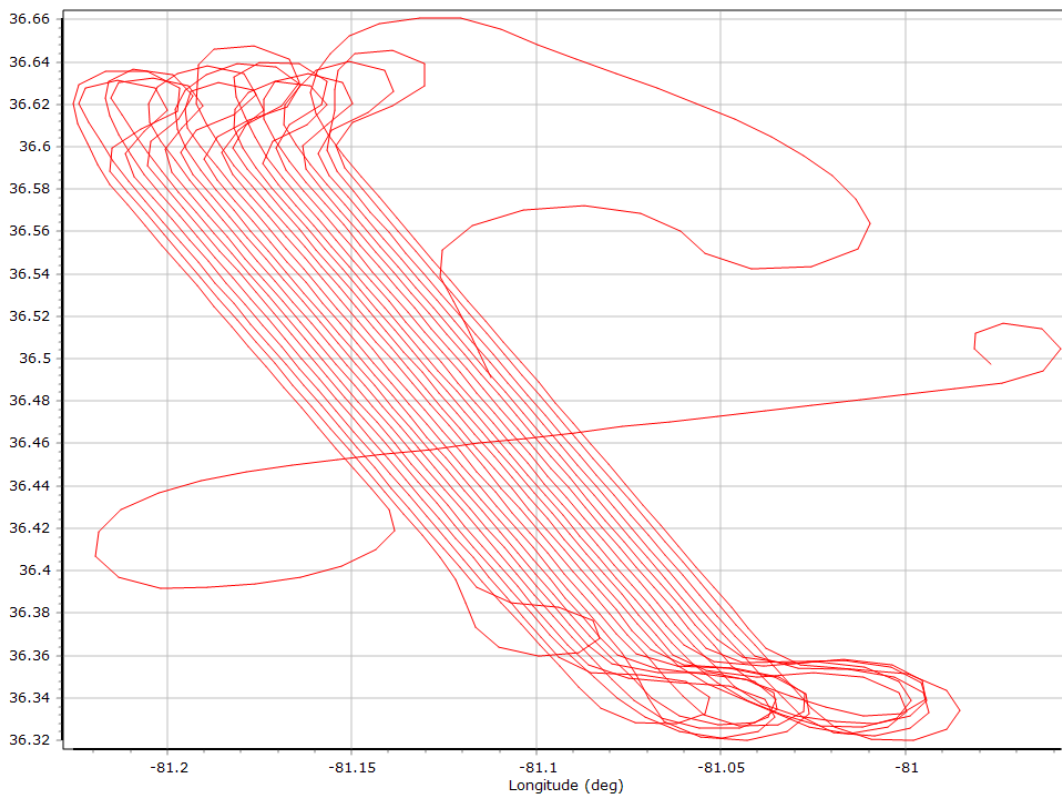


## Body Angular Rate

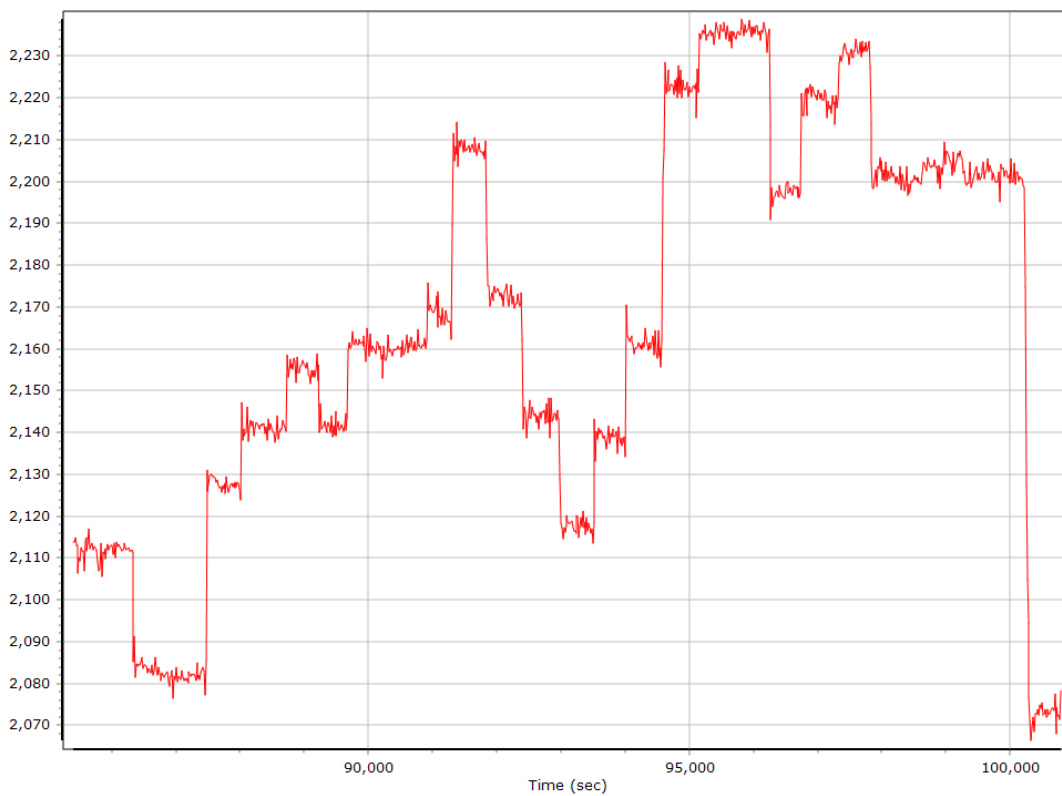


## Forward Processed Trajectory Information

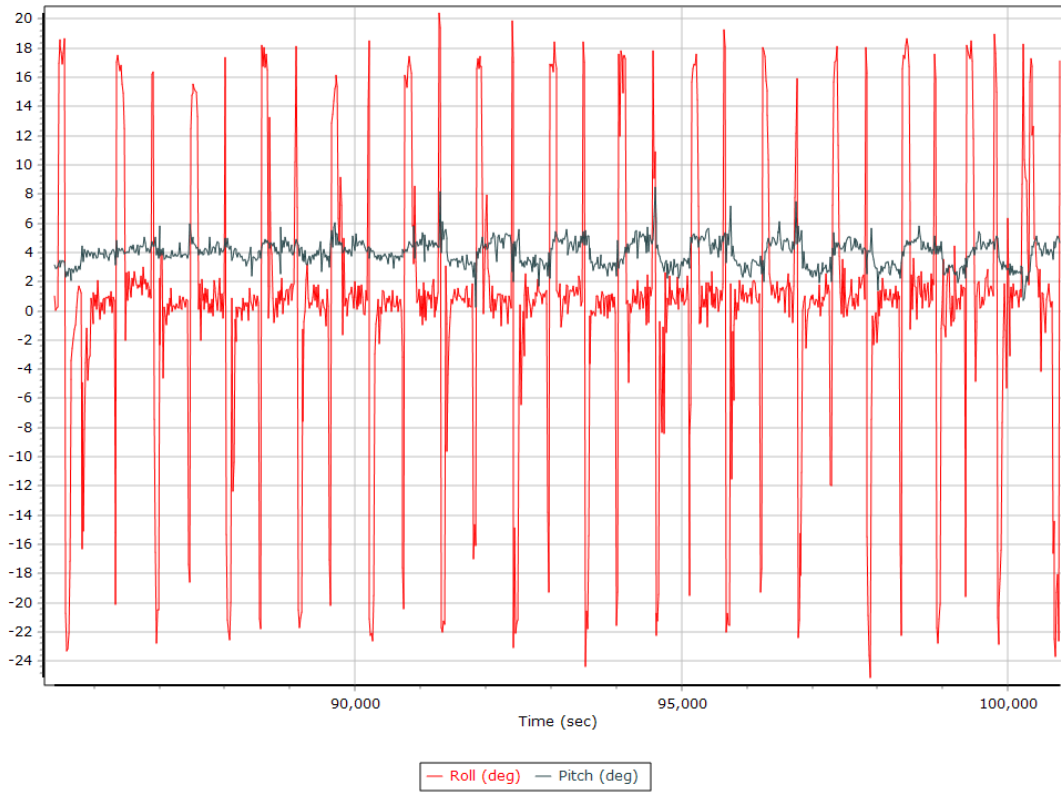
### Top View



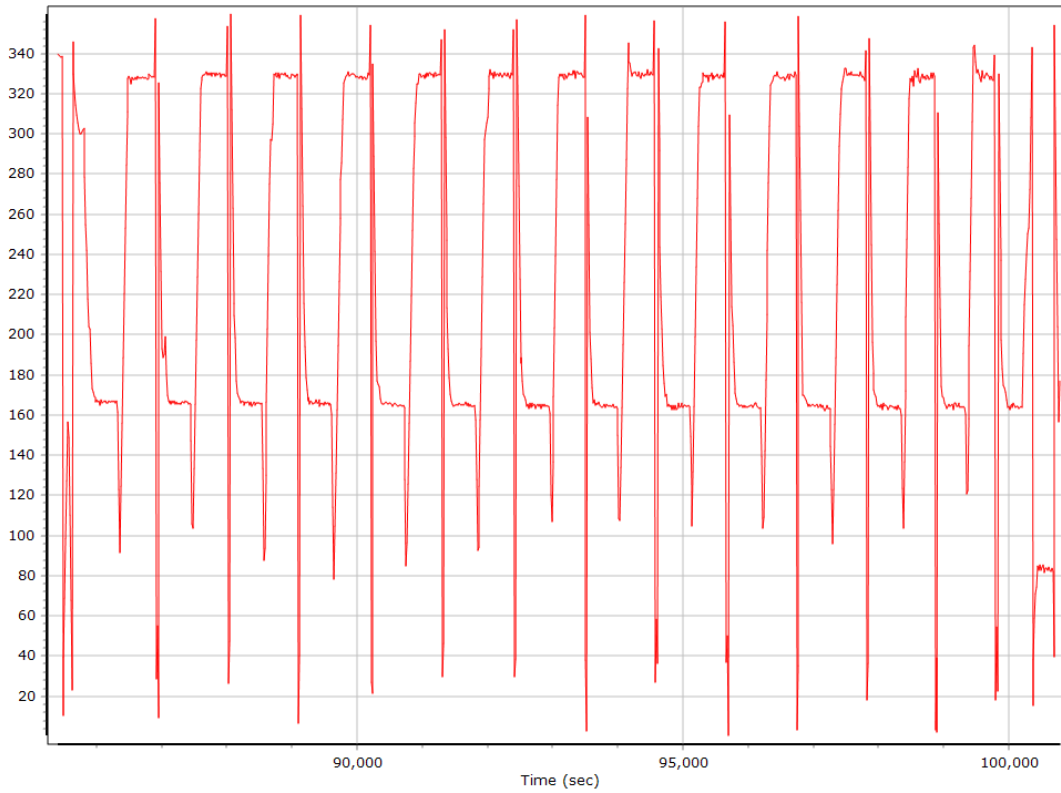
### Altitude



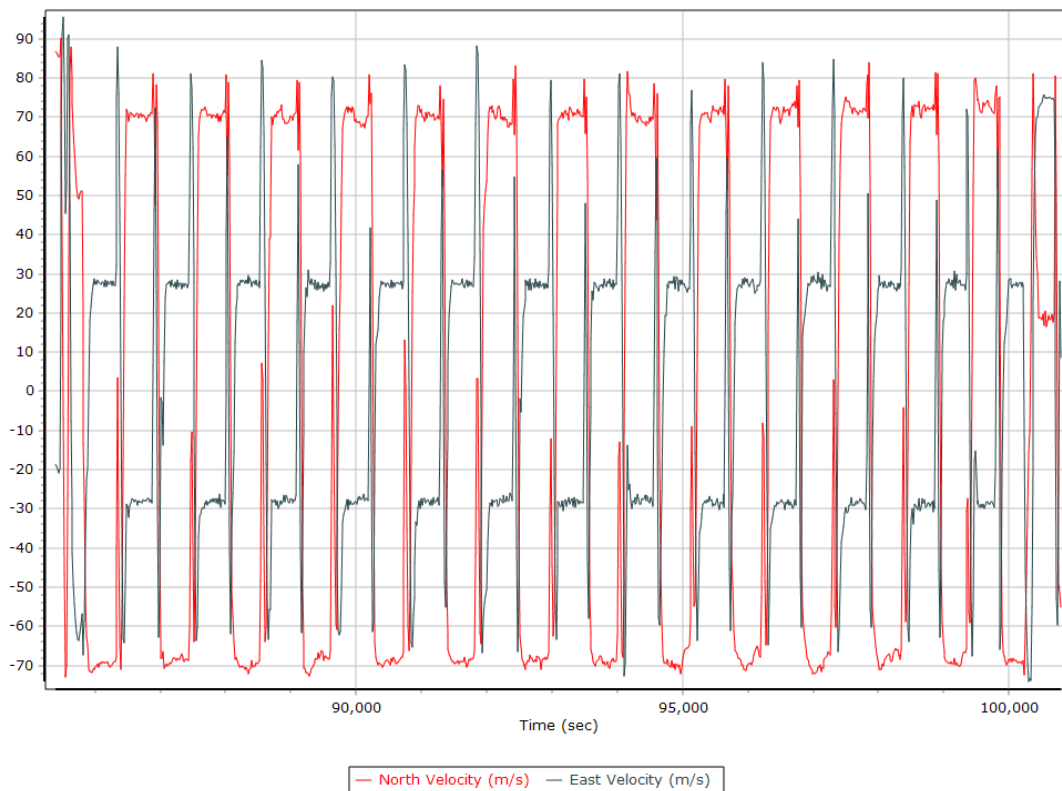
## Roll/Pitch



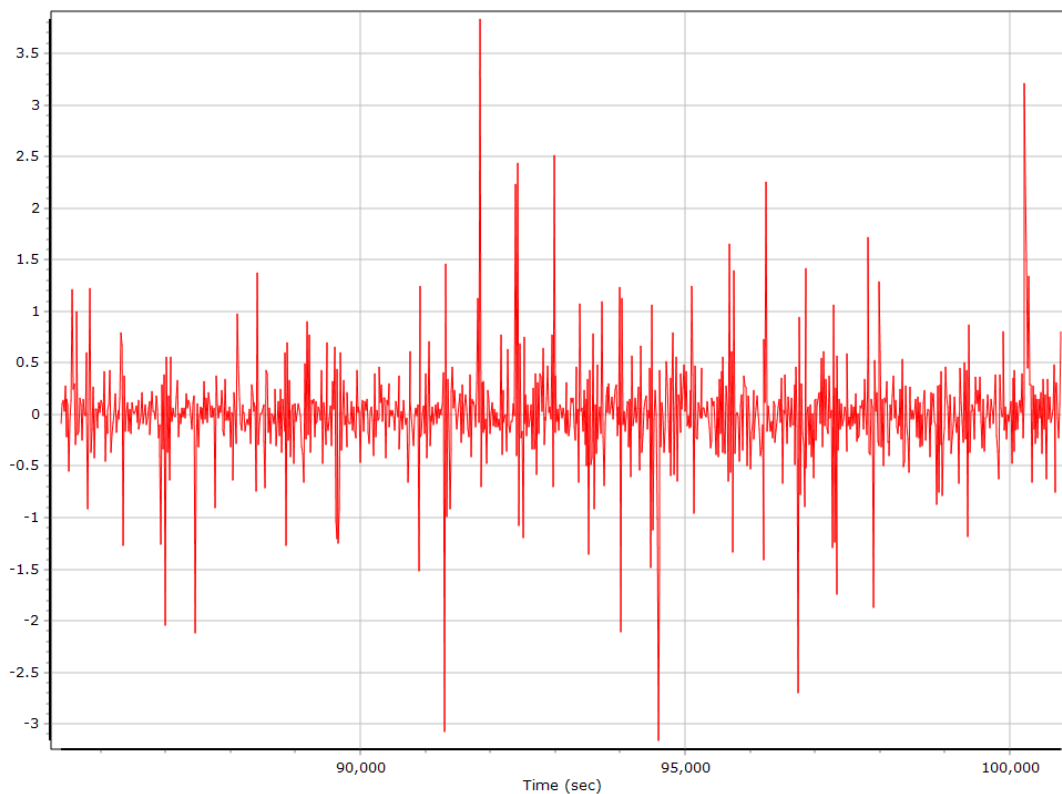
## Heading



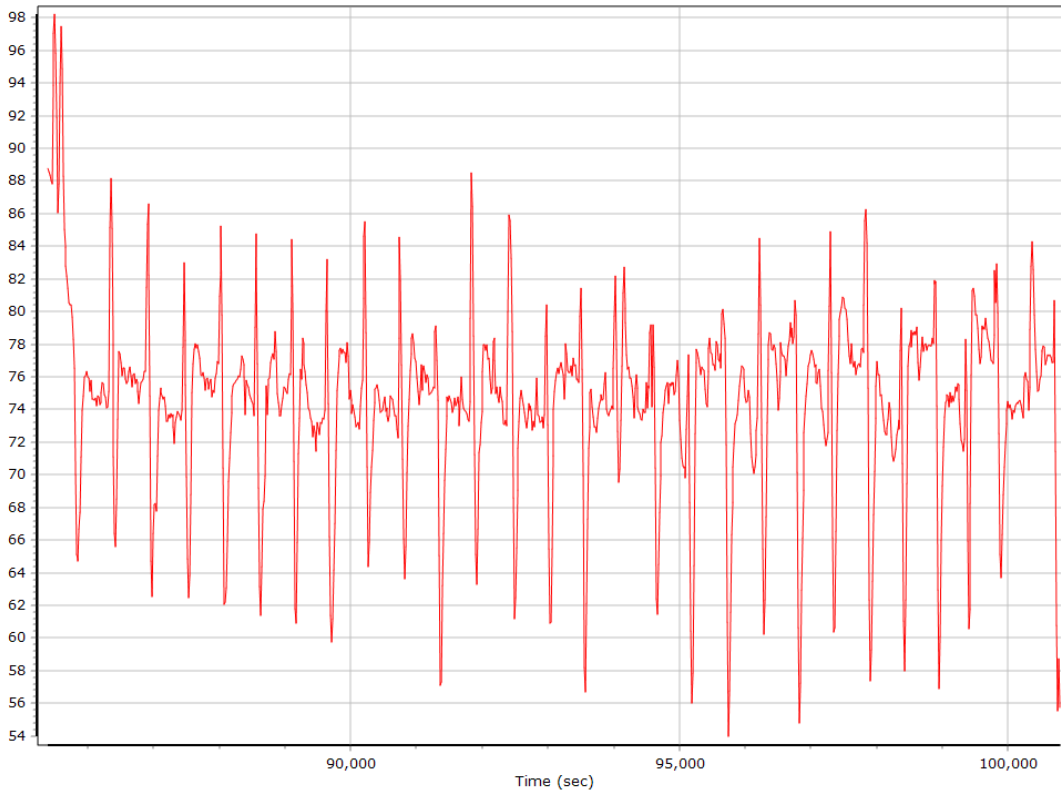
### North/East Velocity



### Down Velocity



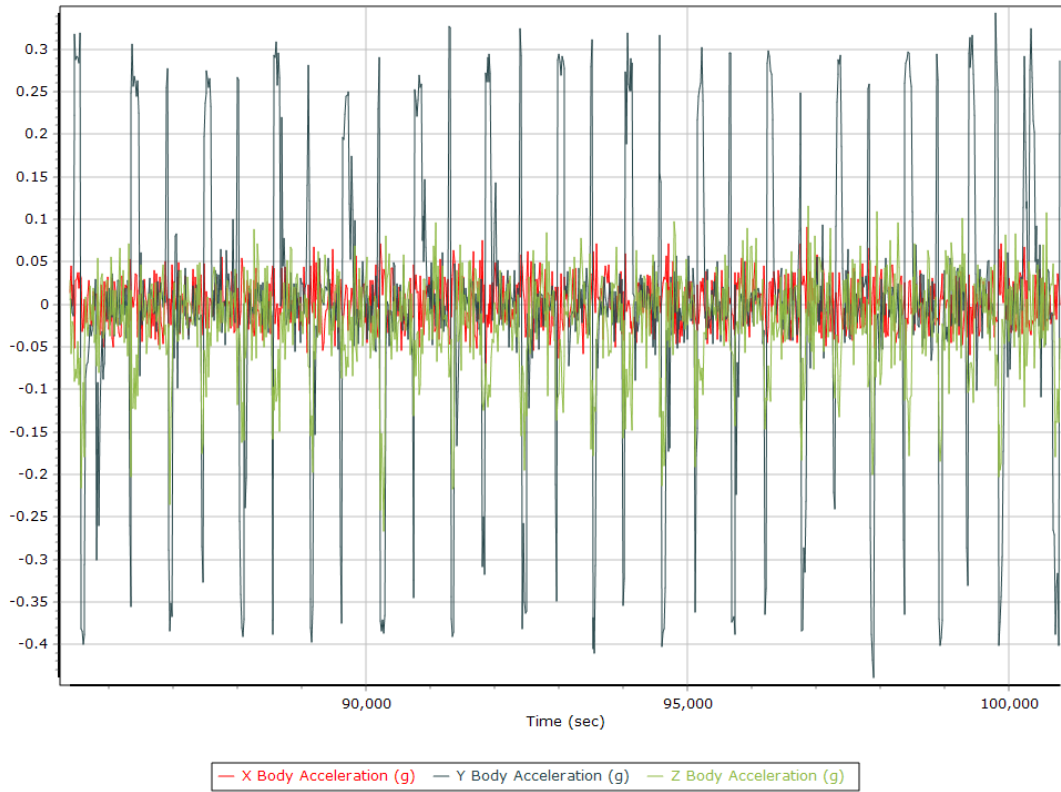
## Total Speed



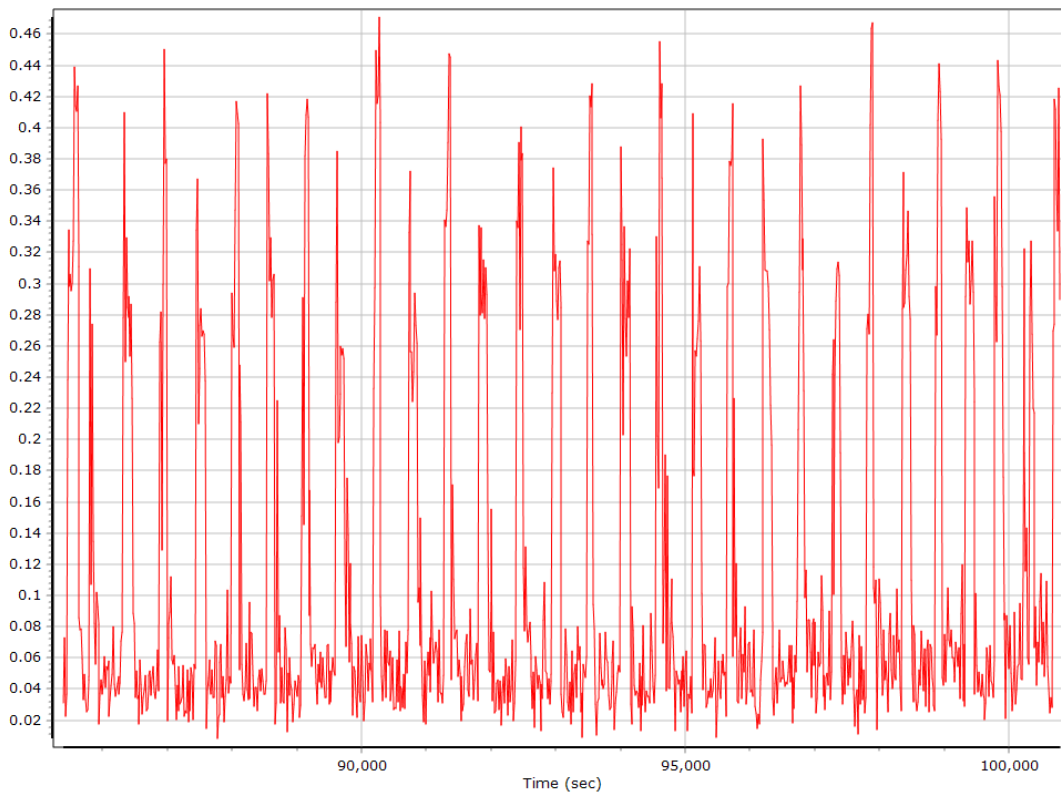
## Ground Speed



## Body Acceleration



## Total Body Acceleration



## Body Angular Rate





## Base Station Information

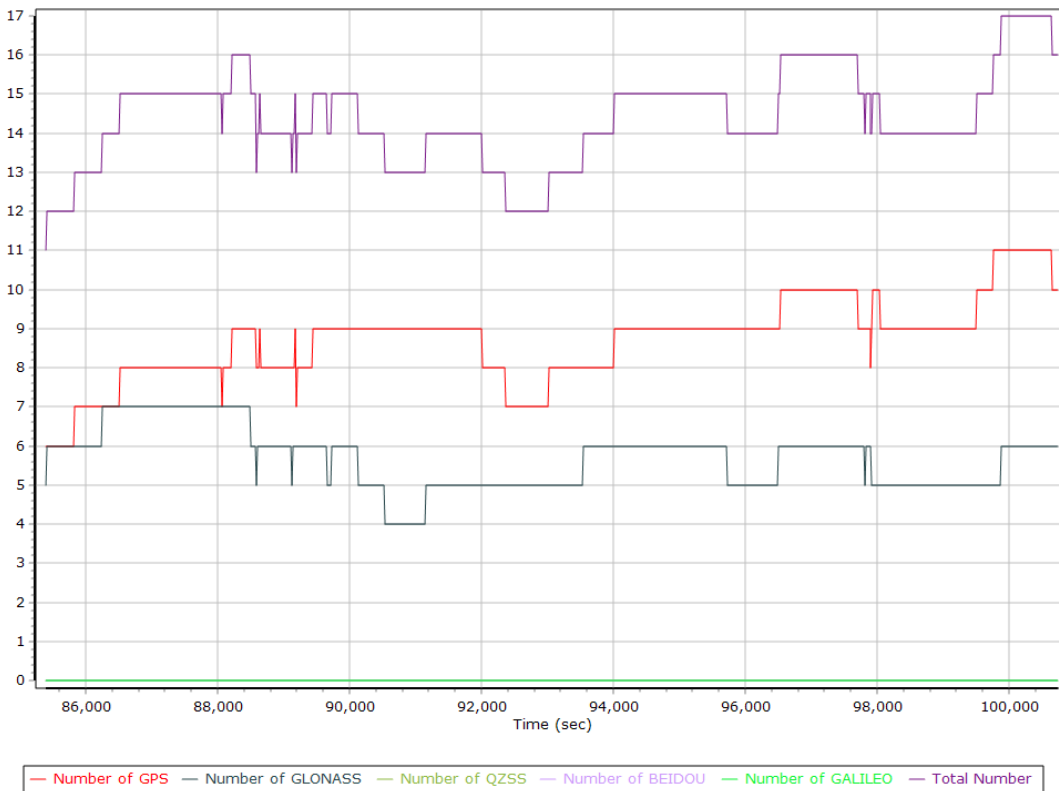
Station ID	NCSR		
Filename	ncsr3480.20o		
Start date	12/13/2020 11:00:00 PM		
End date	12/14/2020 4:00:00 AM		
