Teslin Area Gravity Survey Logistics Report

60° 11’ N 132° 44’ W, NTS 105C/02 Yukon, Canada

WORK PERFORMED:
February 2 – February 6, 2022
April 05 – April 13, 2022
May 28 – June 9, 2022
July 24 – August 12, 2022

EFFECTIVE DATE:
October 24, 2022

Prepared for:

Yukon Geological Survey

Prepared by:

AURORA GEOSCIENCES

LOGISTICS REPORT
Teslin Area Gravity Survey Logistics Report

Prepared for:

Yukon Geological Survey

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1 SUMMARY

This geophysical report describes a gravity survey conducted for the Yukon Geological Survey to assist locating large faults and structures within the survey area. The goal of the program is to assess the geothermal potential of the survey area. The survey was conducted in a 10 km X 10 km area located within NTS map sheet 105C/02 with a station separation of 500 m and a line separation of 500 m. A detailed grid with a station and line separation of 100 m was centred over the Village of Teslin. In total 427 gravity stations were collected on the 500 m X 500 m grid and 245 points on the 100 m X 100 m grid across four phases from February 2 – 6, April 5 – 13, May 28 – June 9 and July 24 – August 12, 2022. Additionally, 21 NRCAN gravity points were extracted from the Canadian Geoscience Data Repository and processed with the collected gravity data.

A bathymetric survey to support gravity reductions was performed from July 27 to August 1, 2022. A total of 223 line-km of water depths on Teslin Lake were measured.

The crew lodged at hotels in the village of Teslin and commuted to and from to the survey grid by truck, snowmachine, ATV or boat. Travel between points was mostly on foot although some areas were amenable to use a vehicle to travel from point to point, particularly by snowmachine on the lake. The first phase of data collection in February was cut short due to very bad overflow conditions on Teslin Lake. A crew log describing daily operations and production is included with this report as Appendix II. Interpretation and modelling of the data are not within the scope of this project.

2 CREW AND EQUIPMENT

The personnel who conducted the survey are shown in Table 1.

Table 1: Personnel list.

Dave Hildes	Geophysicist (Gravity Operator)	Feb 2 – 6, 2022 April 5 – 9, 2022 May 28 – June 9, 2022
Vince Van Delft	Geophysical Tech (Gravity & GPS Operator)	Feb 2 – 6, 2022 April 5 – April 13, 2022 May 28 – June 3, 2022
Braeden Grey	Field Assistant (GPS Operator)	April 9 - April 13, 2022
Robert Chee	Geophysical Tech (Gravity & GPS Operator)	June 3 – June 9, 2022 July 24 – August 8, 2022

Konner Kimball	Field Assistant (GPS Operator)	July 24 – August 8, 2022
Charles Demers	Bathymetric Tech	July 27 – August 1, 2022
Isabella Demers	Bathymetric Assistant	July 27 – August 1, 2022

The crew was equipped with instruments and equipment as detailed in Table 2. Further details of the instruments are in Appendix III.

Table 2: Instruments and equipment.

Gravity	Gravity meter - Scintrex CG-6 Gravimeter s/n: 18060099 Gravity meter - Scintrex CG-5 Gravimeter s/n: 41368 Gravity accessories
GNSS	Leica Rover s/n: 1511863 (GS15), 2805518 (GS14) Leica GS15, Base s/n: 1502747, 1509564 Leica CS15 controller s/n: 1575572, 1596548, 2535869 Satel & PacCrest Radio & Repeater GPS accessories
Other	Laptops with Geosoft, Gravity & GPS processing software Repair tools Satellite phone & messager Garmin handheld GPSes Bear spray and bear bangers Bathymetry equipment 1 - Truck 1 - Trailer 2 - Snowmobiles (phase 1 & phase 2) 2 - ATVs (phase 4 & phase 4) 1 - Boat (phase 4)

3 SURVEY LOCATION

The target area is 10 km X 10 km centred roughly on the village of Teslin. Lines ran 2.5° north of due east with both station and line spacing of 500 m. A 2 km X 1.5 km detailed grid with 100 m spaced lines and stations is embedded in the coarser grid over the townsite. Three points were not collected on the SW corner of the grid due to their inaccessibility. Some point did not achieve acceptable GNSS quality but similarly were too inaccessible to warrant a repeat reading. Achieving acceptable GNSS quality on the northeast portion of the grid was challenging due to both topographical problems with GNSS radio communication and a mature forest with very few natural openings in the canopy.

Phase 1 of the survey began on Teslin Lake but poor snow conditions (overflow) made efficient data collection impossible and the survey was temporarily abandoned. Points on lake were completed in phase 2 (April) when conditions on the lake were much improved; the detailed grid over the townsite was also completed at this time. The bulk of the land points were collected in phases 3 and 4.

NRCAN gravity points from the Canadian Geoscience Data Repository that are within or proximal to the survey area were downloaded and are included with the gravity data collected in 2022.

