

RANGER XL DIMENSIONS (mm)



RANGE MEASUREMENT PERFORMANCE

Laser Pulse Repetition Rate PRR ¹⁾	150 kHz	300 kHz	600 kHz	1200 kHz	1800 kHz
Max. Measuring Range ^{2) 3)} natural targets $P \geq 20\%$ natural targets $P \geq 60\%$	1200 m 1900 m	850 m 1400 m	650 m 1050 m	450 m 750 m	350 m 650 m
Max. Operating Flight Altitude AGL ^{2) 4)} @ $P \geq 20\%$ @ $P \geq 60\%$	900 m (2950 ft) 1400 m (4600 ft)	600 m (1950 ft) 1050 m (3450 ft)	500 m (1650 ft) 900 m (2950 ft)	350 m (1150 ft) 550 m (1800 ft)	250 m (800 ft) 500 m (1650 ft)
Max. Number of Targets per Pulse ⁵⁾	15	15	15	8	5

1) Rounded average PRR.

2) Typical values for average conditions and average ambient brightness. In bright sunlight, the max. range is shorter than under an overcast sky.

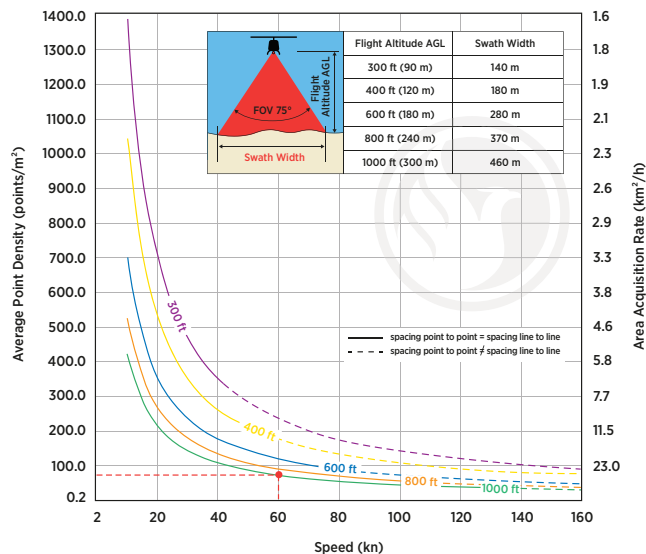
3) The maximum range is specified for flat targets with size in excess of the laser beam diameter, perpendicular angle of incidence, and for atmospheric visibility of 23 km. Range ambiguities have to be resolved by multiple-time-around processing.

4) Effective FOV 75°, additional roll angle $\pm 5^\circ$.

5) If the laser beam hits, in part, more than one target, the laser's pulse power is split accordingly. Thus the achievable range is reduced.

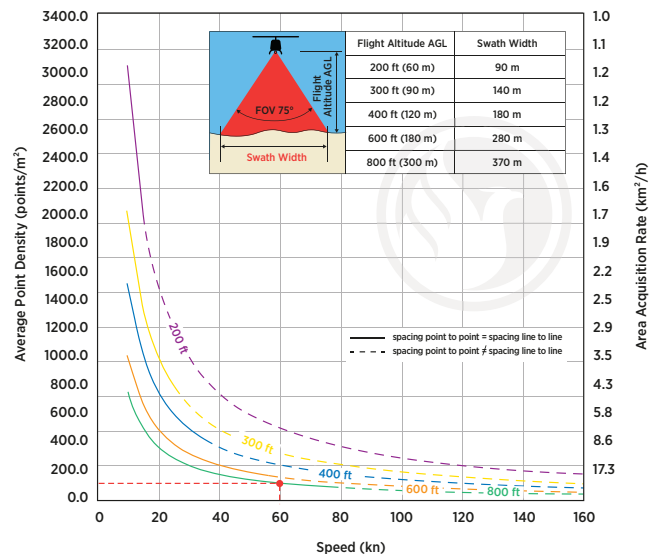
MAX MEASUREMENT RANGE & POINT DENSITY RANGER XL

PRR = 1200KHZ



EXAMPLE	VUX-240 at 1,200,000 pulses/sec, laser power level 100% Altitude = 1,000 ft AGL, Speed 60kn	RESULTS Point Density - 60 pts/m²
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PRR = 1800KHZ



EXAMPLE	VUX-240 at 1,800,000 pulses/sec, laser power level 100% Altitude = 800 ft AGL, Speed 60kn	RESULTS Point Density - 120 pts/m²
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RANGER XL ACCESSORIES



EXPLORE A PHOENIX LiDAR SYSTEM FOR YOUR TEAM, CONTACT US!

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PIONEER EXPLORATION



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Appendix 3

Instrument Specification – Camera System

Main specifications of **α7R V**

General	Camera type	Interchangeable-lens digital camera
	Lens mount	E-mount
Image sensor	Type	35mm full frame (35.7×23.8mm), Exmor R CMOS sensor
	Number of pixels	Approx. 61.0 megapixels (effective), Approx. 62.5 megapixels (total)
	Image sensor aspect ratio	3:2
	Anti-Dust system	Charge protection coating on optical filter and image sensor shift mechanism
Recording system (still image)	Recording format	JPEG (DCF Ver. 2.0, Exif Ver. 2.31, MPFF Baseline compliant), RAW (Sony ARW 2.3 format)
	Image size [3:2] (pixels)	35mm full frame L: 9504 × 6336 (60M), M: 6240 × 4160 (26M), S: 4752 × 3168 (15M) APS-C L: 6240 × 4160 (26M), M: 4752 × 3168 (15M), S: 3120 × 2080 (6.5M)
	[4:3]	35mm full frame L: 8448 × 6336 (54M), M: 5552 × 4160 (23M), S: 4224 × 3168 (13M) APS-C L: 5552 × 4160 (23M), M: 4224 × 3168 (9M), S: 2768 × 2080 (5.8M)
	[16:9]	35mm full frame L: 9504 × 5344 (51M), M: 6240 × 3512 (22M), S: 4752 × 2672 (13M) APS-C L: 6240 × 3512 (22M), M: 4752 × 2672 (13M), S: 3120 × 1752 (5.5M)
	[1:1]	35mm full frame L: 6336 × 6336 (40M), M: 4160 × 4160 (17M), S: 3168 × 3168 (10M) APS-C L: 4160 × 4160 (17M), M: 3168 × 3168 (10M), S: 2080 × 2080 (4.3M)
	Image quality modes	RAW, RAW + JPEG (Extra fine, Fine, Standard), JPEG (Extra fine, Fine, Standard)
	Picture Effect	Posterization (Color), Posterization (B/W), Pop Color, Retro Photo, Partial Color (R/G/B/Y), High Contrast Monochrome, Toy Camera/Normal/Cool/Warm/Green/Magenta), Soft High-key
	Creative Style	Standard, Vivid, Neutral, Clear, Deep, Light, Portrait, Landscape, Sunset, Night Scene, Autumn leaves, Black & White, Sepia, Style Box (1-6), (Contrast (-3 to +3 steps), Saturation (-3 to +3 steps), Sharpness (-5 to +5 steps))
	Picture Profile	Yes (Off / PP1-PP10) Parameters: Black level, Gamma (Movie, Still, Cine1-4, ITU709, ITU709 [800%], S-Log2, S-Log3, HL-G1-3), Black Gamma, Knee, Color Mode, Saturation, Color Phase, Color Depth, Detail, Copy, Reset
	Dynamic range functions	Off, Dynamic Range Optimizer (Auto/Level 1-5))
Recording system (movie)	Color space	sRGB standard (with sYCC gamut) and Adobe RGB standard compatible with TRILUMINOS Color
	14bit RAW	Yes
	Uncompressed RAW	Yes
	Recording format	XAVC S, AVCHD format Ver. 2.0 compliant
	Video compression	XAVC S: MPEG-4 AVC/H.264, AVCHD: MPEG-4 AVC/H.264
	Audio recording format	XAVC S: LPCM 2ch, AVCHD: Dolby Digital (AC-3) 2ch, Dolby Digital Stereo Creator
	Color space	xvYCC standard (x.v.Color when connected via HDMI cable) compatible with TRILUMINOS Color
	Picture Effect	Posterization (Color), Posterization (B/W), Pop Color, Retro Photo, Partial Color (R/G/B/Y), High Contrast Monochrome, Toy Camera (Normal/Cool/Warm/Green/Magenta), Soft High-key
	Creative Style	Standard, Vivid, Neutral, Clear, Deep, Light, Portrait, Landscape, Sunset, Night Scene, Autumn leaves, Black & White, Sepia, Style Box (1-6), (Contrast (-3 to +3 steps), Saturation (-3 to +3 steps), Sharpness (-5 to +5 steps))
	Picture Profile	Yes (Off / PP1-PP10) Parameters: Black level, Gamma (Movie, Still, Cine1-4, ITU709, ITU709 [800%], S-Log2, S-Log3, HL-G1-3), Black Gamma, Knee, Color Mode, Saturation, Color Phase, Color Depth, Detail, Copy, Reset
	Image size (pixels)	NTSC XAVC S 4K: 3840 × 2160 (30p, 100M), 1920 × 1080 (24p, 100M), 3840 × 2160 (30p, 60M), 3840 × 2160 (24p, 60M) XAVC S HD: 1920 × 1080 (120p, 100M), 1920 × 1080 (120p, 60M), 1920 × 1080 (60p, 50M), 1920 × 1080 (30p, 50M), 1920 × 1080 (24p, 50M), 1920 × 1080 (60p, 25M), 1920 × 1080 (30p, 16M) AVCHD: 1920 × 1080 (60i, 24M, FX), 1920 × 1080 (60i, 17M, FH) PAL XAVC S 4K: 3840 × 2160 (25p, 100M), 3840 × 2160 (25p, 60M) XAVC S HD: 1920 × 1080 (100p, 100M), 1920 × 1080 (100p, 60M), 1920 × 1080 (50p, 50M), 1920 × 1080 (25p, 50M), 1920 × 1080 (50p, 25M), 1920 × 1080 (25p, 16M) AVCHD: 1920 × 1080 (50i, 24M, FX), 1920 × 1080 (50i, 17M, FH)
	Slow & Quick Motion (S&Q) / Image frame rate	NTSC mode: 11fps, 21fps, 41fps, 81fps, 151fps, 30fps, 60fps, 120fps PAL mode: 11fps, 21fps, 31fps, 61fps, 121fps, 251fps, 50fps, 100fps
	Slow & Quick Motion (S&Q) / Image size	NTSC mode: 1920x1080 (60p, 30p, 24p), PAL mode: 1920x1080 (50p, 25p)
	Movie functions	Audio Level Display, Audio Rec Level, PAL/NTSC Selector, Proxy Recording (1280 × 720 (Approx.9Mbps)), TC/UB (TC Preset/UB Preset/TC Format/TC Run/TC Make/UB Time Rec), Auto Slow Shutter, REC Control, Clean HDMI Info. (On/Off selectable), Gamma Disp. Assist 3840 × 2160 (25p), 1920 × 1080 (50p), 1920 × 1080 (50p), 1920 × 1080 (24p), 1920 × 1080 (60p), 1920 × 1080 (60i), 3840 × 2160 (30p), 3840 × 2160 (24p), YCbCr 4:2:2 8bit / RGB 8bit
	HDMI output	
Recording system	Location Information Link From Smartphone	Yes
	Media	SD memory card, SDHC memory card (UHS-I/II compliant), SDXC memory card (UHS-I/II compliant), microSD memory card, microSDHC memory card, microSDXC memory card
	Memory card slot	SLOT1 & SLOT2: Slot for SD (UHS-I/II compliant) memory card
Noise reduction	Recording mode on 2 memory cards	Simult. Rec (Still), Simult. Rec (Movie), Simult. Rec (Still/Movie), Sort (JPEG/RAW), Sort (Still/Movie), Auto Switch Media (On/Off), Copy
	Noise reduction	Long exposure NR: On/Off, available at shutter speeds longer than 1 sec. High ISO NR: Normal/Low/Off
	Multi Frame NR	-
White balance	Modes	Auto / Daylight / Shade / Cloudy / Incandescent / Fluorescent (Warm White / Cool White / Day White / Daylight / Flash / Underwater/ Color Temperature (2500 to 9900K) & color filter (G7 to M7 (57-step), A7 to B7 (29-step)) / Custom Yes (G7 to M7, 57-step) (A7 to B7, 29-step)
	AWB micro adjustment	Yes
	Priority Set in AWB	Yes
	Shutter AWB Lock	Yes (Shut. Halfway Down/ Cont. Shooting/ Off)
	Bracketing	3 frames, H/L selectable
	Focus type	Fast Hybrid AF (phase-detection AF/contrast-detection AF)
	Focus sensor	Exmor R CMOS sensor
	Focus point	35mm full frame: 567 points (phase-detection AF), APS-C mode with full frame lens: 325 points (phase-detection AF), with APS-C lens: 247 points (phase-detection AF) / 425 points (contrast-detection AF)
	Focus sensitivity range	EV-3 to EV20 (ISO100 equivalent with F2.0 lens attached)
	Focus mode	AF-A (Automatic AF), AF-S (Single-shot AF), AF-C (Continuous AF), DMF (Direct Manual Focus), Manual Focus
Focus	Focus area	Wide (567 points (phase-detection AF), 425 points (contrast-detection AF)) / Zone / Center / Flexible Spot (S/M/L) / Expanded Flexible Spot/ Tracking (Wide / Zone / Center / Flexible Spot (S/M/L) / Expand Flexible Spot)
	Other features	Eye-start AF (only with LA-EA2 or LA-EA4 attached (Sold separately)), Tracking, Eye AF [Still] Human (Right/Left Eye Select) / Animal (Movie) Human (Right/Left Eye Select), AF micro adjustment, Predictive control, Focus lock, AF Track Sens, Swt.V/H AF Area, AF Area Regist., Circ. of Focus Point
	AF illuminator	Yes (with Built-in LED type) Approx. 0.3m - approx. 3.0m (with FE 28-70mm F3.5-5.6 OSS attached)
	Focus Type with LA-EA1 or LA-EA3 (Sold separately)	Phase-detection
	Metering type	1200-zone evaluative metering
	Metering sensor	Exmor R CMOS sensor
	Metering sensitivity range	EV-3 to EV20 (at ISO100 equivalent with F2.0 lens attached)
	Metering mode	Multi-segment, Center-weighted, Spot, Spot Standard/Large, Entire Screen Avg., Highlight
	Exposure compensation	+/- 5.0EV (1/3 EV, 1/2 EV steps selectable) (with exposure compensation dial: +/- 3EV (1/3 EV steps))
	Exposure bracketing	Bracket: Cont., Bracket: Single, 3/5/9 frames selectable. With 3 or 5 frames, in 1/3, 1/2, 2/3, 1.0, 2.0, or 3.0 EV increments, with 9 frames, in 1/3, 1/2, 2/3, or 1.0 EV increments.
Exposure	AE Lock	Locked when shutter button is pressed halfway. Available with AE lock button. (On/Off/Auto)
	Exposure modes	AUTO (iAuto), Programmed AE (P), Aperture priority (A), Shutter-speed priority (S), Manual (M), Movie (Programmed AE (P) / Aperture priority (A) / Shutter-speed priority (S) / Manual (M)), Slow & Quick Motion (Programmed AE (P) / Aperture priority (A) / Shutter-speed priority (S) / Manual (M))
	ISO sensitivity (Recommended Exposure Index)	Still images: ISO 100-32000 (ISO numbers up from ISO 50 to ISO 102400 can be set as expanded ISO range), AUTO (ISO 100-12800, selectable lower limit and upper limit), Movies: ISO 100-32000 equivalent, AUTO (ISO 100-12800, selectable lower limit and upper limit)
	Anti-flicker shoot	Yes
	Viewfinder type	1.3 cm (0.5 type) electronic viewfinder (color), UXGA OLED Tru-Finder
	Number of dots	5 760 000 dots
	Brightness control	Auto/Manual (5 Steps between -2 and +2)

Viewfinder	Color temperature control	Manual (5 Steps)
	Field coverage	100%
	Magnification	Approx. 0.78 x (with 50mm lens at infinity, -1m ⁻¹)
	Dioptric adjustment	-4.0 to +3.0m ⁻¹
	Eye point	Approx. 23mm from the eyepiece lens, 18.5mm from the eyepiece frame at -1m ⁻¹ (CIPA standard)
	Finder Frame Rate selection	NTSC mode: STD 60fps / HI 120fps, PAL mode: STD 50fps / HI 100fps
	Display Contents	Graphic Display, Display All Info., No Disp. Info., Digital Level Gauge, Histogram
	Type	7.5cm (3.0-type) type TFT
	Number of dots (total)	1,440,000 dots
	Touch panel	Yes
LCD Screen	Brightness control	Manual (5 steps between -2 and +2), Sunny Weather mode
	Adjustable angle	Up by approx. 107 degrees, Down by approx. 41 degrees
	Display Selector (FINDER/LCD)	Yes (Auto/Manual)
	Real-time image-adjustment display	On/Off
	Quick Navi	Yes
	Focus magnifier	Yes (35mm full frame: 5.9x, 11.9x APS-C: 3.9x, 7.8x)
	Zebra	Yes (selectable level + range or lower limit as custom setting)
	Peaking MF	Yes (Level setting: High/Mid/Low/Off, Color: Red/Yellow/Blue/White)
	Others	WhiteMagic™, Grid Line (Rule of 3rds Grid/Square Grid/Diag. + Square Grid/Off), Movie Marker (Center/Aspect/Safety Zone/Guideframe)
	Display Contents	Graphic Display, Display All Info, No Disp. Info, Digital Level Gauge, Histogram, For viewfinder, Monitor Off
Other features	PlayMemories Camera Apps	-
	Clear Image Zoom	Still images: Approx. 2x Movies: Approx. 1.5x (4K), Approx. 2x (HD)
	Digital zoom	Smart zoom (Still images): 35mm full frame: M: approx 1.5x, S: approx 2x / APS-C: M: approx 1.3x, S: approx 2x Digital zoom (Still images): 35mm full frame: L: approx 4x, M: approx 6.1x, S: approx 8x / APS-C: L: approx 4x, M: approx 5.3x, S: approx 8x Digital zoom (Movie): 35mm full frame: approx 4x / APS-C: approx 4x
	Face detection	Modes: Face Priority in AF (On/Off), Face Priority in Multi Metering (On/Off), Regist. Face Priority(On/Off), Face registration, Max. number of detectable: 8 faces
	Others	Interval Recording, Touch Focus: Yes (Touch Focus/Touch Pad/Touch Tracking), ISO AUTO Min. SS, Bright Monitoring, Copyright Info. Set File Name, Save/Import Settings, FTP Transfer Func., Help guide, Area Setting, Shop Front Mode, Video Light Mode, Zoom Ring Rotate
	Shutter	Electronically-controlled, vertical-traverse, focal-plane type
	Shutter speed	Still images: 1/8000 to 30 sec, Bulb, Movies: 1/8000 to 1/4 (1/3 steps), up to 1/60 in AUTO mode (up to 1/30 in Auto slow shutter mode)
	Flash sync. Speed	1/250 sec. ⁻¹
	Electronic Front Shutter Curtain	Yes (ON/OFF)
	Silent Shooting	Yes (ON/OFF)
SteadyShot INSIDE (image stabilization)	Type	Image Sensor-Shift mechanism with 5-axis compensation (Compensation depends on lens specifications)
	Compensation effect	5.5 stops (based on CIPA standard, Pitch/yaw shake only, With Planar T* FE 50mm F1.4 ZA lens mounted, Long exposure NR off.)
Flash	Control	Pre-flash TTL
	Flash compensation	+/- 3.0 EV (switchable between 1/3 and 1/2 EV steps)
	Flash bracketing	3/5/9 frames selectable. With 3 or 5 frames, in 1/3, 1/2, 2/3, 1.0, 2.0, 3.0 EV increments, with 9 frames, in 1/3, 1/2, 2/3, 1.0 EV increments.
	Flash modes	Flash off, Autoflash, Fill-flash, Slow Sync, Rear Sync., Red-eye reduction (on/off selectable), Wireless ⁻¹ , Hi-speed sync. ⁻²
	External flash	Sony α System Flash compatible with Multi Interface Shoe, attach the shoe adaptor for flash compatible with Auto-lock accessory shoe
	FE lock	Yes
Wireless control	Yes	Yes (Light signal: Available with Fill-flash, Slow Sync., Hi-speed sync. /Radio signal: Available with Fill-flash, Rear Sync., Slow Sync., Hi-speed sync.)
Drive	Drive modes	Single Shooting, Continuous shooting (Hi-/Hi/Mid/Low selectable), Self-timer, Self-timer (Cont.), Bracket: Single, Bracket: Cont., White Balance bracket, DRO bracket
	Speed (approx., max.)	Continuous shooting: Hi-: max. 10 fps, Hi: max. 8 fps, Mid: max. 6fps, Lo: max. 3 fps ⁻³
	No. of frame recordable ⁻³ (approx.)	JPEG Extra fine L: 68 frames, JPEG Fine L: 68 frames, RAW: 68 frames, RAW & JPEG: 68 frames, RAW (Uncompressed): 30 frames, RAW (Uncompressed) & JPEG: 30 frames
	Self-timer	10 sec. delay/5 sec. delay/2 sec. delay/Continuous self-timer (3 frames after 10 sec. delay/5 frames after 10 sec. delay/3 frames after 5 sec. delay/5 frames after 2 sec. delay/3 frames after 2 sec. delay)/Bracketing self-timer (Off/2 sec. delay/5 sec. delay/10sec. delay)
	Pixel Shift Multi Shooting	Yes (4/16 image composite) ⁻⁴
Playback	Photo Capture	Yes
	Daylight	Single (with or without shooting information Y RGB histogram & highlight/shadow warning), 9/25-frame index view, Enlarged display mode (L: 23.8x, M: 15.6x, S: 11.9x), Auto Review (10/5/2 sec. Off), Image orientation (Auto/Manual/Off selectable), Slideshow, Folder selection (Date/ Still/ AVCHD/XAVC S HD/XAVC S 4K), Forward/Rewind (movie), Delete, Protect, Rating, Display as group
Interface	PC interface	Mass-storage, MTP, PC remote
	Multi / Micro USB Terminal	Yes ⁻⁵
	USB Type-C™ Terminal	Yes (SuperSpeed USB (USB 3.2 Gen1) compatible)
	NFC™	Yes (NFC forum Type 3 Tag compatible),One-touch remote/One-touch sharing
	Wireless LAN (built-in)	Wi-Fi Compatible, IEEE 802.11a/b/g/n/ac (2.4GHz band/5GHz band) ⁻⁶ , View on Smartphone, Remote control via Smartphone, Send to Computer, View on TV
	Bluetooth®	Yes (Bluetooth Standard Ver. 4.1 (2.4GHz band))
	HD output	HDMI micro connector (Type-B), BRAVIA Sync (Control for HDMI), PhotoTV HD, 4K movie output/4K still image PB
	Multi interface Shoe	Yes (with Digital Audio Interface) ⁻⁷
	Mic terminal	Yes (3.5 mm Stereo minijack)
	Sync. terminal	Yes
Audio	Remote Control	Yes (IR remote control/Bluetooth® remote control)
	Headphone terminal	Yes (3.5 mm Stereo minijack)
	Vertical grip connector	Yes
	PC remote	Yes
	LAN terminal	-
	Microphone	Built-in, stereo
	Speaker	Built-in, monaural
	Compatible standards	Exif Print, Print Image Matching III, DPOF setting
	Custom function	Type
		Custom key settings, Programmable Setting (Body 3 sets /memory card 4 sets), My Menu, My Dial Settings, Reg Cust Shoot Set
Lens compensation	Setting	Peripheral Shading, Chromatic Aberration, Distortion
	Supplied battery	One rechargeable battery pack NP-FZ100
	Still images	Approx. 530 shots (Viewfinder) / approx. 670 shots (LCD monitor) (CIPA standard) ⁻⁸
	Movies (actual recording)	Approx. 90 min (Viewfinder) / Approx. 105 min (LCD monitor) (CIPA standard) ⁻⁹
	Movies (continuous recording)	Approx. 160 min (Viewfinder) / Approx. 170 min (LCD monitor) (CIPA standard)
	Internal battery charge	Yes (Available with Multi/Micro USB Terminal or USB Type-C Terminal)
	Power consumption With viewfinder	Still images: approx. 3.7W (with FE 28-70mm F3.5-5.6 OSS lens attached), Movies: approx. 6.2W (with FE 28-70mm F3.5-5.6 OSS lens attached)
	Power consumption With LCD screen	Still images: approx. 2.9W (with FE 28-70mm F3.5-5.6 OSS lens attached), Movies: approx. 5.8W (with FE 28-70mm F3.5-5.6 OSS lens attached)
	USB power supply	Yes (Available with Multi/Micro USB Terminal or USB Type-C Terminal)
	Operating temperature	32 - 104 degrees F / 0 - 40 degrees C
Size & Weight	Dimensions (W x H x D) (Approx.)	Approx. 128.9mm x 96.4mm x 77.5mm, Approx. 128.9mm x 96.4mm x 67.3mm (from grip to monitor) / Approx. 5 1/8 x 3 7/8 x 3 1/8 inches, Approx. 5 1/8 x 3 7/8 x 2 3/4 inches (from grip to monitor)
	Weight	Approx. 578 g / approx 11b 5 oz (with battery and SD card)
What's in the box		Power cord, Rechargeable Battery NP-FZ100, Cable Protector, Battery Charger BC-QZ1, Shoulder strap, Body cap, Accessory shoe cap, Eyepiece cup, USB Type-C™ cable

*1 With compatible Sony external flash *2 With compatible external flash *3 Varies according to shooting conditions or memory card used *4 Images shot in Pixel Shift Multi Shooting mode can be processed using Imaging Edge desktop software. Maximum flash-sync speed is limited to 1/8 second. *5 Supports Micro USB compatible device *6 (Configuration method/Access method) WPS or manually /infrastructure mode. When connecting to smartphones, the camera can always work as a base without a wireless access point. (Security: WEP/WPA-PSK/WPA2-PSK) Models sold in some countries/regions support IEEE 802.11b/g/n (2.4GHz) wireless LAN only. *7 Sony accessories for the Accessory Shoe can be attached. *8 The LCD screen is turned on, shot once every 30 seconds, operate zoom alternately between W and T ends, flash strobe once every two times, turn power off and on once every ten times.
*9 Indication recording time, which is defined by repeating the cycle: Power on, start recording, zoom, stand-by and power off.



PIONEER EXPLORATION

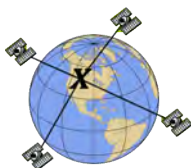


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Safety Association

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Appendix 4

NRCAN PPP Report



CSRS-PPP 3.54.2 (2022-11-10)



PioneerEmli_raw_202408031149.240
70_BASE_Aug3

Data Start	Data End	Duration of Observations
2024-08-03 11:50:05.99	2024-08-03 21:59:27.99	10:09:22
Processing Time		Product Type
18:24:25 UTC 2024/08/07		NRCan Rapid
Observations	Frequency	Mode
Phase and Code	Double	Static
Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities
7.5 degrees	0.00 %	47.60 %
Antenna Model	APC to ARP	ARP to Marker
EML_REACH_RS2 NONE	L1 = 0.135 m L2 = 0.137 m	H:1.602m / E:0.000m / N:0.000m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for PioneerEmli_raw_202408031149.240

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2010.0)†	71° 19' 14.18758"	-79° 19' 42.27172"	169.110 m
SIG_PPP(95%)‡	0.006 m	0.004 m	0.020 m
SIG_TOT(95%)‡	0.056 m	0.040 m	0.043 m
A priori*	71° 19' 14.17986"	-79° 19' 42.24958"	170.175 m
Estimated – A priori	0.239 m	-0.220 m	-1.065 m

Orthometric Height
CGVD2013
(CGG2013a)
(2010.0)

177.463 m

(click for height reference
information)

95% PPP Error Ellipse (mm)

semi-major: 7 mm

semi-minor: 5 mm

semi-major azimuth: 7° 44' 50.07"

95% TOT Error Ellipse (mm)

semi-major: 70 mm

semi-minor: 49 mm

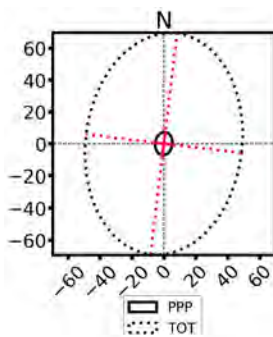
semi-major azimuth: 6° 49' 32.81"

UTM (North)
Zone 17

7913980.382 m (N)

559745.667 m (E)

Scale Factors
0.99964366 (point)
0.99961722 (combined)

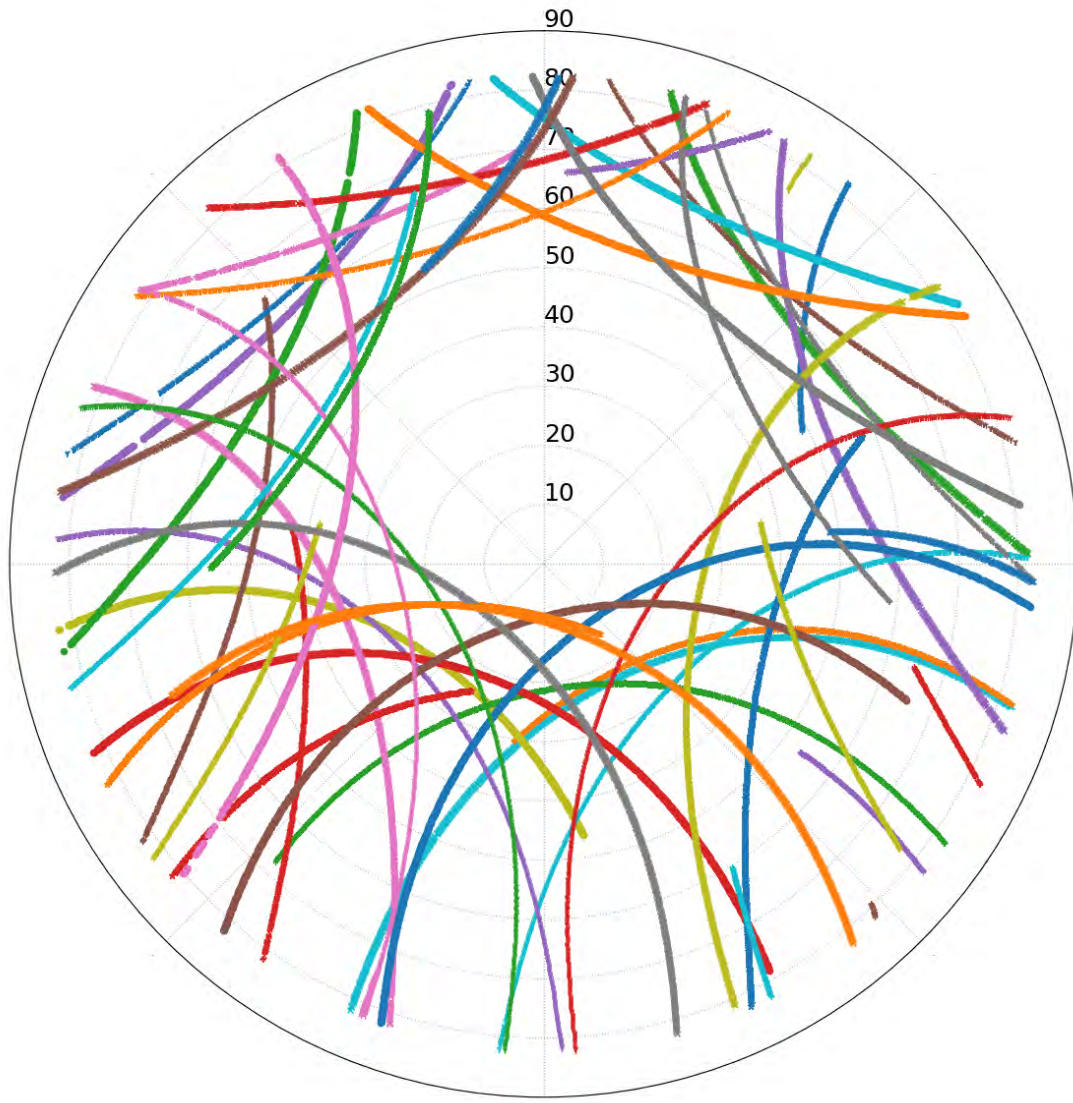


*(Coordinates from RINEX header used as a priori position)