Duration	05:00:00.000		
Data type	GNSS		
Receiver manufacturer, model, serial no.	Trimble	NetR5	5009K65826
Antenna manufacturer, model	Trimble	Zephyr Geodetic 2 RoHS	
Antenna height [m]	0.000		
Antenna measurement method	Bottom of antenna mount		
Offset from measured point to APC (m)	0.08546		
Latitude	N36°29'51.90633"		
Longitude	W81°06'52.93276"		
Ellipsoidal height (m)	839.99250		
Frame	NAD83		
Epoch	2011		
Ellipsoid	NAD83		
Velocity North (mm/y)	0		
Velocity East (mm/y)	0		
Velocity Up (mm/y)	0		

## GNSS QC

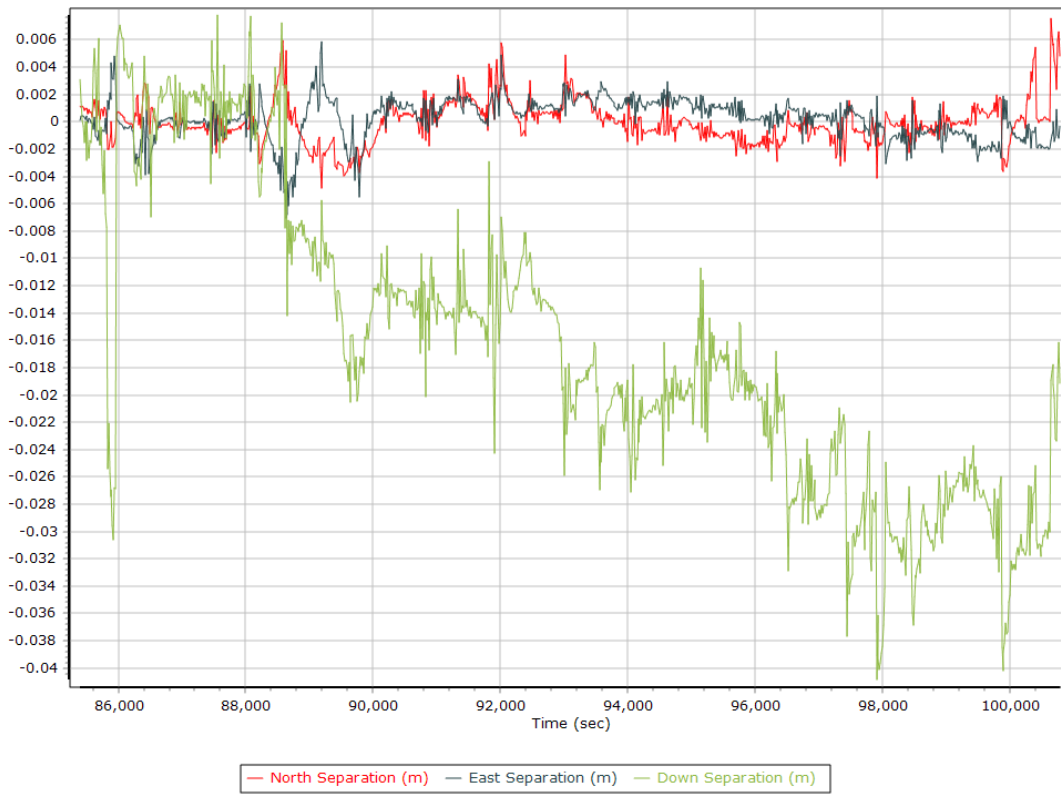
### GNSS QC Statistics

Statistics	Min	Max	Mean
Baseline length (km)	1.28	35.52	
Number of GPS SV	6	11	8
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	6	17	14
PDOP	1.24	5.04	1.68
QC Solution Gaps	1.00	1.00	
Solution Type	Fixed	Float	No solution
Epoch (sec)	17007.00	0.00	1.00
Percentage	99.99	0.00	0.01