Figure 1 shows the locations of the gravity stations surveyed in 2022. All coordinates in this report are in the NAD83 (CSRS) datum using UTM Zone 8 projection, and the elevations are recorded as orthometric heights using the CGVD2013 datum.

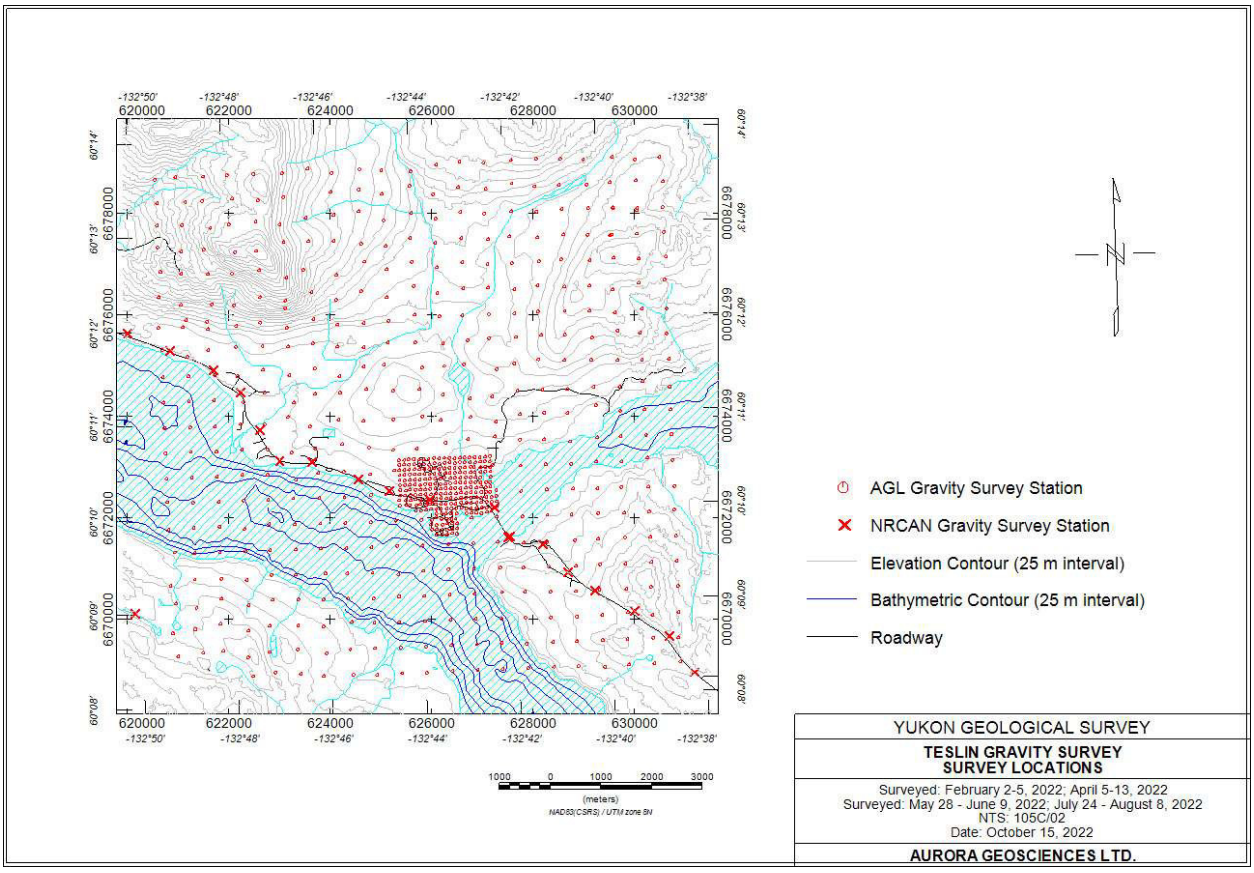


Figure 1: Gravity survey location map.

4 SURVEY SPECIFICATIONS

4.1 Pre-job Gravimeter Checks

Prior to mobilization for each phase, the gravimeter was warmed up for a minimum of 48 hours and kept level on a cement floor. The instrument was then cycled for 24+ hours taking 60 seconds readings continuously to determine the remnant instrument drift and to adjust the drift constant if required. Drift tests are shown in Figure 2, Figure 3, Figure 4 and Figure 5; although a tidal correction has been applied

to these data, a 10-15 µGal remnant tidal effect can be seen over the 30+ hour cycling. The gravimeter remained under power at all times throughout the survey operation with the exception of a short power failure in phase 4 of data collection.