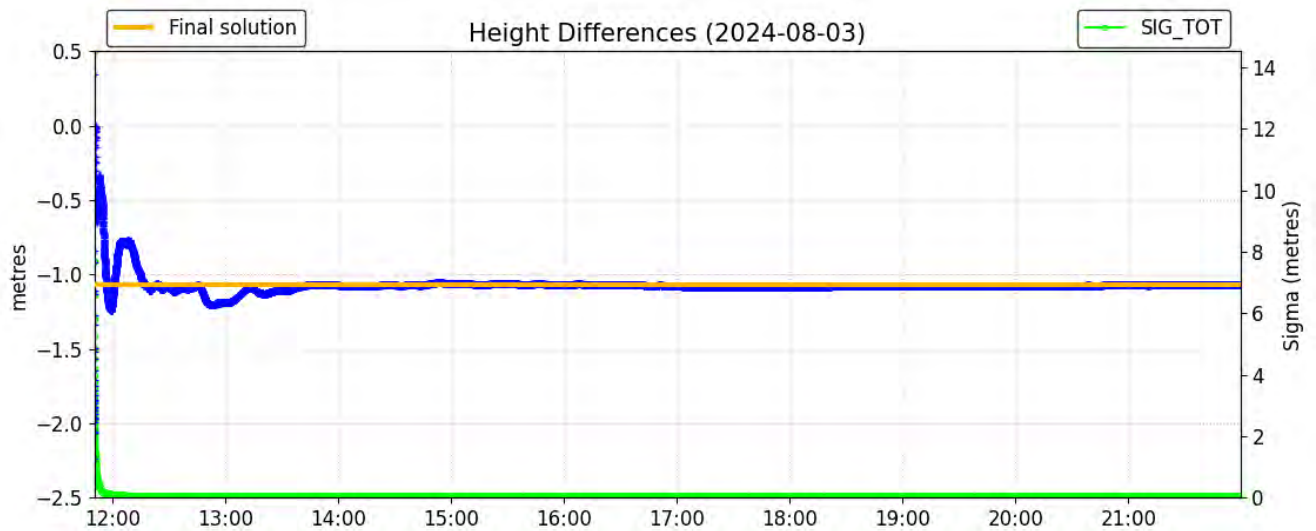
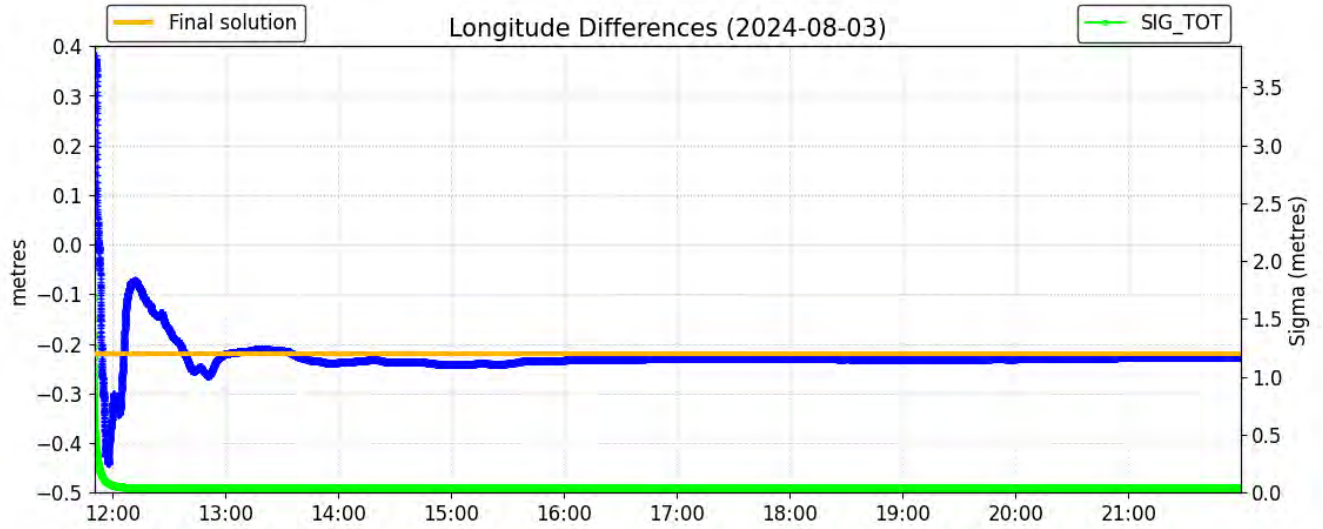
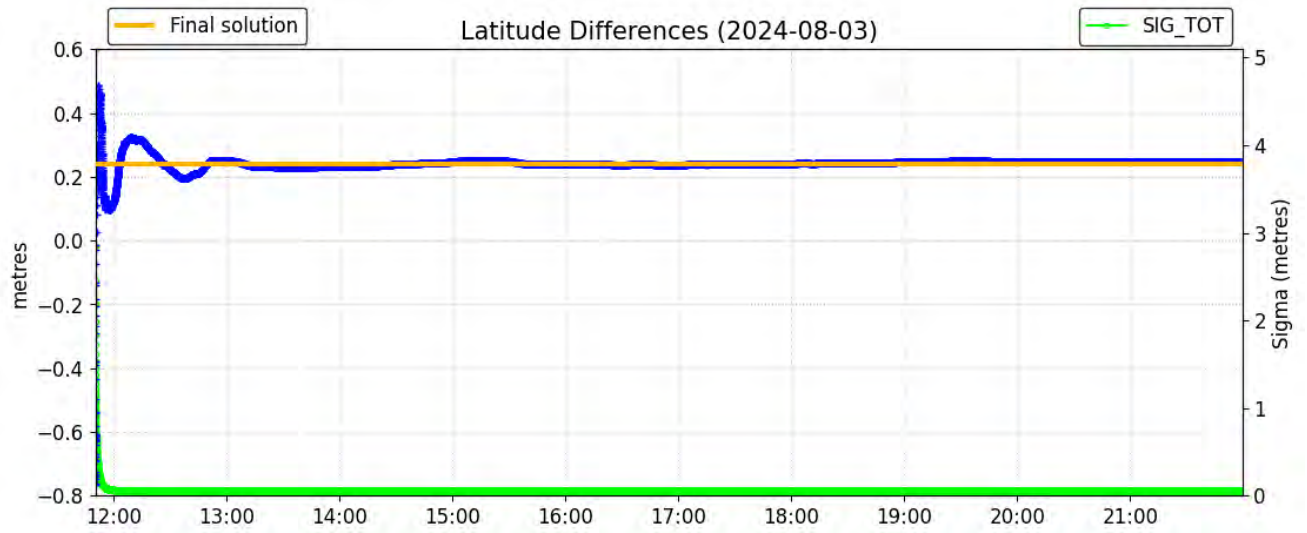
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

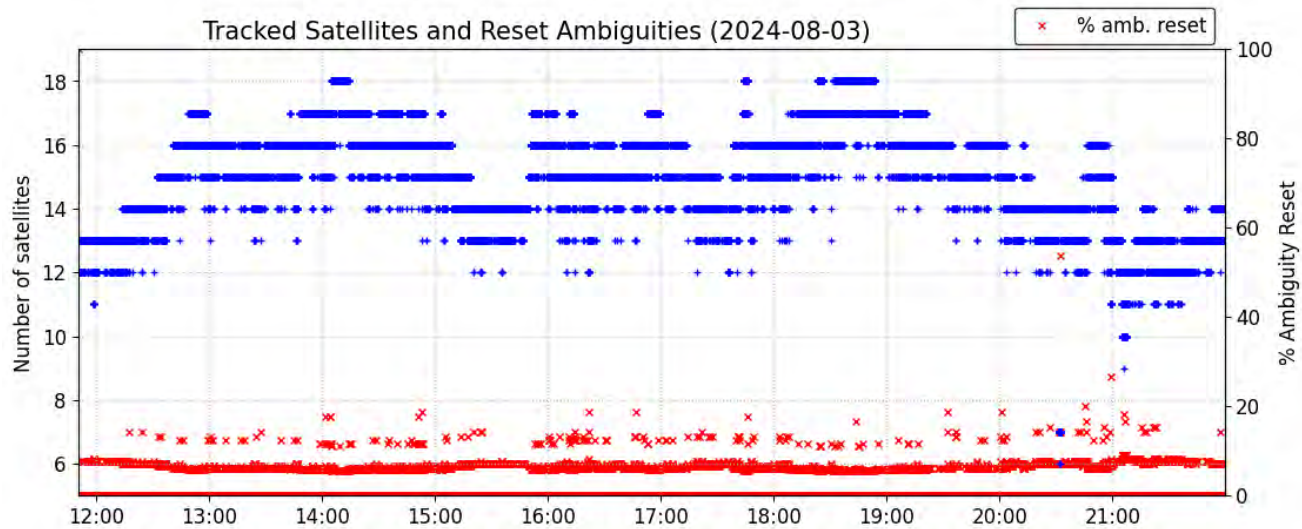
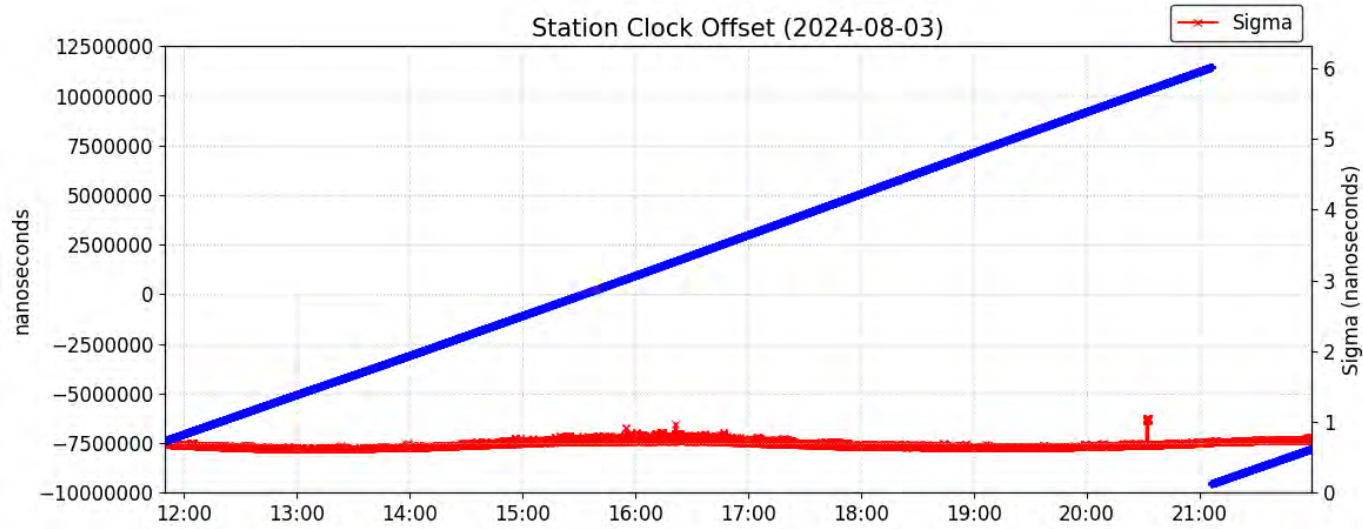
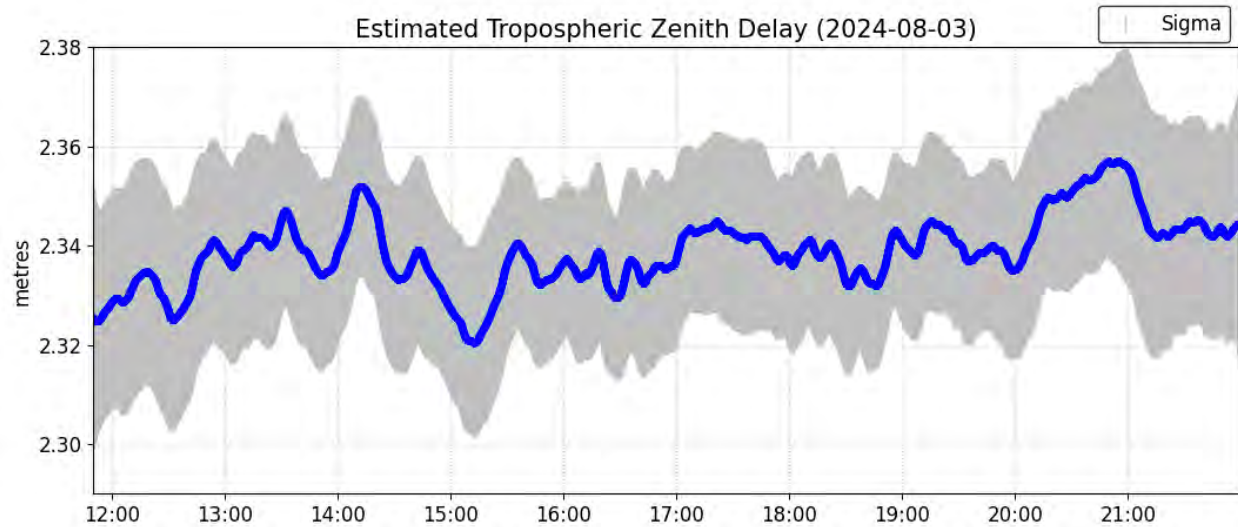
‡SIG_PPP indicates PPP-derived uncertainties, SIG_TOT incorporates uncertainties from epoch transformation

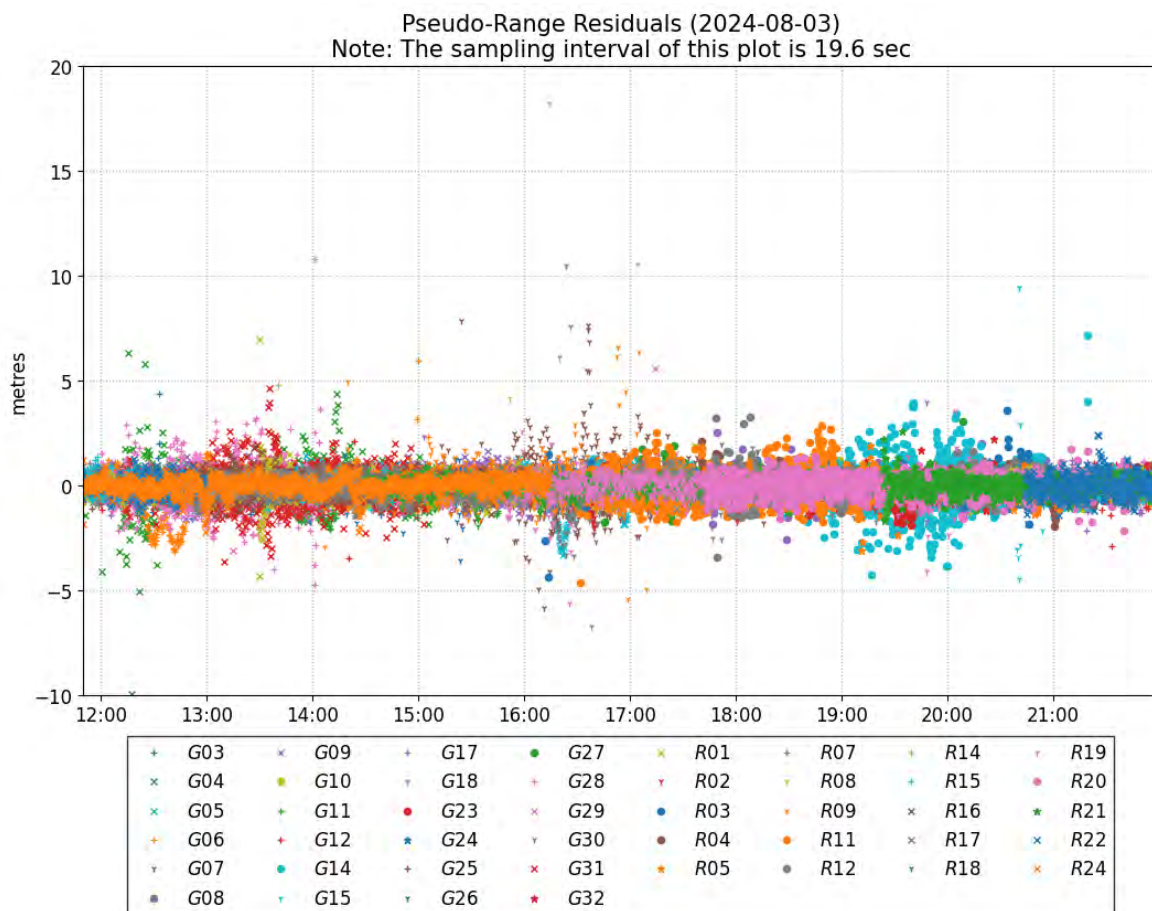
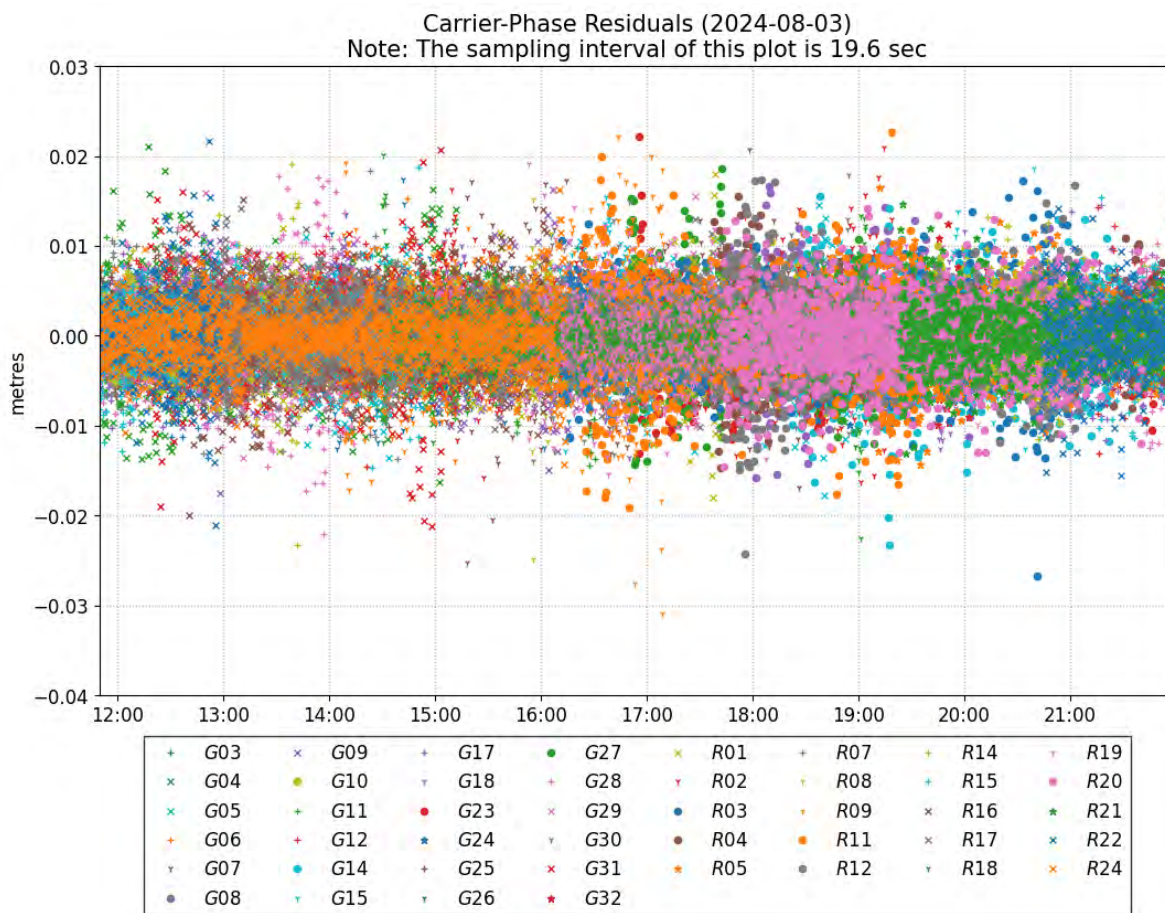
Satellite Sky Distribution
 Note: The sampling interval of this plot is 19.6 sec



+	G03	+	G11	+	G25	★	G32	▼	R08	×	R17
×	G04	+	G12	▼	G26	×	R01	▼	R09	▼	R18
×	G05	●	G14	●	G27	▼	R02	●	R11	▼	R19
+	G06	▼	G15	+	G28	●	R03	●	R12	●	R20
▼	G07	+	G17	×	G29	●	R04	▼	R14	★	R21
●	G08	▼	G18	▼	G30	★	R05	+	R15	×	R22
×	G09	●	G23	×	G31	+	R07	×	R16	×	R24
●	G10	★	G24								

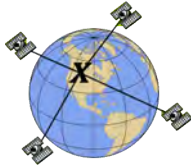






Phase Ambiguity Status (2024-08-03)
 Note: The sampling interval of this plot is
 19.6 sec





CSRS-PPP 3.54.2 (2022-11-10)



PioneerEmli_raw_202408031341.240
StensbybaseAug3

Data Start	Data End	Duration of Observations
2024-08-03 13:41:44.00	2024-08-03 20:04:26.01	6:22:42.010
Processing Time		Product Type
18:56:48 UTC 2024/08/07		NRCan Rapid
Observations	Frequency	Mode
Phase and Code	Double	Static
Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities
7.5 degrees	0.00 %	50.79 %
Antenna Model	APC to ARP	ARP to Marker
EML_REACH_RS2 NONE	L1 = 0.135 m L2 = 0.137 m	H:0.890m / E:0.000m / N:0.000m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for PioneerEmli_raw_202408031341.240

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2010.0)†	70° 26' 33.17662"	-78° 21' 2.31561"	186.400 m
SIG_PPP(95%)‡	0.008 m	0.005 m	0.023 m
SIG_TOT(95%)‡	0.051 m	0.036 m	0.055 m
A priori*	70° 26' 33.18116"	-78° 21' 2.23819"	185.204 m
Estimated – A priori	-0.141 m	-0.804 m	1.196 m

Orthometric Height
CGVD2013
(CGG2013a)
(2010.0)

199.409 m

(click for height reference
information)

95% PPP Error Ellipse (mm)

semi-major: 10 mm
semi-minor: 6 mm
semi-major azimuth: 11° 18' 10.81"

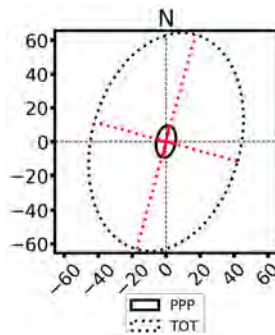
95% TOT Error Ellipse (mm)

semi-major: 65 mm
semi-minor: 44 mm
semi-major azimuth: 15° 23' 21.56"

UTM (North)
Zone 17

7817382.591 m (N)
598954.480 m (E)

Scale Factors
0.99971978 (point)
0.99969064 (combined)

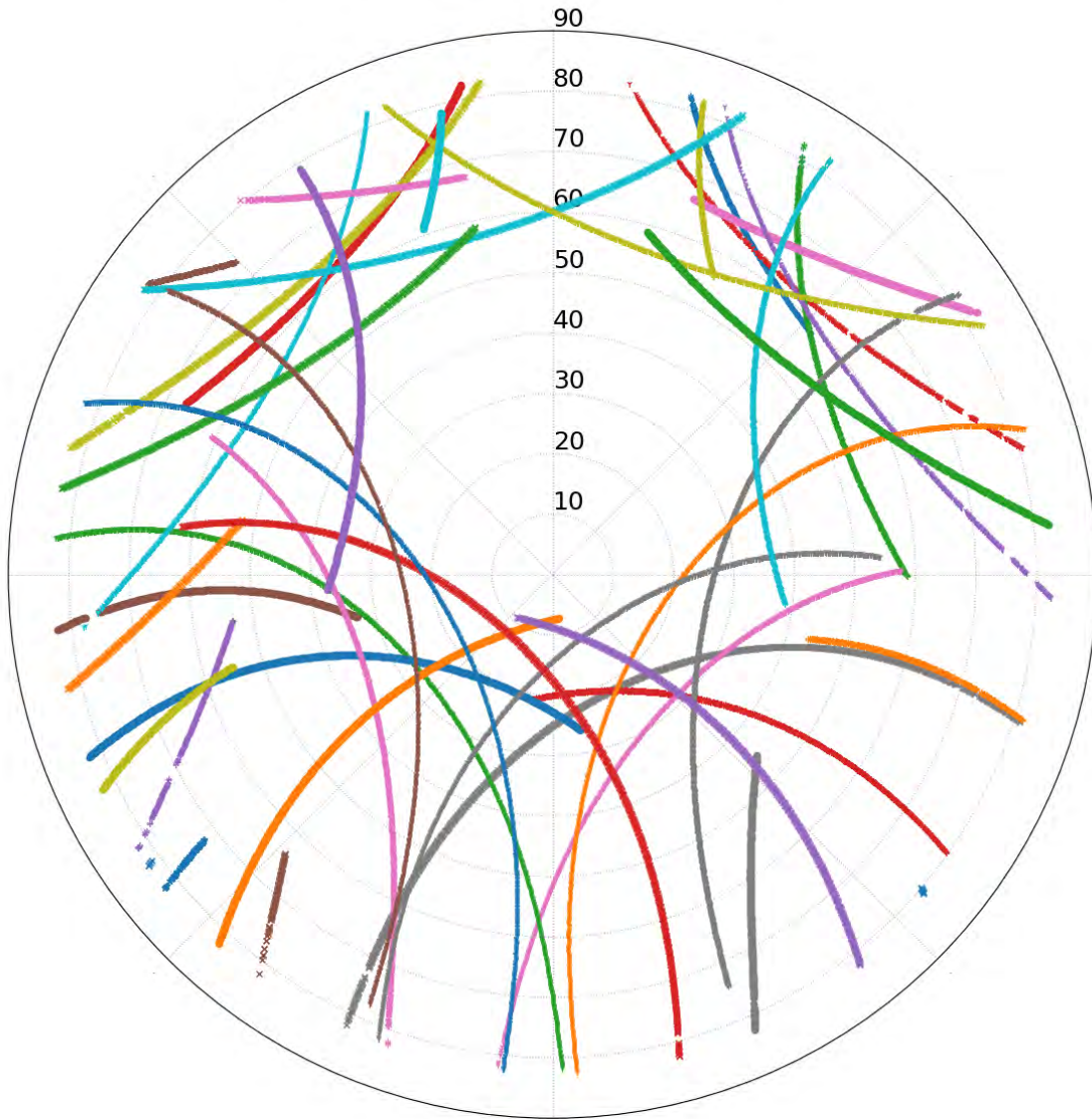


*(Coordinates from RINEX header used as a priori position)

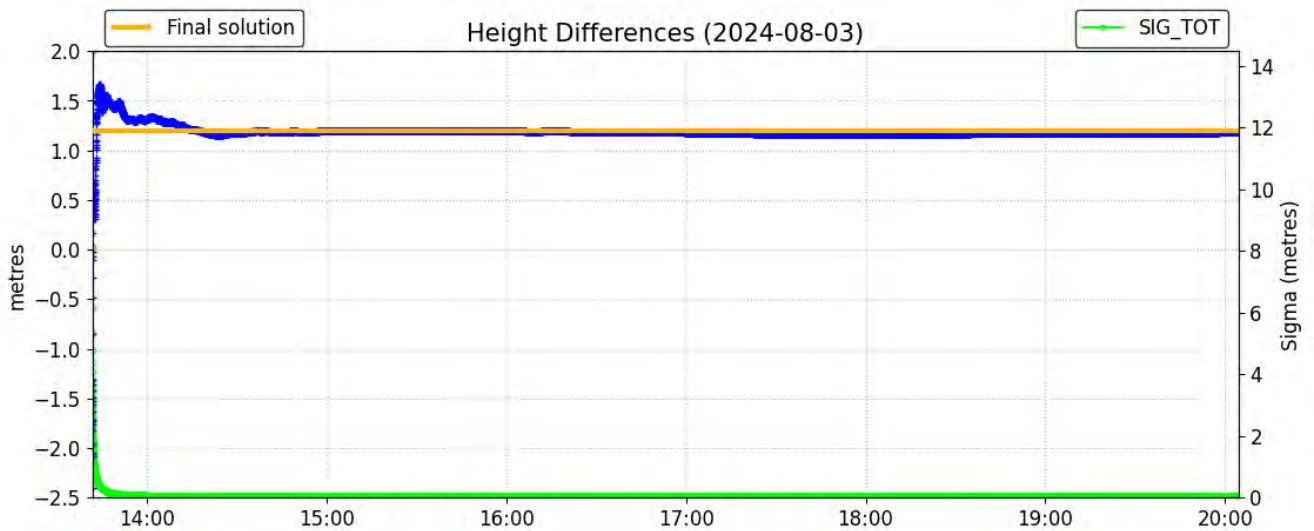
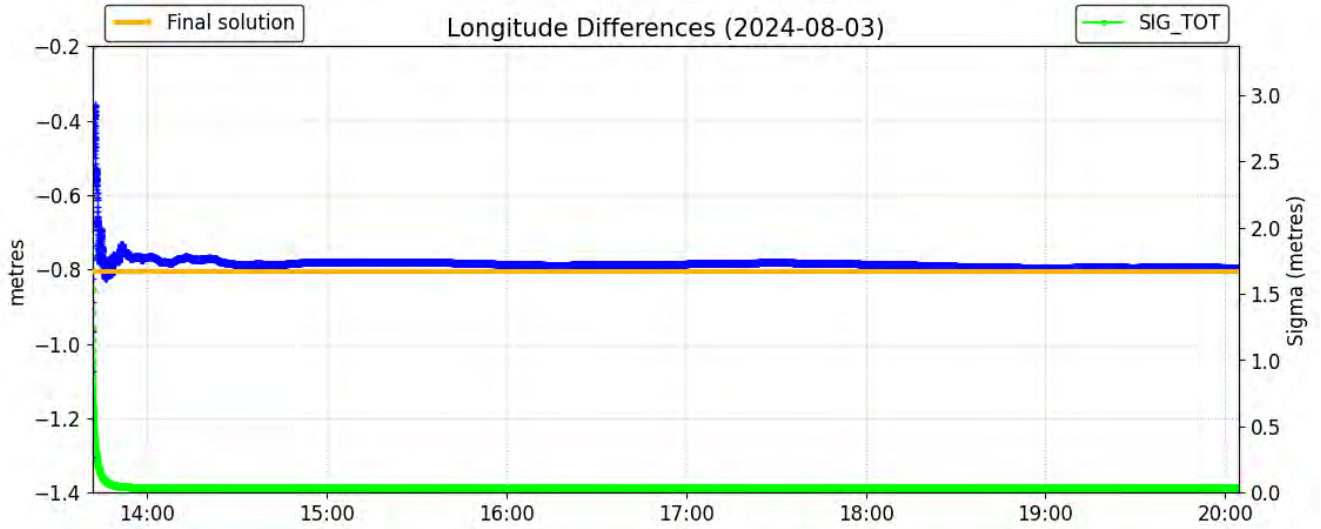
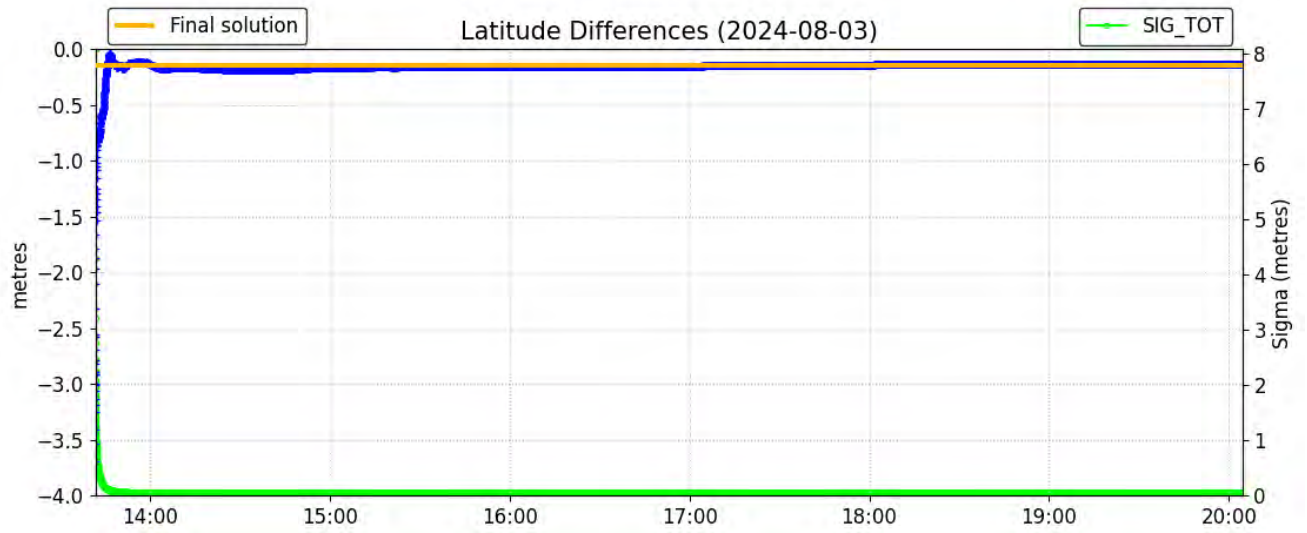
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