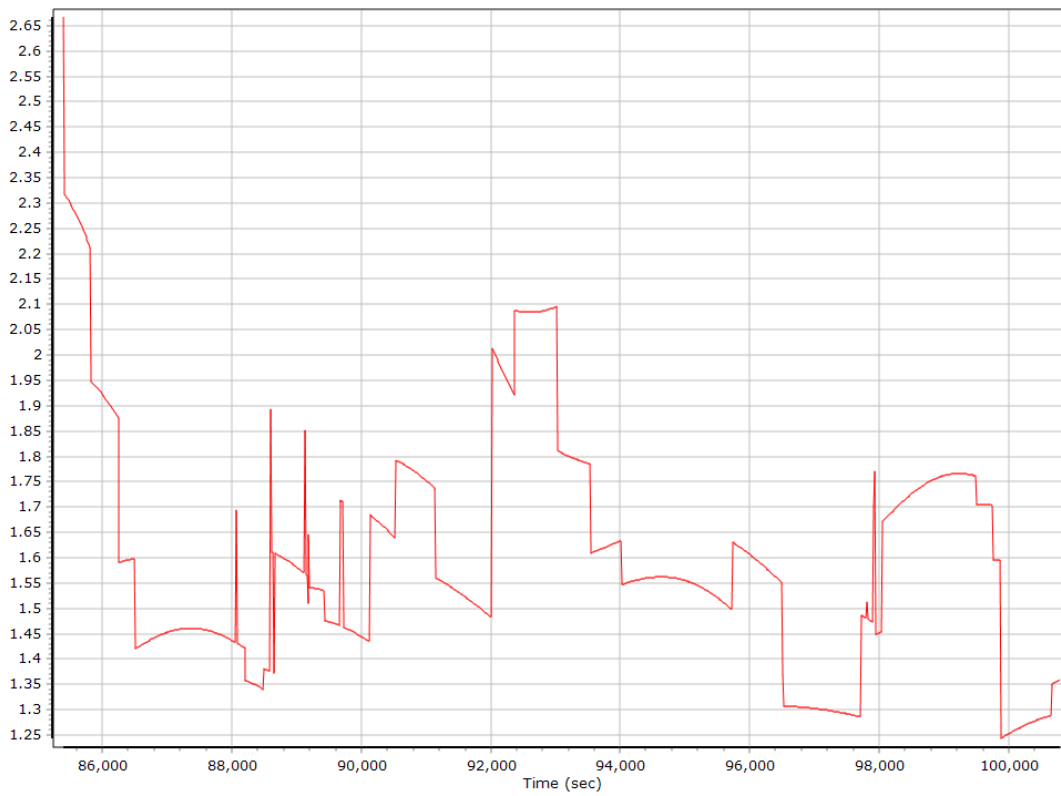
### Num SVs in solution



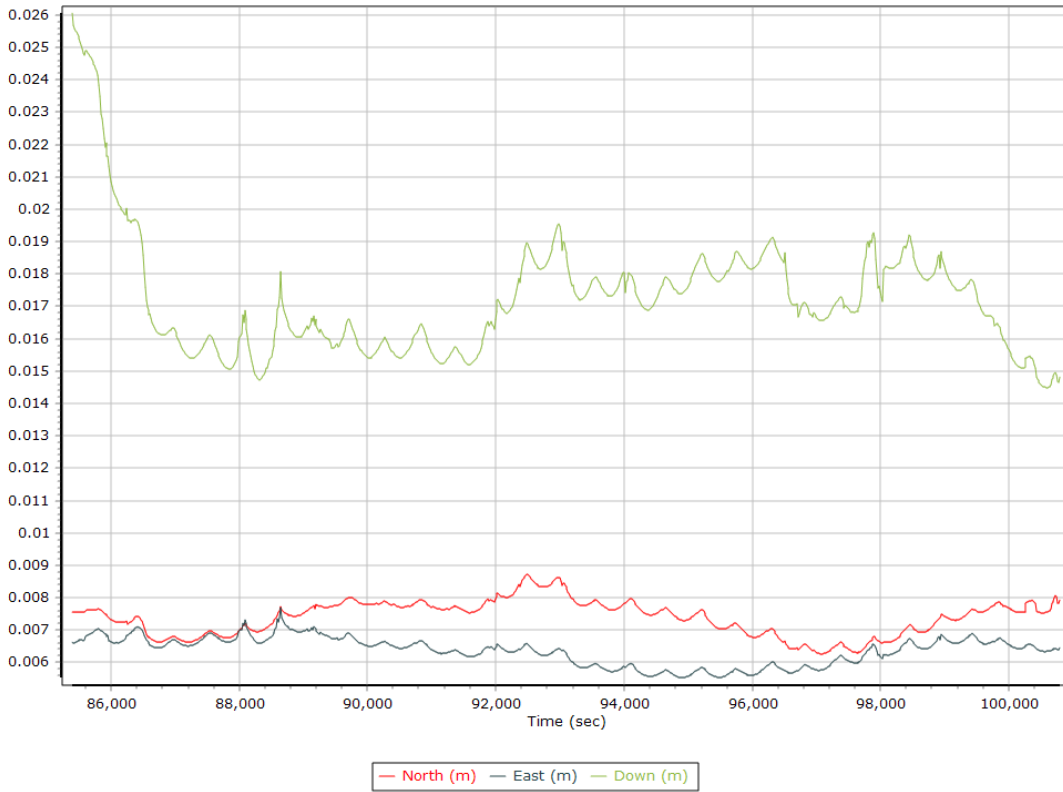
## Forward/Reverse Separation



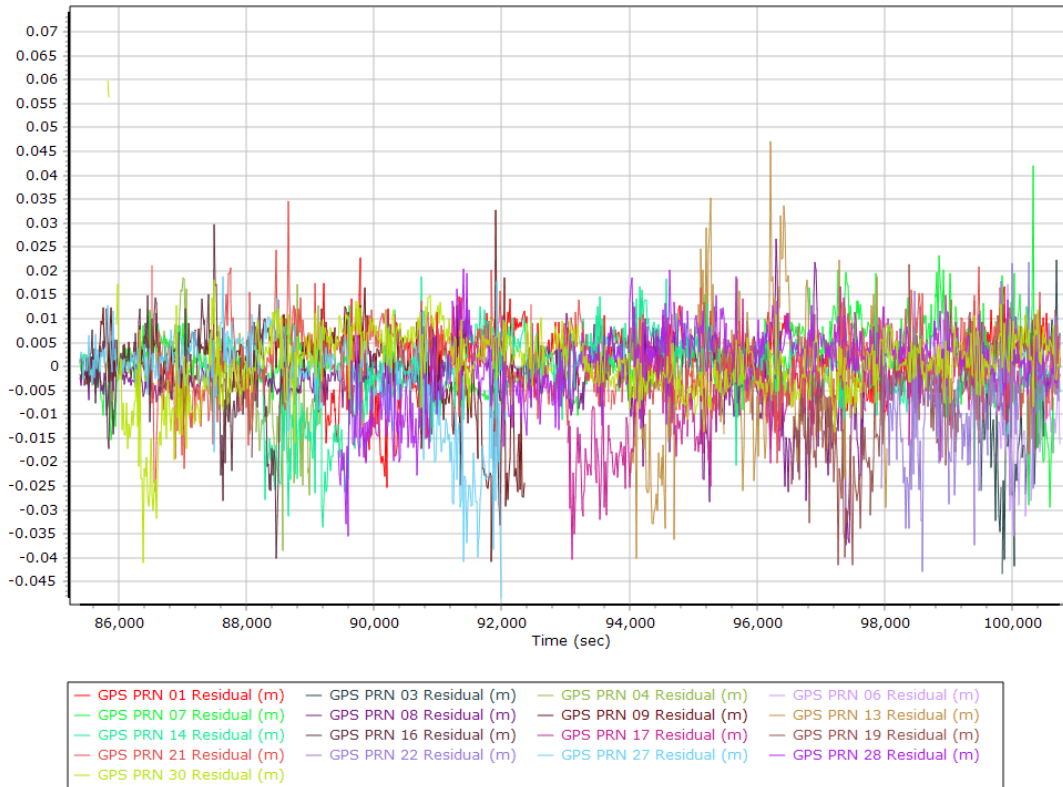
## PDOP



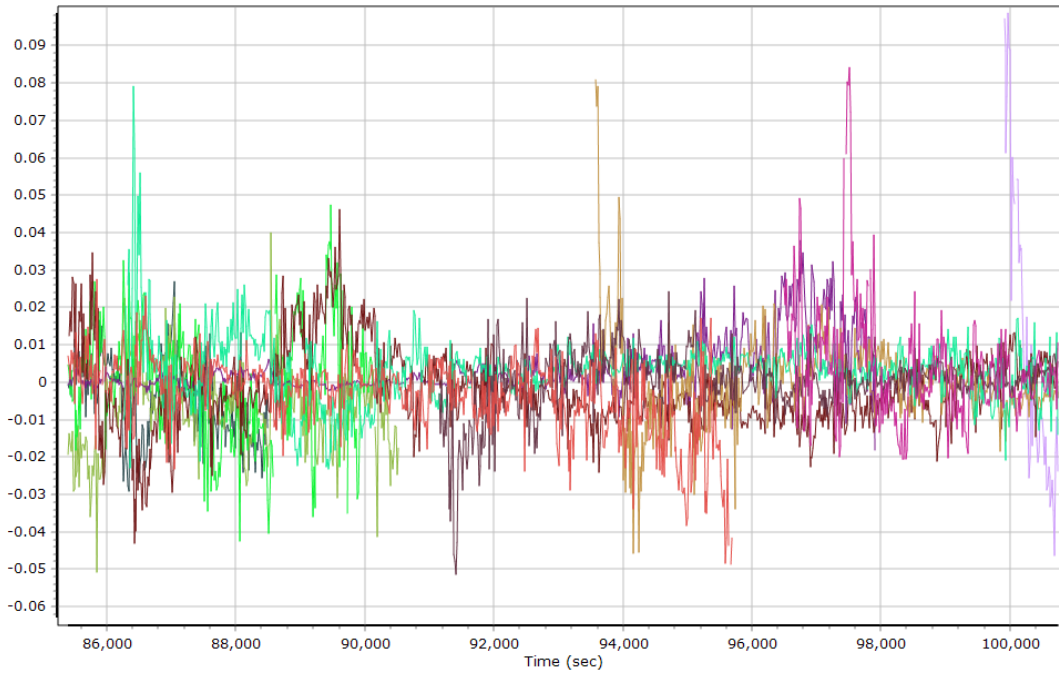
### Estimated Position Accuracy



### GPS Residuals



## GLONASS Residuals



- |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|
| GLONASS 03 Residual (m) | GLONASS 04 Residual (m) | GLONASS 05 Residual (m) | GLONASS 09 Residual (m) |
| GLONASS 13 Residual (m) | GLONASS 14 Residual (m) | GLONASS 15 Residual (m) | GLONASS 16 Residual (m) |
| GLONASS 17 Residual (m) | GLONASS 18 Residual (m) | GLONASS 19 Residual (m) | GLONASS 23 Residual (m) |
| GLONASS 24 Residual (m) |                         |                         |                         |

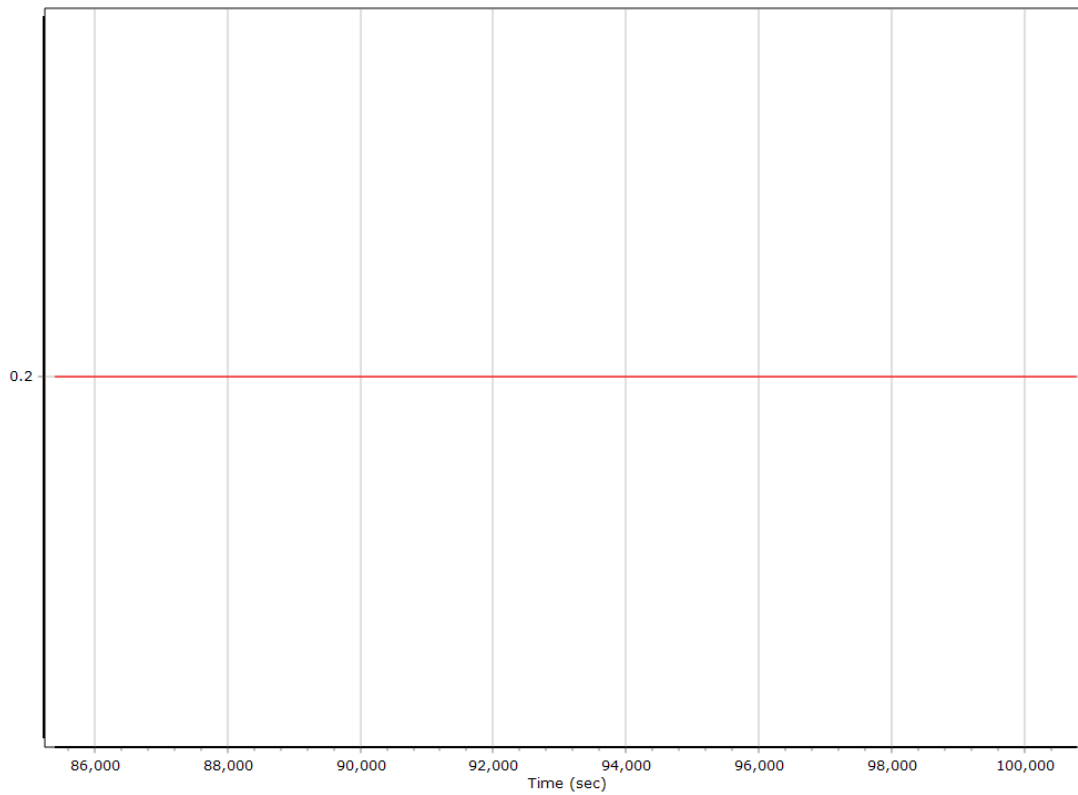
## GNSS-Inertial Processor Configuration

Processing mode	IN-Fusion Single Base		
Stabilized mount	False		
Base station	NCSR		
Processing start time	85337.000 (12/13/2020 11:42:17 PM)		
Processing end time	101100.000 (12/14/2020 4:05:00 AM)		
Initial attitude source	Real-Time VNAV/RNAV Attitude		
IMU Sensor Context	Processing with Onboard IMU		
Reference to IMU lever arm (m)	0.000	0.000	0.000
Reference to IMU mounting angles (deg)	0.000	0.000	180.000
Reference to Primary GNSS lever arm (m)	0.200	-0.220	-1.100
Reference 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

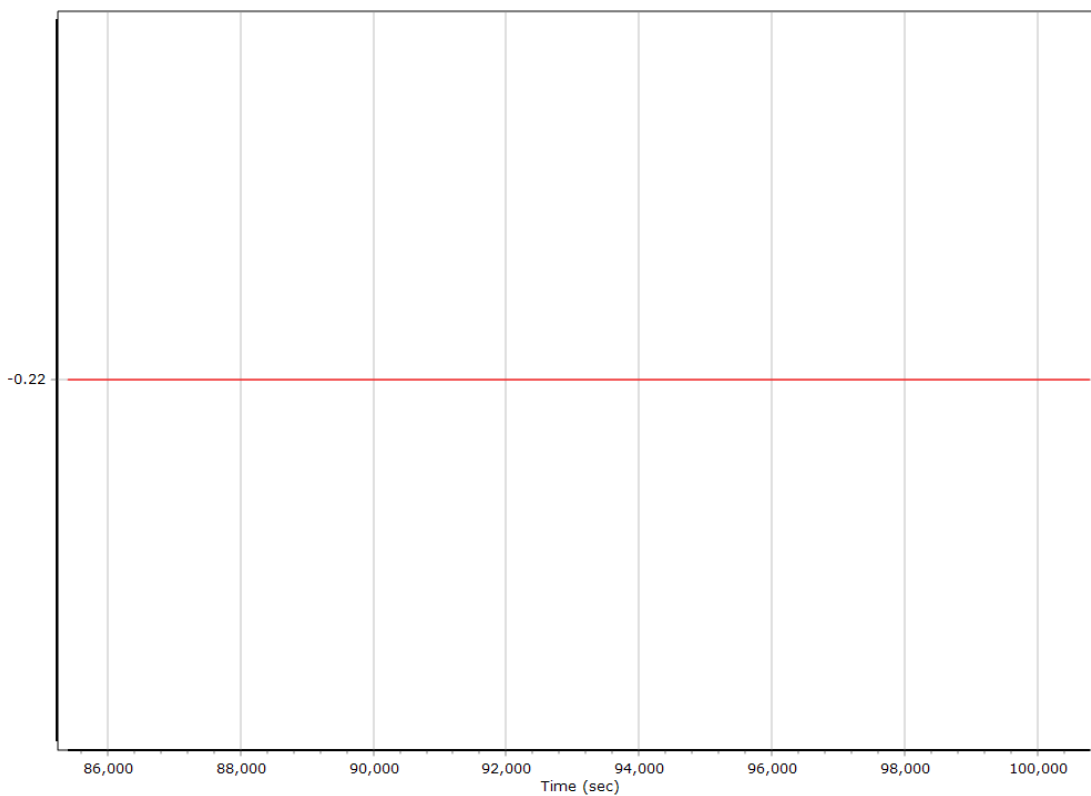
## Calibrated Installation Parameters

### Reference-Primary GNSS Lever Arm (m)

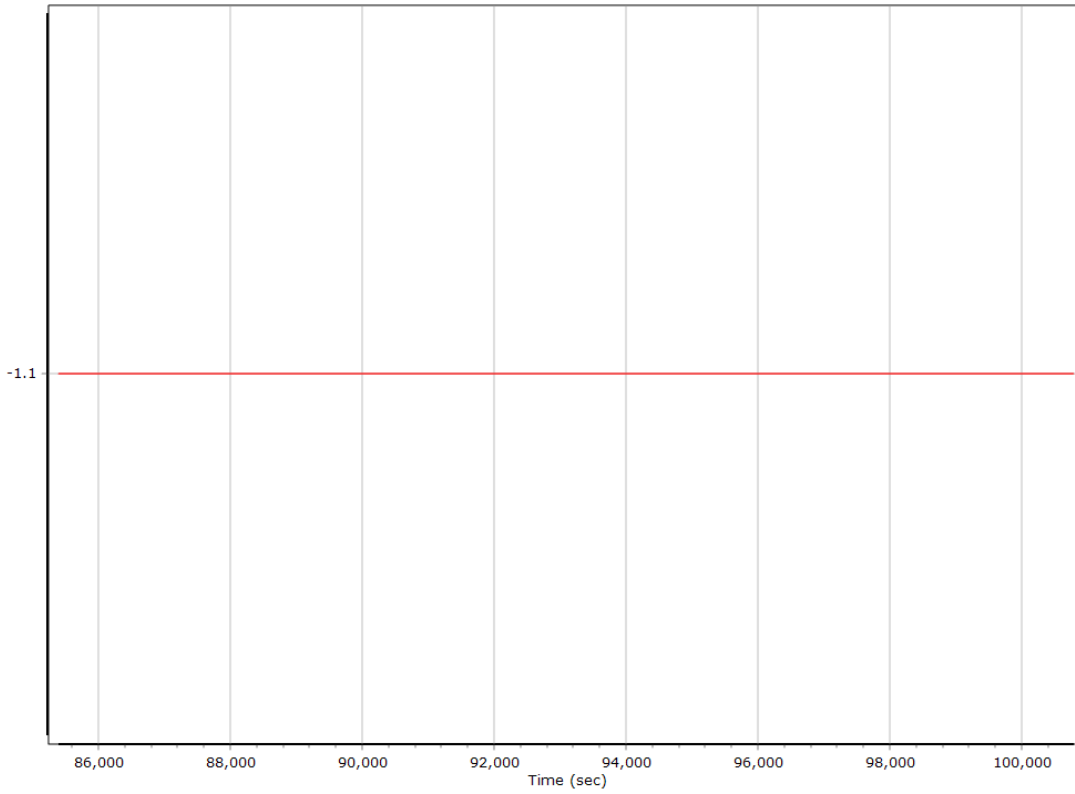
#### X Reference-Primary GNSS Lever Arm (m)



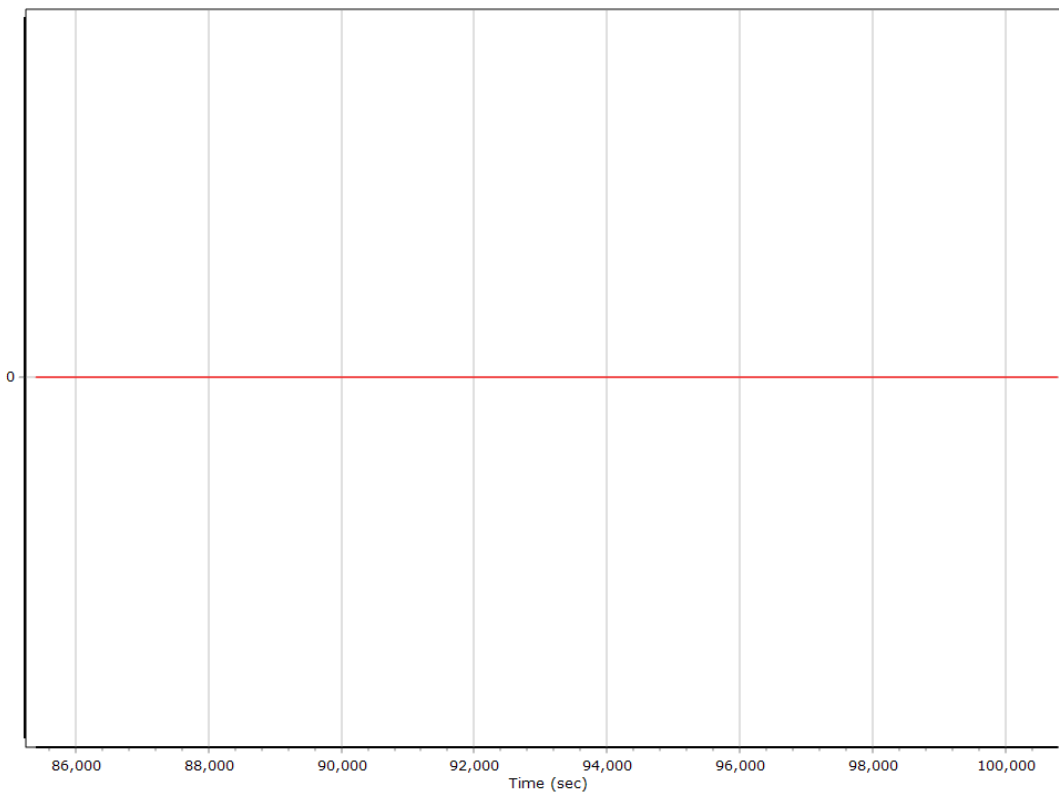
#### Y Reference-Primary GNSS Lever Arm (m)