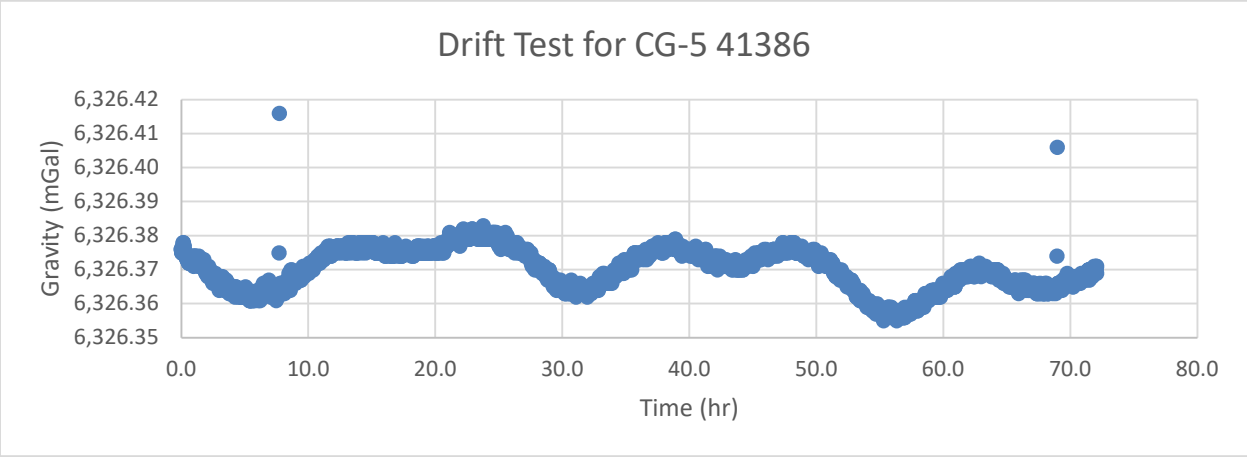


Figure 2: Drift test prior to phase 1 mobilization on January 28-31, 2022.

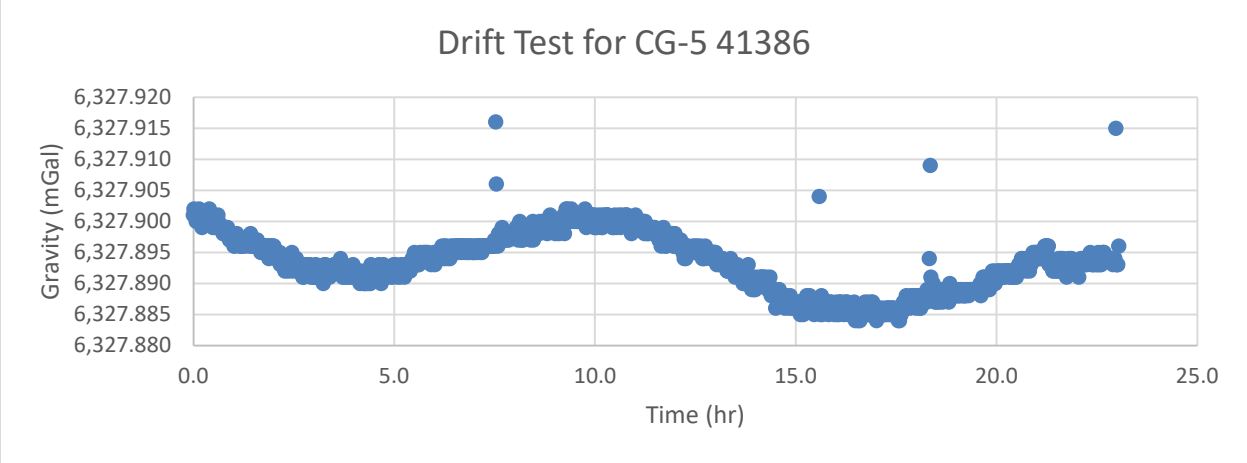


Figure 3: Drift test prior to phase 2 mobilization on March 31 - April 1, 2022.