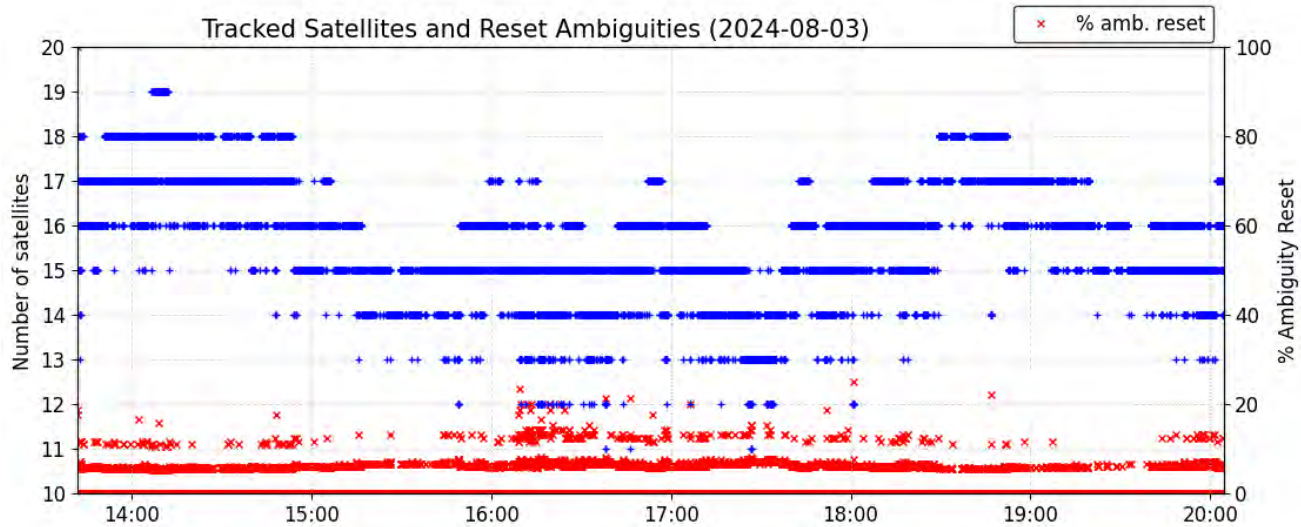
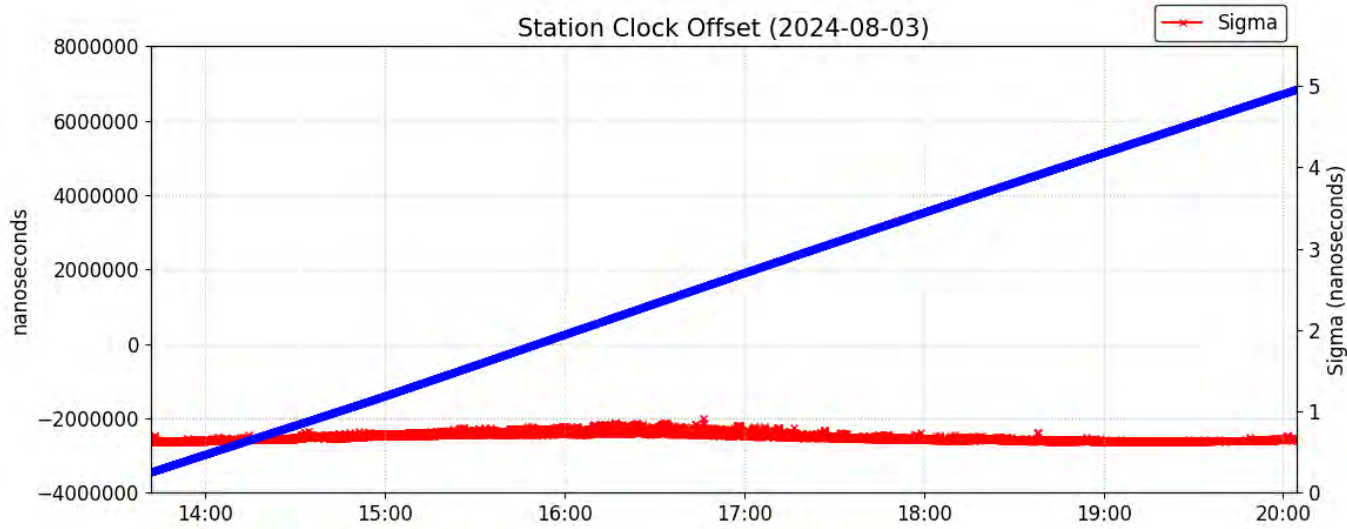
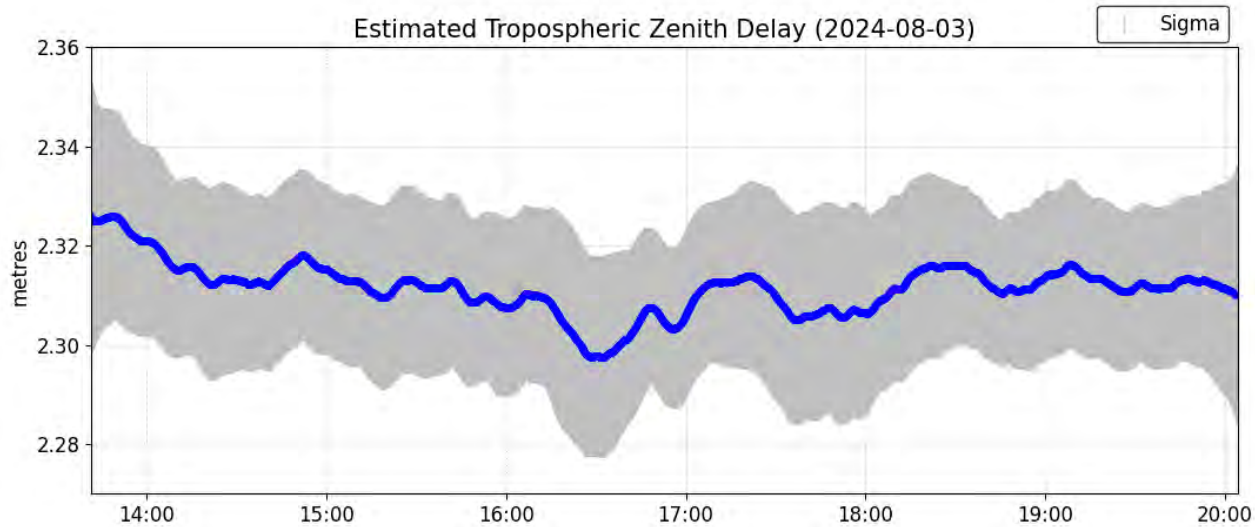
‡SIG_PPP indicates PPP-derived uncertainties, SIG_TOT incorporates uncertainties from epoch transformation

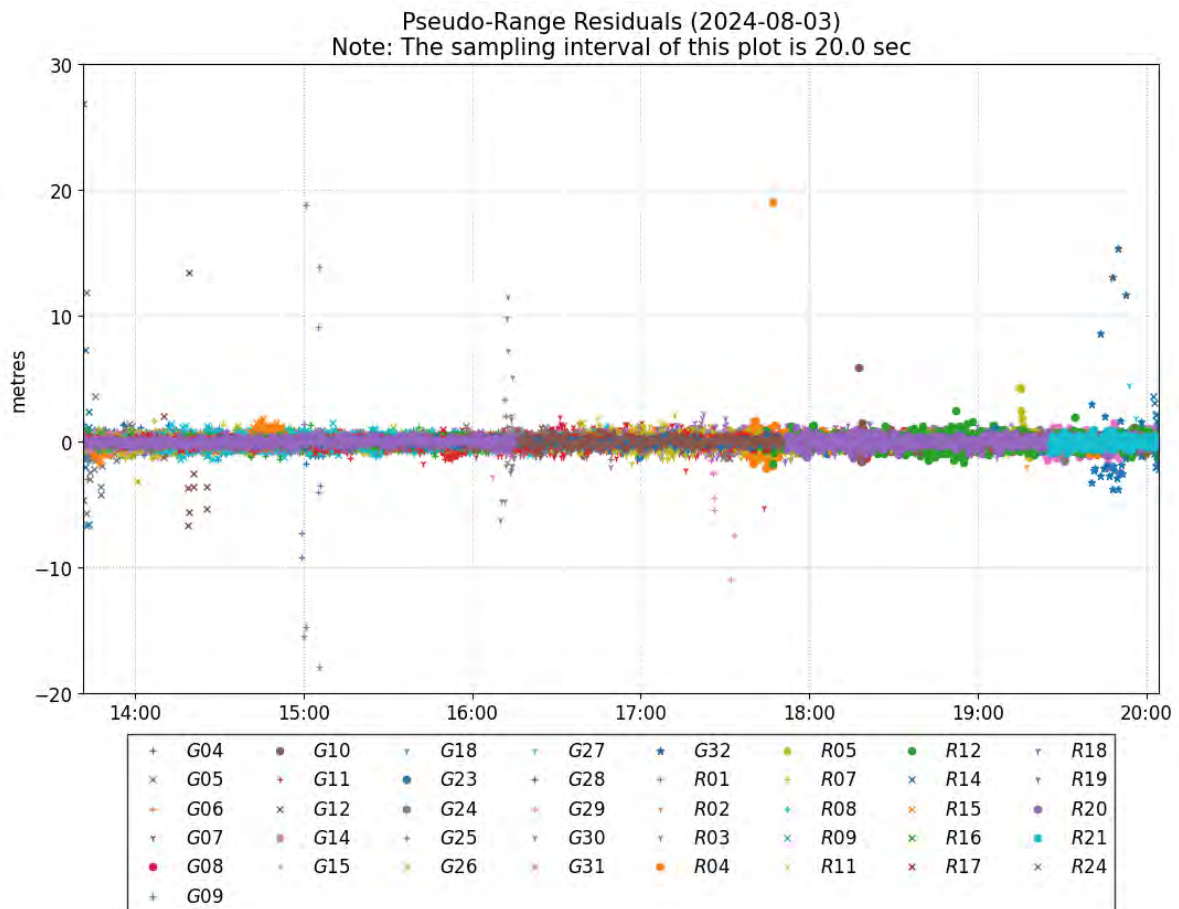
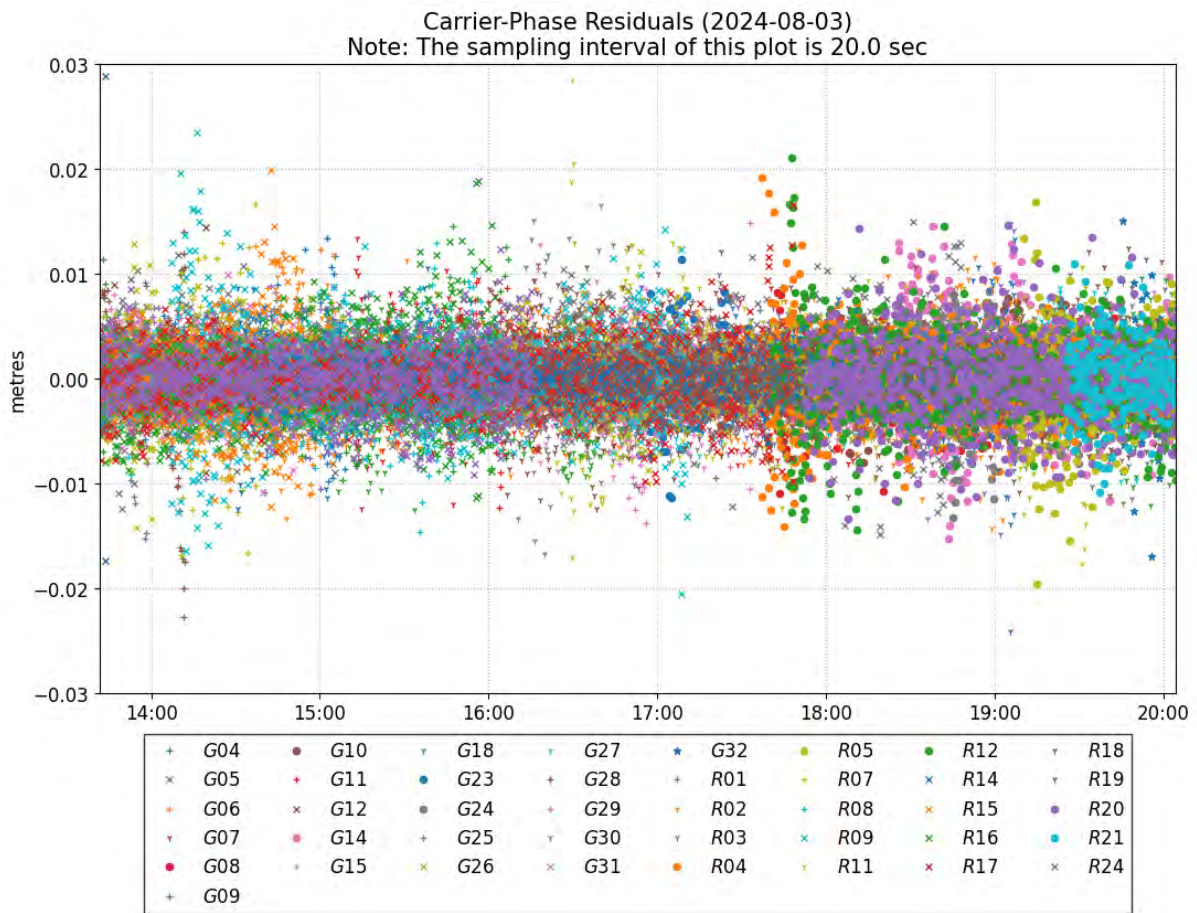
Satellite Sky Distribution
 Note: The sampling interval of this plot is 20.0 sec

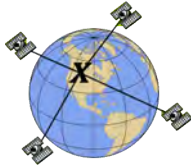


+	G04	+	G11	+	G25	+	G32	+	R08	+	R17
x	G05	x	G12	x	G26	x	R01	x	R09	x	R18
+	G06	+	G14	+	G27	+	R02	+	R11	+	R19
+	G07	+	G15	+	G28	+	R03	+	R12	+	R20
+	G08	+	G18	+	G29	+	R04	+	R14	+	R21
+	G09	+	G23	+	G30	+	R05	+	R15	+	R24
+	G10	+	G24	+	G31	+	R07	+	R16		









CSRS-PPP 3.54.2 (2022-11-10)



PioneerReac_raw_202408071321.240
FieldBase6_August_7

Data Start	Data End	Duration of Observations
2024-08-07 13:22:01.00	2024-08-07 20:31:08.01	7:09:07.010
Processing Time	Product Type	
23:11:51 UTC 2024/08/07	NRCan Ultra-rapid	
Observations	Frequency	Mode
Phase and Code	Double	Static
Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities
7.5 degrees	0.00 %	70.20 %
Antenna Model	APC to ARP	ARP to Marker
EML_REACH_RS2 NONE	L1 = 0.135 m L2 = 0.137 m	H:1.038m / E:0.000m / N:0.000m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for PioneerReac_raw_202408071321.240

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2010.0)†	70° 57' 16.11568"	-78° 22' 48.20775"	196.901 m
SIG_PPP(95%)‡	0.007 m	0.004 m	0.023 m
SIG_TOT(95%)‡	0.055 m	0.039 m	0.049 m
A priori*	70° 57' 16.15211"	-78° 22' 48.23933"	201.165 m
Estimated – A priori	-1.129 m	0.320 m	-4.263 m

Orthometric Height
CGVD2013
(CGG2013a)
(2010.0)

206.269 m

(click for height reference
information)

95% PPP Error Ellipse (mm)

semi-major: 9 mm

semi-minor: 5 mm

semi-major azimuth: 9° 8' 53.56"

95% TOT Error Ellipse (mm)

semi-major: 69 mm

semi-minor: 47 mm

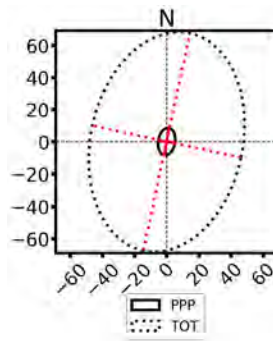
semi-major azimuth: 12° 7' 30.91"

UTM (North)
Zone 17

7874381.604 m (N)

595392.797 m (E)

Scale Factors
0.99971130 (point)
0.99968052 (combined)

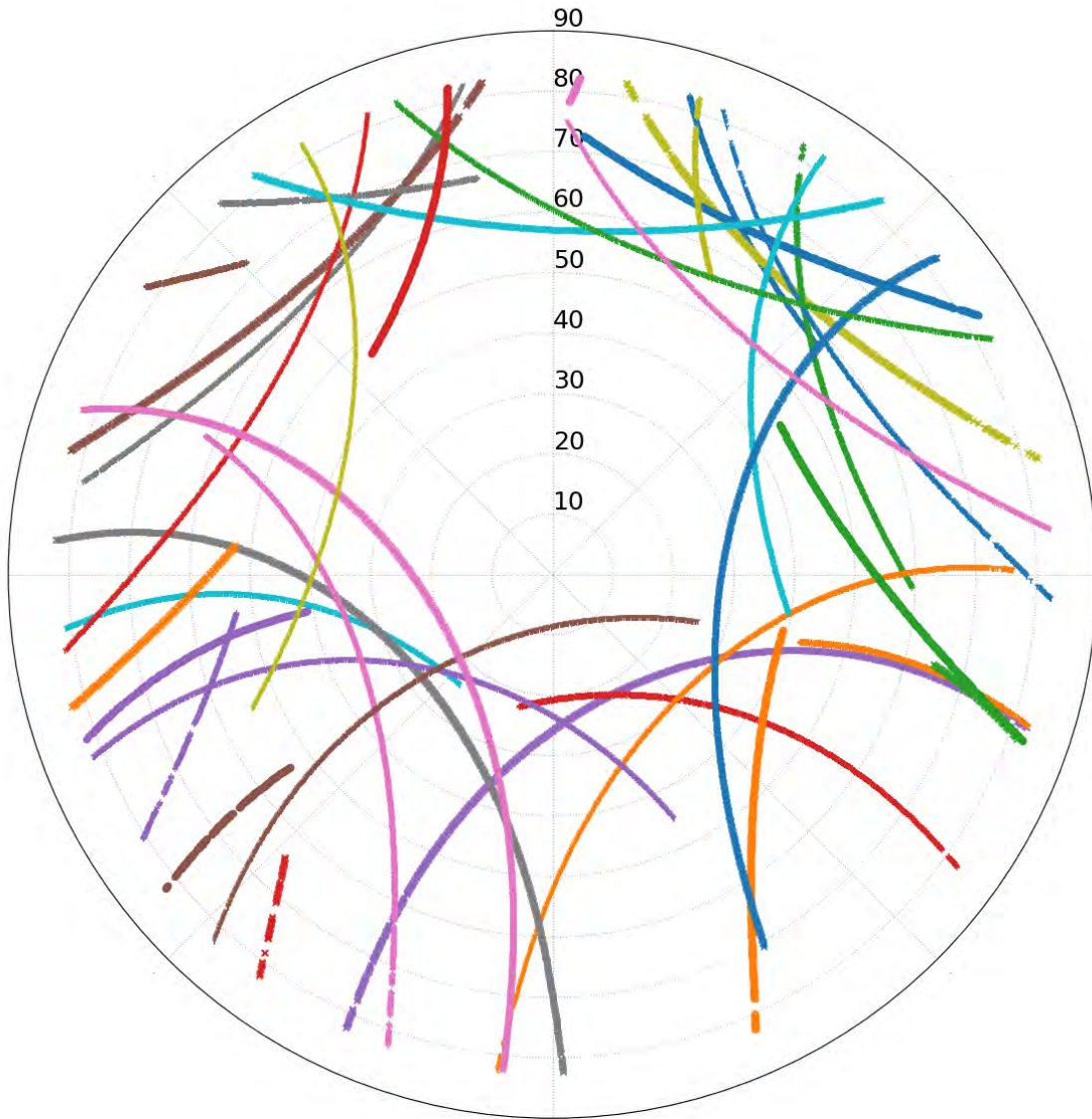


*(Coordinates from RINEX header used as a priori position)

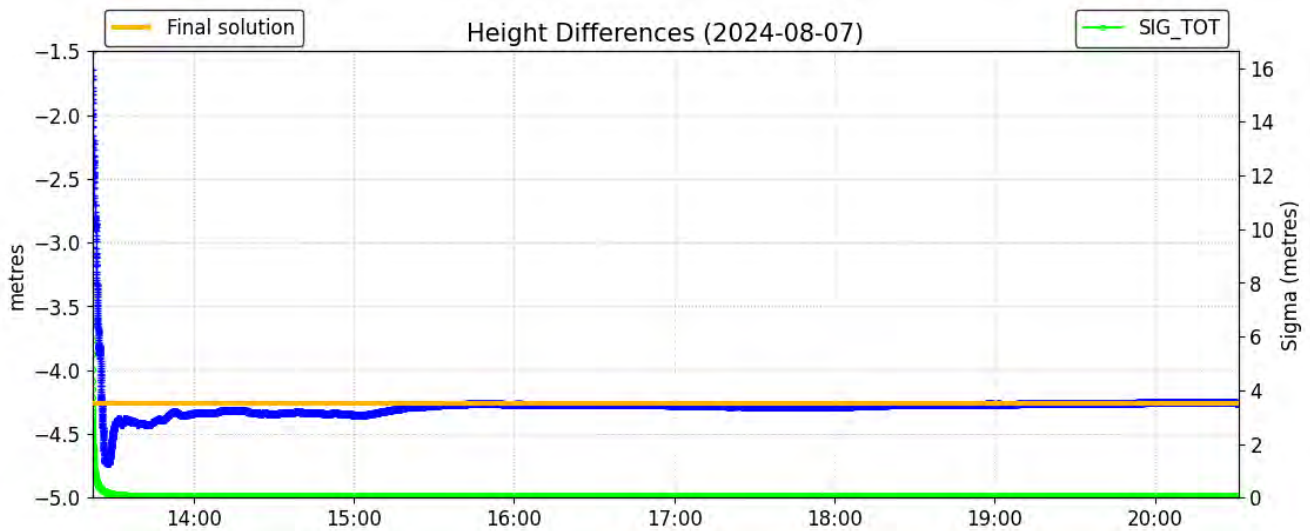
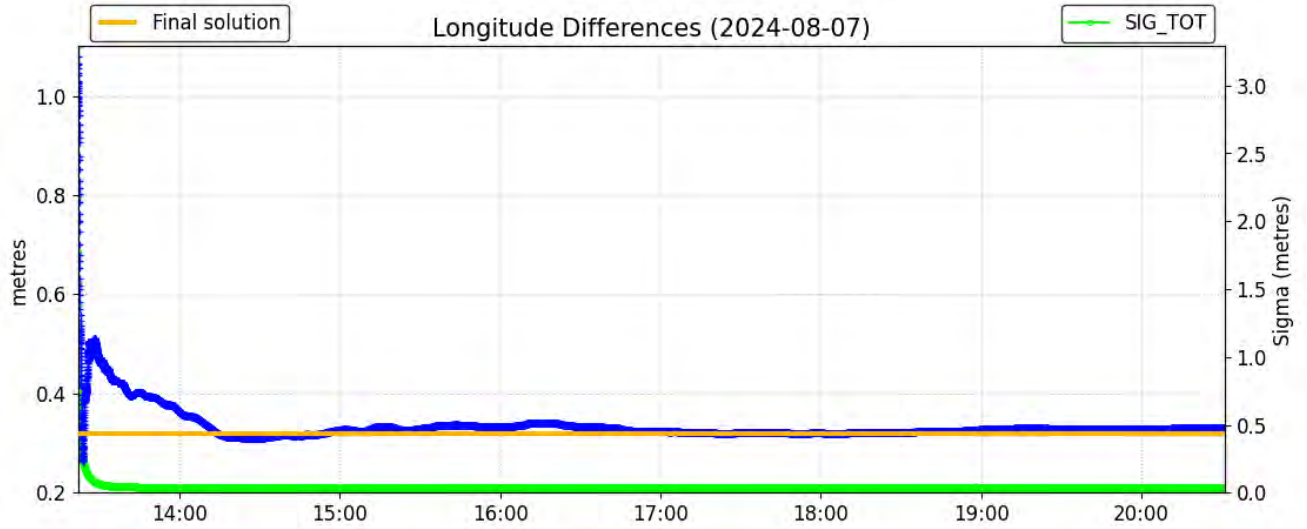
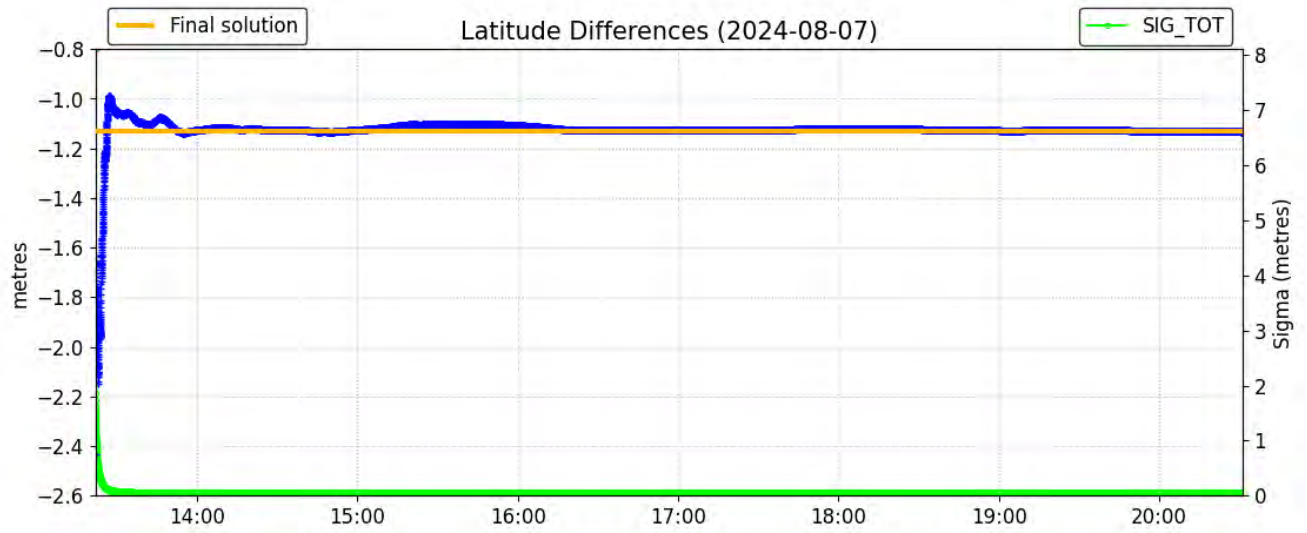
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

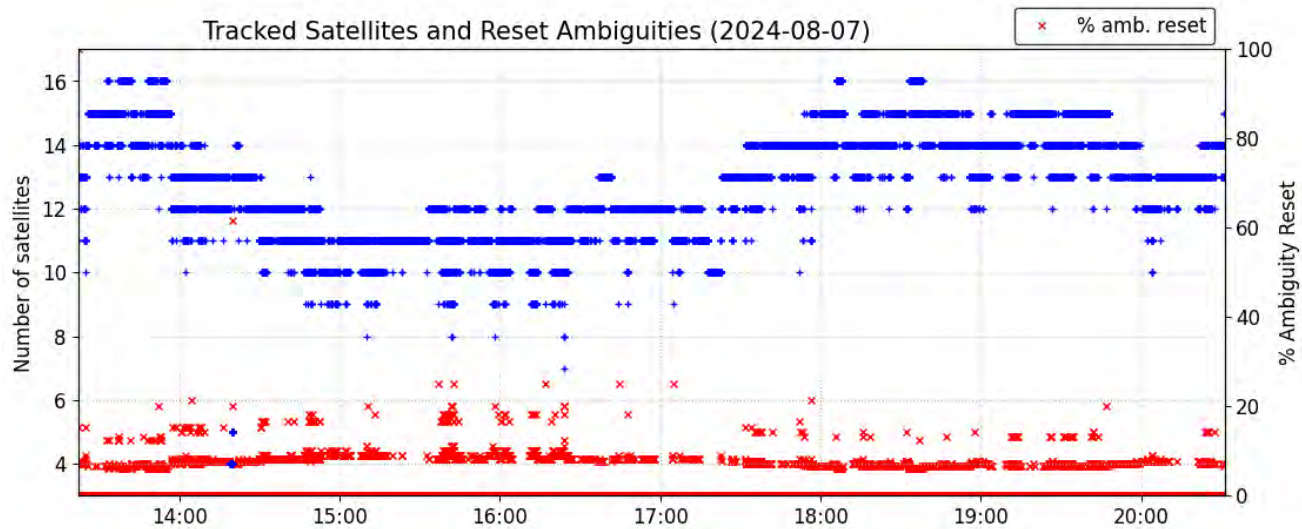
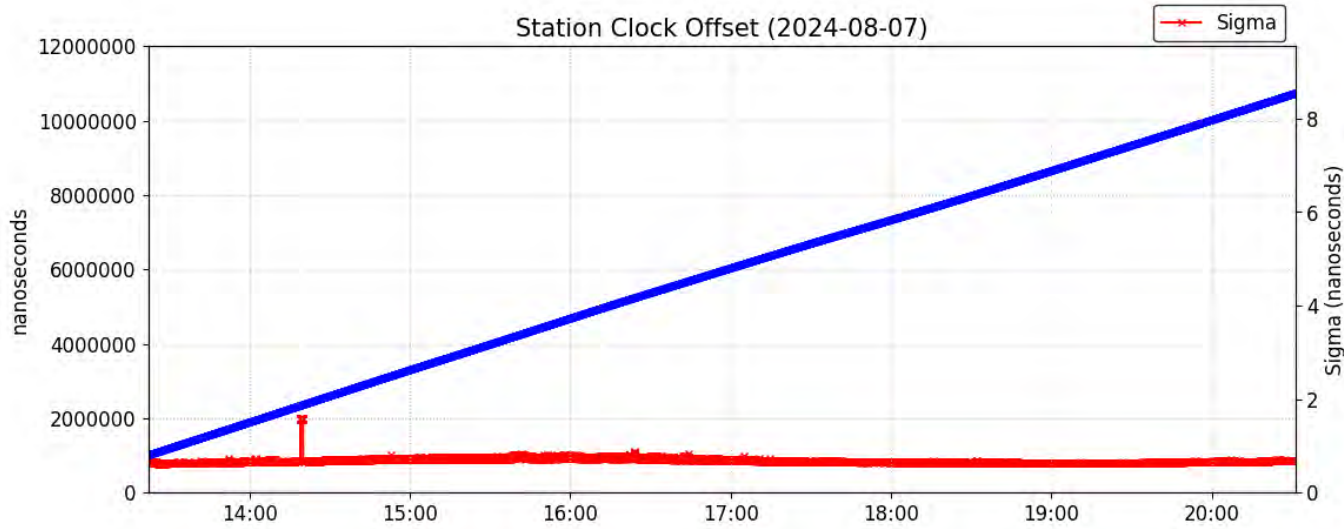
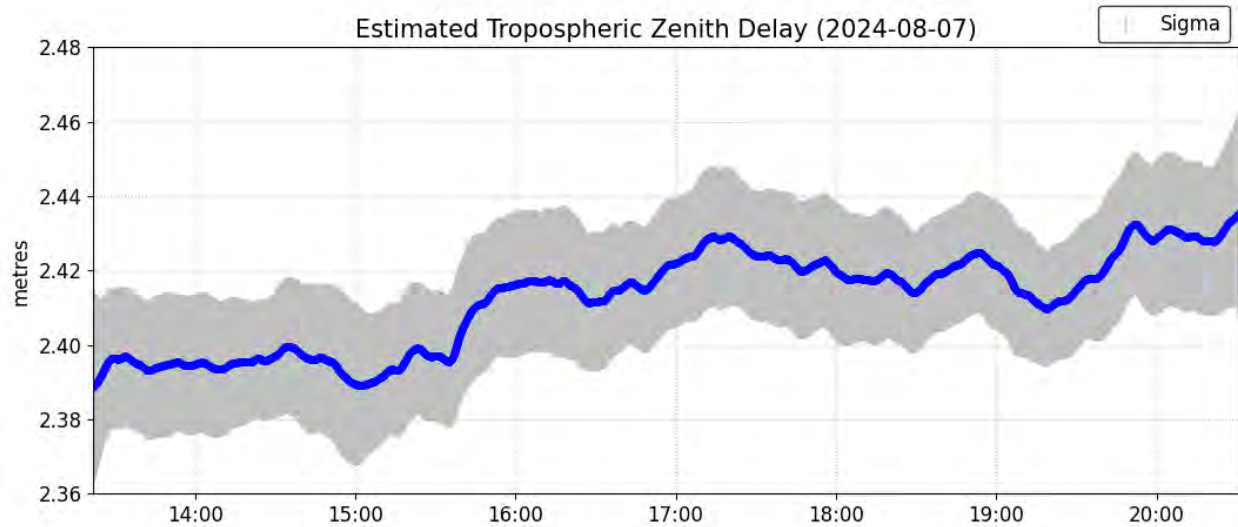
‡SIG_PPP indicates PPP-derived uncertainties, SIG_TOT incorporates uncertainties from epoch transformation