### Z Reference-Primary GNSS Lever Arm (m)



### Reference-Primary GNSS Lever Arm Figure of Merit

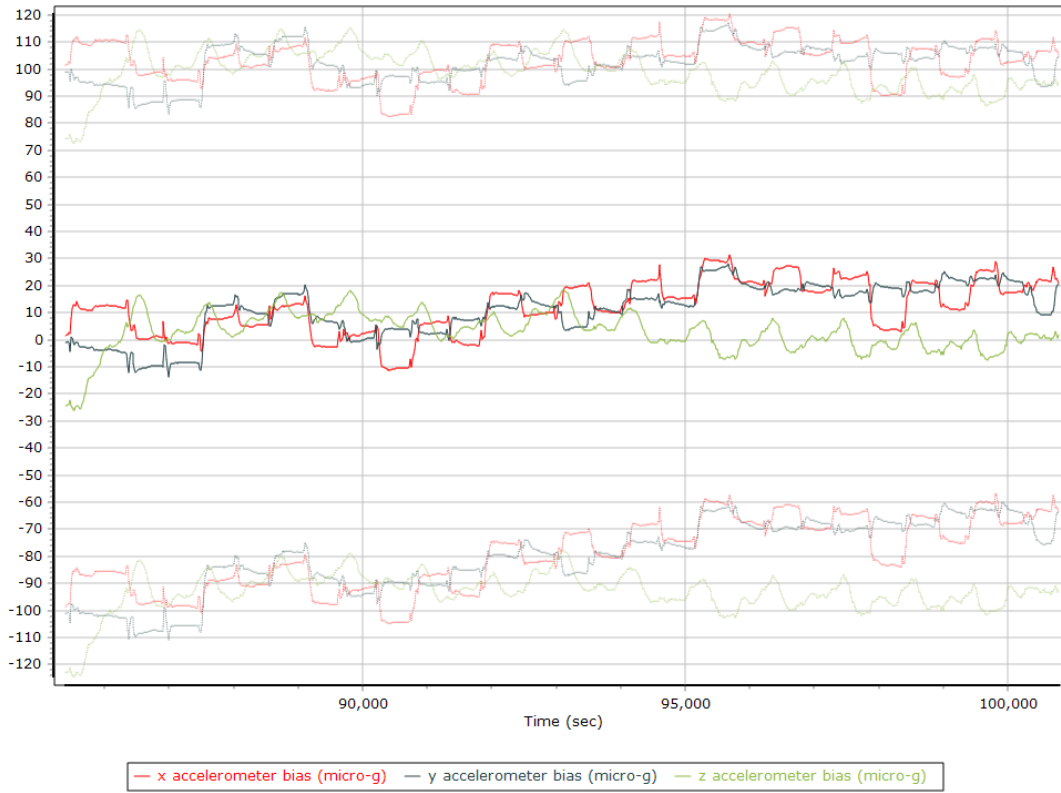




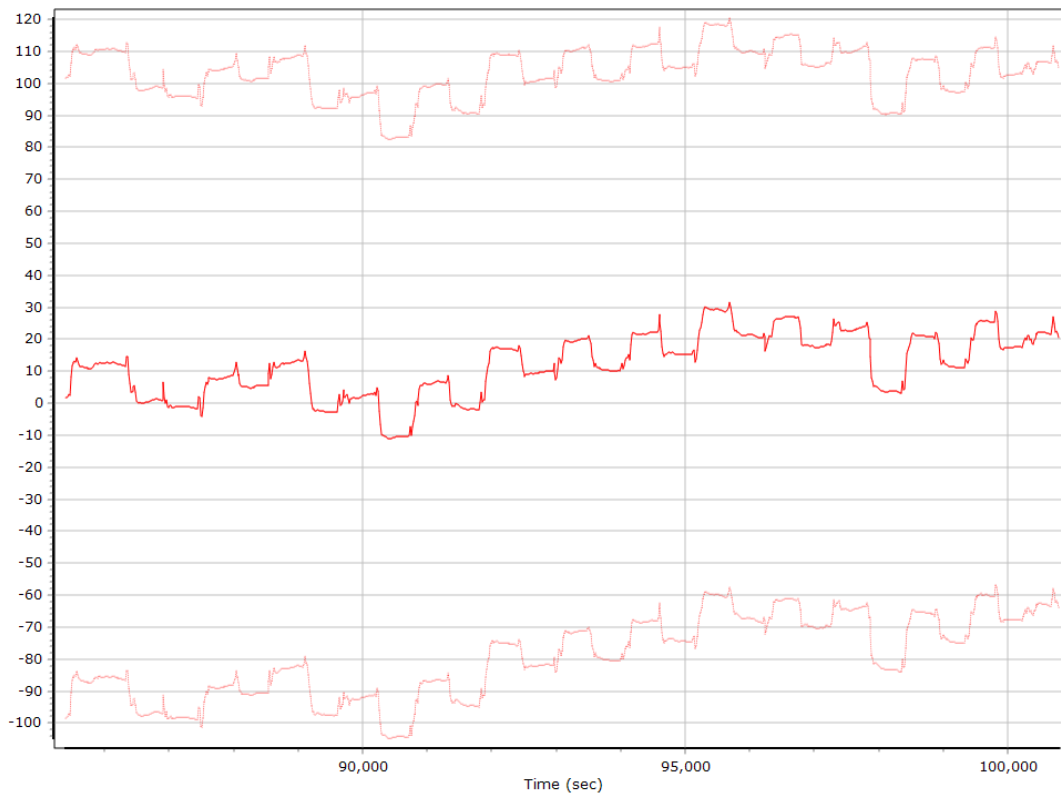
## IN-Fusion QC

### Forward Processed Estimated Errors, Reference Frame

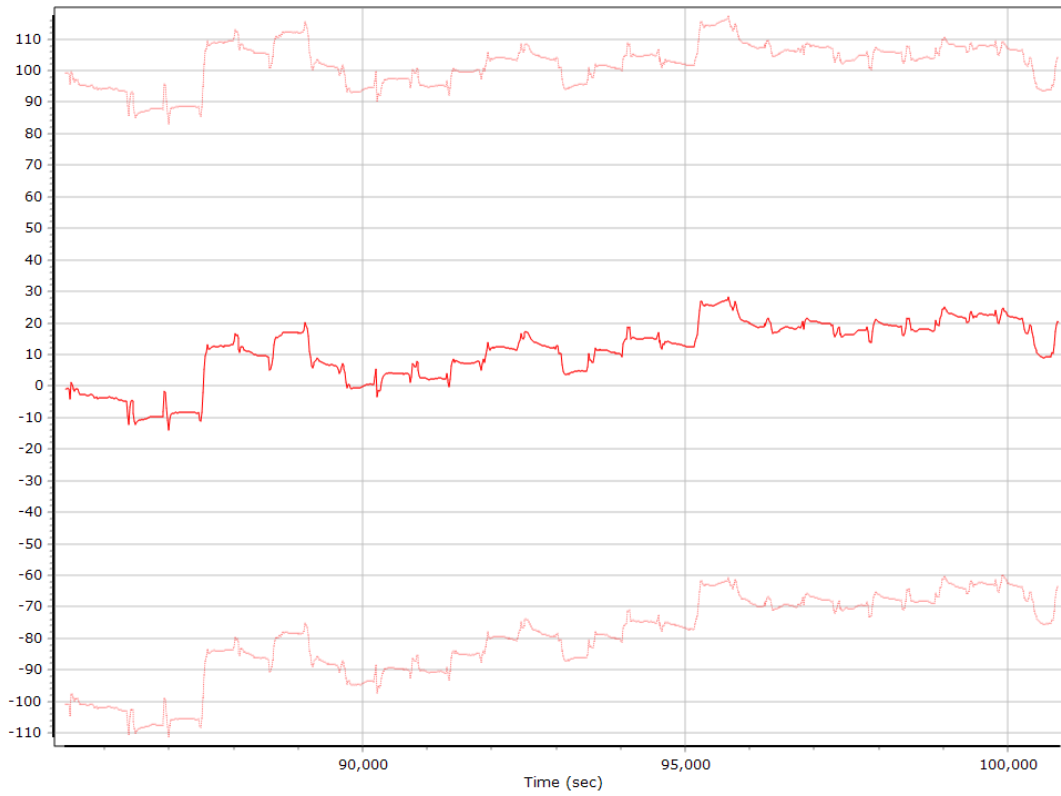
#### Accelerometer Bias (micro-g)



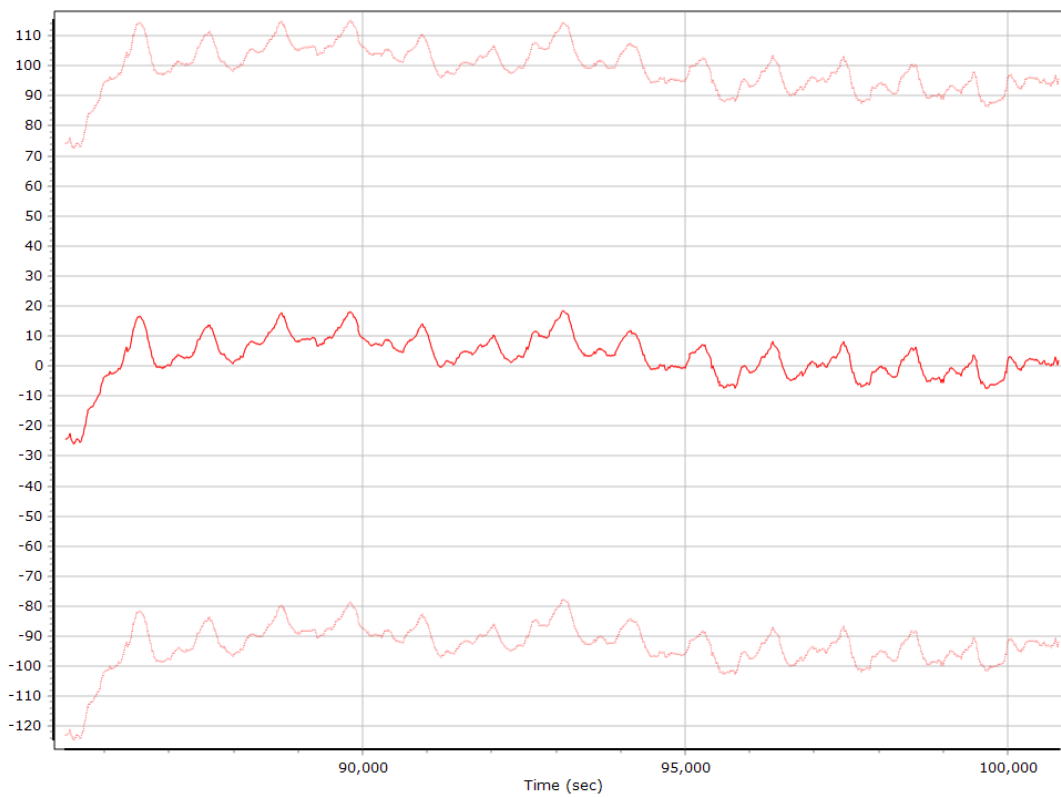
#### X Accelerometer Bias (micro-g)



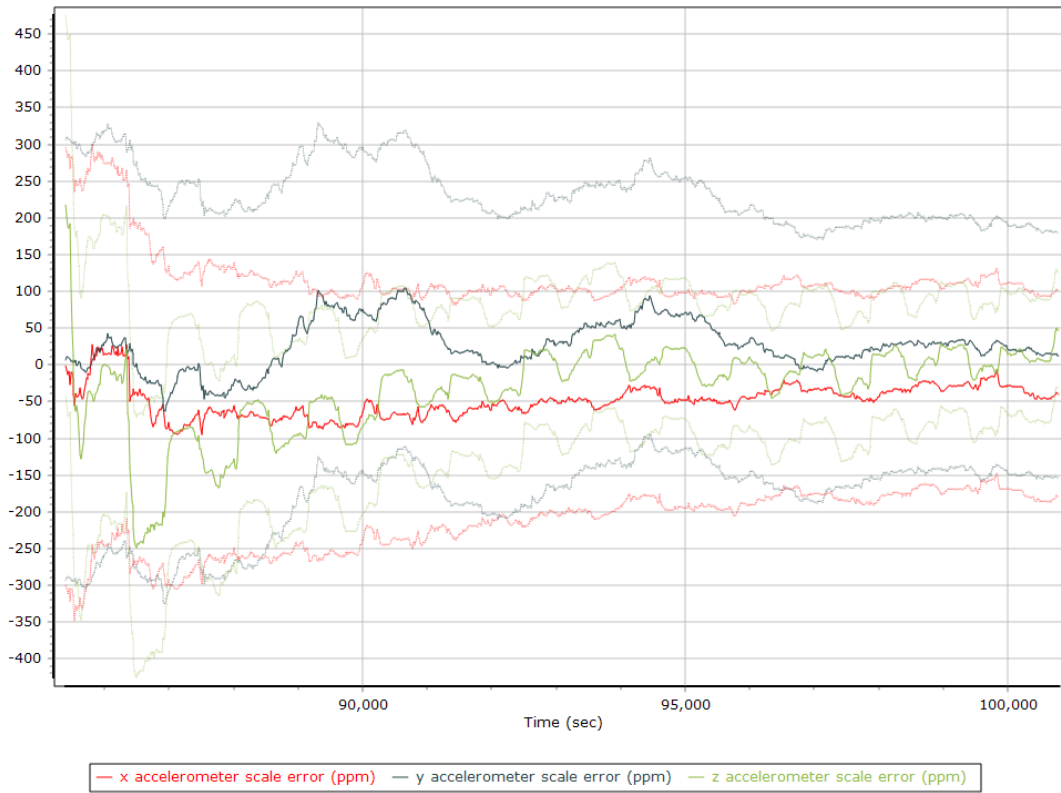
### Y Accelerometer Bias (micro-g)



### Z Accelerometer Bias (micro-g)



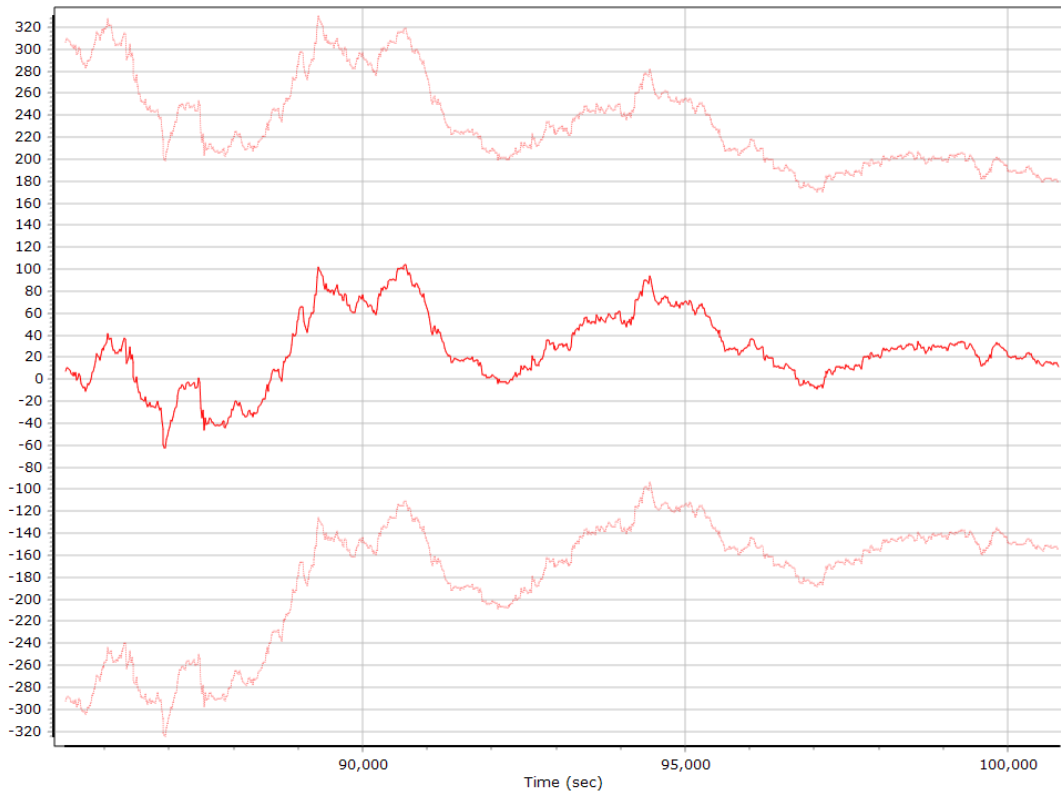
### Accelerometer Scale Error (ppm)



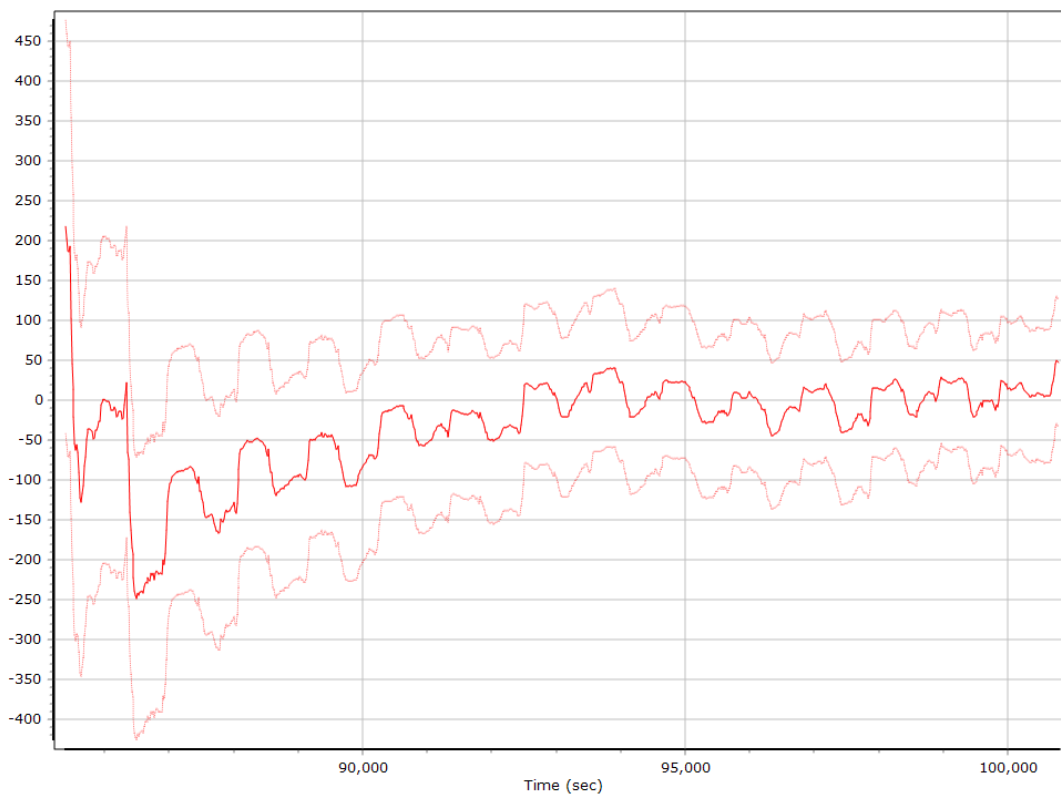
### X Accelerometer Scale Error (ppm)



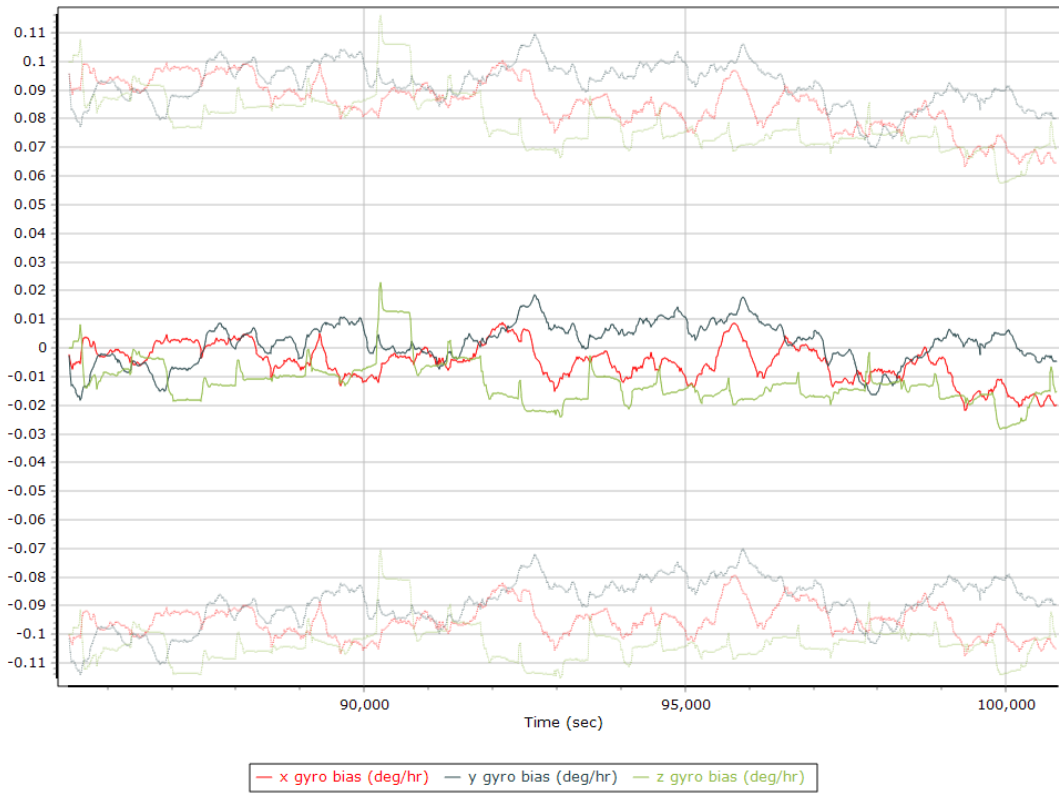
### Y Accelerometer Scale Error (ppm)



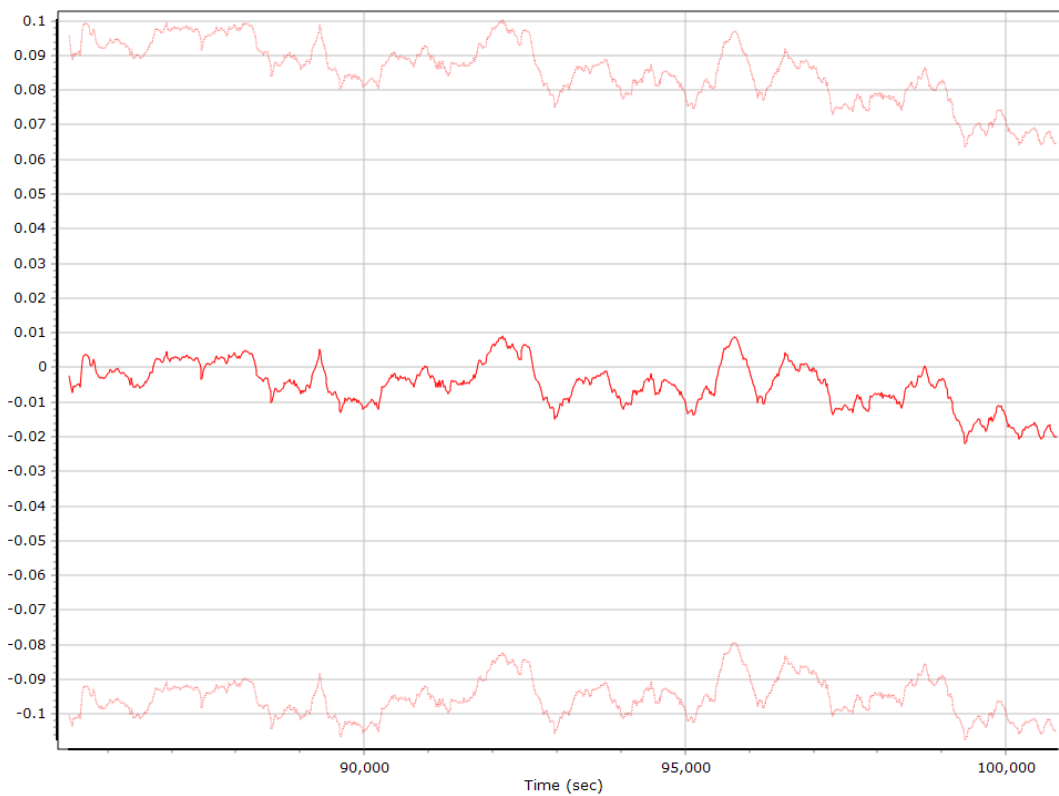
### Z Accelerometer Scale Error (ppm)