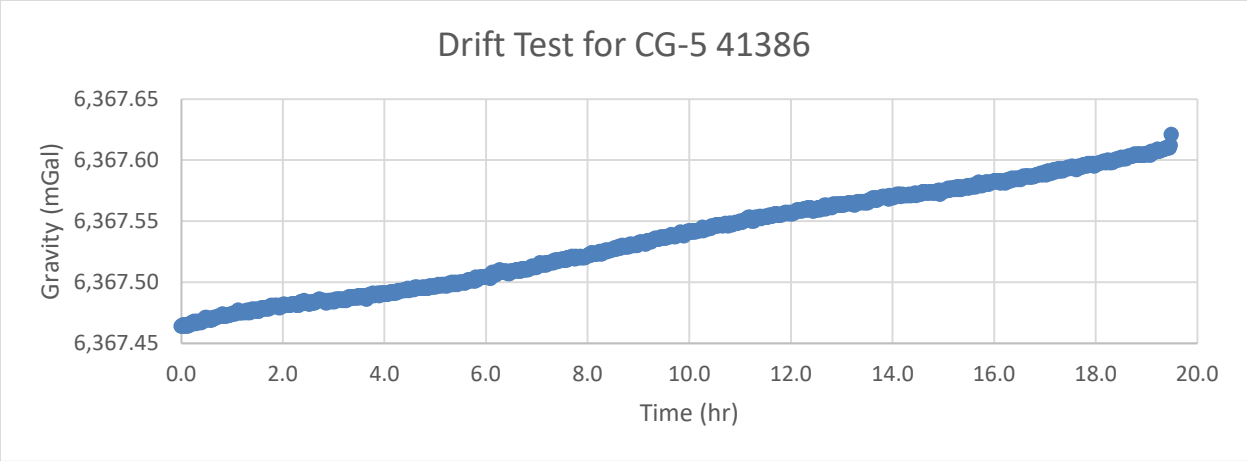


Figure 4: Drift test prior to phase 3 mobilization on May 27-28, 2022.

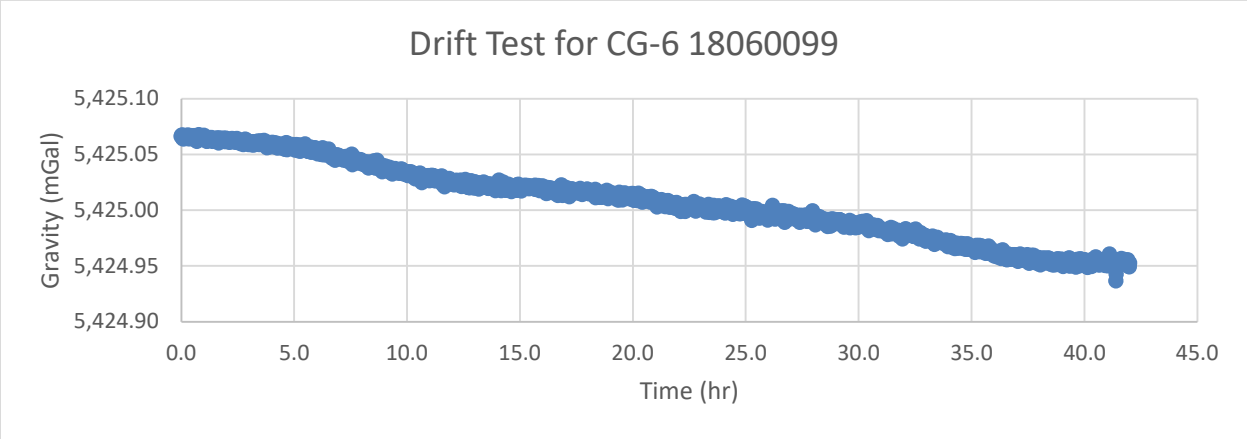


Figure 5: Drift test prior to phase 4 mobilization on July 22-24, 2022.

Walk tests to simulate actual survey conditions were performed prior to mobilization for each phase. A walk test entails repeatedly picking up the gravimeter and walking with it to simulate the motion of walking from station to station. The instrument is returned to a precise location and a suite of short continuous readings are taken. Walk tests for phases 1 and 3 are shown in Figure 6 and Figure 7 where a settling time of 60 s is sufficient to limit the settling error to less than 10 µGal. Practically it takes longer than this to prepare and level the gravimeter at each station in the field so this is not a significant issue for this survey.