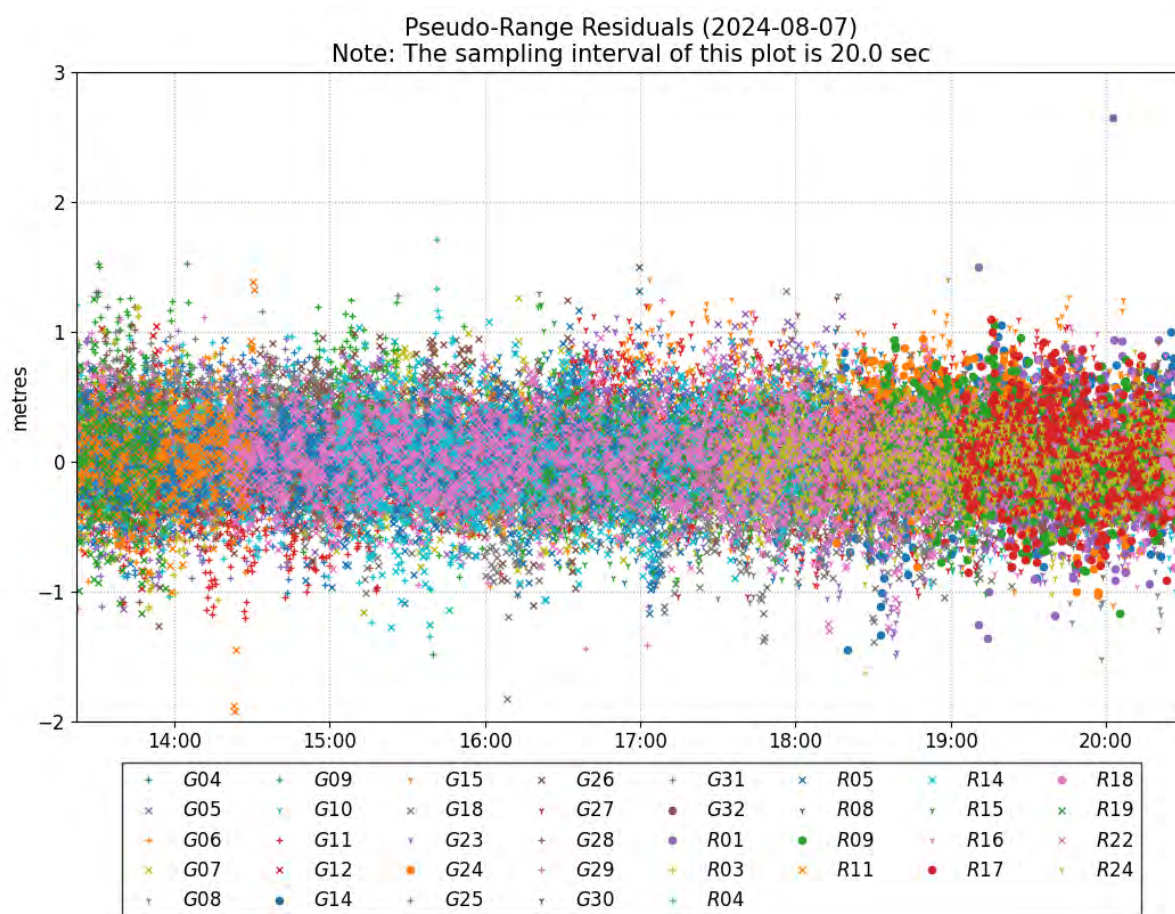
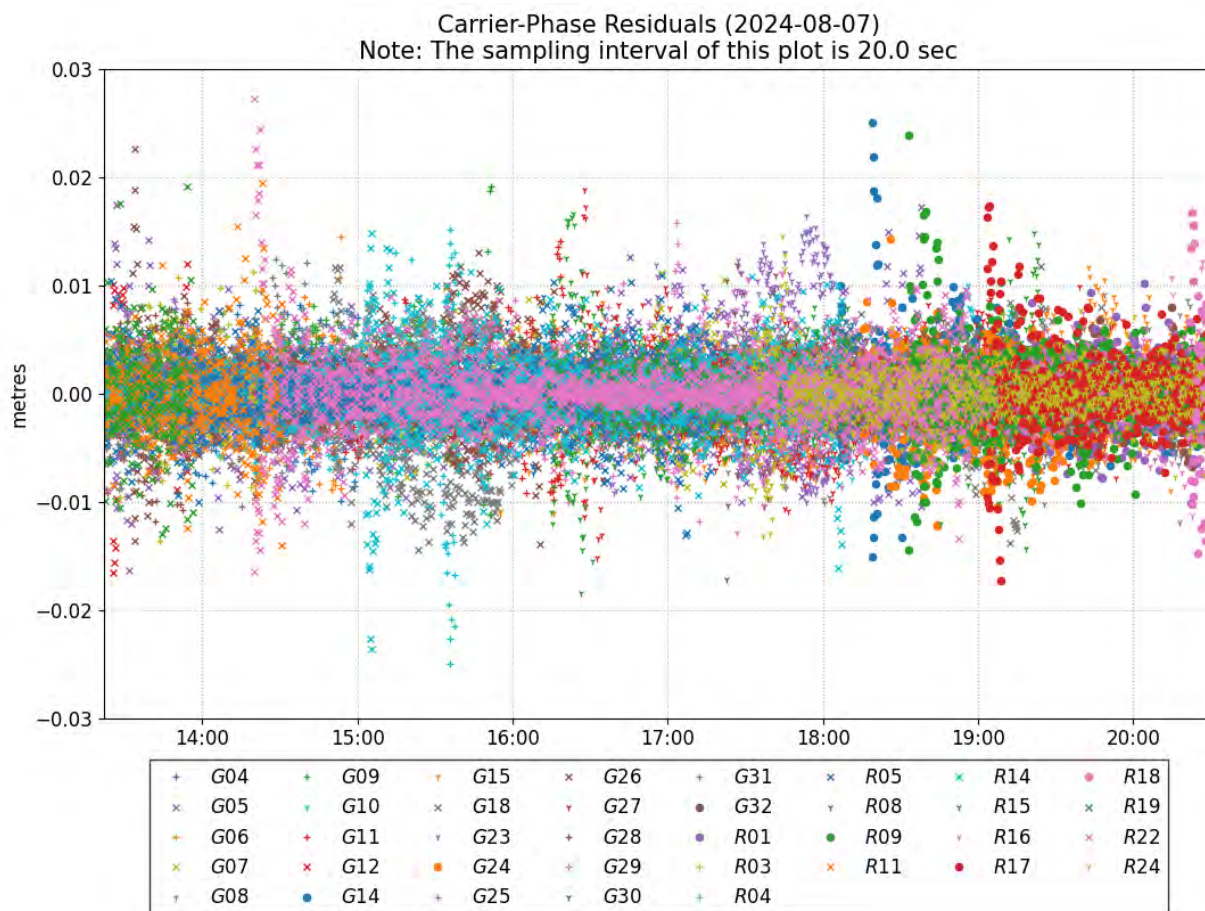
Satellite Sky Distribution
 Note: The sampling interval of this plot is 20.0 sec



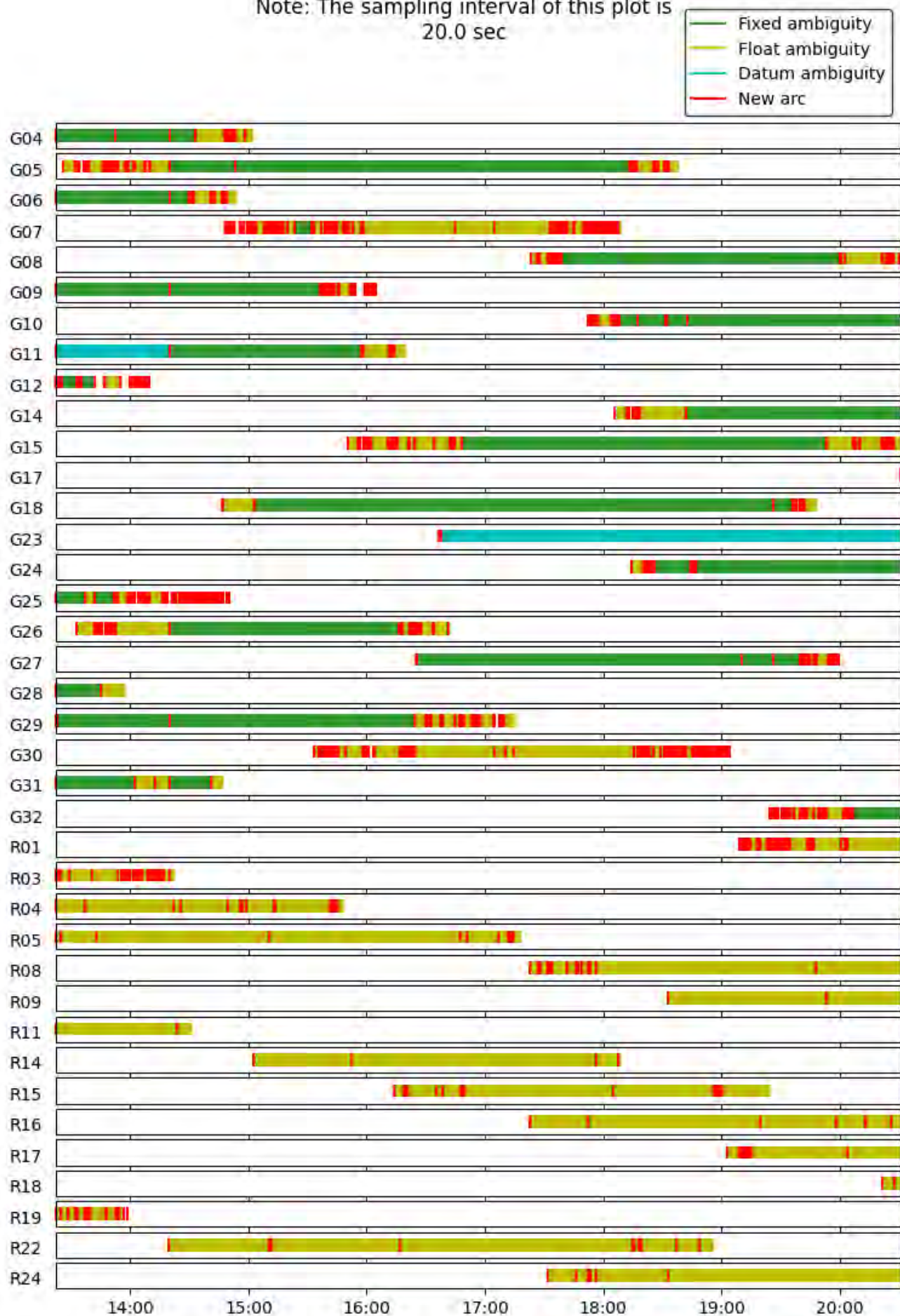
+	G04	+	G11	+	G24	+	G30	+	R05	+	R16
x	G05	x	G12	+	G25	+	G31	+	R08	+	R17
+	G06	+	G14	x	G26	+	G32	+	R09	+	R18
x	G07	+	G15	+	G27	+	R01	+	R11	+	R19
+	G08	x	G18	+	G28	+	R03	+	R14	+	R22
+	G09	+	G23	+	G29	+	R04	+	R15	+	R24
+	G10										

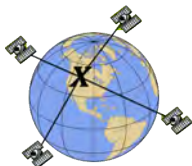






Phase Ambiguity Status (2024-08-07)
 Note: The sampling interval of this plot is
 20.0 sec





CSRS-PPP 3.54.2 (2022-11-10)



PORT_30072024_005304.24O
0050

Data Start		Data End	Duration of Observations
2024-07-30 00:53:30.00		2024-07-30 01:50:30.00	0:57:00
Processing Time		Product Type	
16:15:34 UTC 2024/07/31		NRCan Rapid	
Observations	Frequency		Mode
Phase and Code	Double		Static
Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	93.70 %	30.00 sec
Antenna Model	APC to ARP		ARP to Marker
GTCG10E2250	Unknown		H:1.472m / E:0.000m / N:0.000m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for PORT_30072024_005304.24O

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2010.0)†	71° 49' 54.34216"	-80° 49' 20.77166"	274.500 m
SIG_PPP(95%)‡	0.017 m	0.011 m	0.065 m
SIG_TOT(95%)‡	0.059 m	0.042 m	0.074 m
A priori*	71° 49' 54.41320"	-80° 49' 20.83692"	280.309 m
Estimated – A priori	-2.202 m	0.631 m	-5.809 m

Orthometric Height
CGVD2013
(CGG2013a)
(2010.0)

282.873 m

(click for height reference
information)

95% PPP Error Ellipse (cm)

semi-major: 2.1 cm

semi-minor: 1.4 cm

semi-major azimuth: -1° 48' 40.4"

95% TOT Error Ellipse (cm)

semi-major: 7.4 cm

semi-minor: 5.2 cm

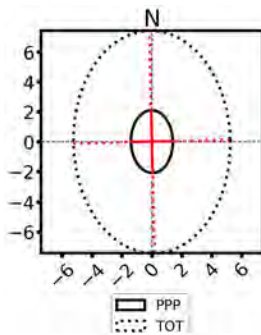
semi-major azimuth: -1° 35' 58.34"

UTM (North)
Zone 17

7970176.196 m (N)

506179.514 m (E)

Scale Factors
0.99960047 (point)
0.99955756 (combined)

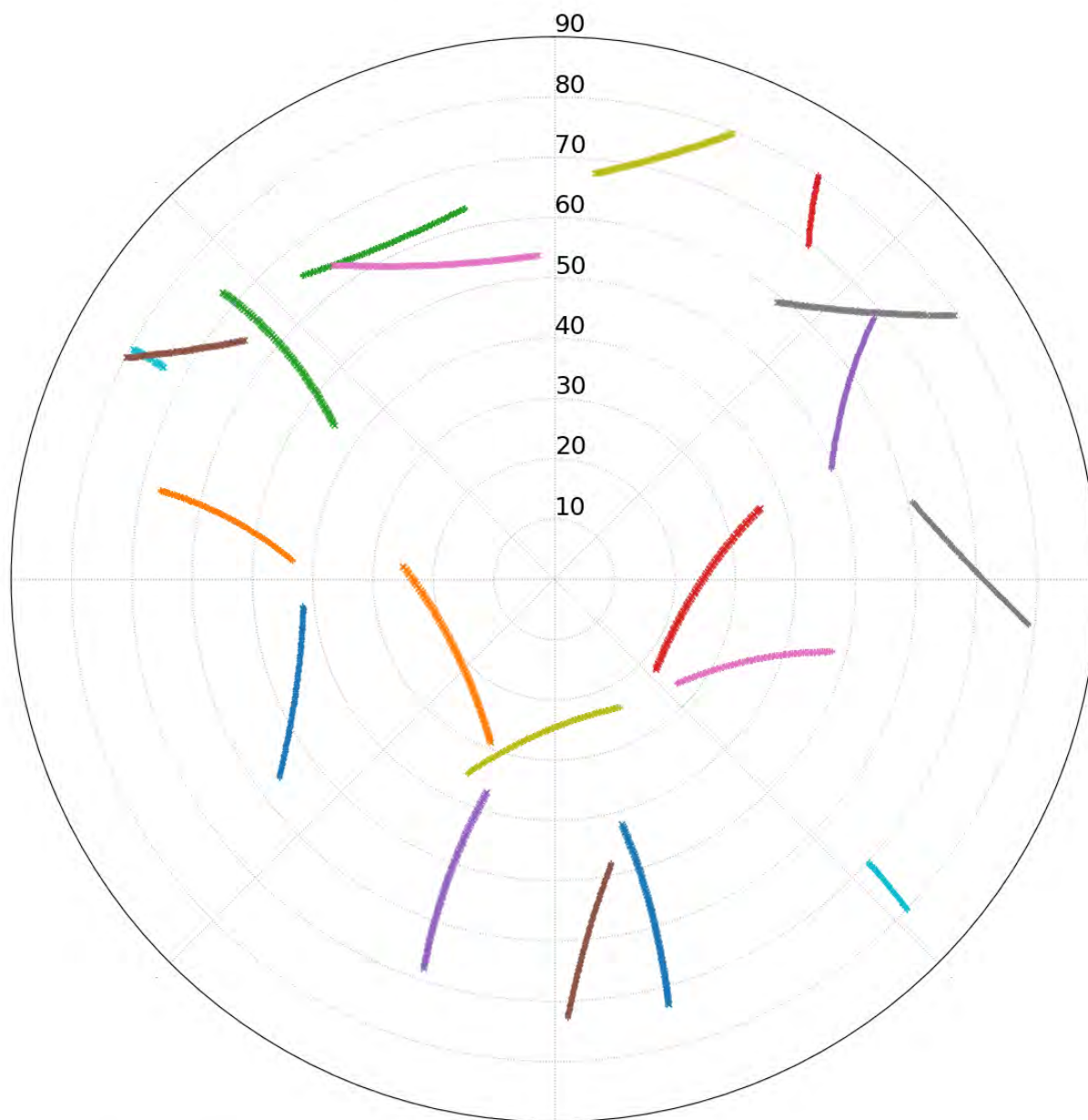


*(Coordinates from RINEX header used as a priori position)

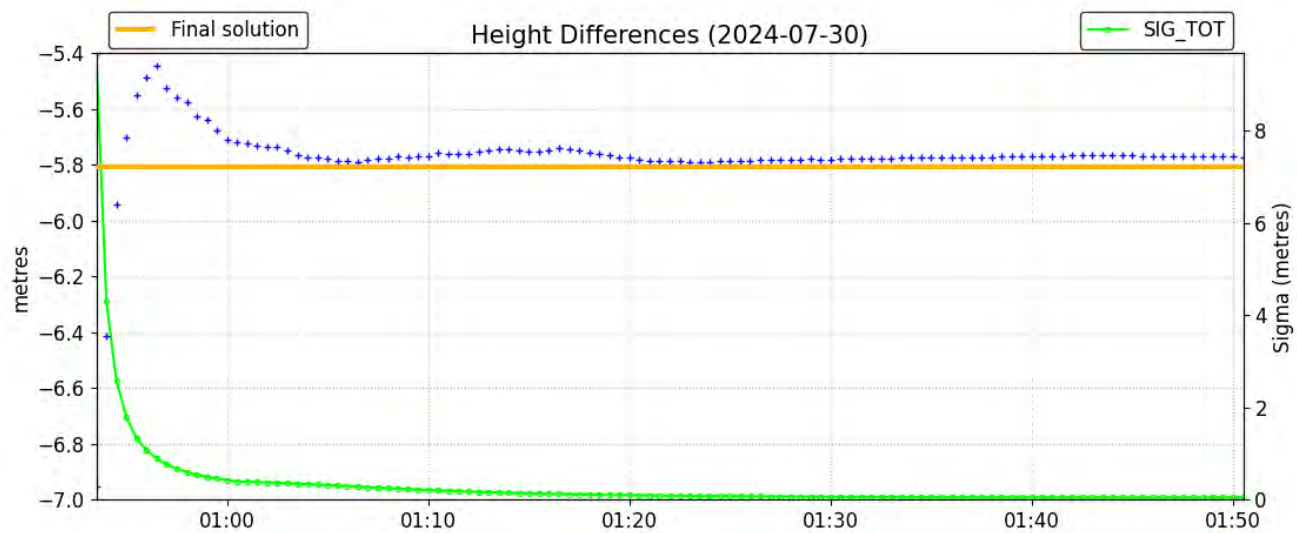
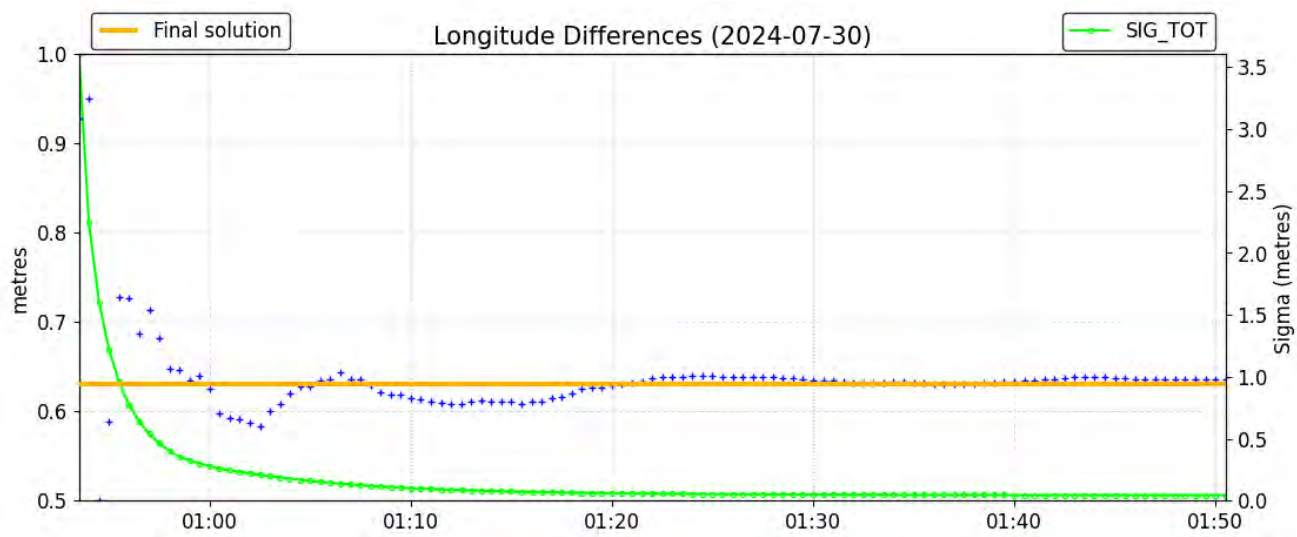
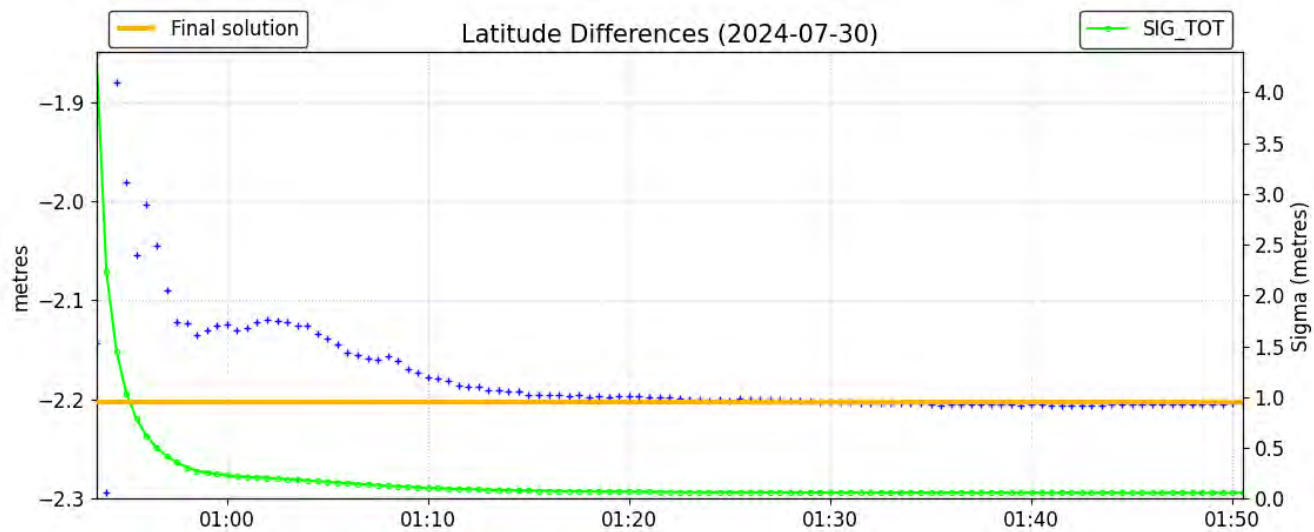
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

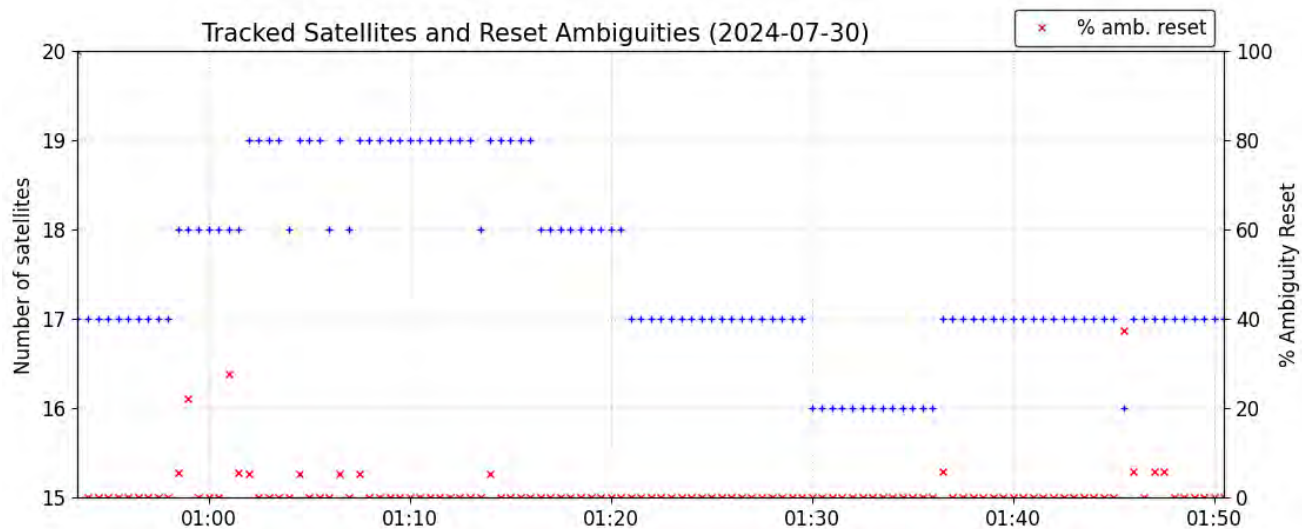
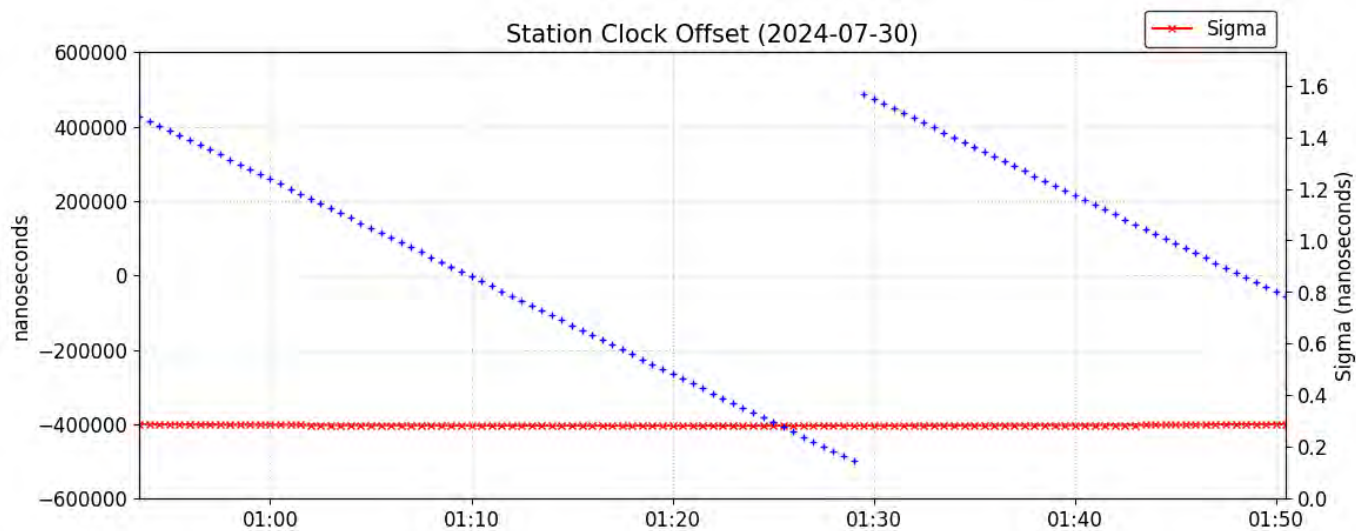
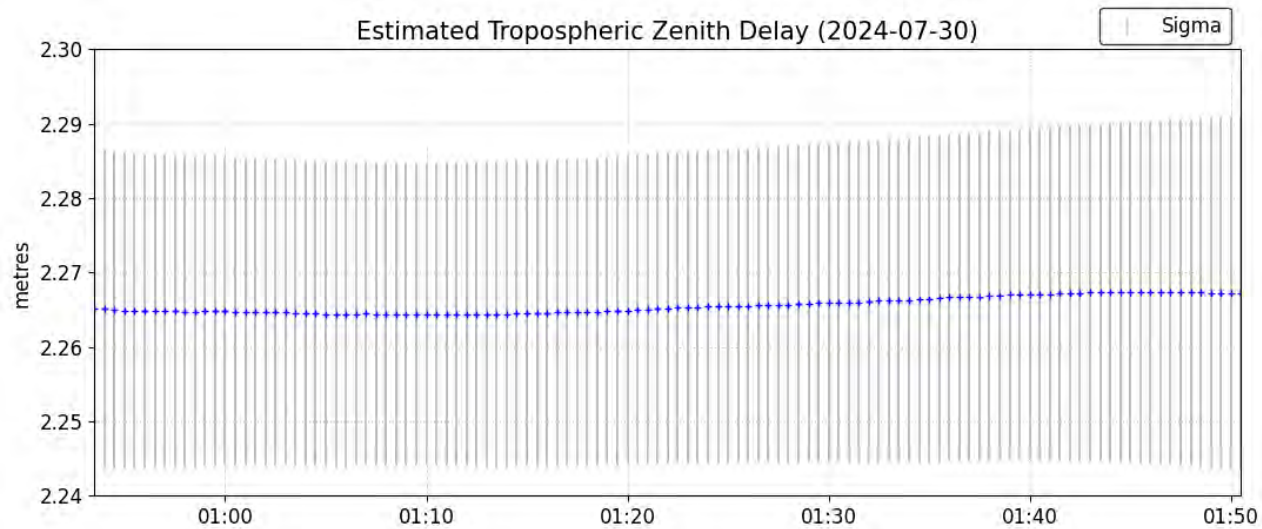
‡SIG_PPP indicates PPP-derived uncertainties, SIG_TOT incorporates uncertainties from epoch transformation