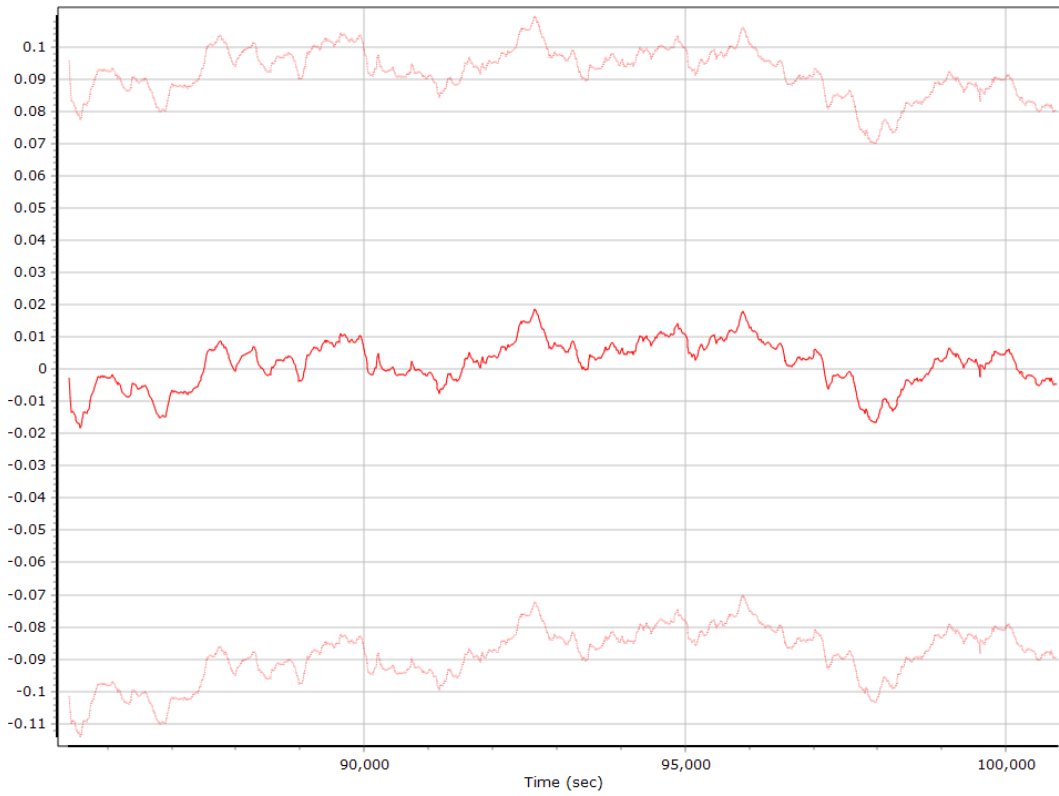
### Gyro Bias (deg/h)



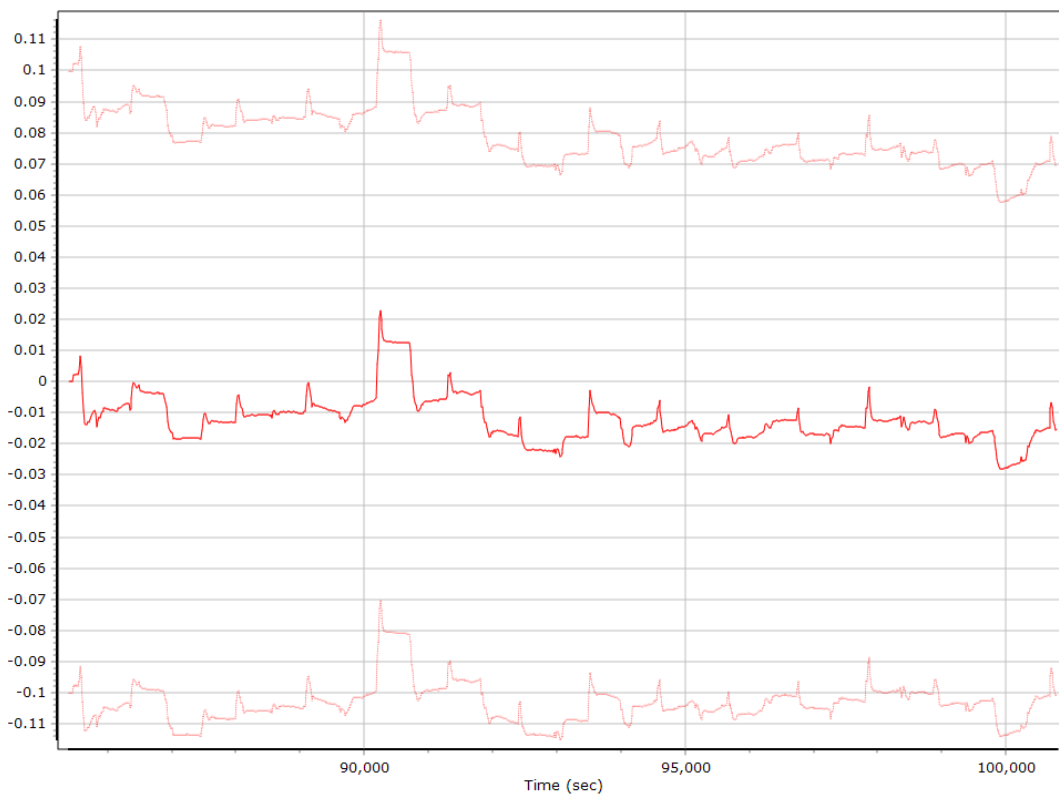
### X Gyro Bias (deg/h)



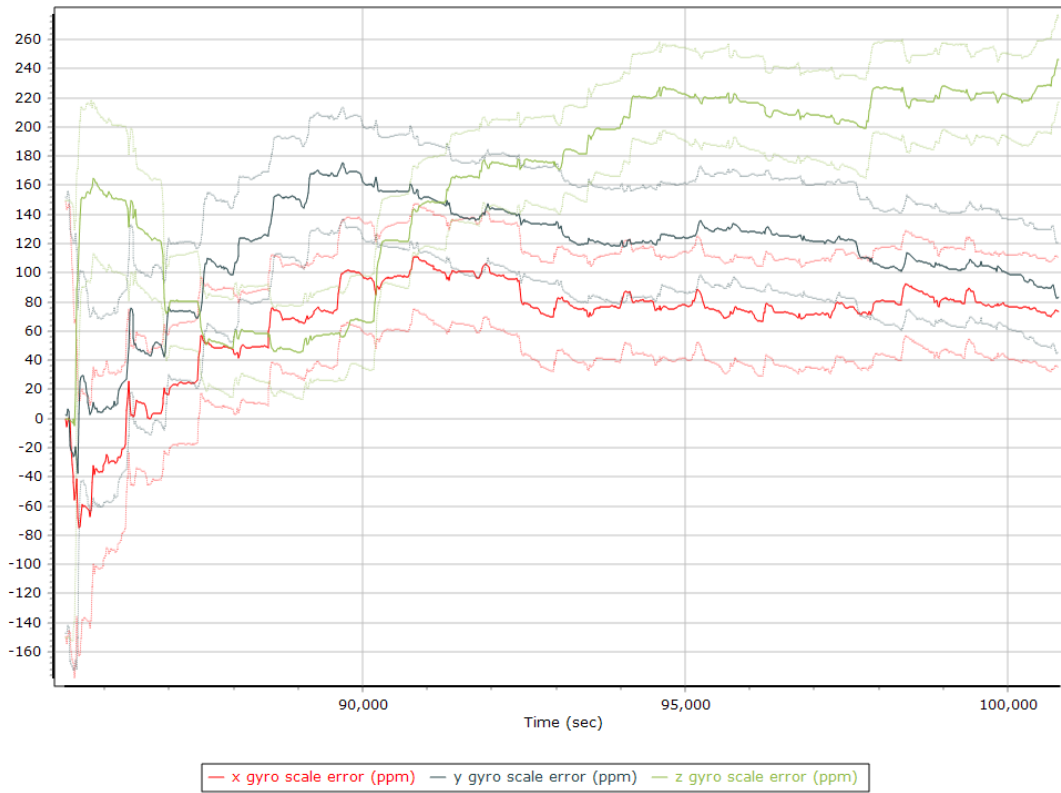
### Y Gyro Bias (deg/h)



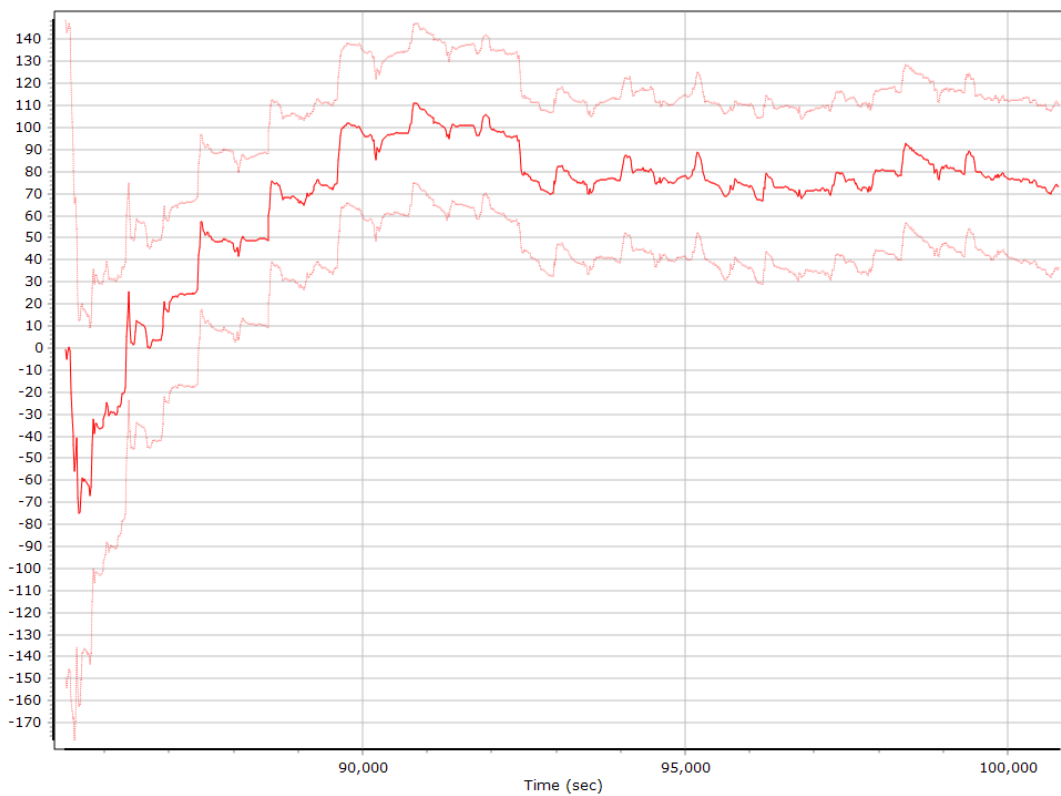
### Z Gyro Bias (deg/h)



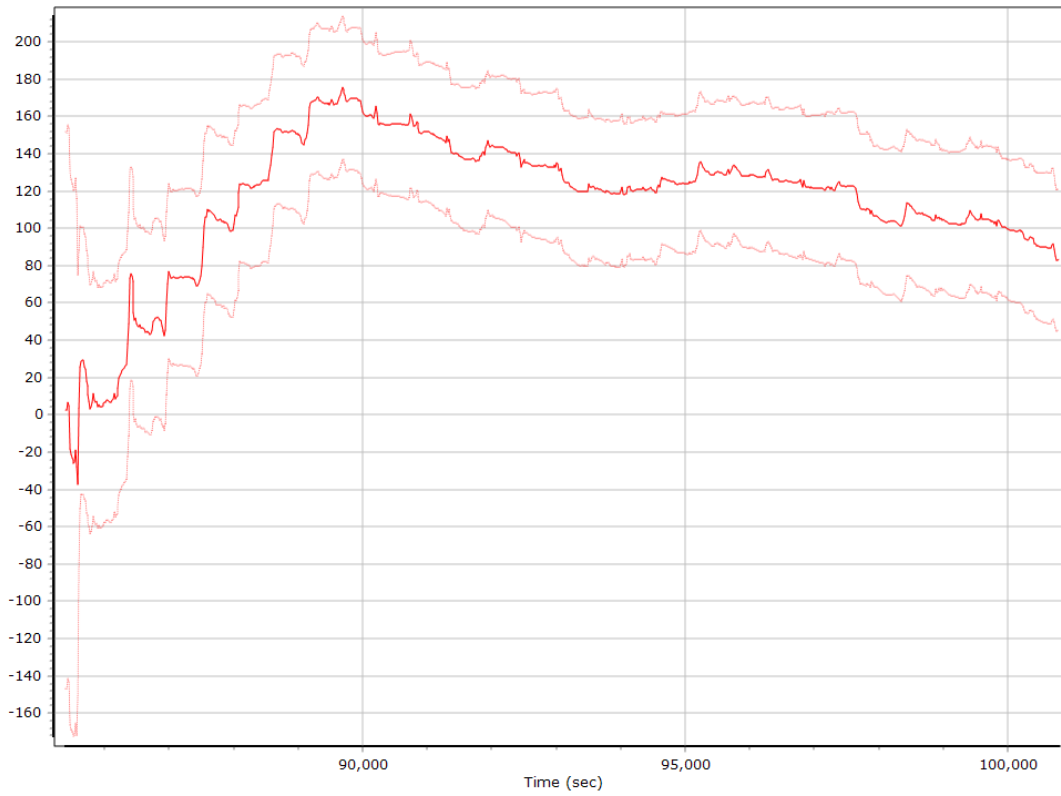
### Gyro Scale Error (ppm)



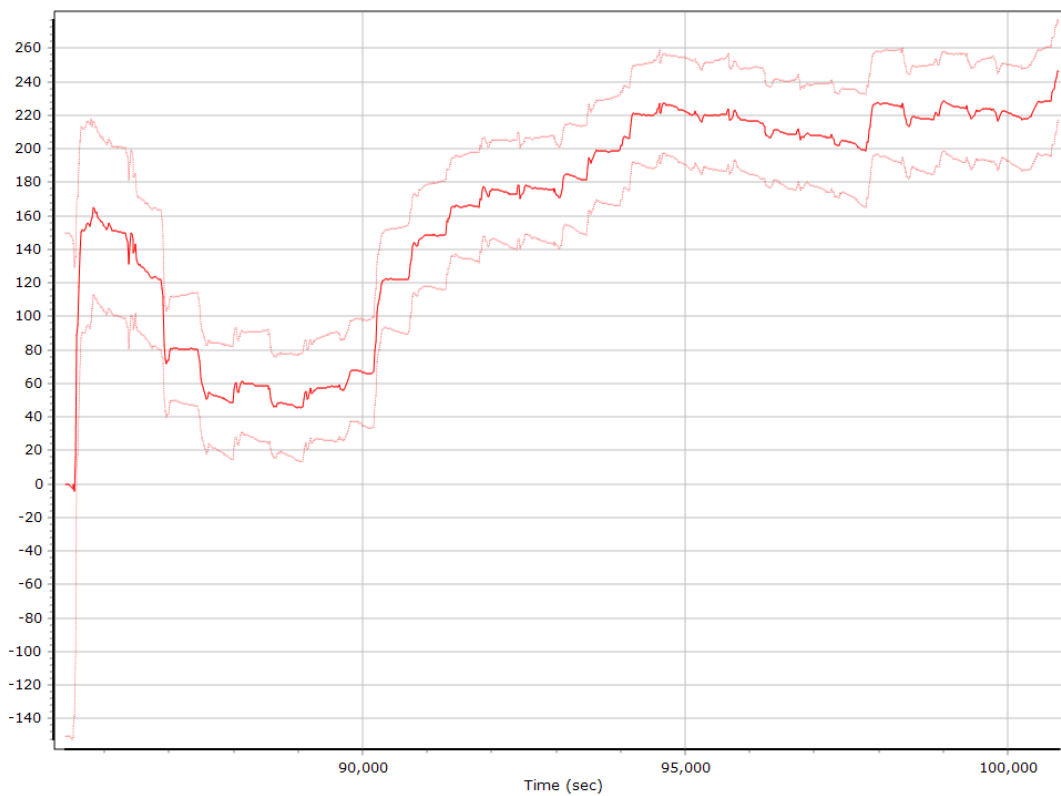
### X Gyro Scale Error (ppm)