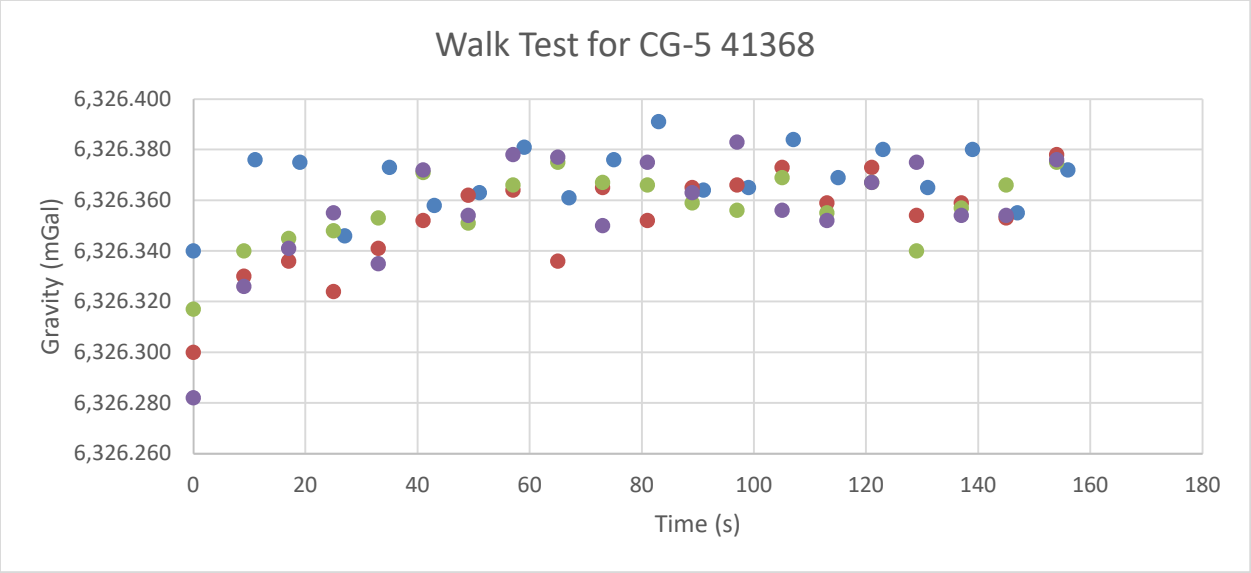


Figure 6: Walk test prior to phase 1 mobilization on January 31, 2022.

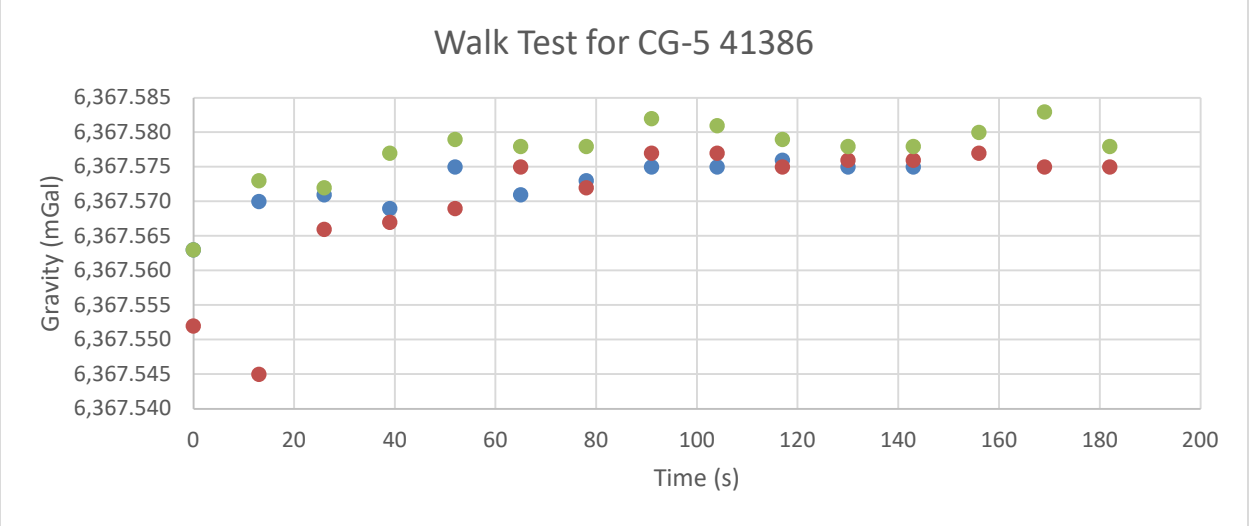


Figure 7: Walk test prior to phase 3 mobilization on May 27, 2022.

4.2 Gravity Survey Specifications & Method

Each gravity station is located using a handheld Garmin GPS. The site is cleared of snow, soft moss and organics or preferentially located on a low boulder if available. The station is usually marked by a flagged nail tagged with the station and line number as well as flagging on a nearby tree; these are omitted when working in populated areas.

During the survey, readings are stacked for a minimum of 60 s (or 2 X 30 s) and when the standard deviation in individual 5 Hz readings (after seismic filtering) is greater than 0.05 mGal, repeat readings are

taken. Repeats are also taken at any station at the discretion of the operator. Seismic filters were engaged to remove seismic noise and wind noise.

Prior and post daily surveying, readings are taken at a control station, established at locations as detailed in Section 5. A minimum of three readings are taken at the control with a maximum range of 0.02 mGal.

4.3 GNSS Survey Specifications & Method

Accompanying the gravity survey is a dual-frequency Global Navigation Satellite System (GNSS) survey to provide vertical control for the gravity reductions described in Section 6.4 using the GPS, Glonass and Galileo constellations. GNSS readings are taken in the same locations as the gravity readings using a 2.0 m rover antenna height. Real-Time Kinetic (RTK) phase-fixed solutions are achieved through the use of a base GNSS station and a radio link between the base and rover. Specification for the 3D Coordinate Quality (CQ3D) is 2.5 cm. If the 2.5 cm threshold is not met, up to 30 minutes of rover GNSS data are recorded for post-processing.

Base stations are established as detailed in Section 5 and log GNSS data, recording the data to disk as well as broadcasting over the radio link.