Satellite Sky Distribution

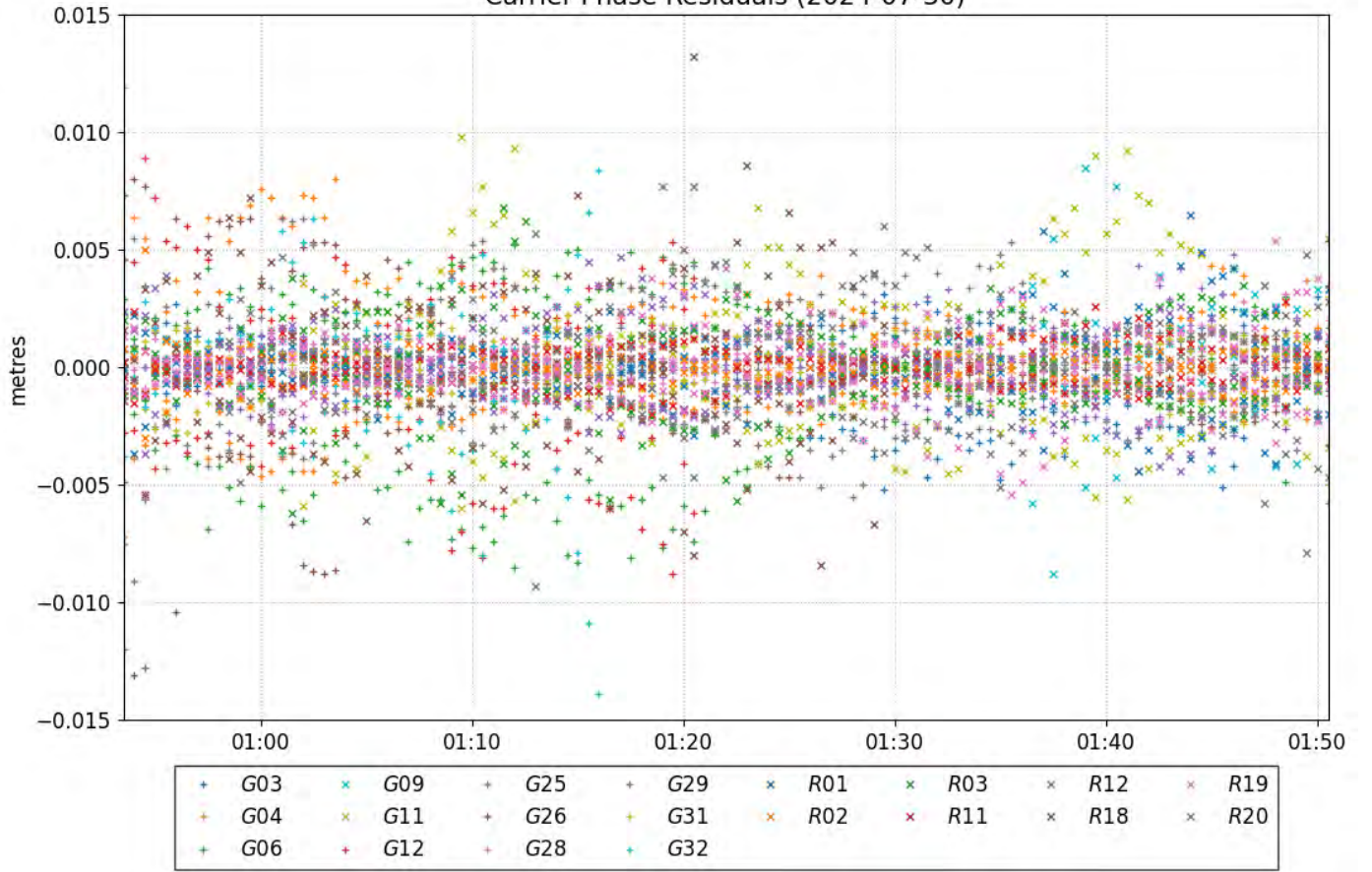


+	G03	×	G11	+	G28	+	G32	×	R03	×	R18
+	G04	+	G12	+	G29	×	R01	×	R11	×	R19
+	G06	+	G25	+	G31	×	R02	×	R12	×	R20
×	G09	+	G26								

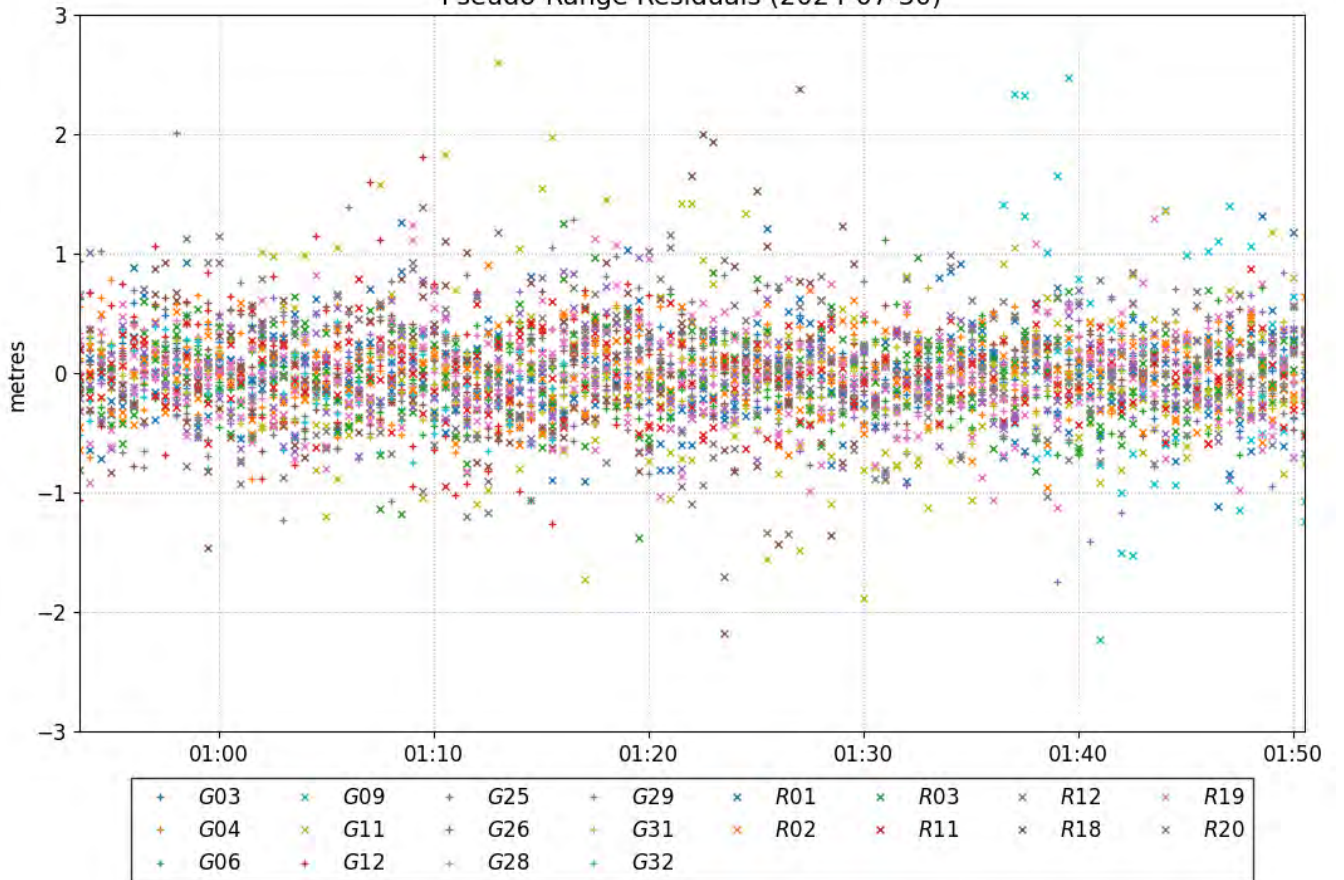




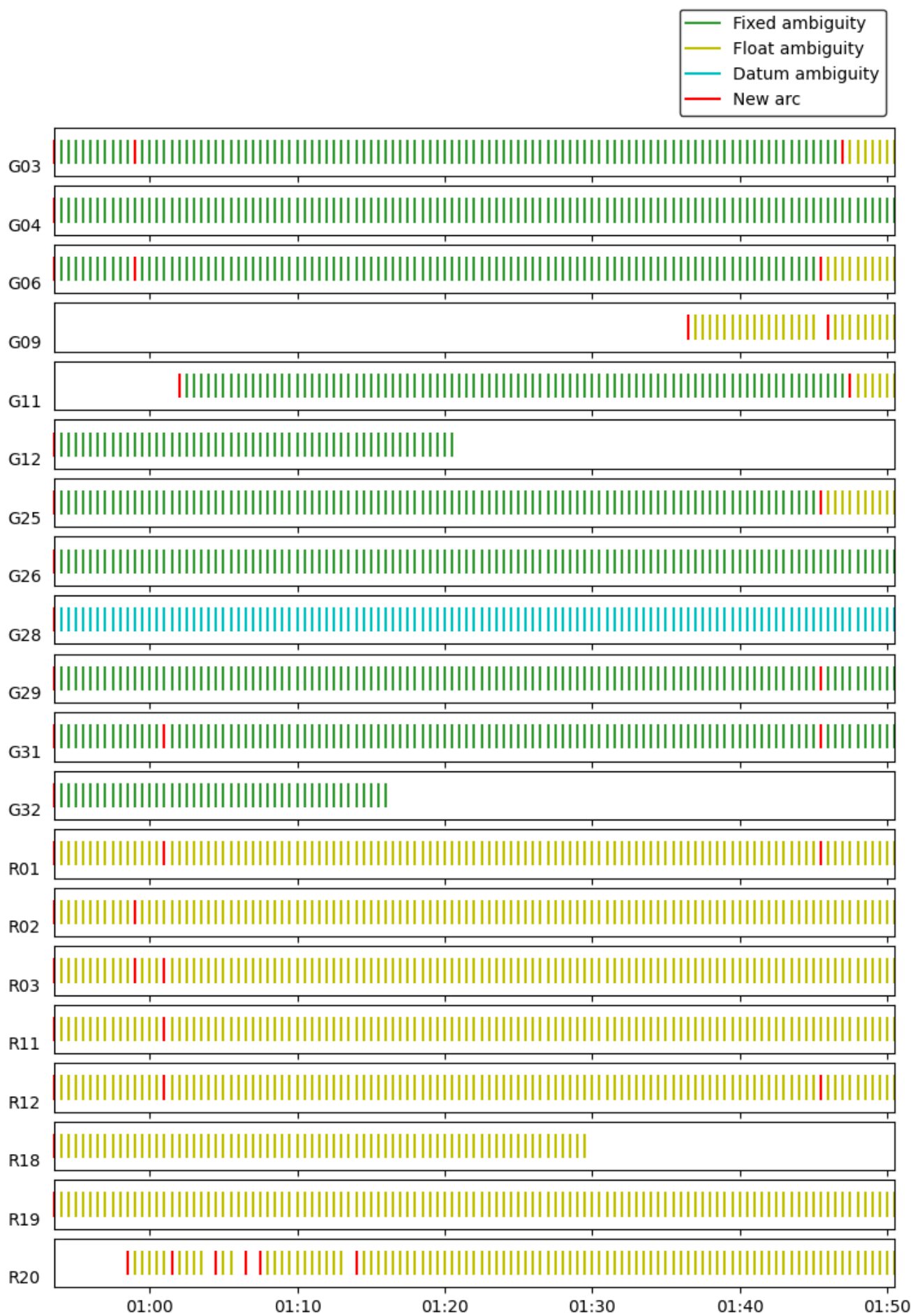
Carrier-Phase Residuals (2024-07-30)

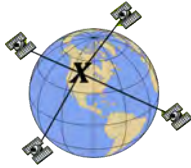


Pseudo-Range Residuals (2024-07-30)



Phase Ambiguity Status (2024-07-30)





CSRS-PPP 3.54.2 (2022-11-10)



PioneerEmli_raw_202408101208.240
HeliBaseAug10

Data Start		Data End	Duration of Observations
2024-08-10 12:08:35.00		2024-08-10 18:46:42.01	6:38:07.010
Processing Time		Product Type	
14:46:56 UTC 2024/08/17		NRCan Rapid	
Observations	Frequency		Mode
Phase and Code	Double		Static
Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	45.96 %	1.00 sec
Antenna Model	APC to ARP		ARP to Marker
EML_REACH_RS2 NONE	L1 = 0.135 m L2 = 0.137 m		H:1.690m / E:0.000m / N:0.000m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for PioneerEmli_raw_202408101208.240

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2010.0)†	71° 19' 27.77155"	-79° 22' 13.87633"	165.282 m
SIG_PPP(95%)‡	0.006 m	0.005 m	0.021 m
SIG_TOT(95%)‡	0.056 m	0.040 m	0.043 m
A priori*	71° 19' 27.83212"	-79° 22' 14.07961"	170.924 m
Estimated – A priori	-1.877 m	2.019 m	-5.642 m

Orthometric Height
CGVD2013
(CGG2013a)
(2010.0)

173.704 m

(click for height reference
information)

95% PPP Error Ellipse (mm)

semi-major: 8 mm

semi-minor: 7 mm

semi-major azimuth: -7° 33' 10.04"

95% TOT Error Ellipse (mm)

semi-major: 69 mm

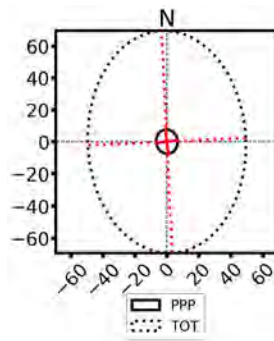
semi-minor: 49 mm

semi-major azimuth: -2° 18' 58.41"

UTM (North)
Zone 17

7914360.021 m (N)
558229.483 m (E)

Scale Factors
0.99964147 (point)
0.99961563 (combined)

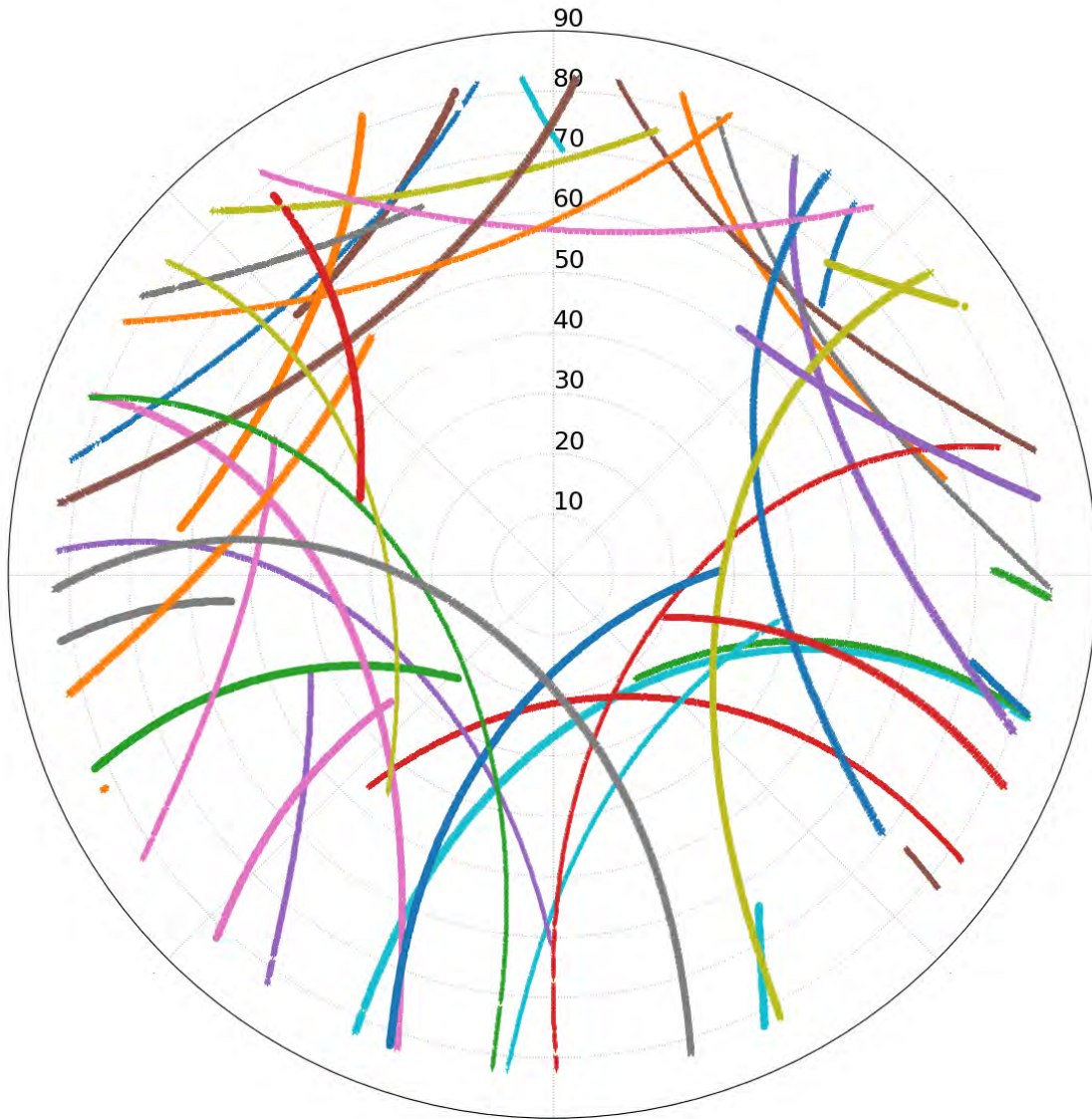


*(Coordinates from RINEX header used as a priori position)

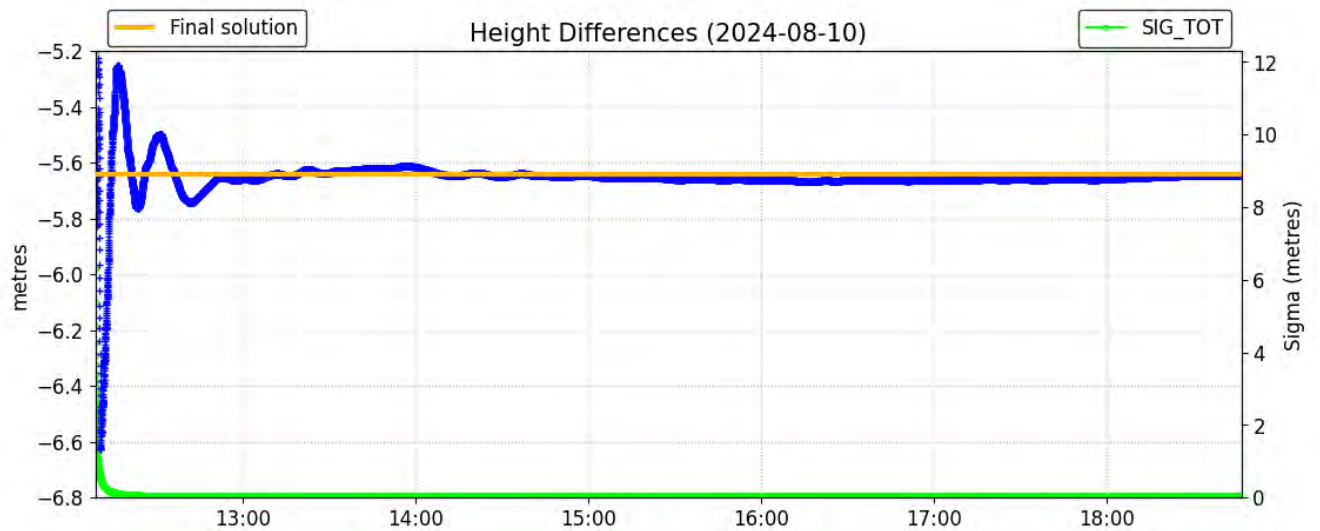
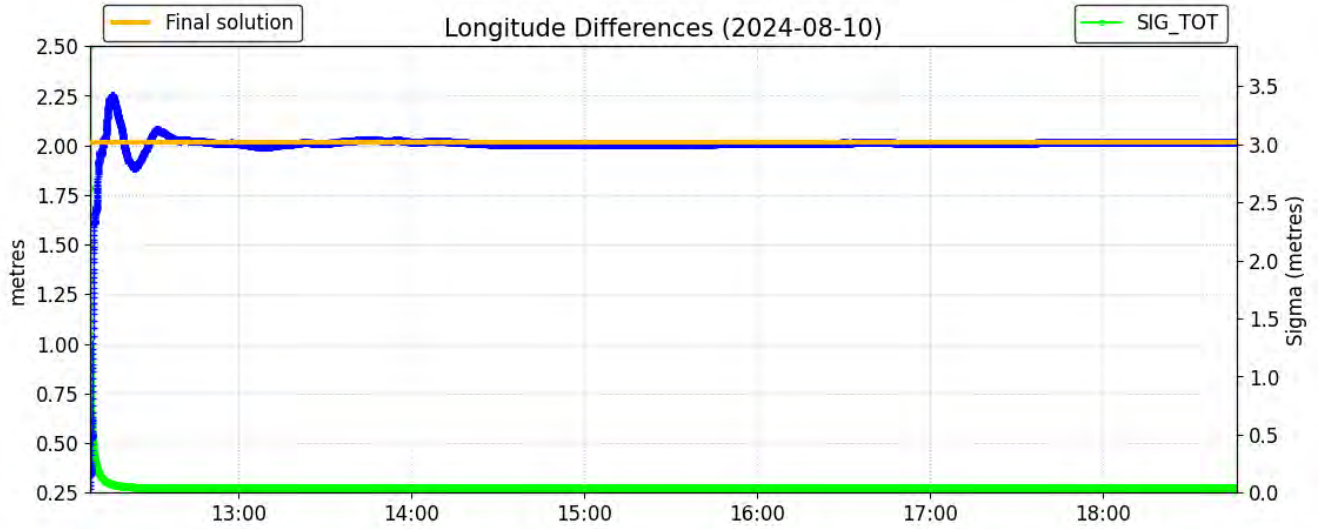
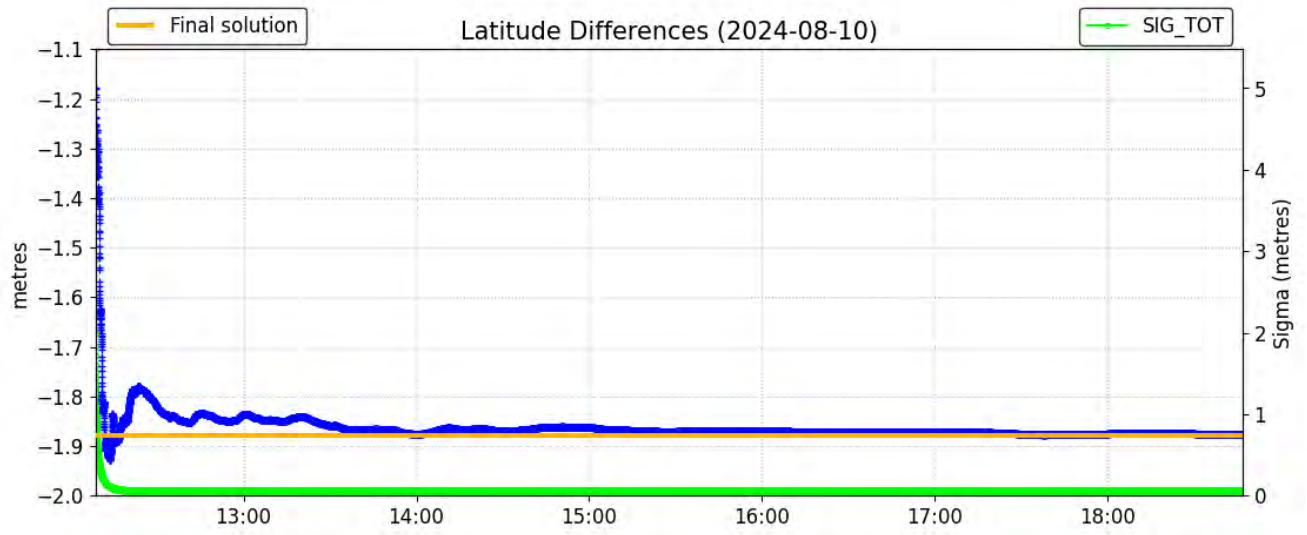
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

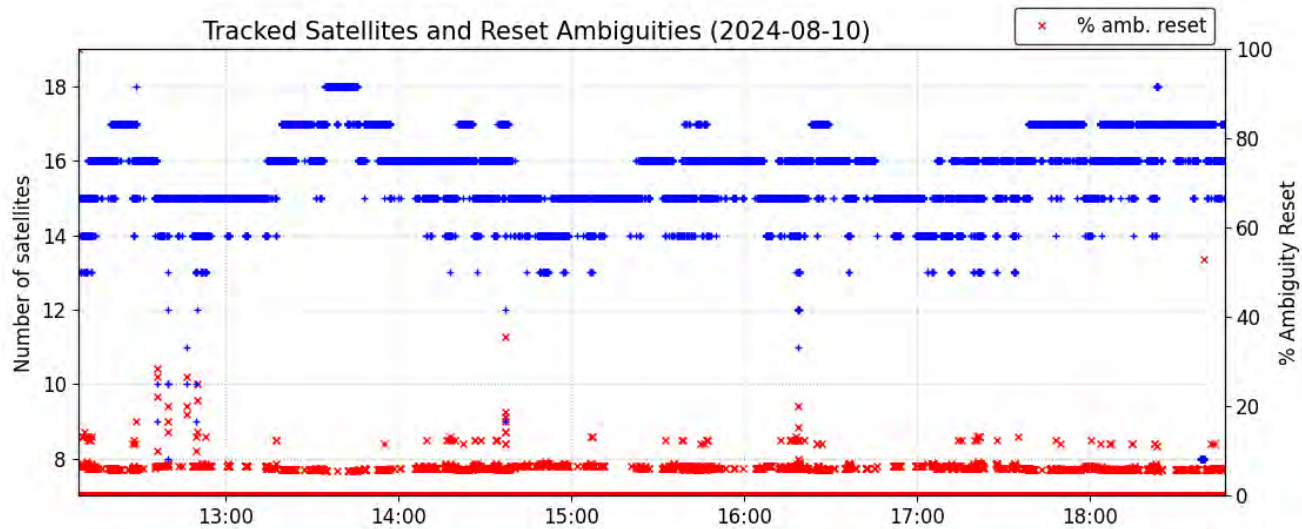
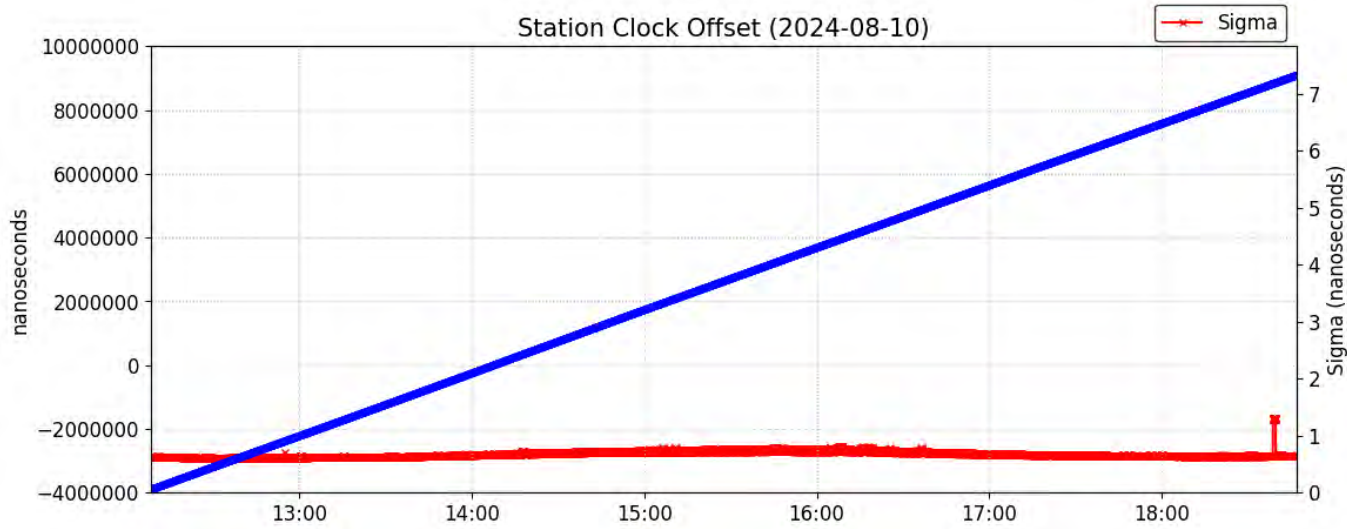
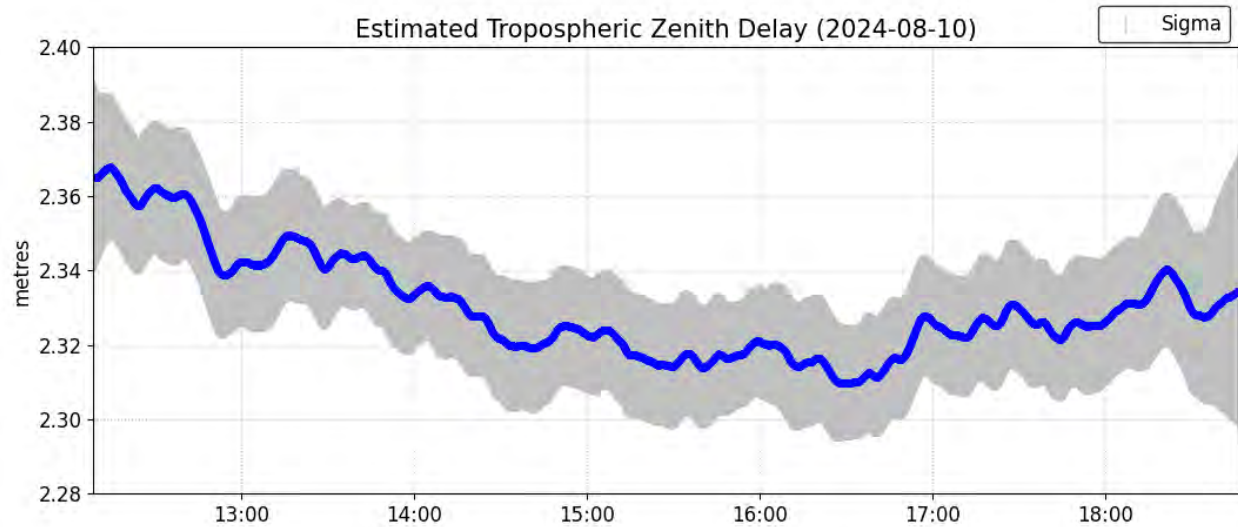
‡SIG_PPP indicates PPP-derived uncertainties, SIG_TOT incorporates uncertainties from epoch transformation

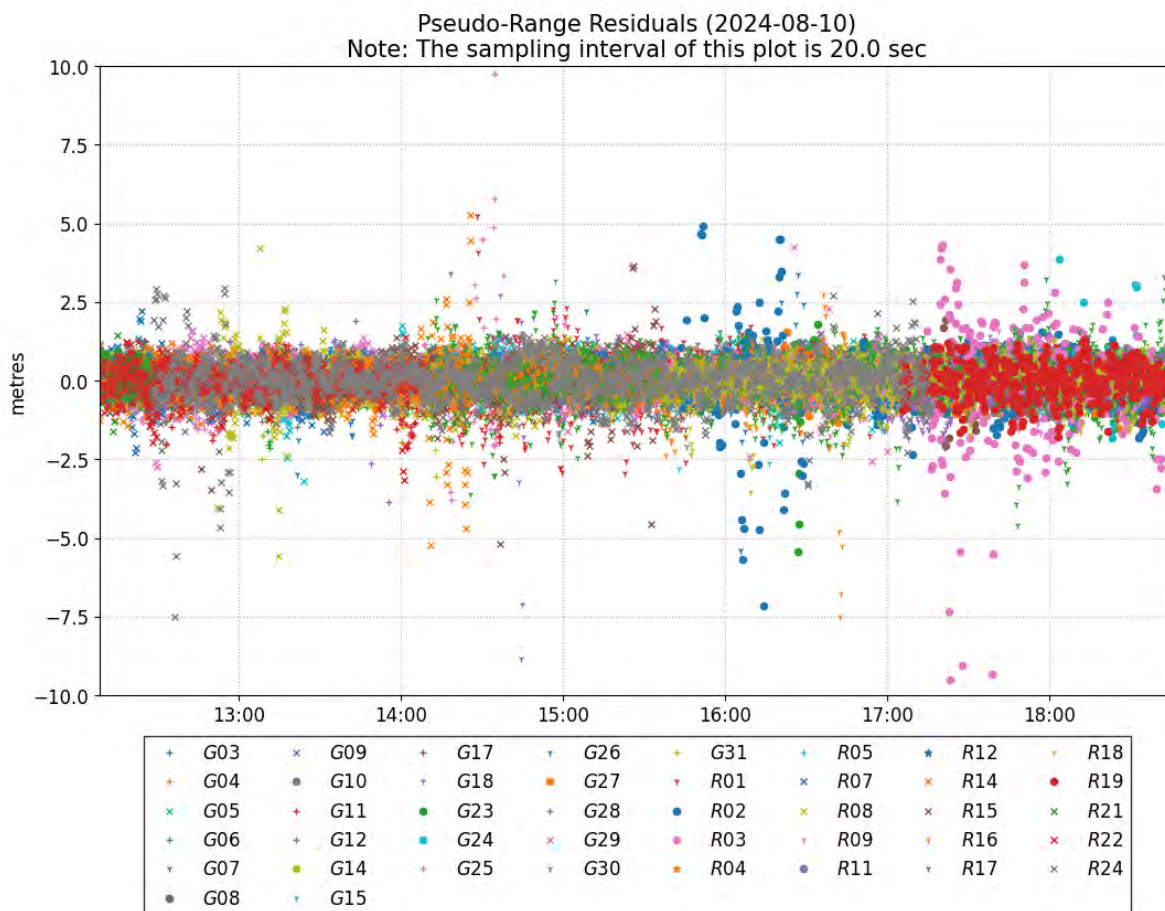
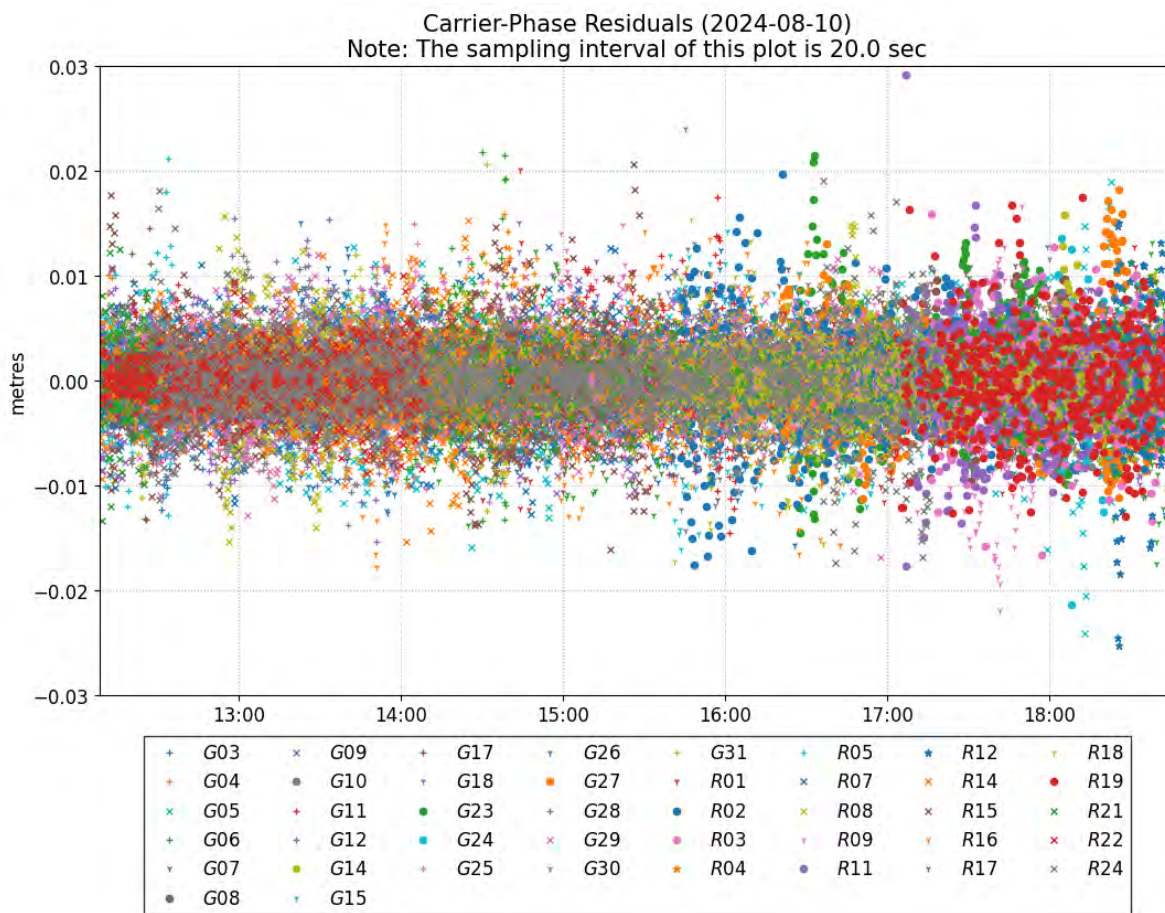
Satellite Sky Distribution
 Note: The sampling interval of this plot is 20.0 sec



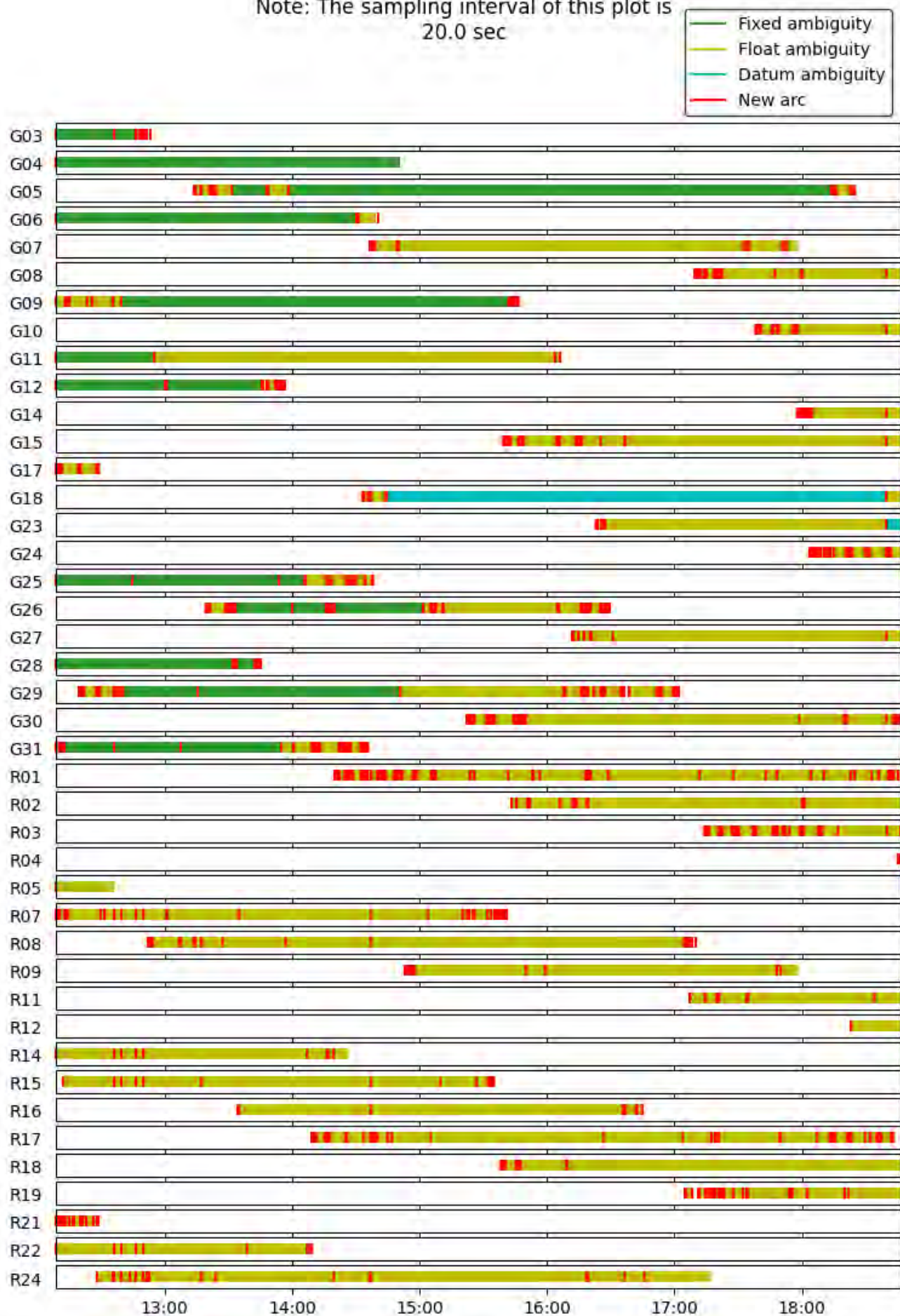
+	G03	•	G10	•	G23	•	G30	×	R07	+	R16
+	G04	+	G11	•	G24	+	G31	×	R08	•	R17
×	G05	+	G12	+	G25	•	R01	•	R09	•	R18
+	G06	•	G14	•	G26	•	R02	•	R11	•	R19
•	G07	•	G15	•	G27	•	R03	•	R12	•	R21
•	G08	+	G17	+	G28	•	R04	•	R14	•	R22
×	G09	•	G18	•	G29	•	R05	×	R15	×	R24