### Y Gyro Scale Error (ppm)

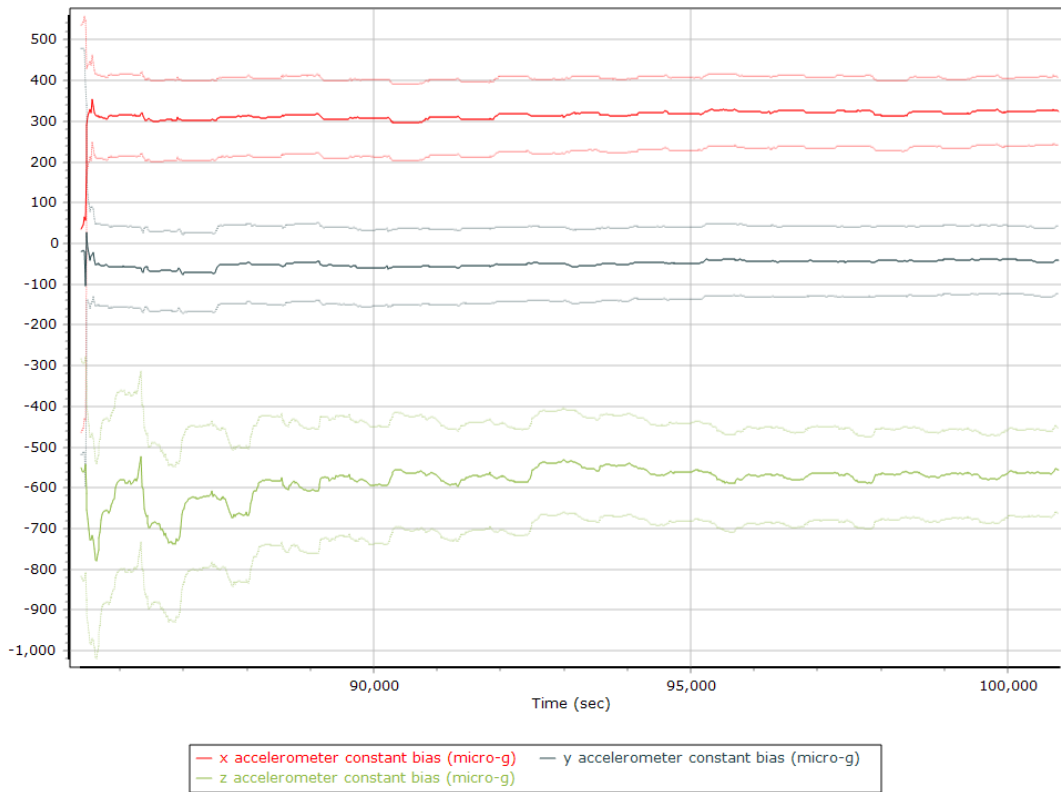


### Z Gyro Scale Error (ppm)

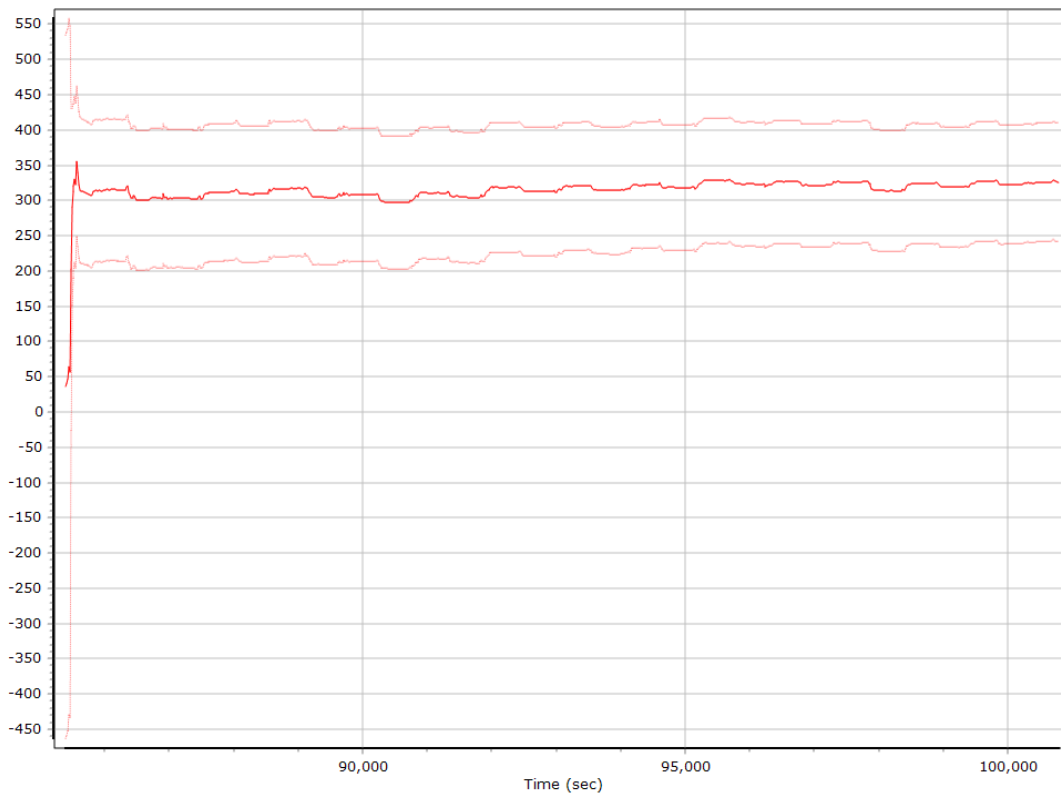




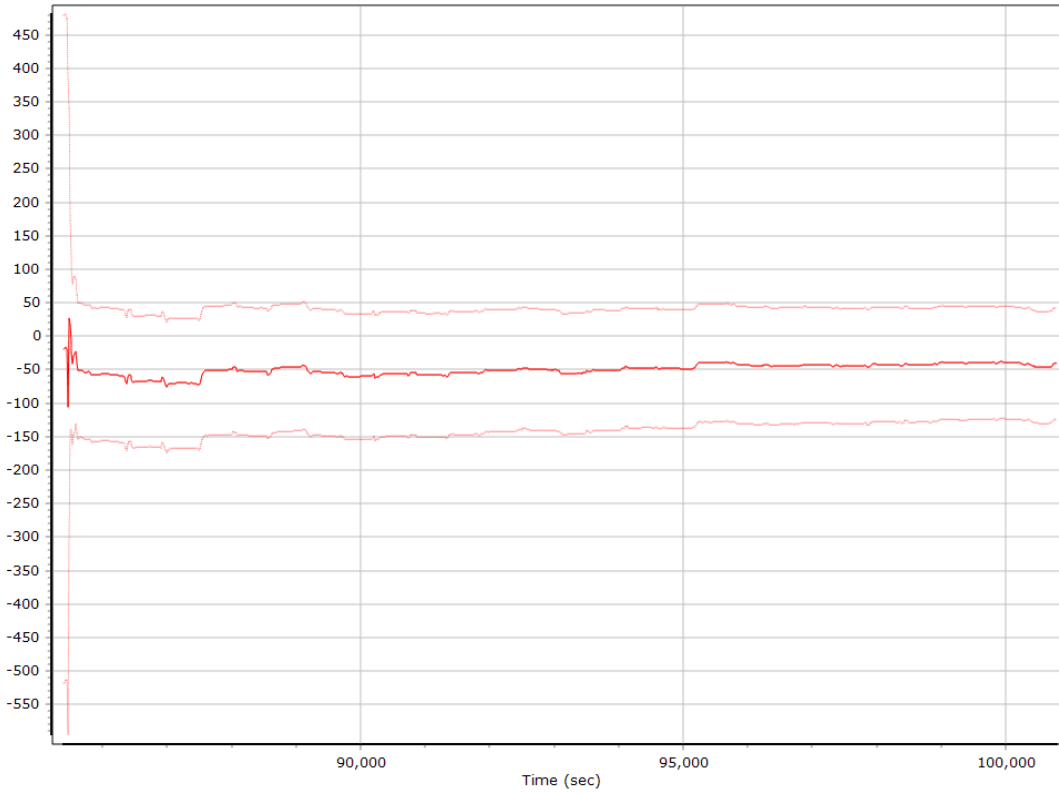
### Forward Processed Estimated Constant Errors, Reference Frame Accelerometer Bias (micro-g)



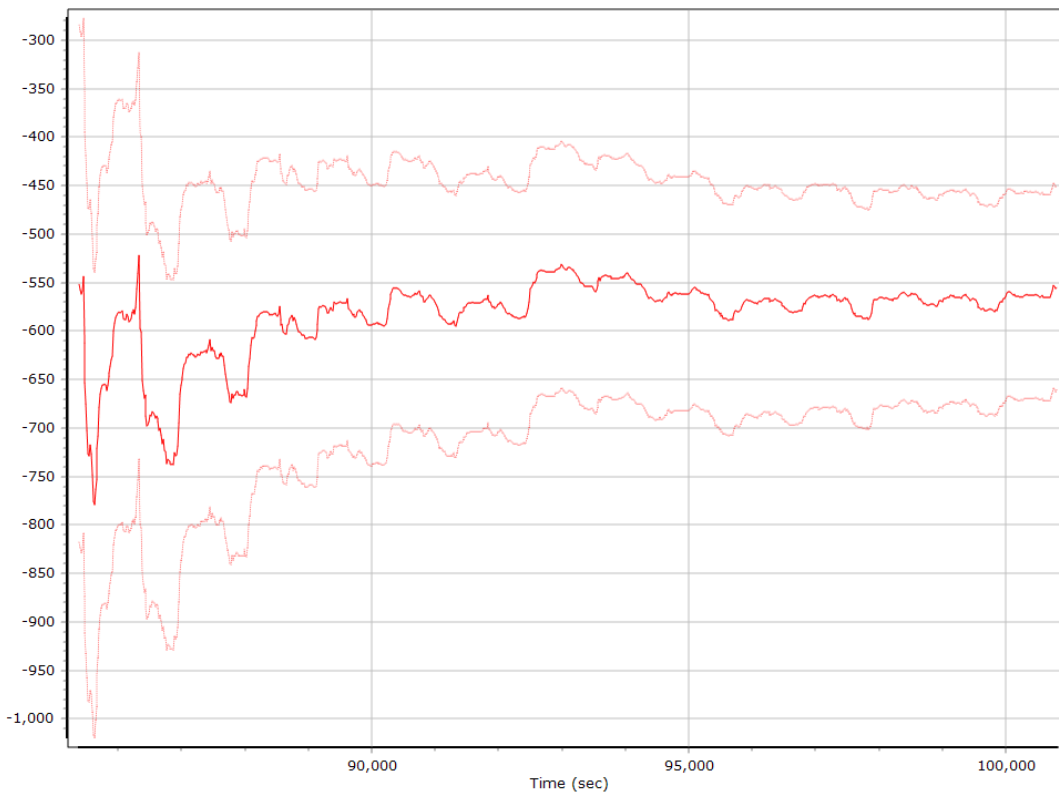
### X Accelerometer Bias (micro-g)



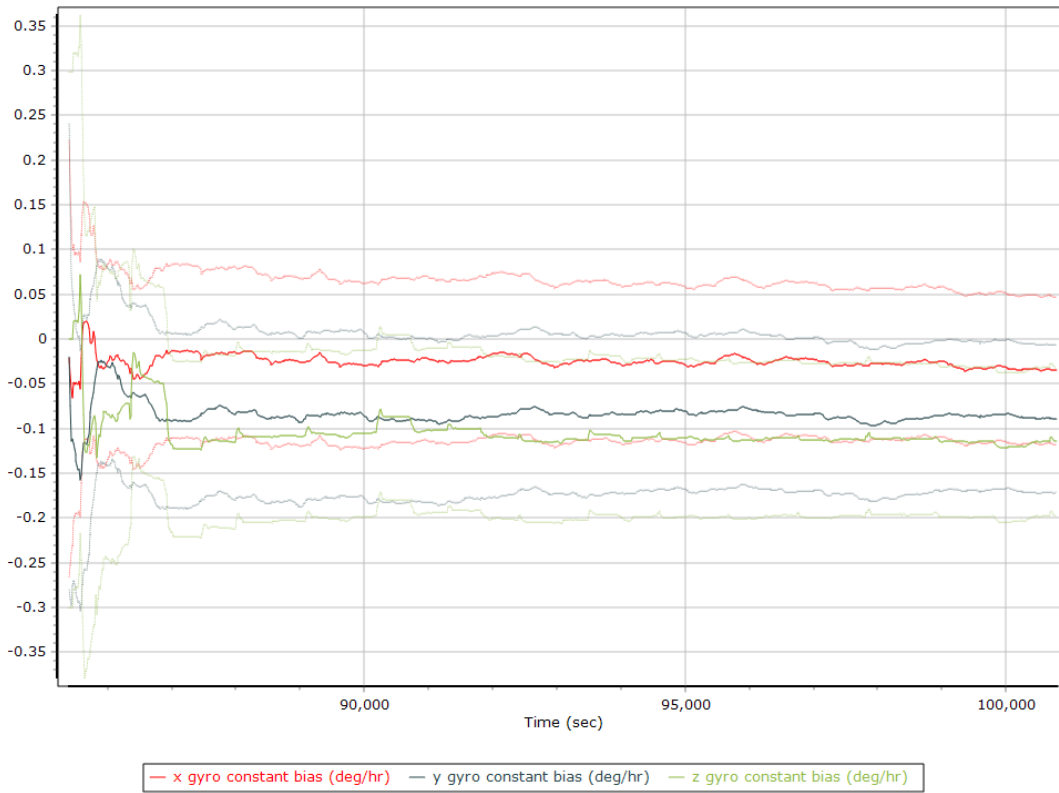
### Y Accelerometer Bias (micro-g)



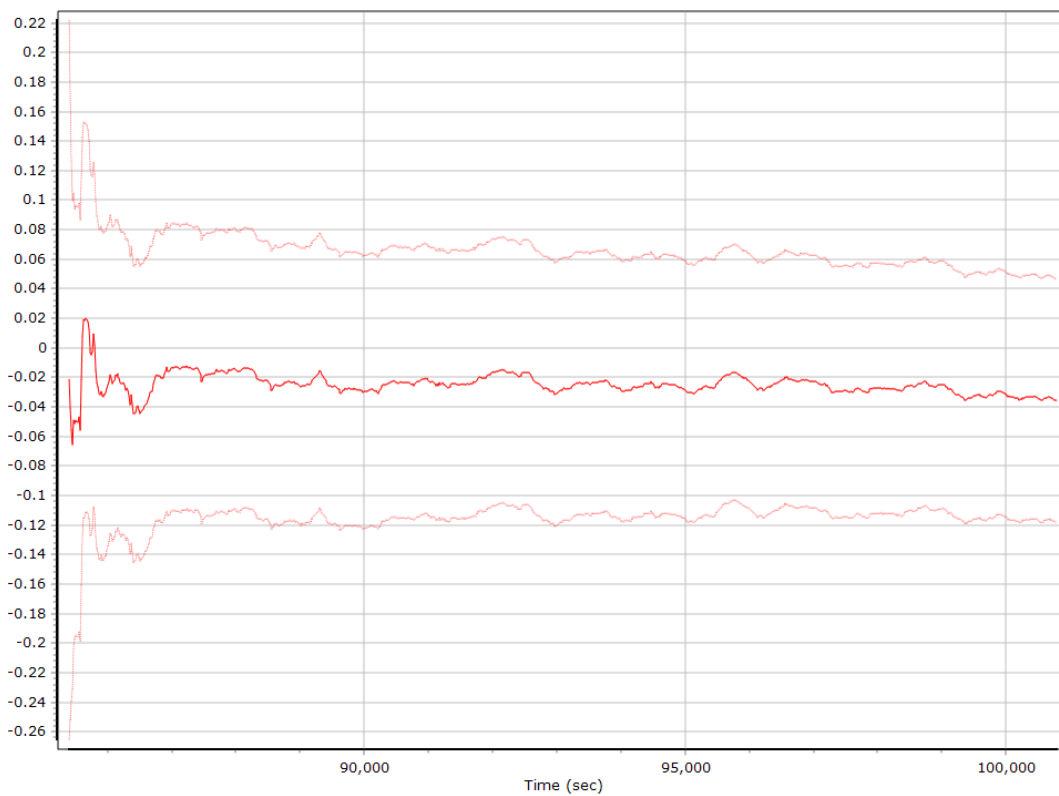
### Z Accelerometer Bias (micro-g)



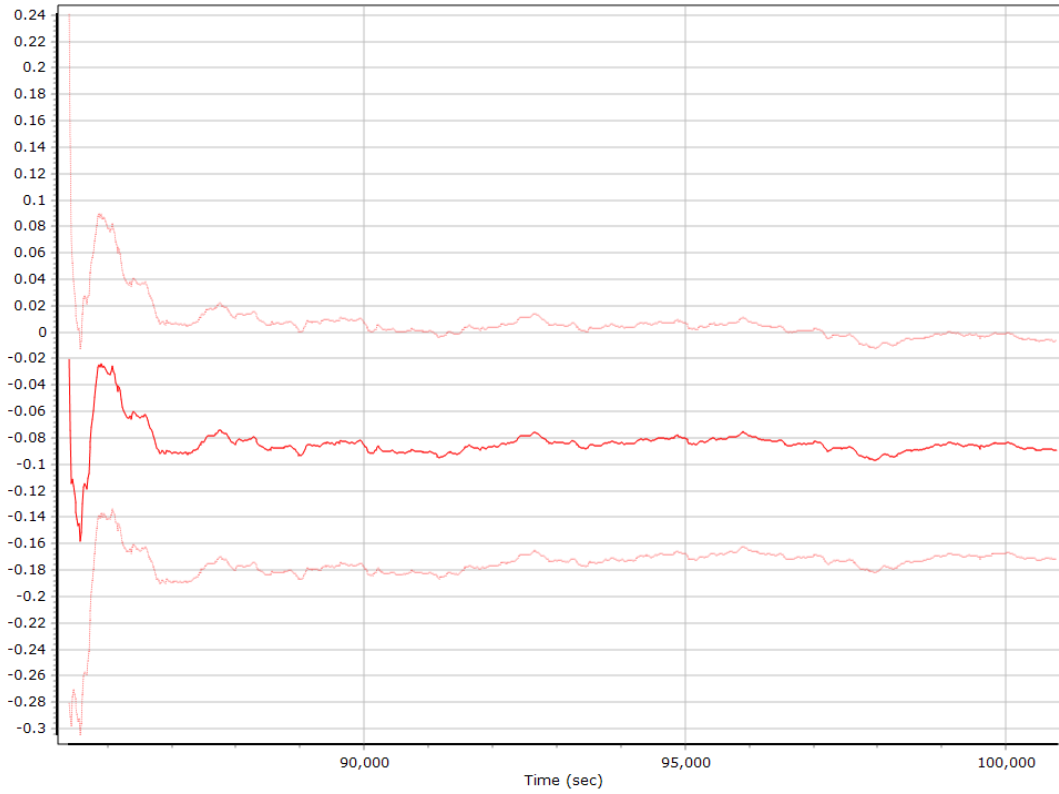
### Gyro Bias (deg/h)



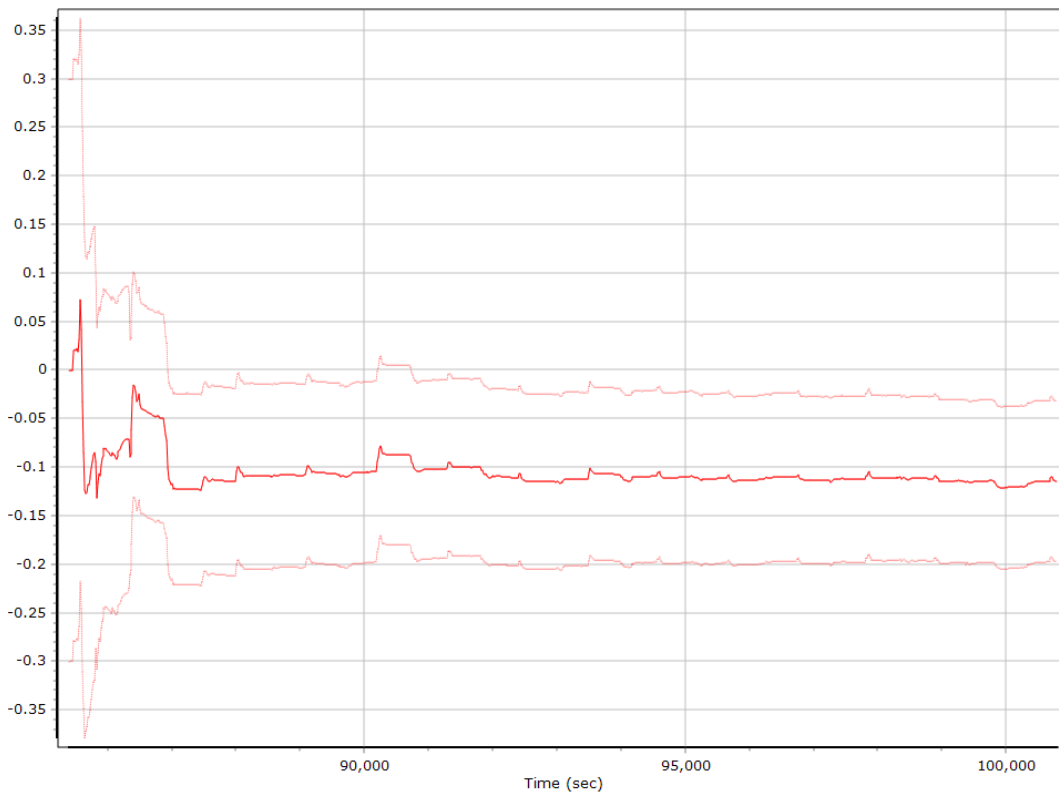
### X Gyro Bias (deg/h)