Achieving a good GNSS solution was challenging for many parts of the survey because of canopy cover and topographic features obstructing radio connectivity. Actual point locations differed from the planned positions by up to 100 metres as the field crew would look for a hole in the canopy in to increase the quality of the GNSS solution.

The rover measurements are not always made on the exact gravity station. Long occupation times are sometimes required and to expedite the survey the GNSS measurement is initiated simultaneously with the gravimeter reading, but this requires the GNSSS measurement to be made approximately 25 cm away from the gravity point. Every effort is made to ensure the GNSS measurement point is at the same elevation as the gravity measurement point. This is acceptable because an accurate vertical survey is very important for gravity reductions as described in Section 6.4 while the same accuracy for the horizontal survey is not required.

4.4 Bathymetry Survey Specifications & Method

Bathymetry data are used in the gravity reductions described in Section 6.4 to correct for the effect a body of water in the vicinity of a gravity reading has on the gravity reading. The bathymetry survey is boat based and data are measured using a 50 kHz / 200 kHz sonar transducer, capable of achieving accurate depth soundings down to 300 m. The transducer is mounted off the transom of the boat and sits at 0.355 m below water surface.

Bathymetry data are surveyed continuously on lines spaced 250 m apart along the lines of gravity collection. Longitudonal lines extending past the gravity survey area are also measured for water depth. The surveyed lines are shown in Figure 8 along with the detailed bathymetric survey done in support of the Nisutlin Bay bridge replacement. Line orientation is chosen to ensure maximize resolution coincident with gravity measurements as proximal water depth has a larger effect on the gravity than distal measurements. The survey grid is located by the operator using a handheld non-differential GPS. Bathymetry data sampling rates are based on water depths and determined automatically by the transducer controller to provide an accurate profile at intervals not exceeding 1 m.