Phase Ambiguity Status (2024-08-10)
 Note: The sampling interval of this plot is
 20.0 sec



~~~ Disclaimer ~~~

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PIONEER EXPLORATION



International
Airborne Geophysics
Safety Association

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T. 1-306-715-6802

Appendix 5

Ground Control Points

Table 3: List of Ground Control Points collected for this project.

GCP ID	Reference Station	Easting (m)	Northing (m)	Orthometric Height (m)
North1	RTK BasePort	501194.249	7975632.42	4.376
North2	RTK BasePort	506168.466	7977172.058	173.531
North3	RTK BasePort	514915.204	7962330.9	276.165
North3A	RTK BasePort	506182.56	7970177.383	282.812
North4	RTK BasePort	518946.774	7964680.309	321.554
North5	RTK Base8North	520529.888	7946323.909	318.339
North6	RTK Base8North	524057.288	7949426.474	316.532
North7	RTK Base8North	526382.821	7928574.641	321.234
North8	RTK Base8North	530891.048	7929540.362	378.854
North9	RTK Base8North	527725.4	7914485.001	131.518
North10	RTK Base8North	532672.26	7920379.377	247.118
North11	RTK Base8North	537118.187	7929161.272	256.755
North12	RTK Base8North	537000.583	7916874.373	205.575
North13	EMLID PPP	552650.204	7918409.047	212.843
North14	EMLID PPP	551287.054	7913231.669	271.252
North15	Base PPP	567780.102	7914935.313	576.504
North16	RTK Base15North	575886.632	7918435.661	661.555
North11A	RTK Base15North	542994.812	7926276.933	298.469
North17	RTK Base15North	575341.318	7911134.12	505.142
North18	RTK Base15North	568777.306	7910509.314	467.068
Tote1	MINE_CTRL22	506514.171	7971273.788	57.62
Tote2	SA_56	512378.89	7966836.71	81.74
Tote3	SA_55	521653.72	7953622.22	111.95
Tote4	SA_54	525507.42	7937427.92	170.84
Tote5	SA_65	536585.85	7919963.66	235.61
Tote6	SA_50	557822.48	7915135.11	172.08
Tote7	SA_53	528183.61	7929240.35	163.17
Steensby1	RTK BASE3South	597281.9285	7798428.854	39.966
Steensby2	RTK BASE3South	593975.1905	7802150.358	80.886
Steensby3A	RTK BASE3South	601090.4885	7825453.801	322.57
Steensby3B	RTK BASE3South	598963.4865	7817389.981	199.06
Steensby4	EMLID PPP	609751.947	7841814.356	309.663
Steensby4A	EMLID PPP	607053.317	7837962.483	260.651
Steensby5	RTK Base6South	604091.296	7855368	332.125
Steensby5A	RTK Base6South	605807.5522	7859196.178	317.729
Steensby5C	RTK Base6South	603230.148	7863771.863	242.461
Steensby6	RTK Base6South	595383.5492	7874410.027	205.556
Steensby6A	RTK Base6South	599521.905	7874570.459	207.627
Steensby7	RTK Base6South	592692.729	7893850.583	154.281
Steensby7A	RTK Base6South	596403.161	7896223.454	184.634
Steensby8	RTK Base15North	573433.28	7902769.088	261.957
Steensby8A	EMLID PPP	577040.612	7905077.838	481.374
BasePort	PPP	506179.483	7970176.196	282.889
Base6South	PPP	595392.8	7874381.596	206.267
Base15North	PPP	567780.102	7914935.313	576.504
Base8North	PPP	530890.979	7929540.576	378.846
Base70	PPP	559745.6818	7913980.375	177.4814444



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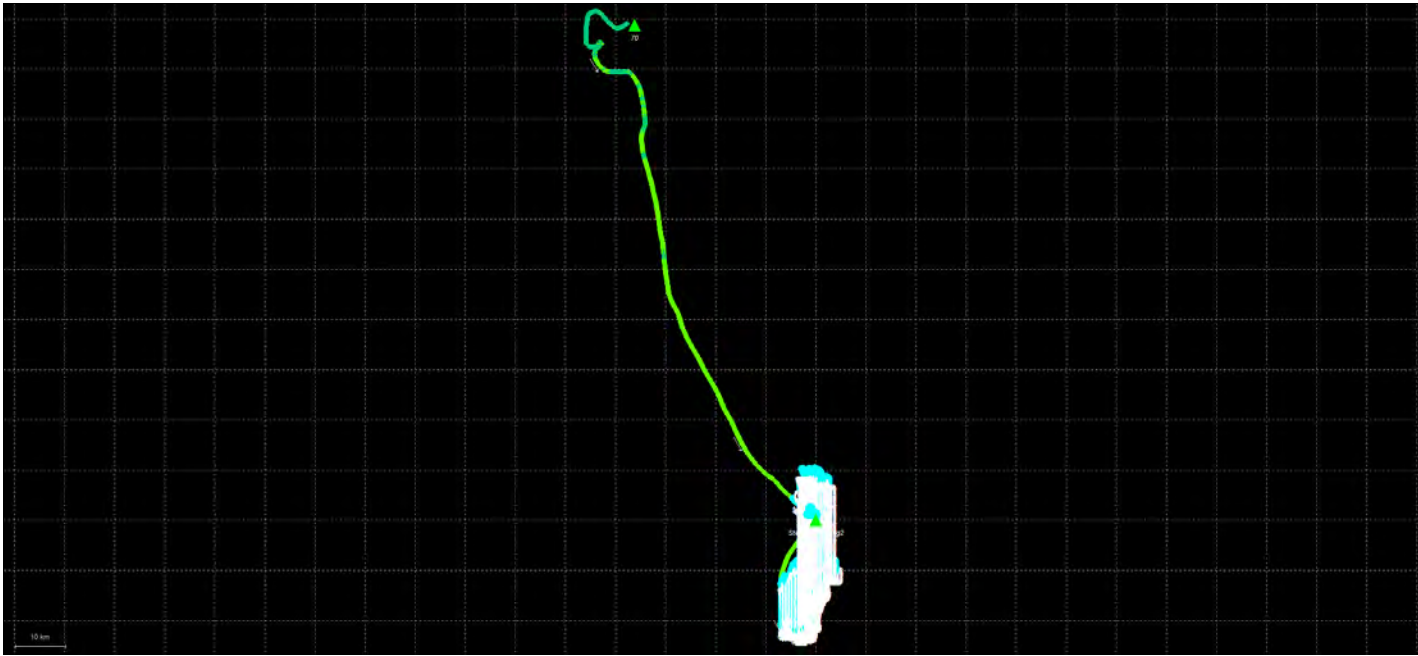
Appendix 6

Trajectory Optimization Statistics

Output Results for Aug2_Flight1

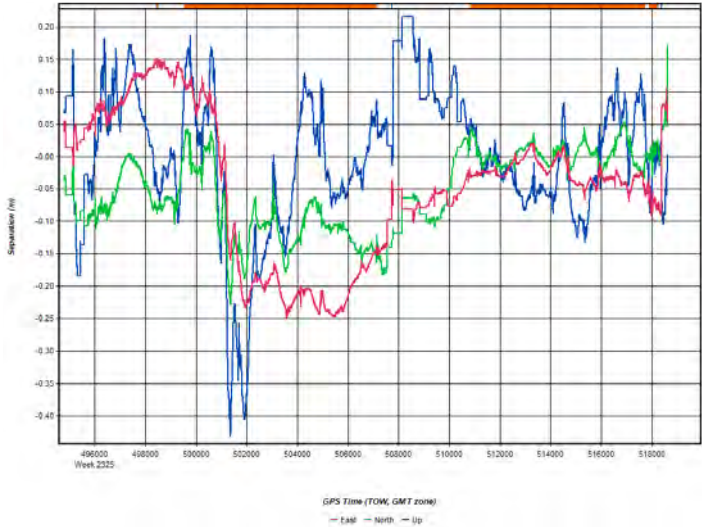
Inertial Explorer Version 9.00.2207
09/20/2024

Figure 1: Smoothed TC Combined - Map



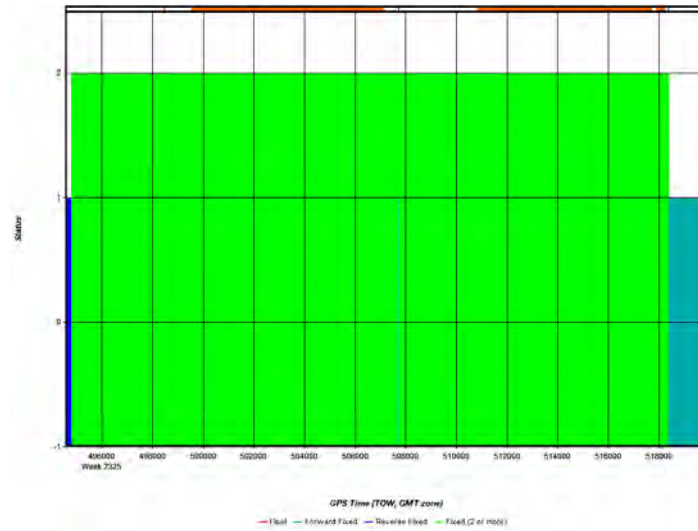
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 2: Aug2_Flight1 [Smoothed TC Combined] - Forward/Reverse or Combined Separation Plot



Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 3: Aug2_Flight1 [Smoothed TC Combined] - Float or Fixed Ambiguity



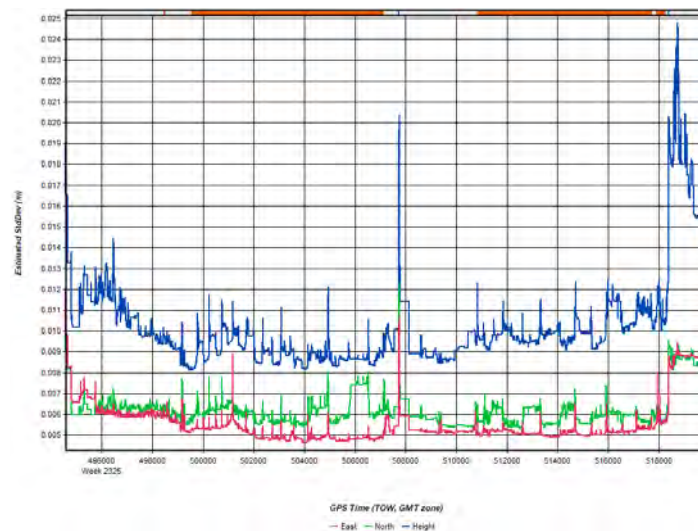
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 4: Aug2_Flight1 [Smoothed TC Combined] - Forward/Reverse Separation Plot (Fixed)



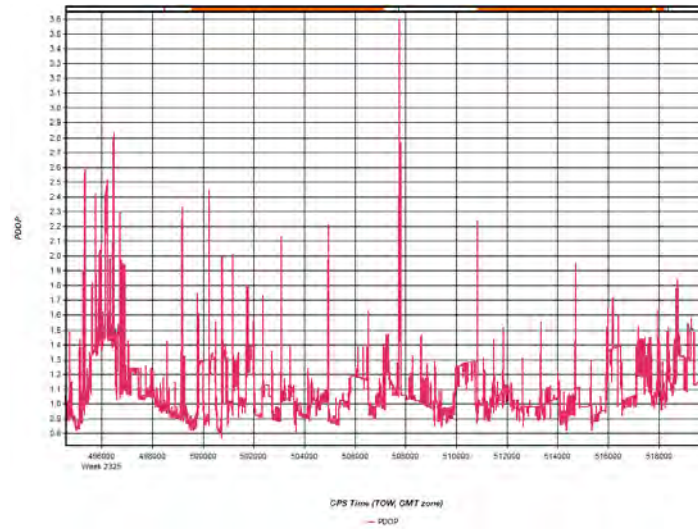
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 5: Aug2_Flight1 [Smoothed TC Combined] - Estimated Position Accuracy Plot



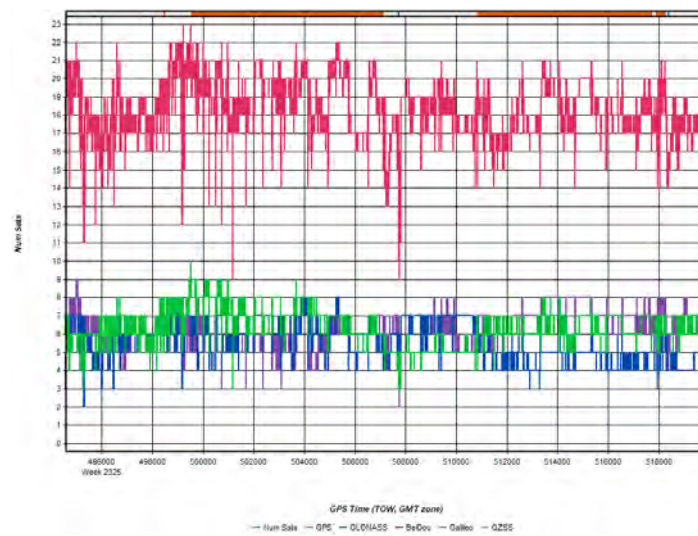
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 6: Aug2_Flight1 [Smoothed TC Combined] - PDOP Plot



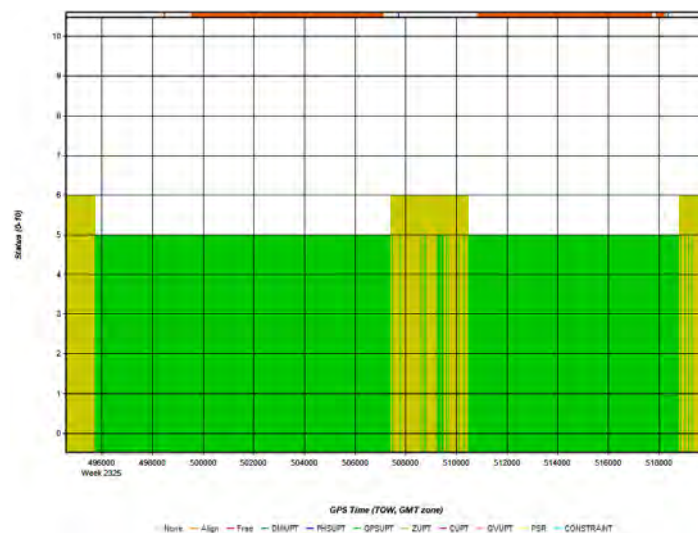
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 7: Aug2_Flight1 [Smoothed TC Combined] - Number of Satellites Line Plot



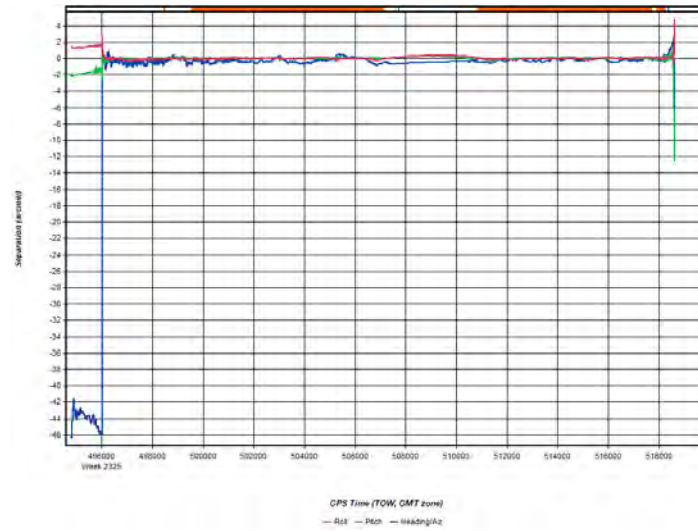
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 8: Aug2_Flight1 [Smoothed TC Combined] - Status flag for IMU processing



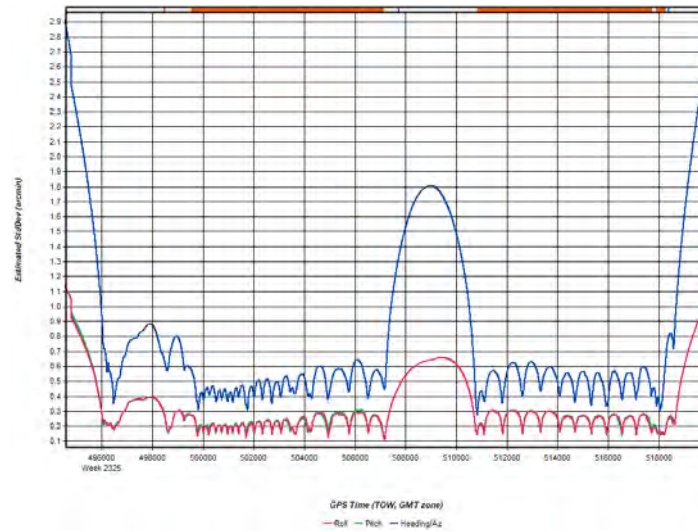
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 9: Aug2_Flight1 [Smoothed TC Combined] - Fwd/Rev Attitude Separation Plot



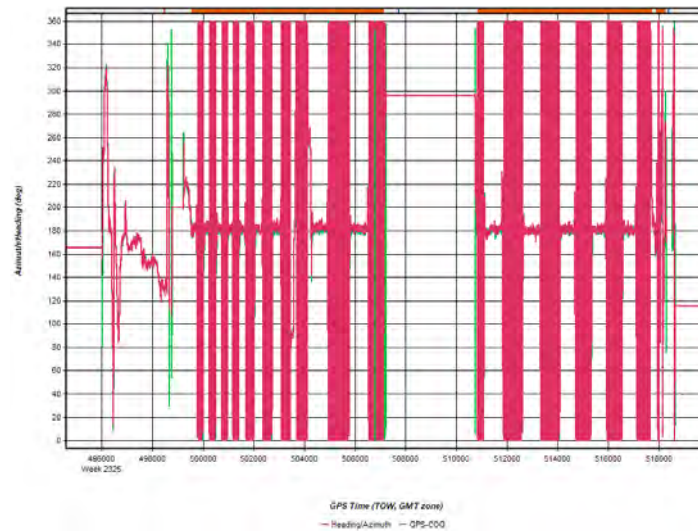
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 10: Aug2_Flight1 [Smoothed TC Combined] - Estimated Attitude Accuracy Plot



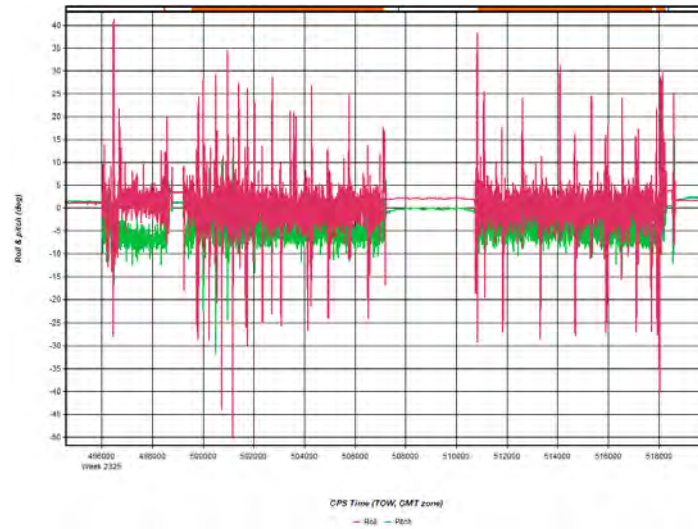
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 11: Aug2_Flight1 [Smoothed TC Combined] - Azimuth Plot



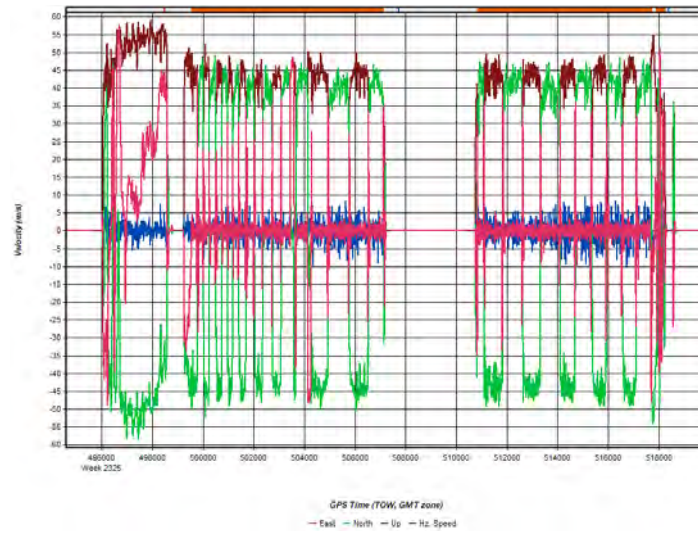
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 12: Aug2_Flight1 [Smoothed TC Combined] - Roll & Pitch Plot