### Y Gyro Bias (deg/h)

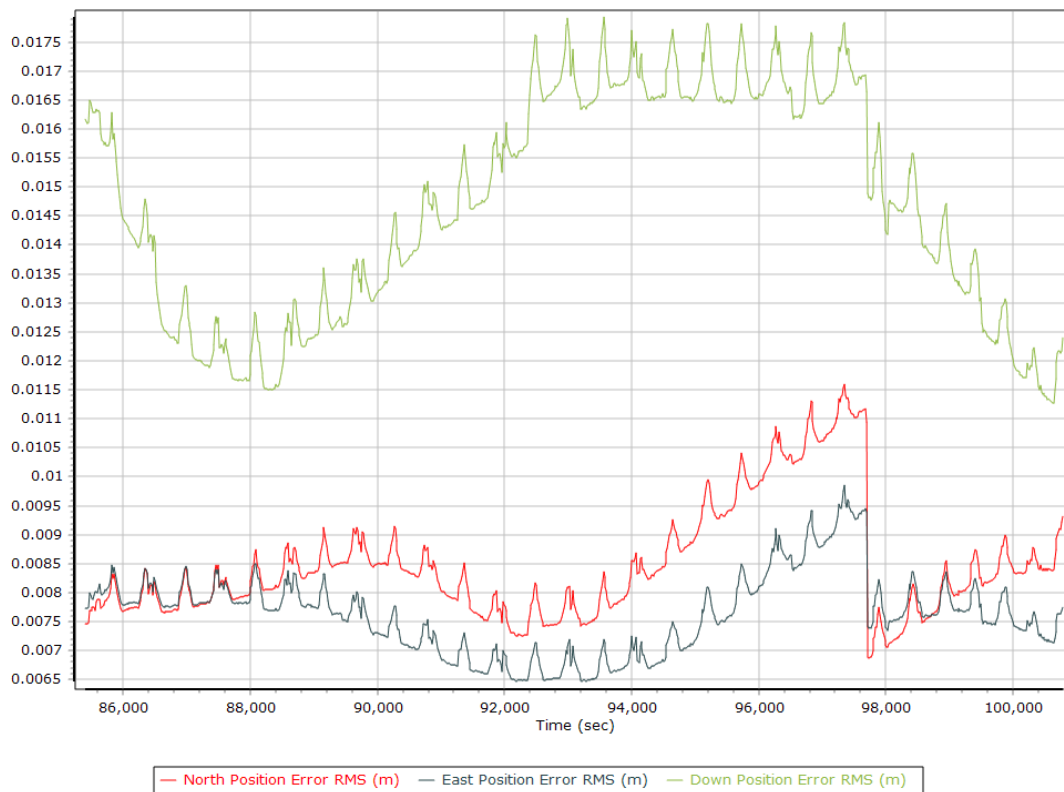


### Z Gyro Bias (deg/h)

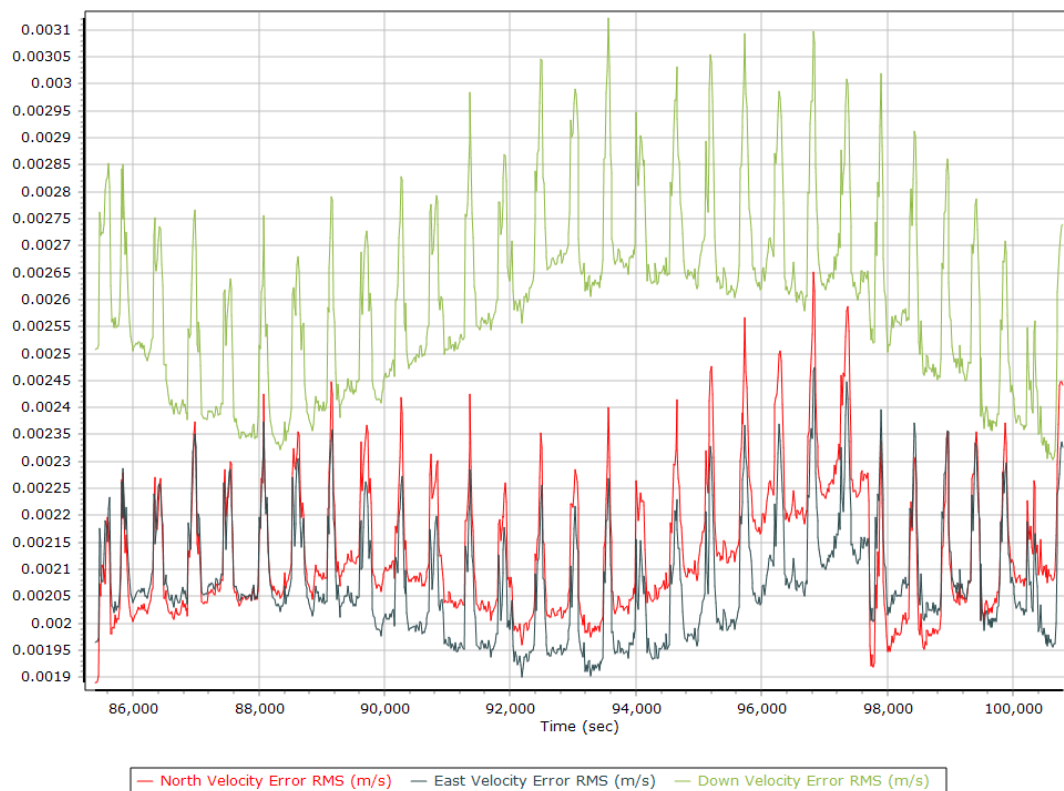


## Smoothed Performance Metrics

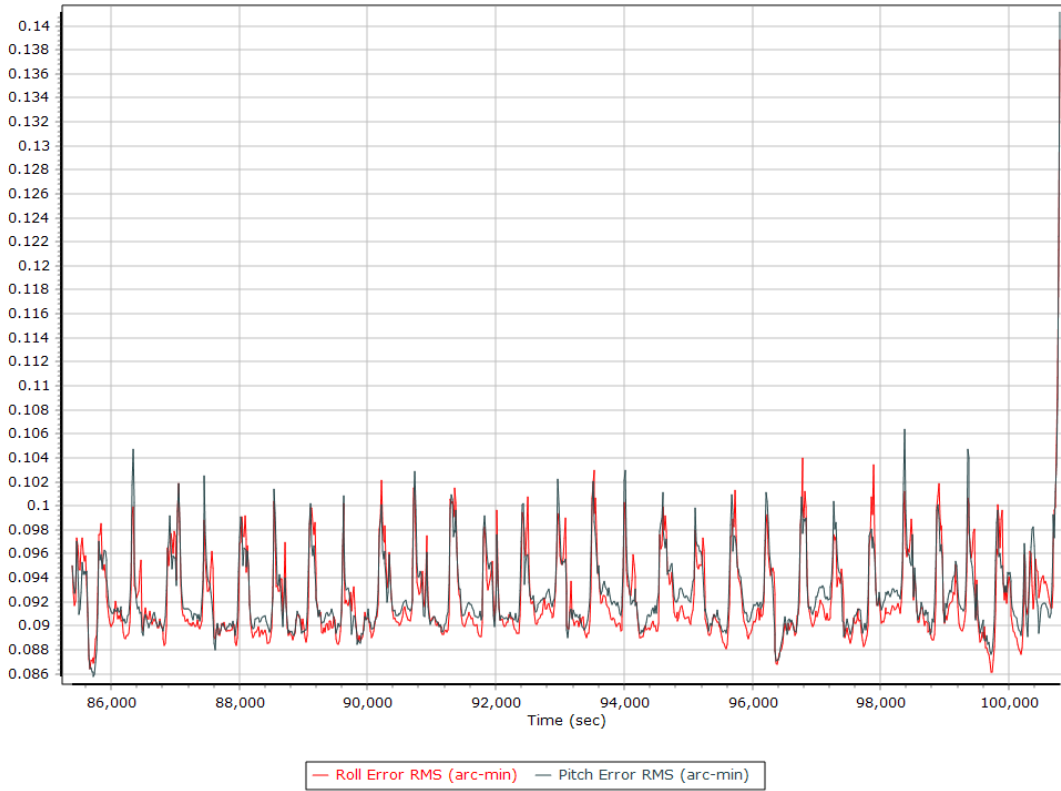
### Position Error RMS (m)



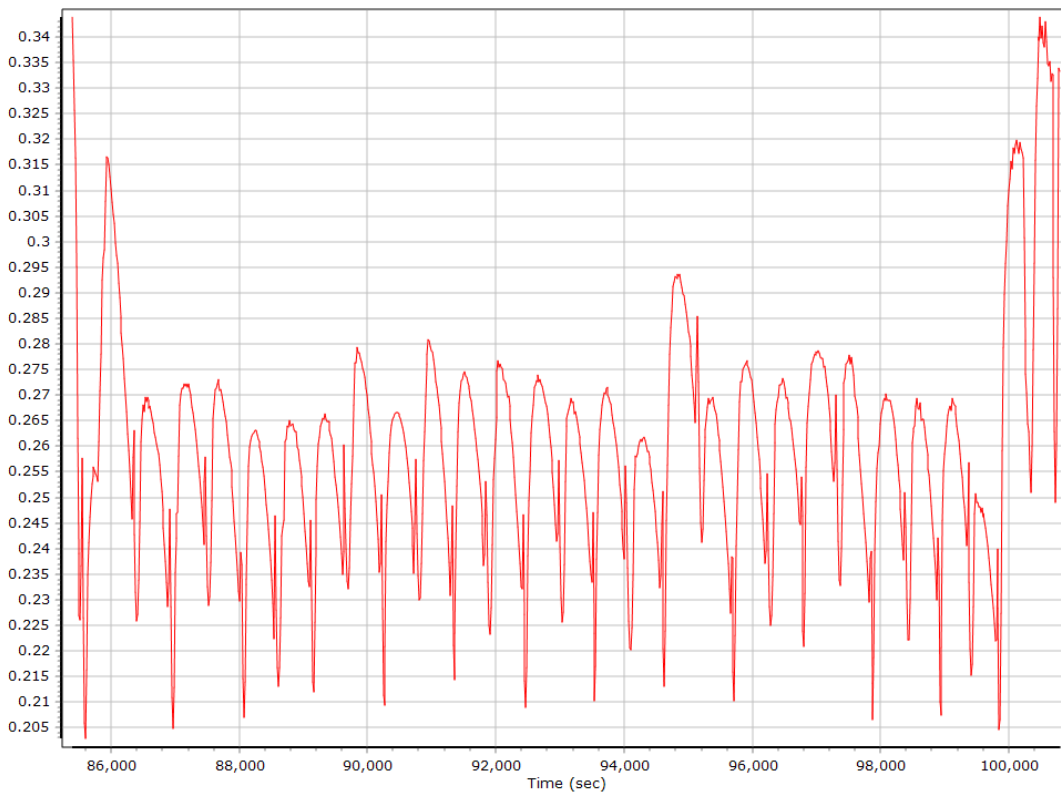
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)

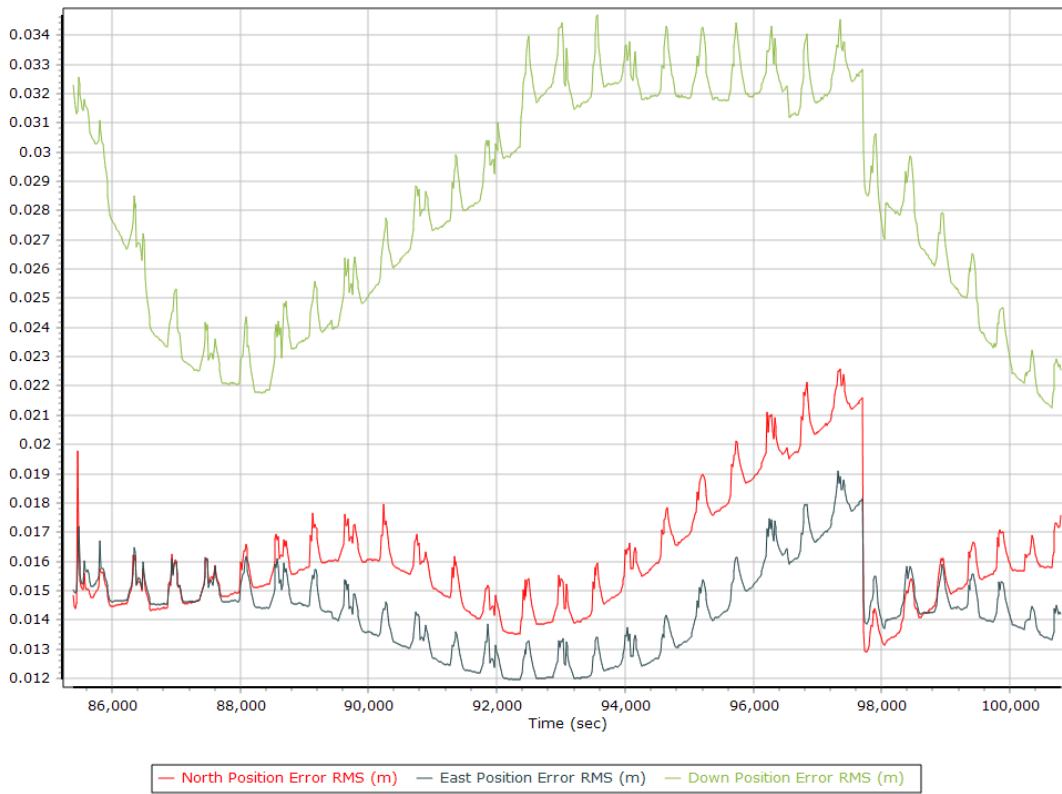


### Heading Error RMS (arc-min)

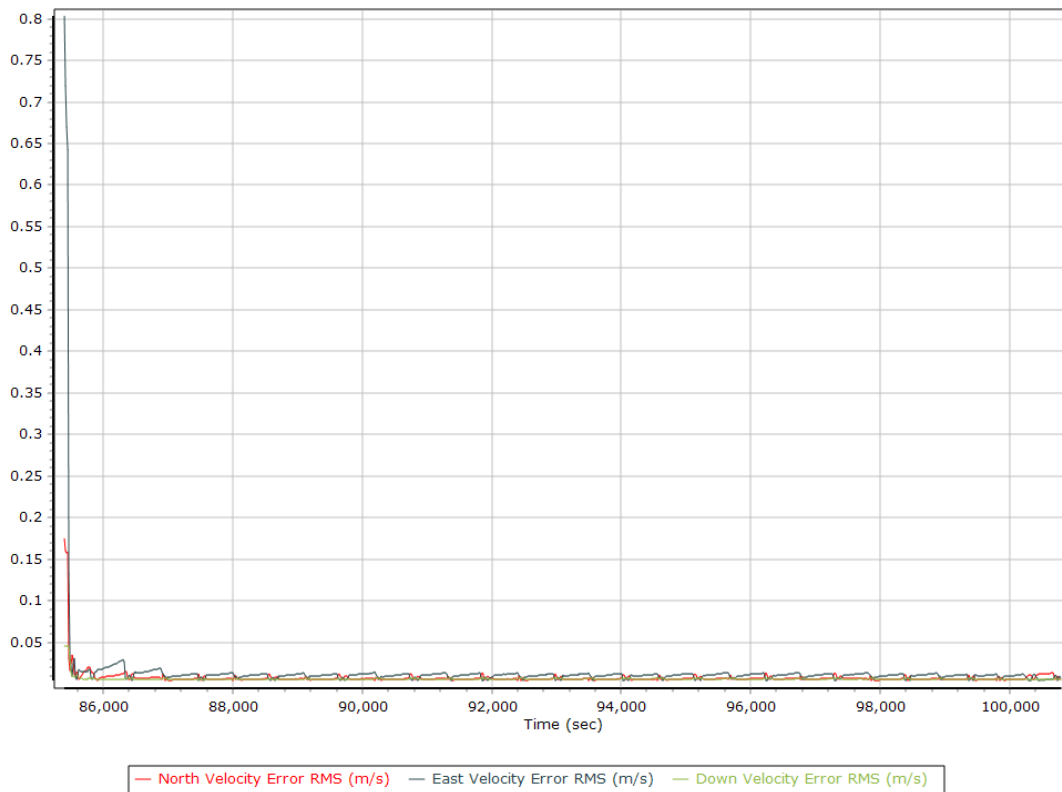


## Forward Processed Performance Metrics

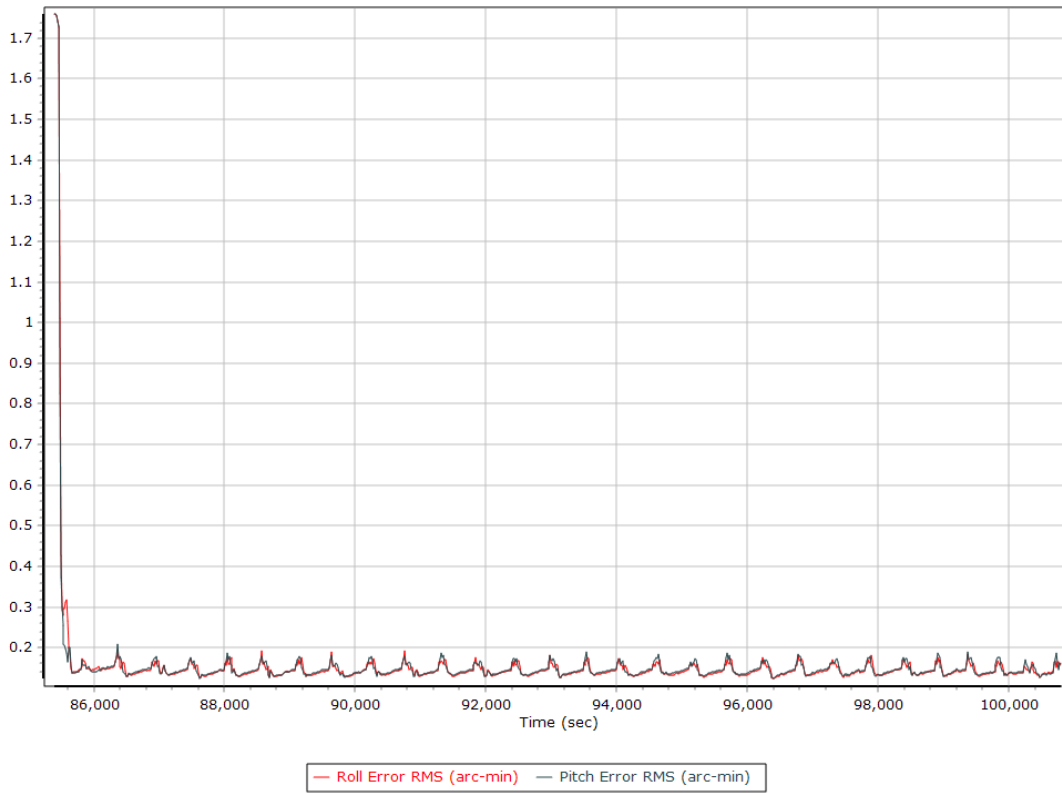
### Position Error RMS (m)