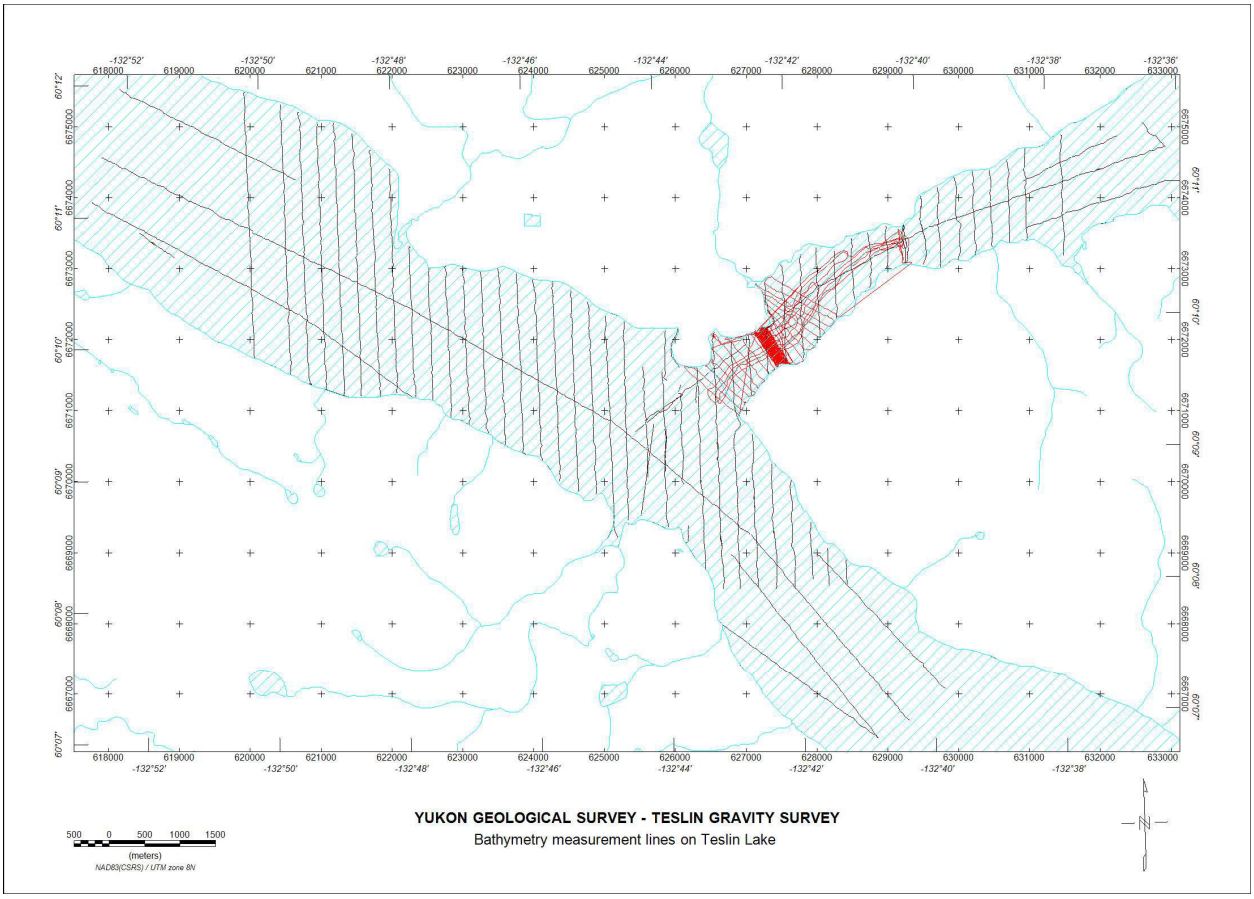


Figure 8: Bathymetry survey lines. Black lines were surveyed by Aurora to support the gravity survey. Red lines show bathymetry done by Yukon Highways and Public Works - Transportation Engineering Branch.

Water depth calibration measurements are plumbed manually along a surveyed line using a weighted metre chain by the operator. Assuming lake bottom material density remains relatively constant across the surveyed grid, any offset observed between the manual bathymetry reading and the sonar bathymetry reading is applied to the sonar dataset as a static correction.

4.5 Remeasured Stations

Several stations were remeasured to assess the quality of the overall methodology.

These are separate from the “repeat” readings described above where the gravimeter was not moved from the tripod and were taken at the discretion of the operator because of non-ideal ground or noisy conditions. Line and station numbers are not changed for the repeats and typically it is only done for the gravity measurement and not for the GNSS measurement.

Remeasurements are surveyed on different days and therefore use a completely different constellation for the GNSS solution. They are assigned a unique line-station identifier by incrementing the station or line number by 1. An effort was always made to re-occupy the exact location however the station markings were not implemented in populated areas and finding the identical location was not always possible.

5 Control Points

5.1 Gravity

Gravity control points, marked with a concrete pad, were established at two locations in 2022 as detailed in Table 3 and shown in Figure 9 and Figure 10. The concrete pad defines the gravity control station using a standard Scintrex CG-5 tripod with the legs close to their minimum extension or a CG-6 tripod.

Table 3: Gravity control locations and dates used.

Location Description	UTM Easting (m)	UTM Northing (m)	Geoid Height (m)	Dates used (2022)	Absolute Gravity (mGal)
Teslin Lake (9990)	626989.175	6672059.834	683.632	February 2 – 6 April 5 – 10	981713.8664
Nisutlin Trading Post Propane Station (8880)	626890 (approx.)	6672339 (approx.)		April 8 – 15 May 27 – June 9 July 24 – August 12	981711.9002

Figure 9: Control station by Teslin Lake in April 2022 (Station 9990).

Figure 10: Control station at Nisutlin Trading Post in April 2022 (Station 8880).

The gravity reference station 9340-1978 at Teslin Lake as shown in Figure 13 and Figure 14 and described in Appendix I was surveyed over 6 days immediately before or after the daily check-in at station 8880 (hotel station) and from these measurements an absolute value for station 8880 is calculated as shown in Figure 11 and Table 4.

Gravity was measured at station 9990 bracketed by measurements of station 8880 as shown in Figure 12 and Table 5.

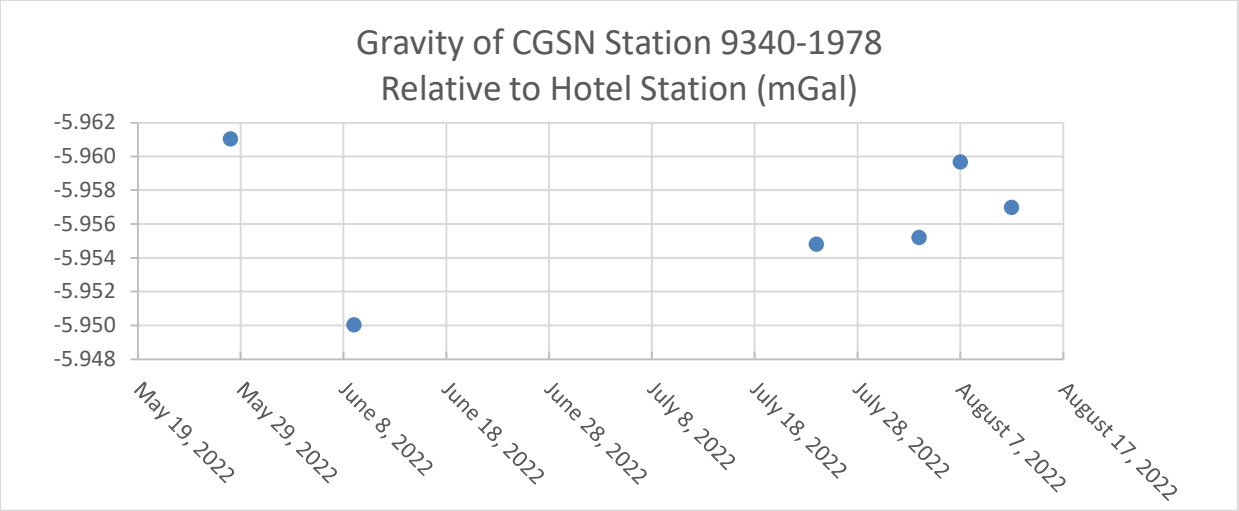


Figure 11: Gravity measurements at CGSN absolute station to measure absolute gravity at station 8880.