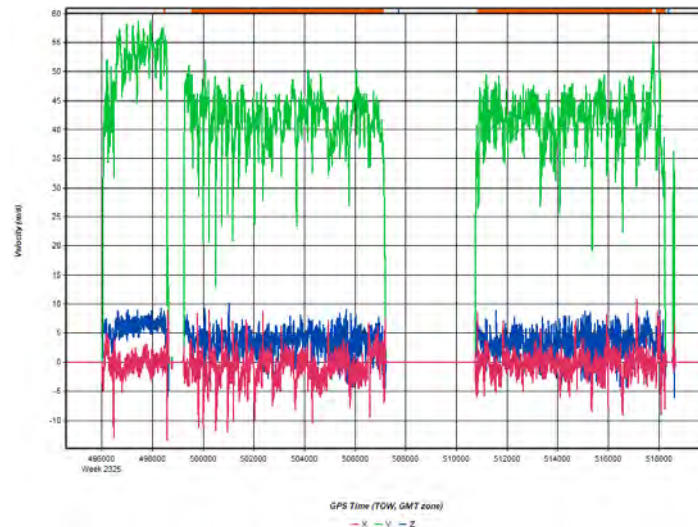
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 13: Aug2_Flight1 [Smoothed TC Combined] - Velocity Profile Plot



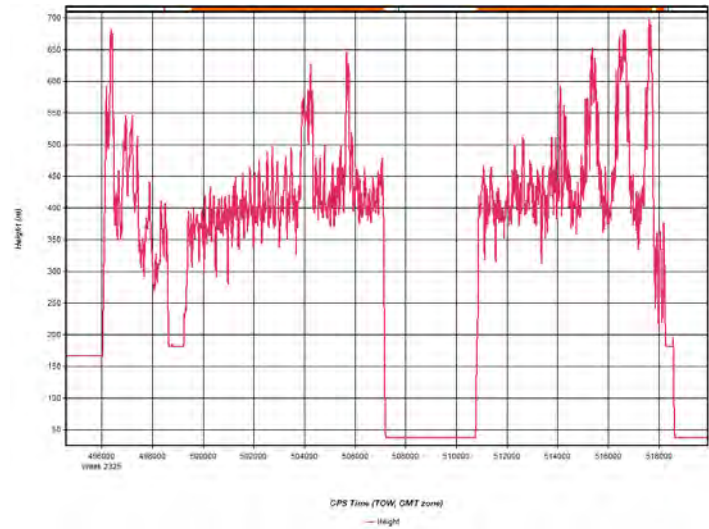
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 14: Aug2_Flight1 [Smoothed TC Combined] - Body Frame Velocity Plot



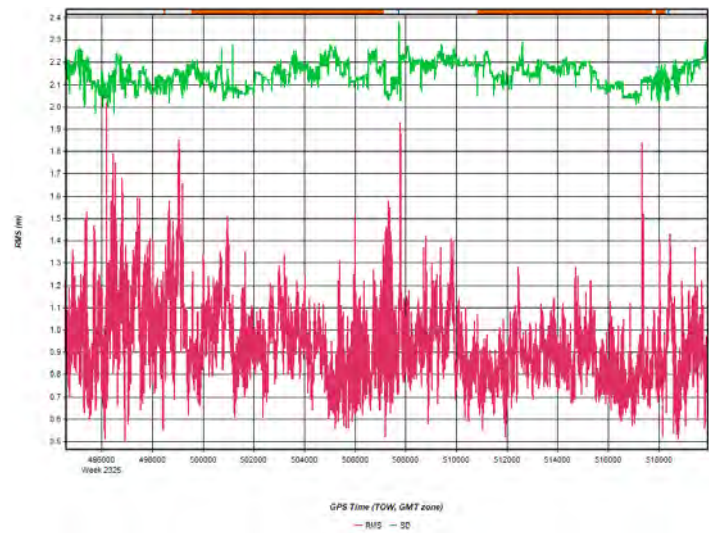
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 15: Aug2_Flight1 [Smoothed TC Combined] - Height Profile Plot



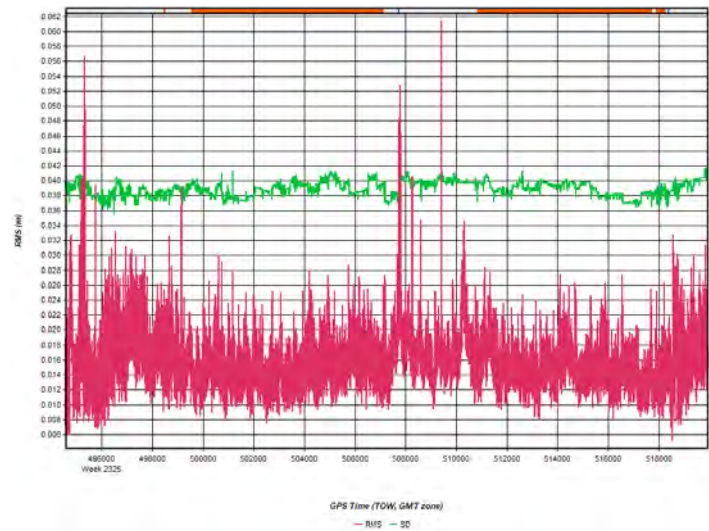
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 16: Aug2_Flight1 [Smoothed TC Combined] - C/A Code Residual RMS Plot



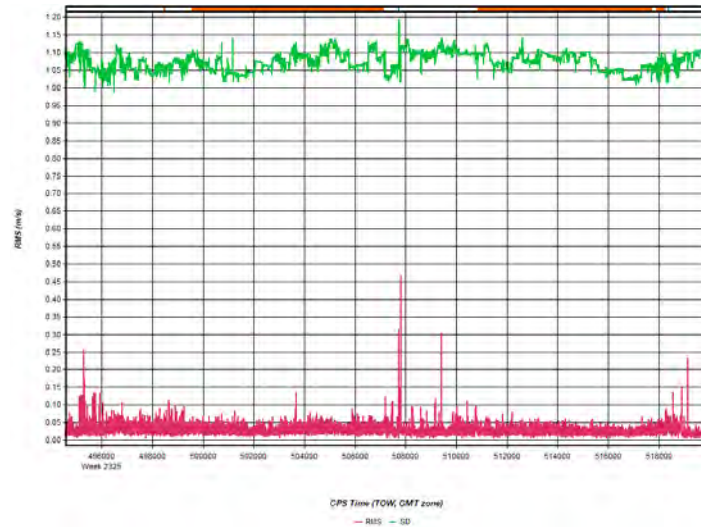
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 17: Aug2_Flight1 [Smoothed TC Combined] - Carrier Residual RMS Plot



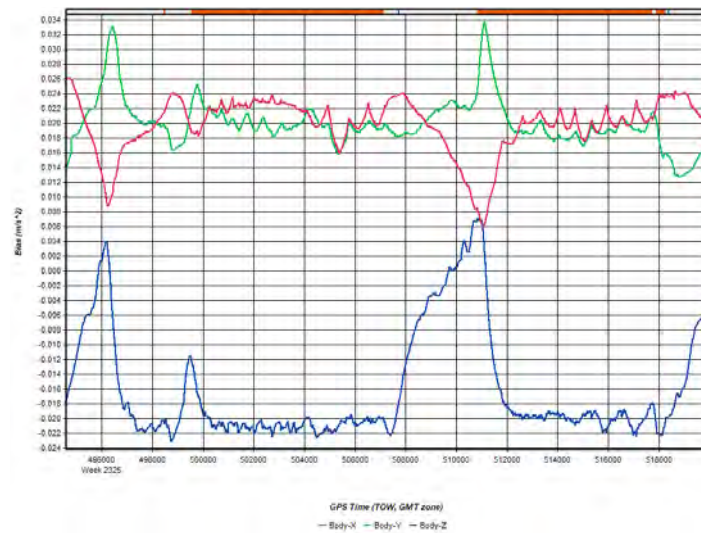
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 18: Aug2_Flight1 [Smoothed TC Combined] - Doppler Residual RMS Plot



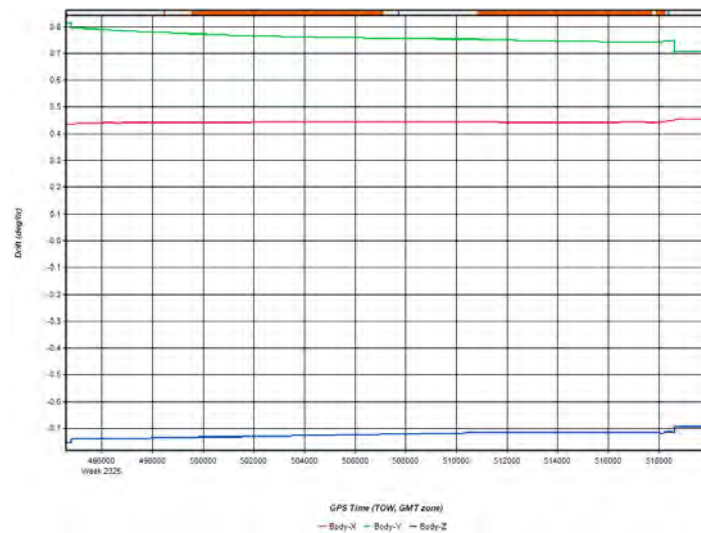
Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 19: Aug2_Flight1 [Smoothed TC Combined] - Accelerometer Bias Plot



Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Figure 20: Aug2_Flight1 [Smoothed TC Combined] - Gyro Drift Plot

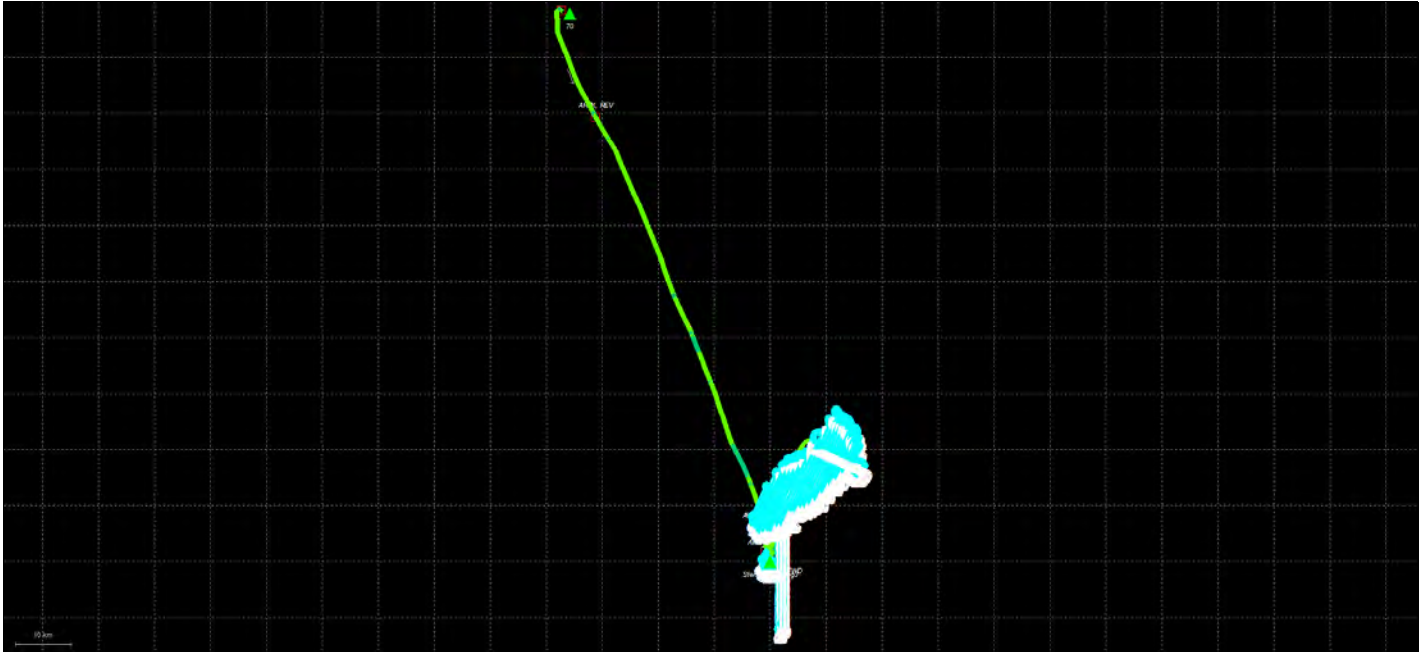


Process	Aug2_Flight1	by Unknown	on 9/20/2024	at 21:27:07
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Output Results for Aug3_Flight1

Inertial Explorer Version 9.00.2207
09/20/2024

Figure 1: Smoothed TC Combined - Map



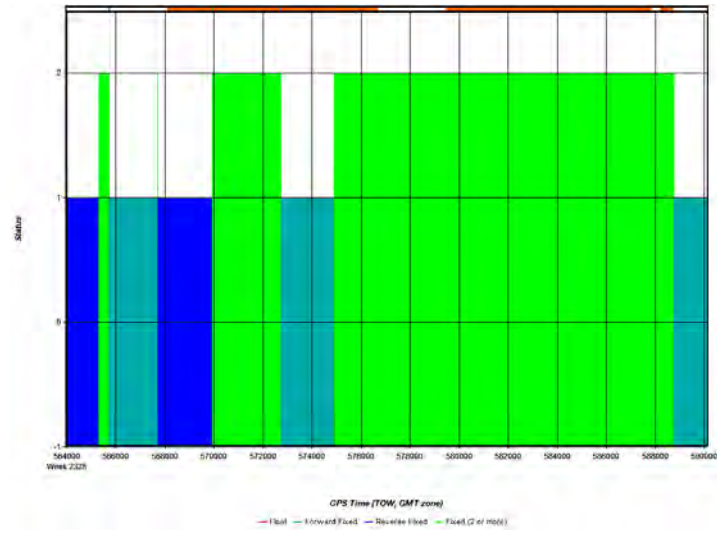
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 2: Aug3_Flight1 [Smoothed TC Combined] - Forward/Reverse or Combined Separation Plot



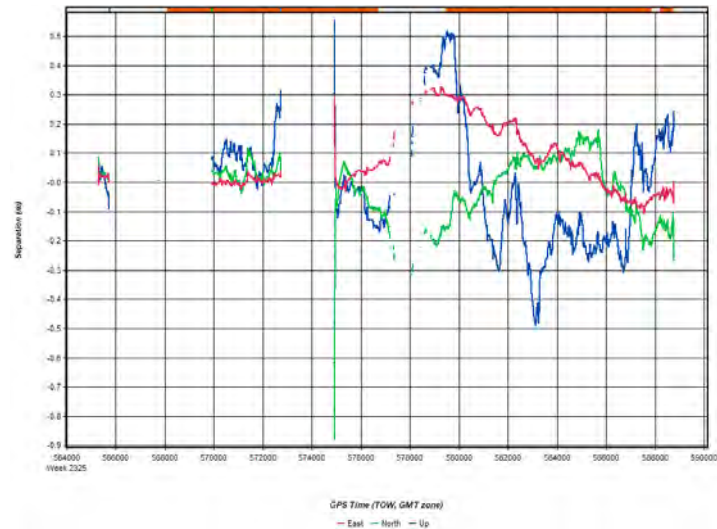
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 3: Aug3_Flight1 [Smoothed TC Combined] - Float or Fixed Ambiguity



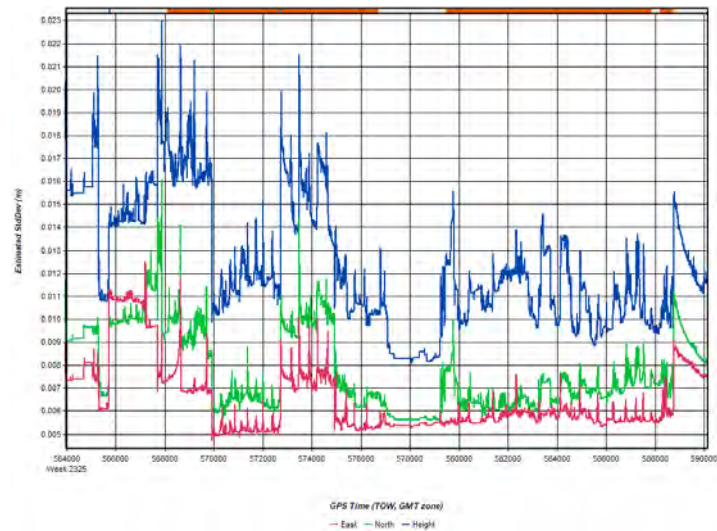
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 4: Aug3_Flight1 [Smoothed TC Combined] - Forward/Reverse Separation Plot (Fixed)



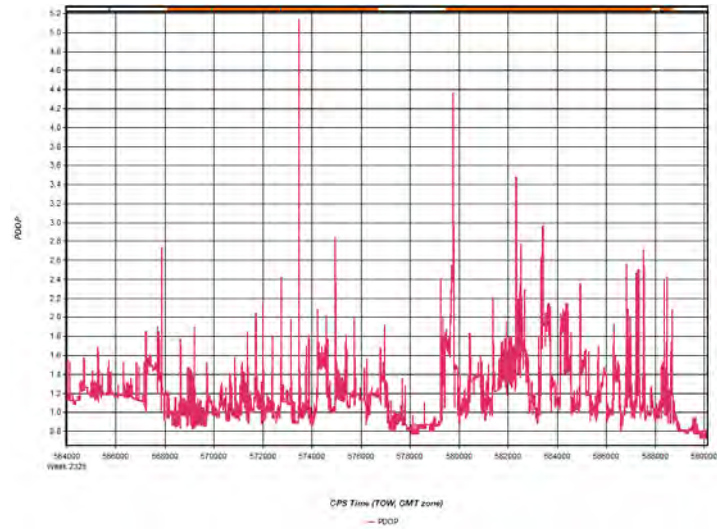
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 5: Aug3_Flight1 [Smoothed TC Combined] - Estimated Position Accuracy Plot



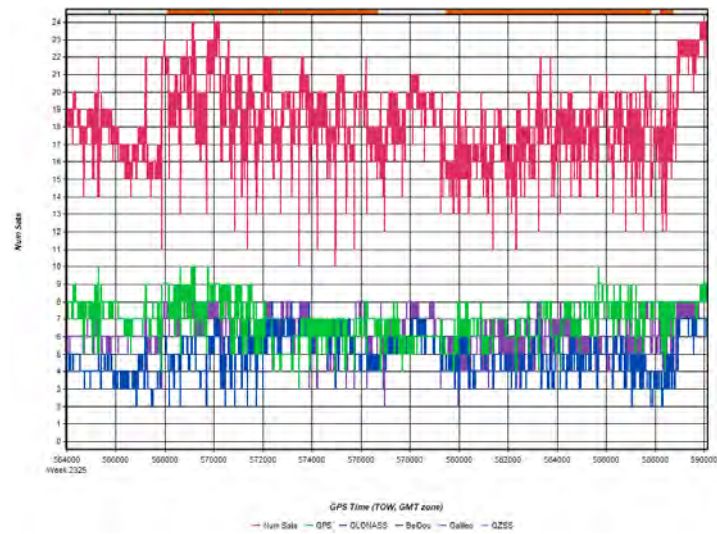
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 6: Aug3_Flight1 [Smoothed TC Combined] - PDOP Plot



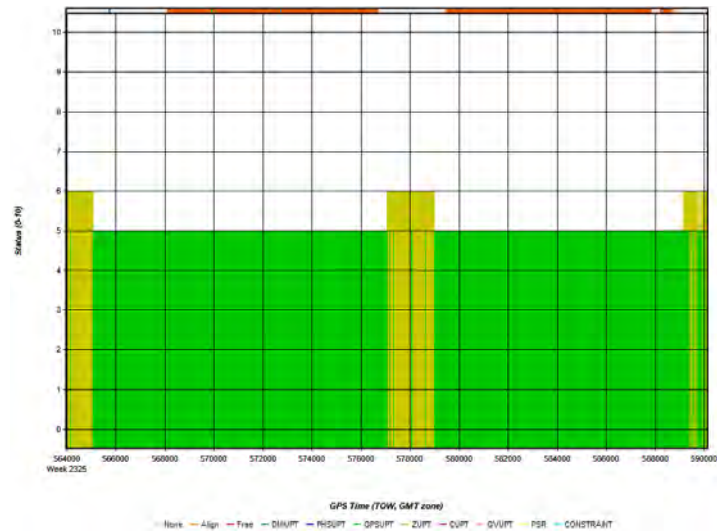
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 7: Aug3_Flight1 [Smoothed TC Combined] - Number of Satellites Line Plot



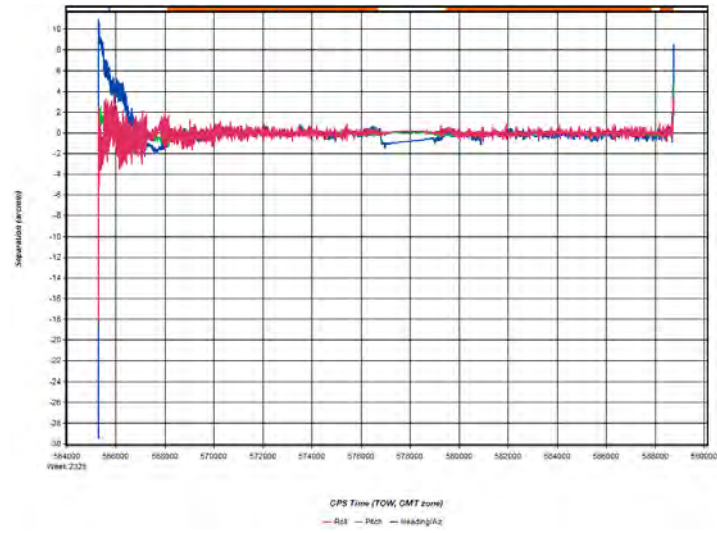
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 8: Aug3_Flight1 [Smoothed TC Combined] - Status flag for IMU processing



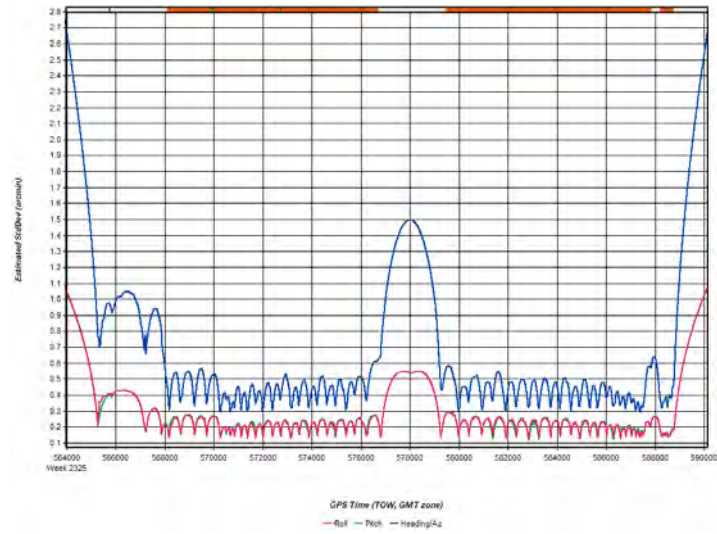
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 9: Aug3_Flight1 [Smoothed TC Combined] - Fwd/Rev Attitude Separation Plot



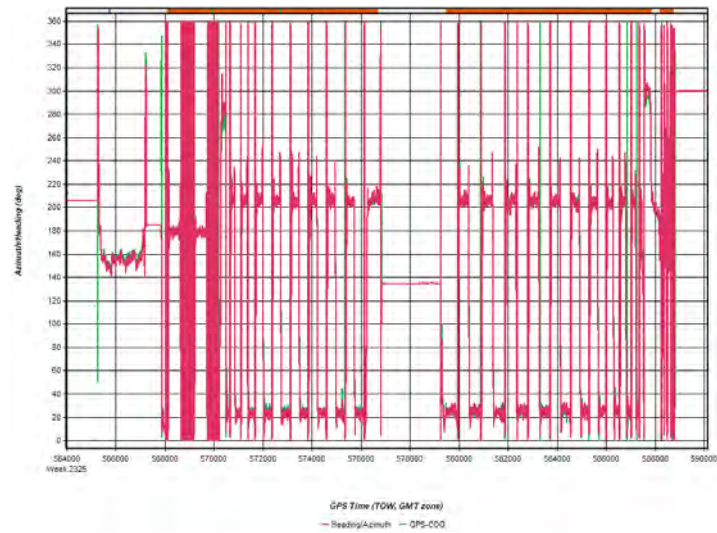
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 10: Aug3_Flight1 [Smoothed TC Combined] - Estimated Attitude Accuracy Plot



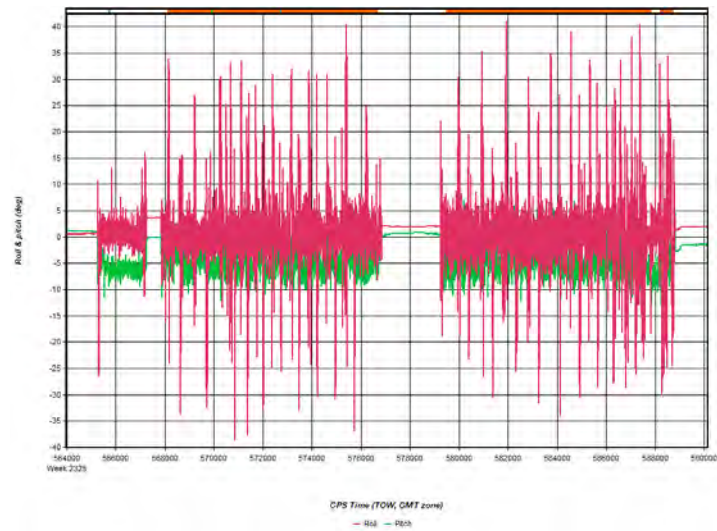
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 11: Aug3_Flight1 [Smoothed TC Combined] - Azimuth Plot



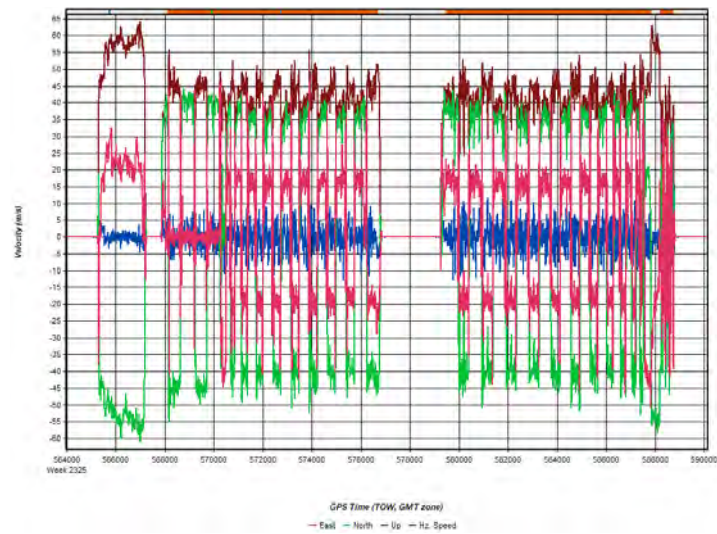
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 12: Aug3_Flight1 [Smoothed TC Combined] - Roll & Pitch Plot



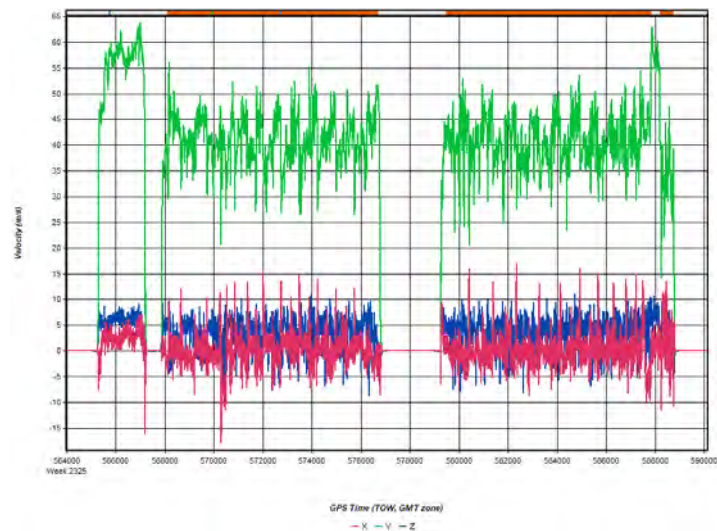
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 13: Aug3_Flight1 [Smoothed TC Combined] - Velocity Profile Plot



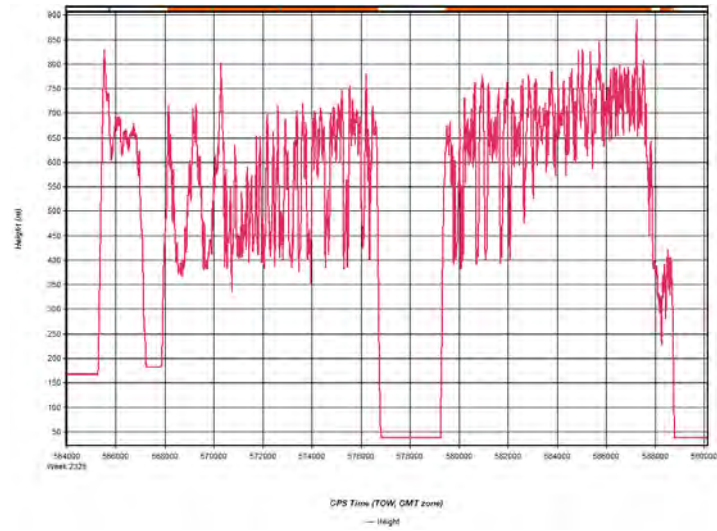
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 14: Aug3_Flight1 [Smoothed TC Combined] - Body Frame Velocity Plot



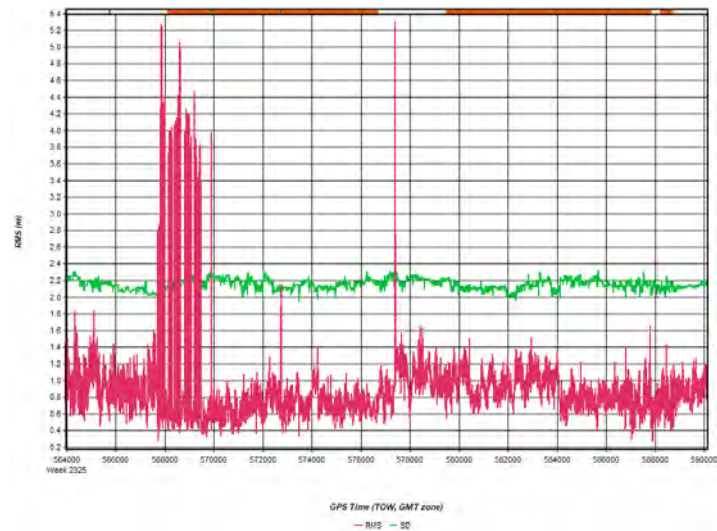
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 15: Aug3_Flight1 [Smoothed TC Combined] - Height Profile Plot



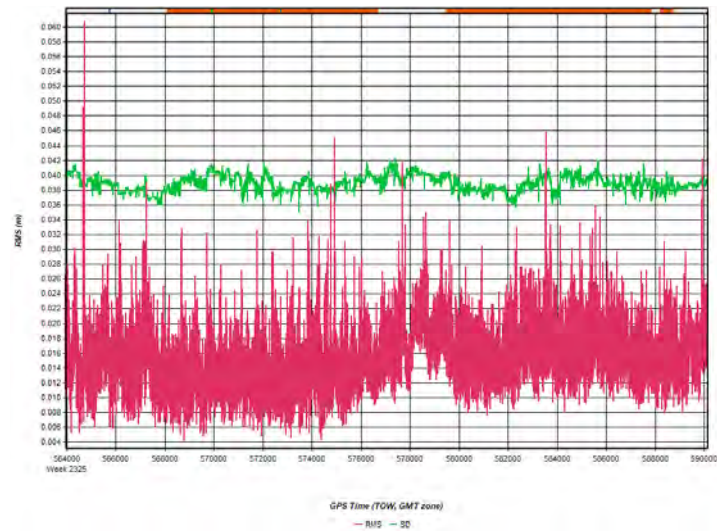
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 16: Aug3_Flight1 [Smoothed TC Combined] - C/A Code Residual RMS Plot



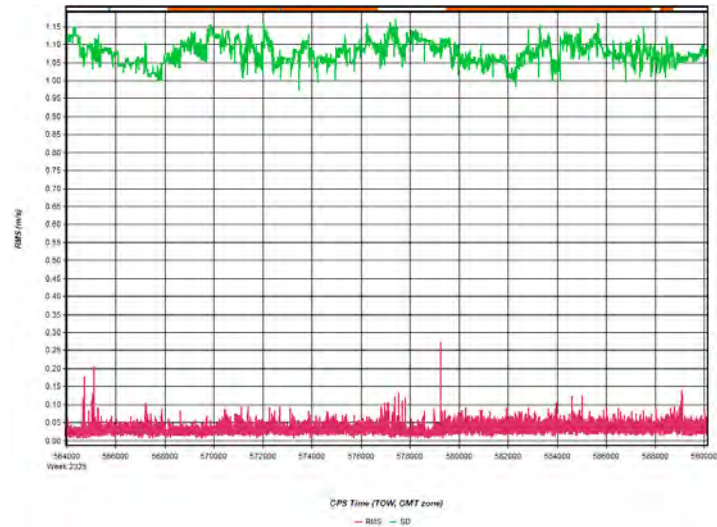
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 17: Aug3_Flight1 [Smoothed TC Combined] - Carrier Residual RMS Plot



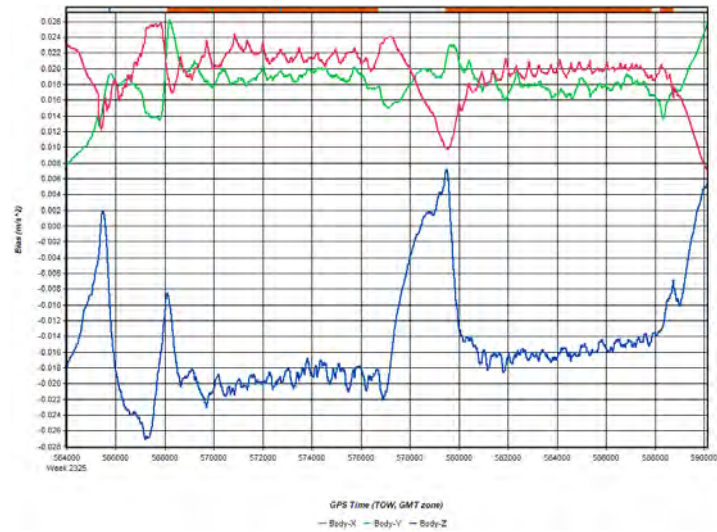
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 18: Aug3_Flight1 [Smoothed TC Combined] - Doppler Residual RMS Plot



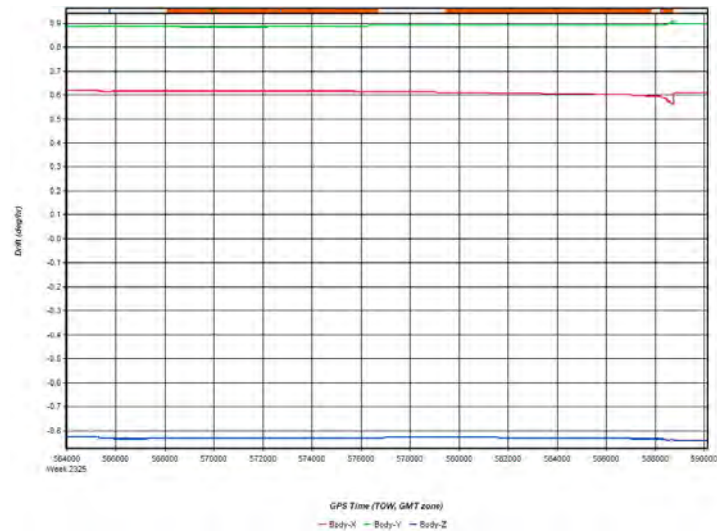
Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 19: Aug3_Flight1 [Smoothed TC Combined] - Accelerometer Bias Plot



Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Figure 20: Aug3_Flight1 [Smoothed TC Combined] - Gyro Drift Plot

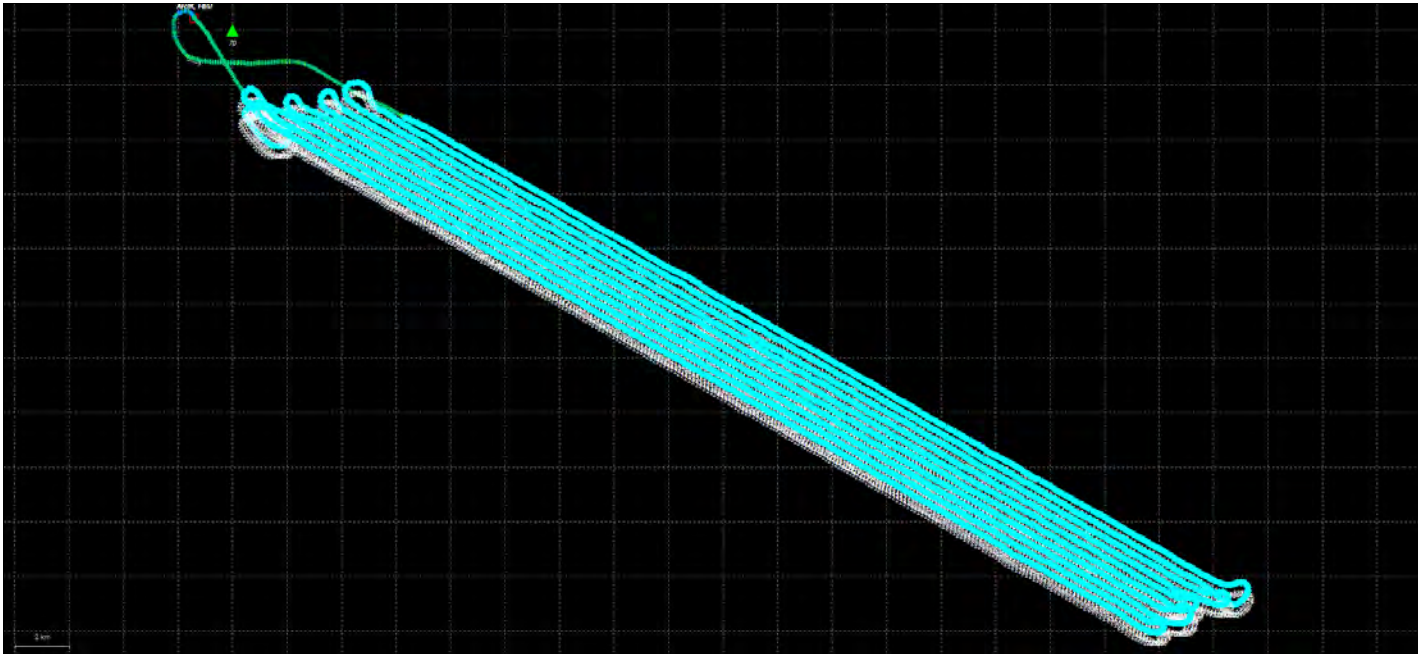


Process	Aug3_Flight1	by Unknown	on 9/20/2024	at 21:57:41
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Output Results for Aug10Flight1

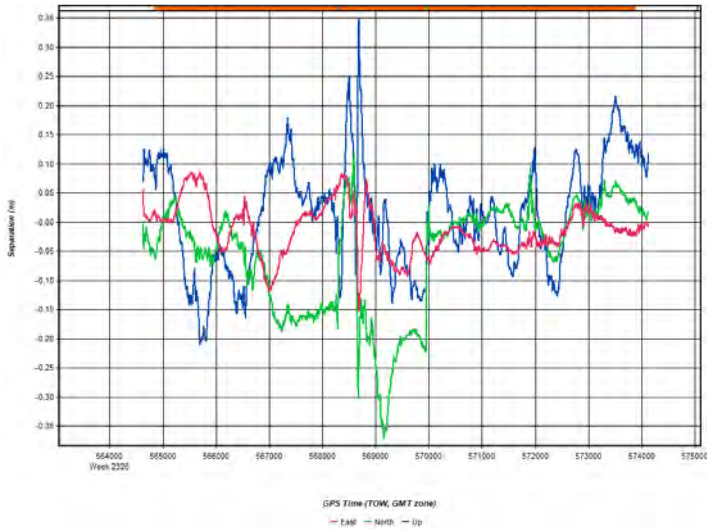
Inertial Explorer Version 9.00.2207
09/18/2024

Figure 1: Smoothed TC Combined - Map