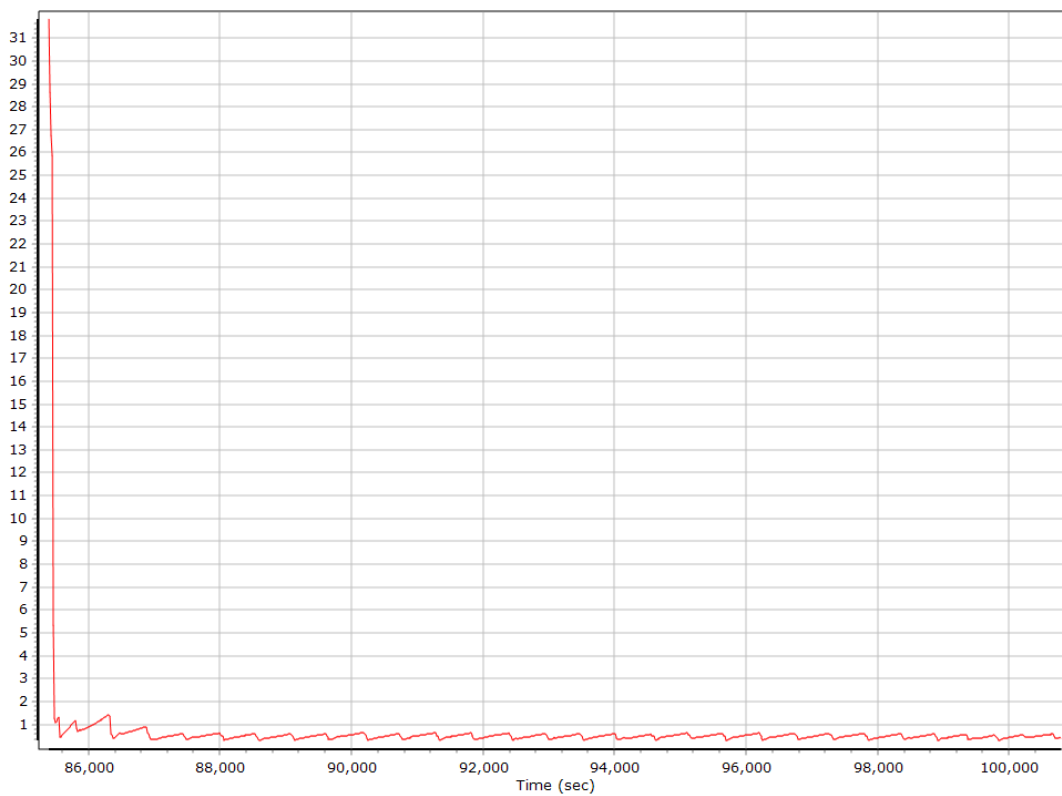
### Velocity Error RMS (m/s)



### Roll/Pitch Error RMS (arc-min)



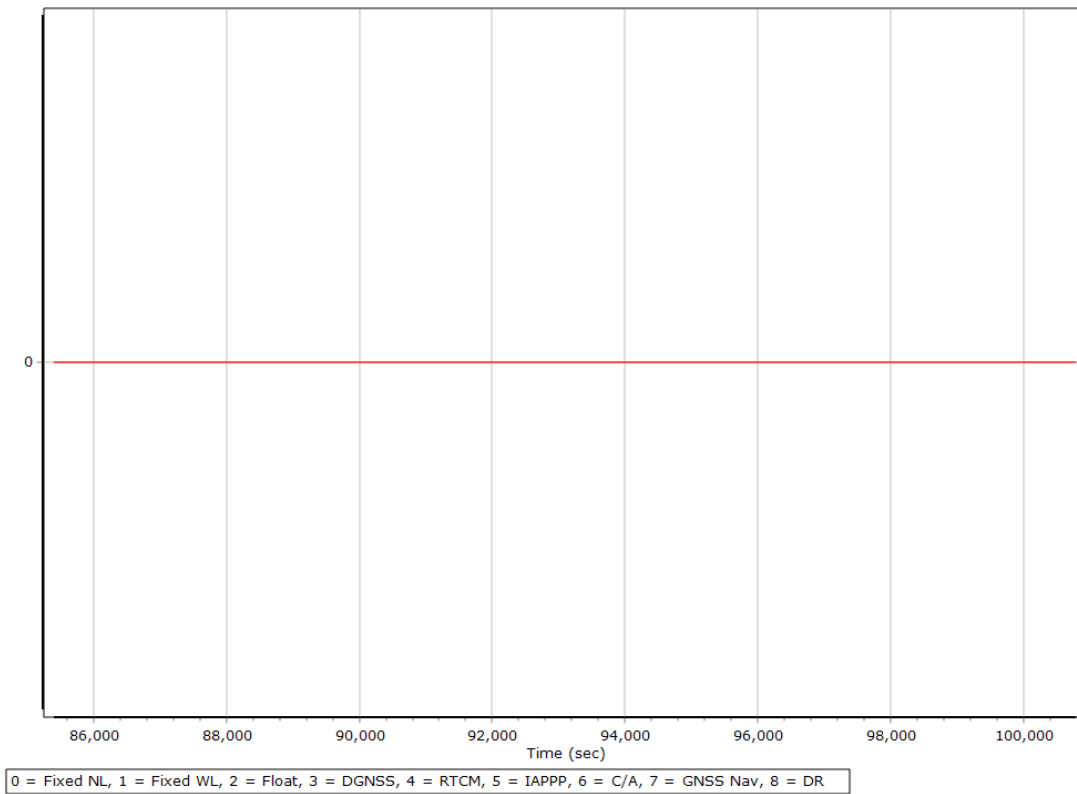
### Heading Error RMS (arc-min)



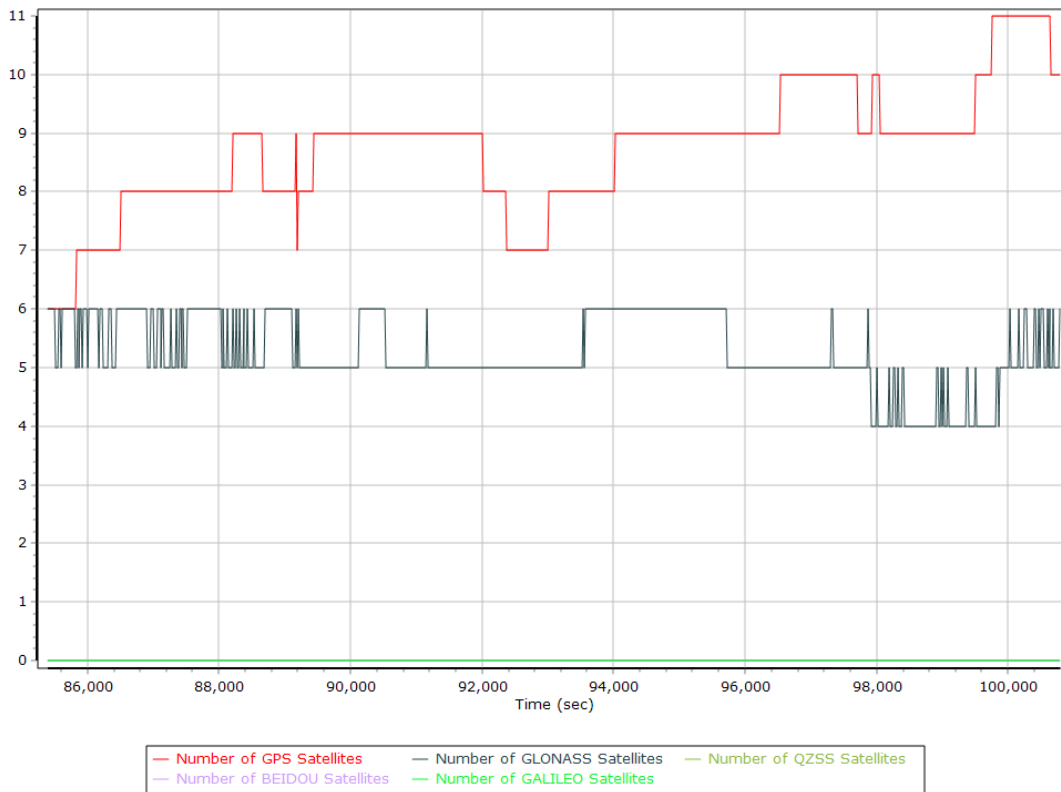


## Smoothed Solution Status

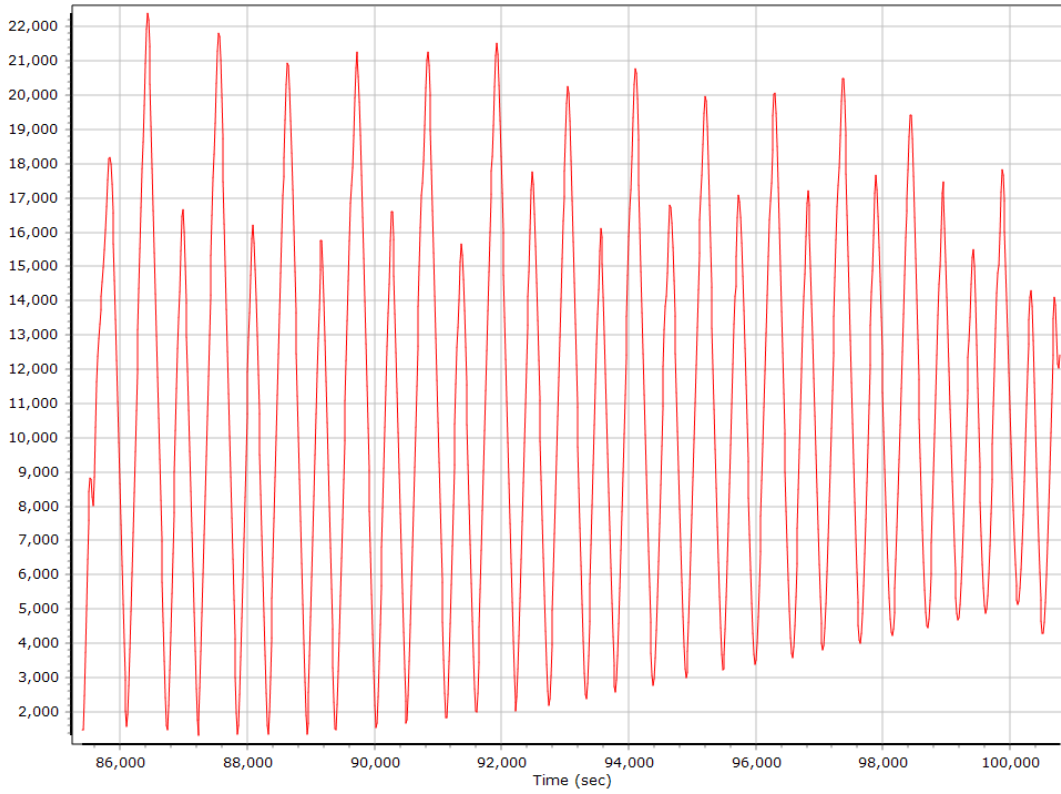
### Processing Mode



### Number of Satellites

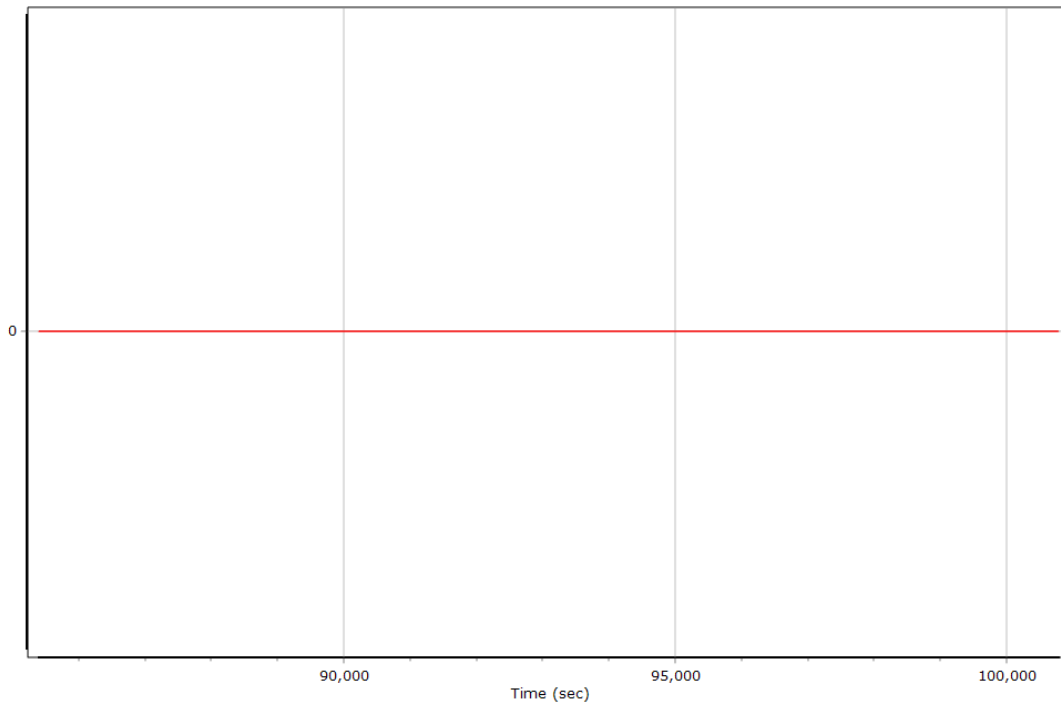


### Baseline Length



### Forward Processed Solution Status

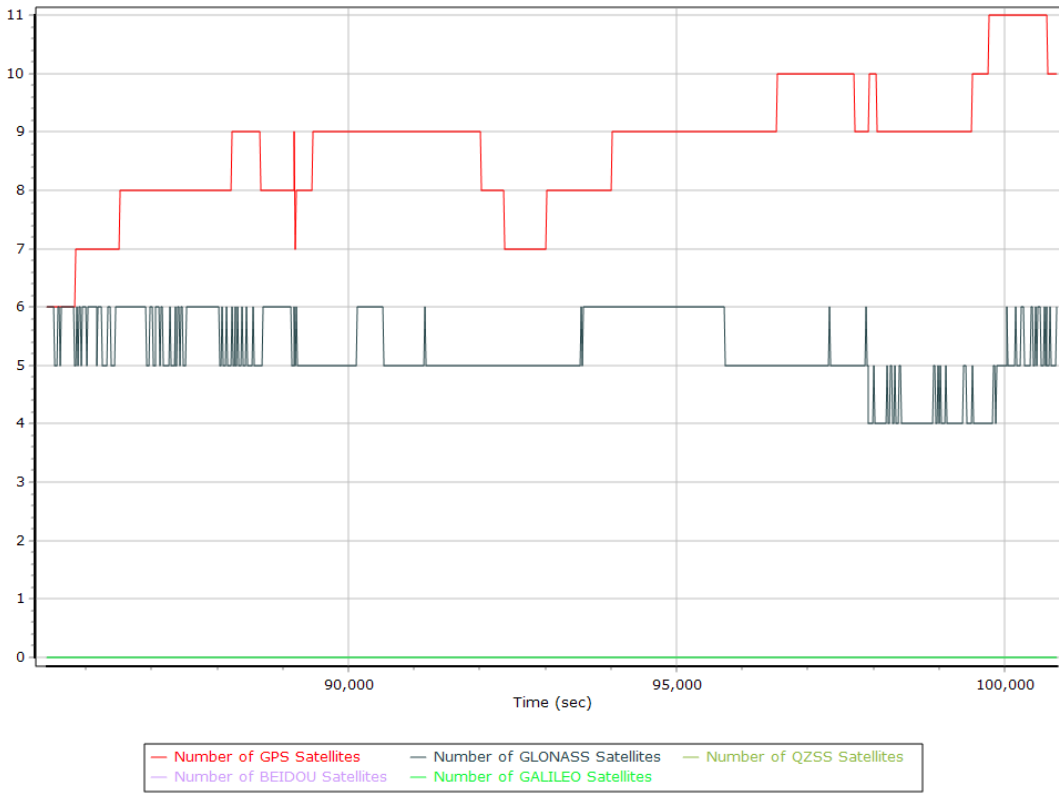
#### Processing Mode



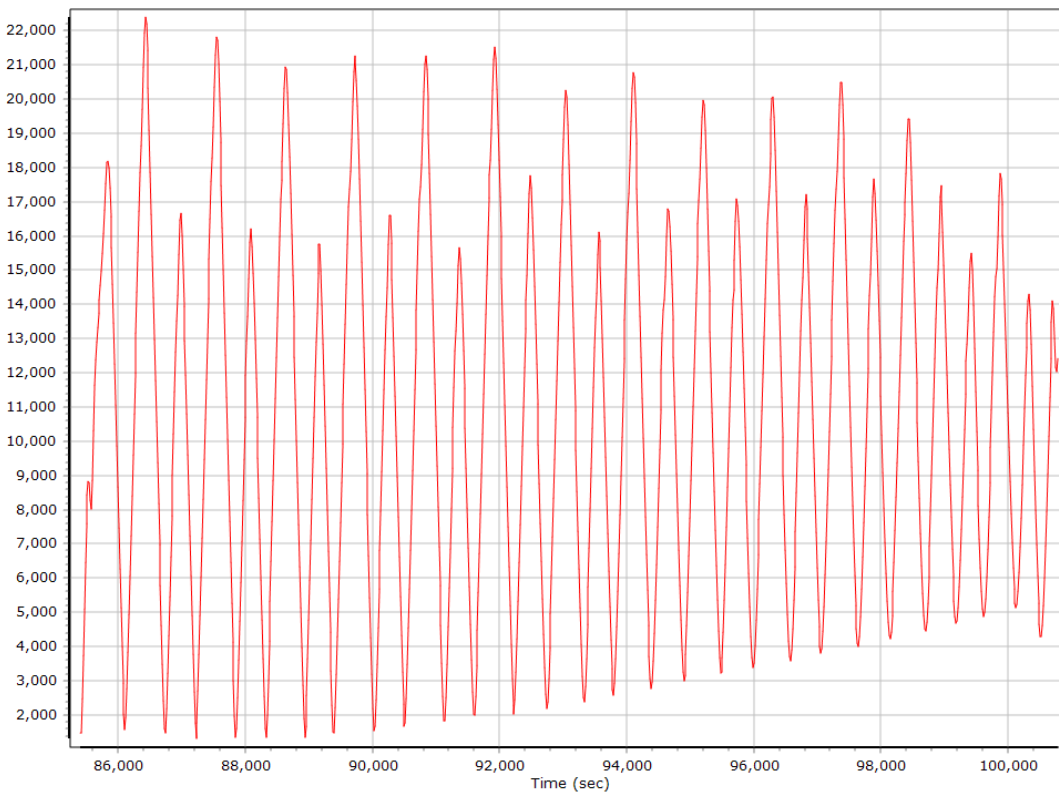
Forward  Reverse

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



### Baseline Length



## SBET IAKAR Separation