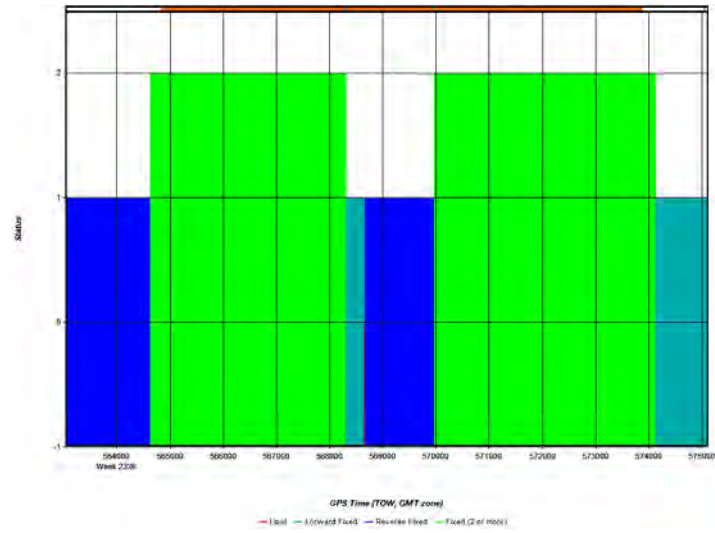
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 2: Aug10Flight1 [Smoothed TC Combined] - Forward/Reverse or Combined Separation Plot



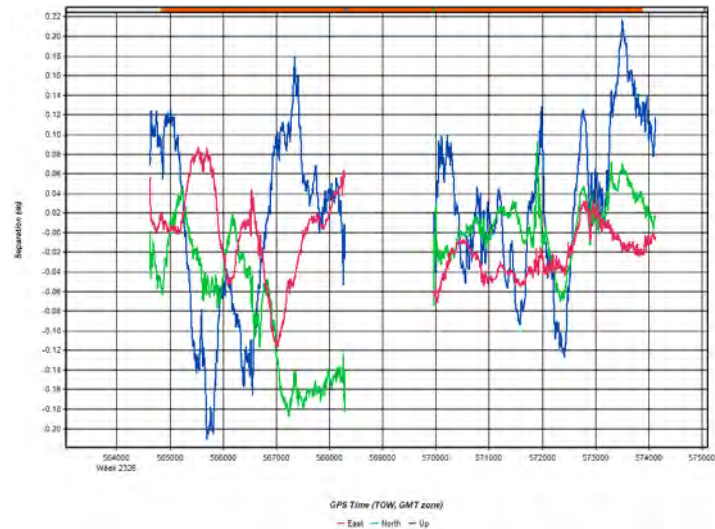
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 3: Aug10Flight1 [Smoothed TC Combined] - Float or Fixed Ambiguity



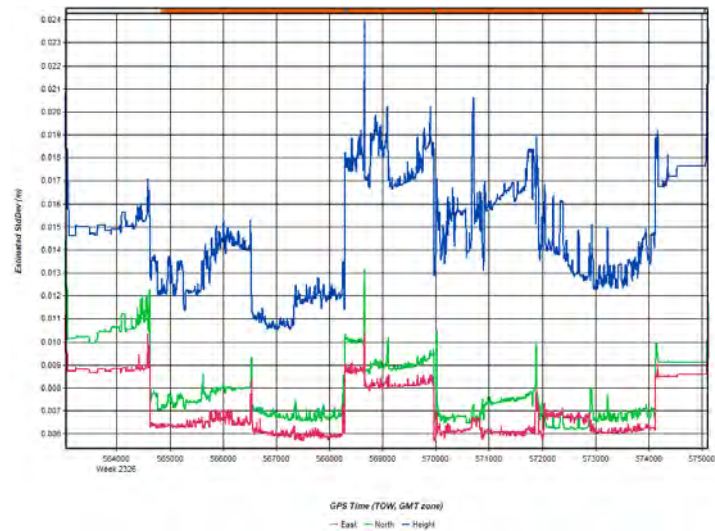
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 4: Aug10Flight1 [Smoothed TC Combined] - Forward/Reverse Separation Plot (Fixed)



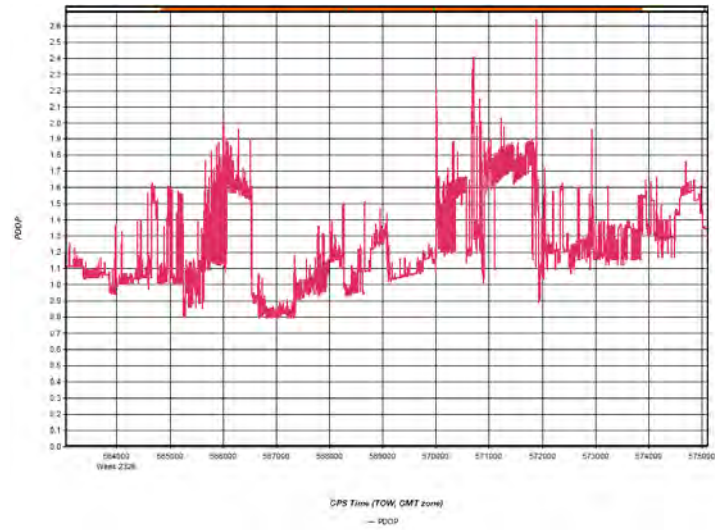
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 5: Aug10Flight1 [Smoothed TC Combined] - Estimated Position Accuracy Plot



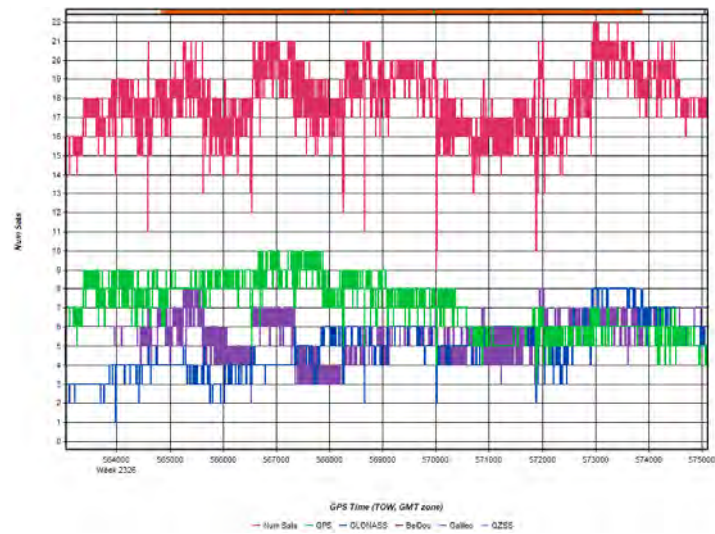
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 6: Aug10Flight1 [Smoothed TC Combined] - PDOP Plot



Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 7: Aug10Flight1 [Smoothed TC Combined] - Number of Satellites Line Plot



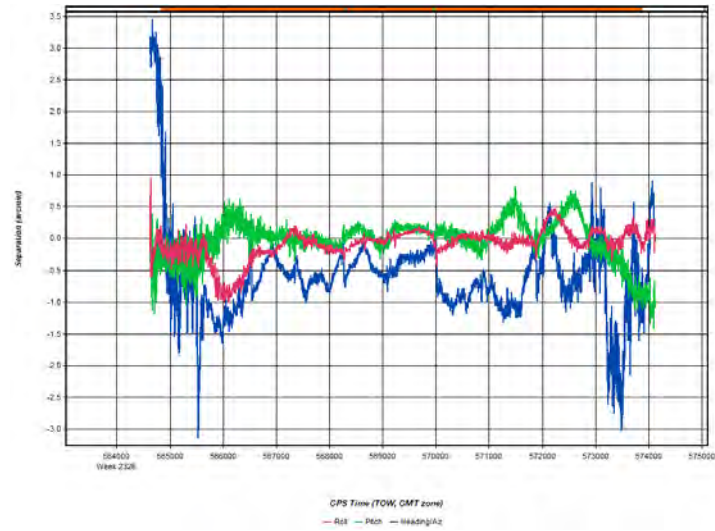
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 8: Aug10Flight1 [Smoothed TC Combined] - Status flag for IMU processing



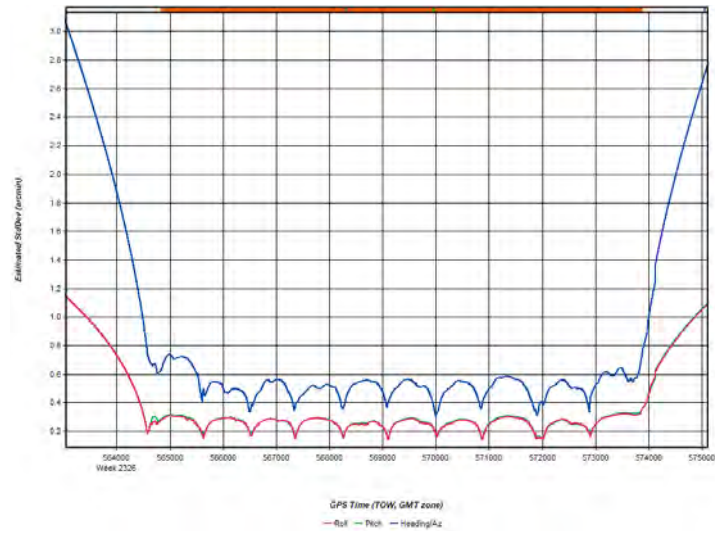
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 9: Aug10Flight1 [Smoothed TC Combined] - Fwd/Rev Attitude Separation Plot



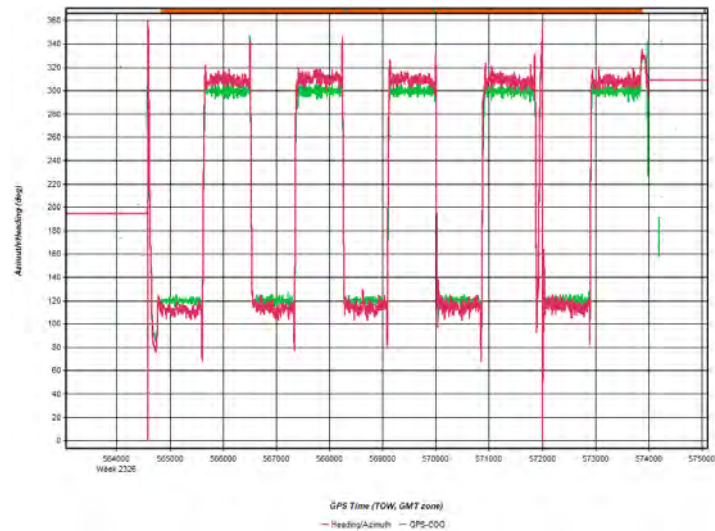
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 10: Aug10Flight1 [Smoothed TC Combined] - Estimated Attitude Accuracy Plot



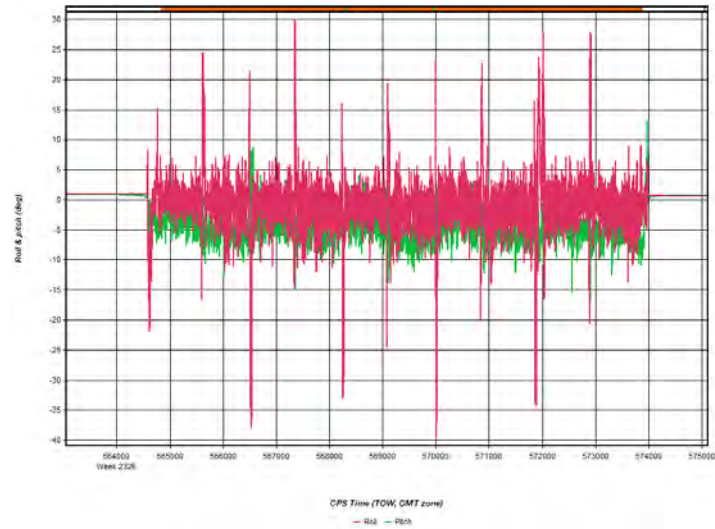
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 11: Aug10Flight1 [Smoothed TC Combined] - Azimuth Plot



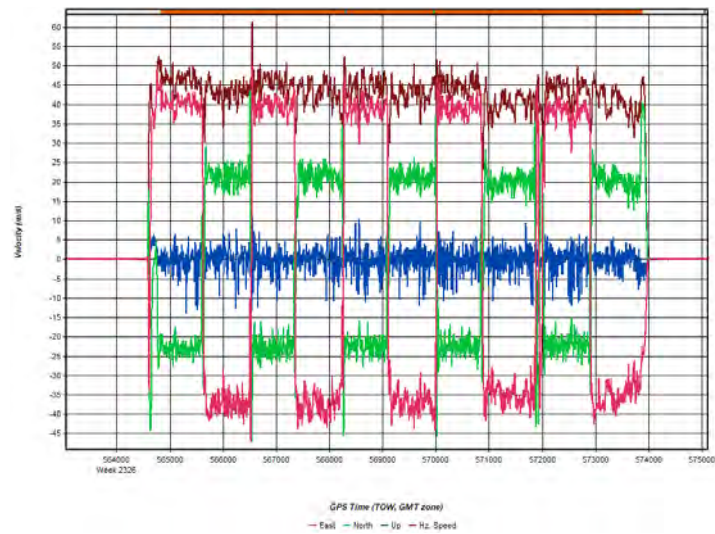
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 12: Aug10Flight1 [Smoothed TC Combined] - Roll & Pitch Plot



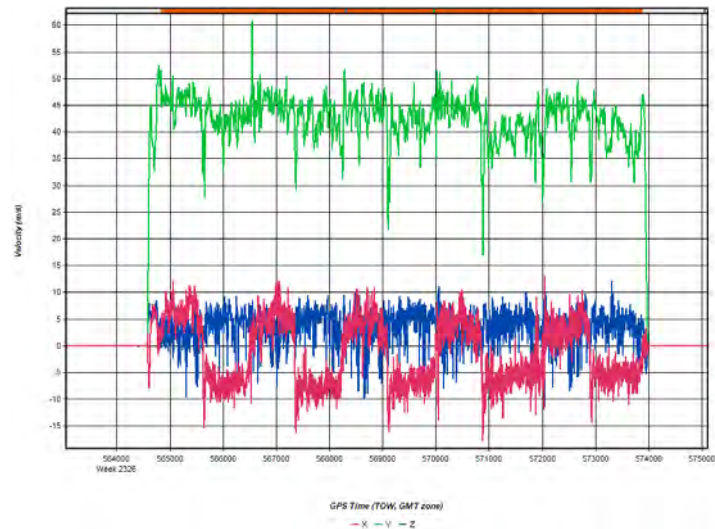
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 13: Aug10Flight1 [Smoothed TC Combined] - Velocity Profile Plot



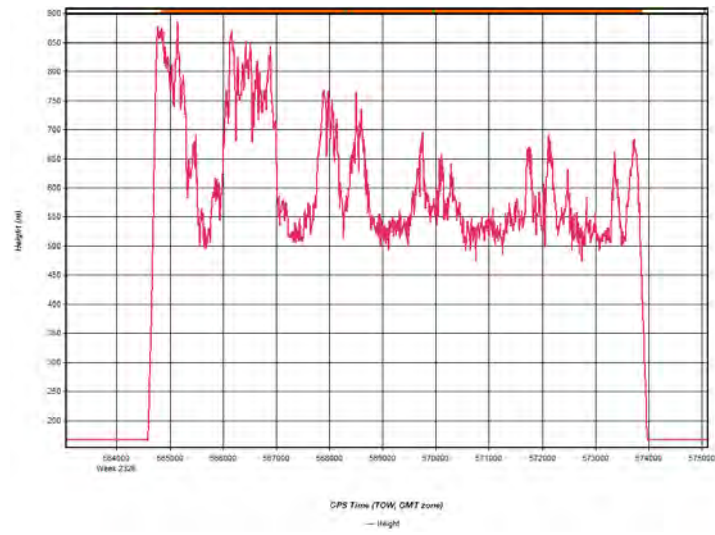
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 14: Aug10Flight1 [Smoothed TC Combined] - Body Frame Velocity Plot



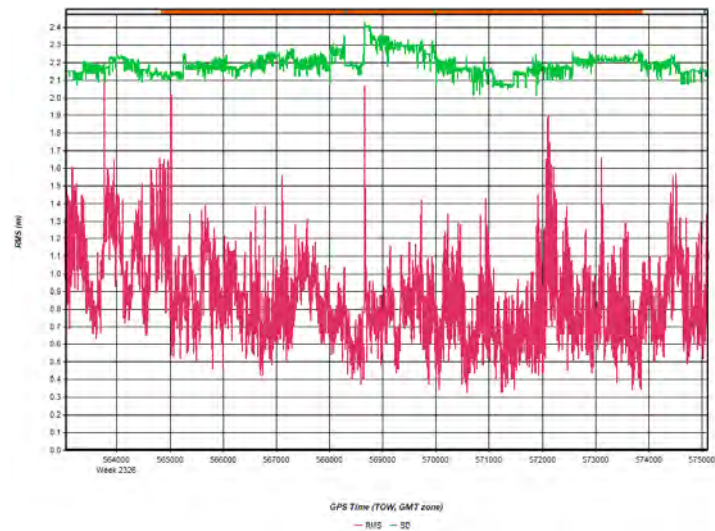
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 15: Aug10Flight1 [Smoothed TC Combined] - Height Profile Plot



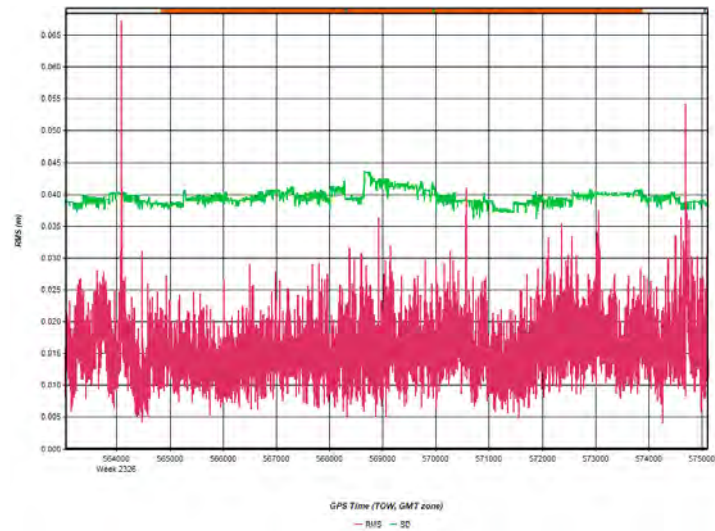
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 16: Aug10Flight1 [Smoothed TC Combined] - C/A Code Residual RMS Plot



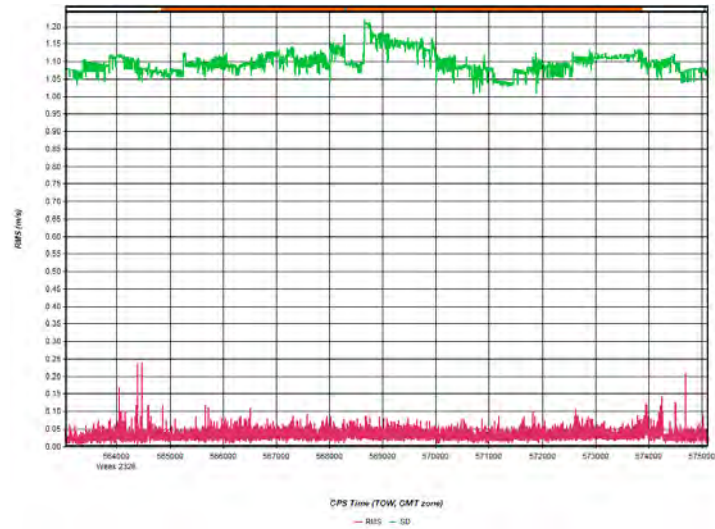
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 17: Aug10Flight1 [Smoothed TC Combined] - Carrier Residual RMS Plot



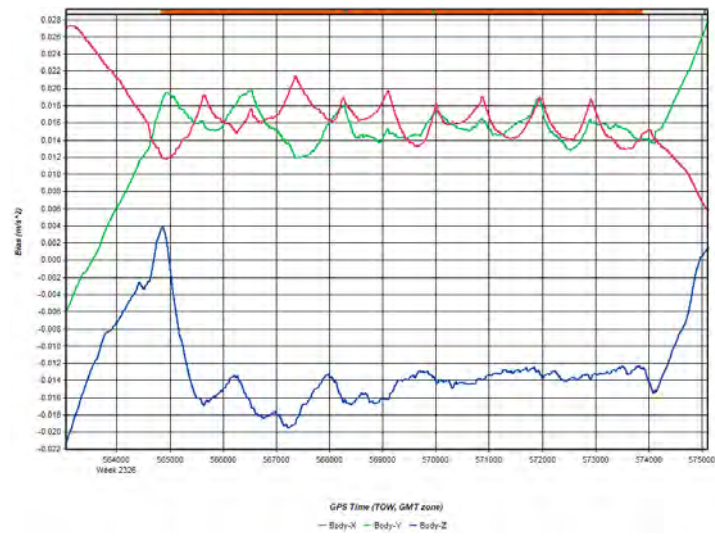
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 18: Aug10Flight1 [Smoothed TC Combined] - Doppler Residual RMS Plot



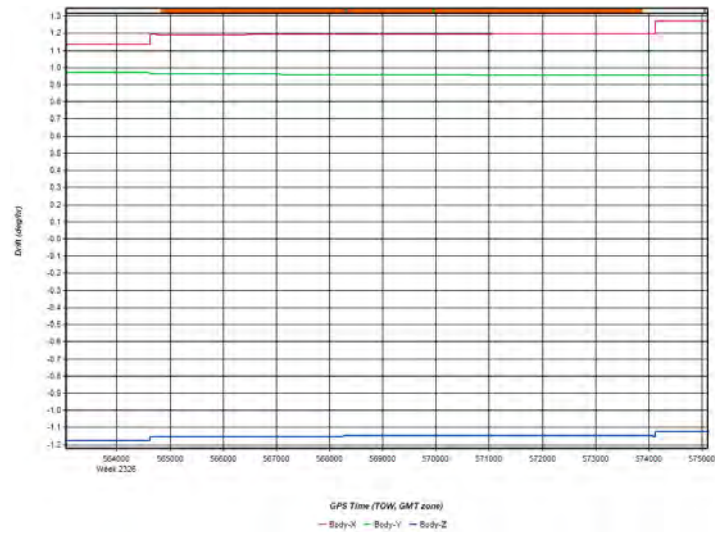
Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 19: Aug10Flight1 [Smoothed TC Combined] - Accelerometer Bias Plot



Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Figure 20: Aug10Flight1 [Smoothed TC Combined] - Gyro Drift Plot

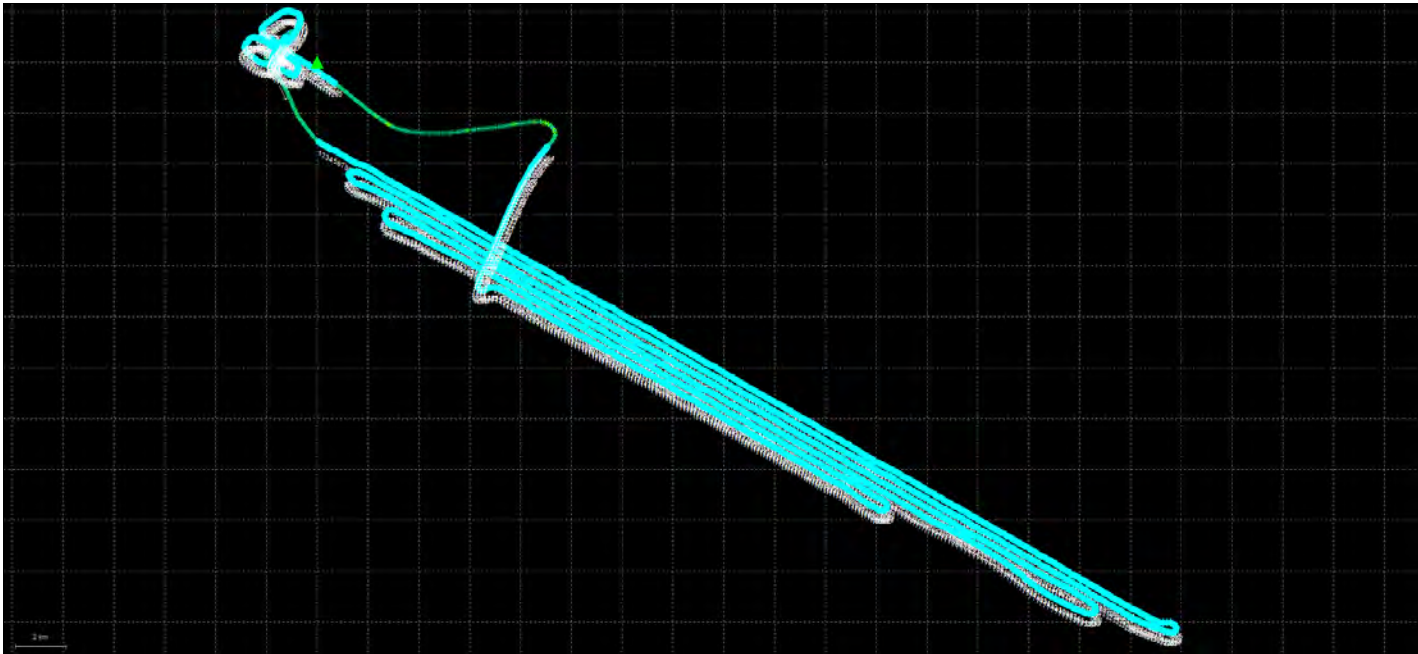


Process	Aug10Flight1	by Unknown	on 9/18/2024	at 19:06:55
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Output Results for Aug10Flight2

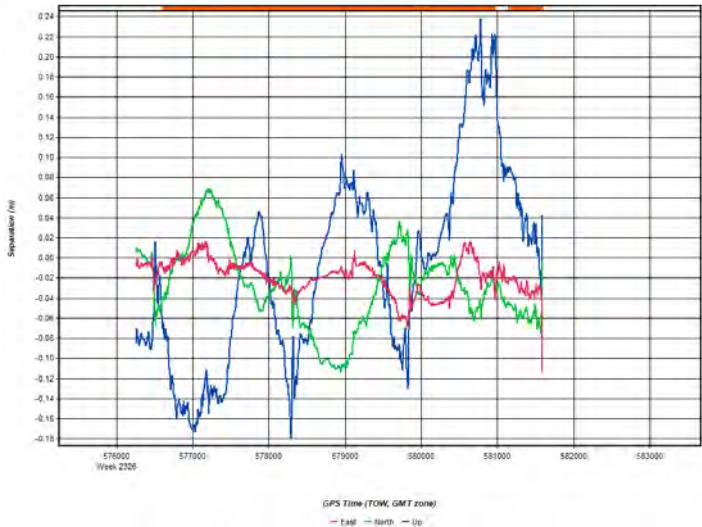
Inertial Explorer Version 9.00.2207
09/18/2024

Figure 1: Smoothed TC Combined - Map



Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 2: Aug10Flight2 [Smoothed TC Combined] - Forward/Reverse or Combined Separation Plot



Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 3: Aug10Flight2 [Smoothed TC Combined] - Float or Fixed Ambiguity

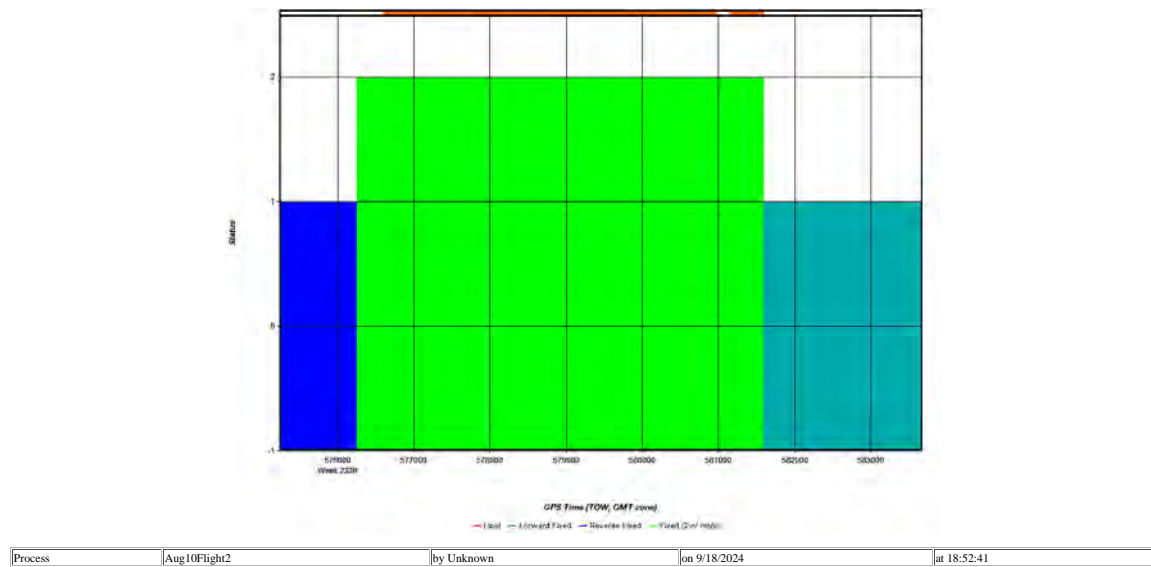


Figure 4: Aug10Flight2 [Smoothed TC Combined] - Forward/Reverse Separation Plot (Fixed)

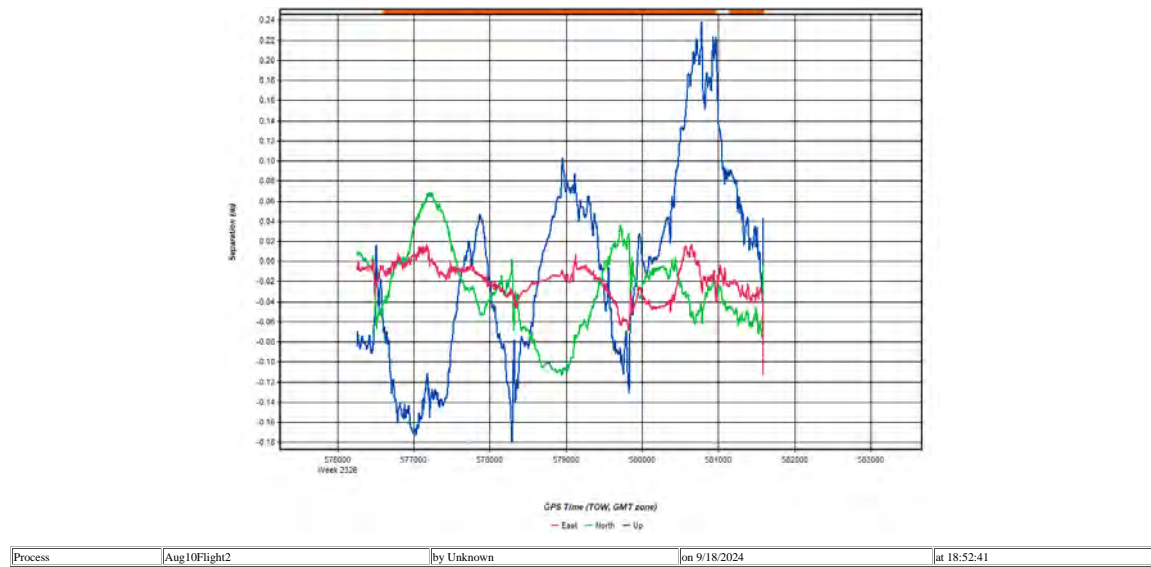
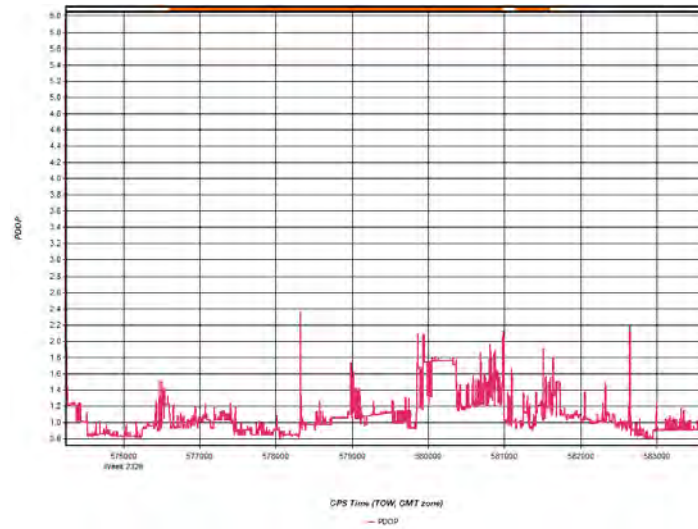


Figure 5: Aug10Flight2 [Smoothed TC Combined] - Estimated Position Accuracy Plot

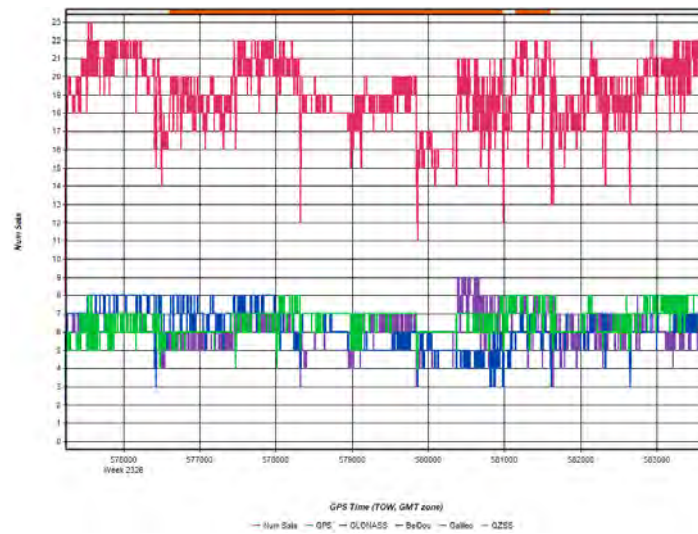


Figure 6: Aug10Flight2 [Smoothed TC Combined] - PDOP Plot



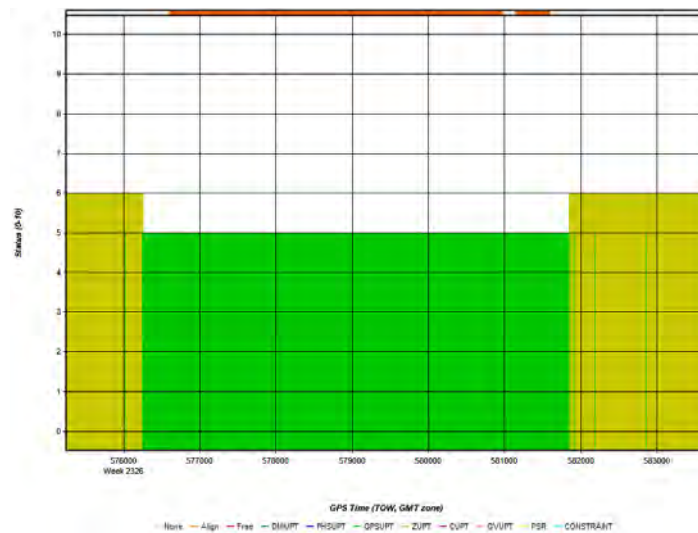
Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 7: Aug10Flight2 [Smoothed TC Combined] - Number of Satellites Line Plot



Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 8: Aug10Flight2 [Smoothed TC Combined] - Status flag for IMU processing



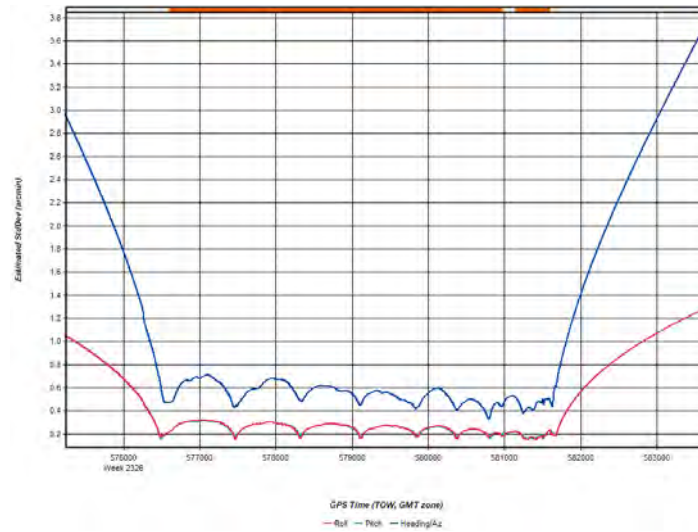
Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 9: Aug10Flight2 [Smoothed TC Combined] - Fwd/Rev Attitude Separation Plot



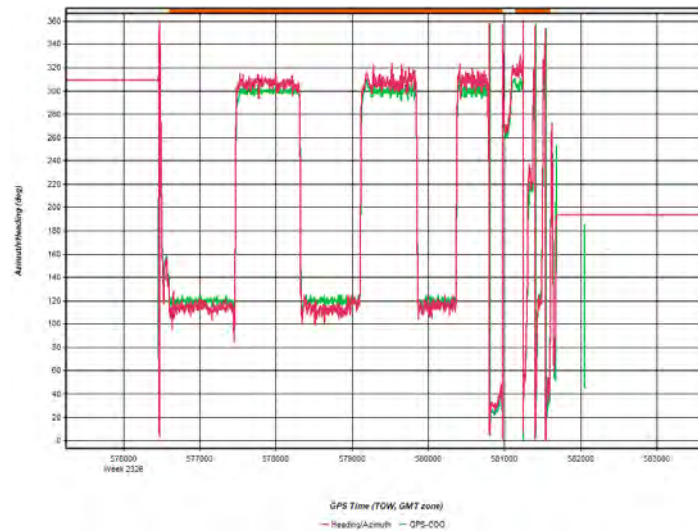
Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 10: Aug10Flight2 [Smoothed TC Combined] - Estimated Attitude Accuracy Plot



Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 11: Aug10Flight2 [Smoothed TC Combined] - Azimuth Plot



Process	Aug10Flight2	by Unknown	on 9/18/2024	at 18:52:41
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Figure 12: Aug10Flight2 [Smoothed TC Combined] - Roll & Pitch Plot