Table 4: Calculation details of station 8880 (Lake Station) absolute gravity

Date	Gravity (mGal)	Serial Number	Model
2022-05-28	-5.961	1368	CG-5
2022-06-09	-5.950	1368	CG-5
2022-07-24	-5.955	0099	CG-6
2022-08-03	-5.955	0099	CG-6
2022-08-07	-5.960	0099	CG-6
2022-08-12	-5.957	0099	CG-6
Mean	**-5.956**		
SD	0.0039		
Absolute Gravity of Hotel Station			981711.9002

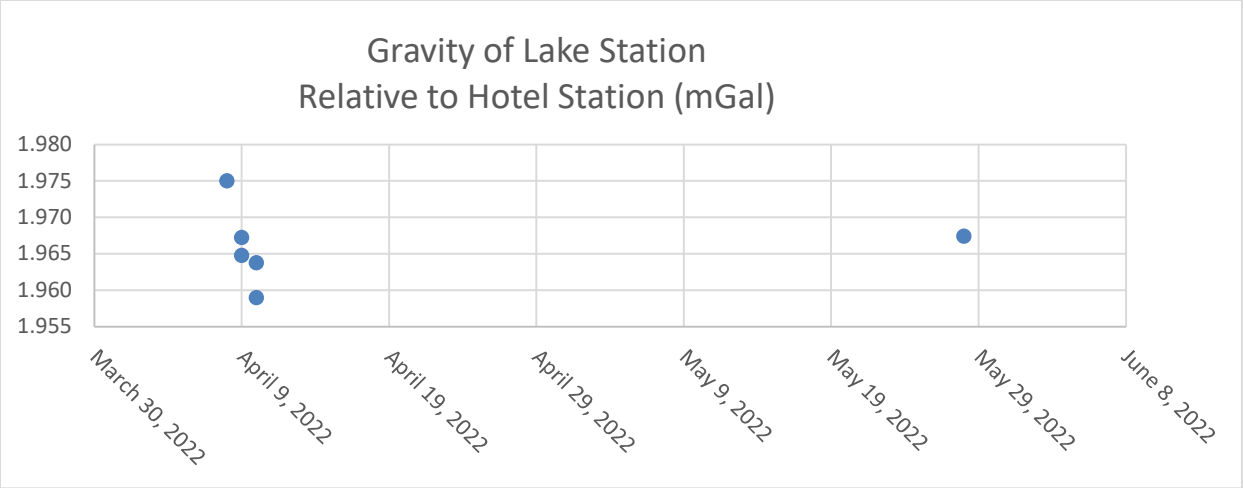


Figure 12: Gravity measurements at station 9990 to measure absolute gravity.

Table 5: Calculation details of station 9990 (Lake Station) absolute gravity.

Date	Gravity (mGal)	Serial Number	Model
2022-04-08	1.975	1368	CG-5
2022-04-09	1.967	1368	CG-5
2022-04-09	1.965	1368	CG-5
2022-04-10	1.964	1368	CG-5
2022-04-10	1.959	1368	CG-5
2022-05-28	1.967	1368	CG-5
Mean	**1.966**		
SD	0.0053		
Absolute Gravity of Lake Station			981713.8664

Figure 13: Teslin Lake CGSN Station 9340-1978.

Figure 14: Teslin Lake CGSN Station 9340-1978.

During the survey, drift measurements were made at a control point prior to and after each day's survey. Figure 15 (control station 9990 – phase 1), Figure 16 (control station 9990 – phase 2), Figure 17 (control station 8880 – phase2), Figure 18 & Figure 19 (control station 8880 – phase 3) and Figure 20 (control station 8880 – phase 4) show the drift for the instrument. The gravity measurement is shown on the y-axis in mGal versus decimal date on the x-axis. A list of the control point locations and dates used is in Table 3.

The discontinuity in Figure 20 on August 5 is due to a temporary power problem overnight and slight cooling of the gravimeter. The gravimeter was re-stabilized for several hours before surveying the next day, although the rate of drift is higher on this day.

There is a discontinuity in the check in on the last day of phase 2 on April 13 (see Figure 17) – the cause is not known.

There will be an increase in error associated with the drift correction on these two days but the scale of the increased error is relatively small, likely on the order of 10-15 µGal.

The slope of the drift changed for an unknown reason part way through phase 3 as evidence in Figure 18. The internal drift constant was reset to compensate. No additional error in the drift correction in anticipated from this.

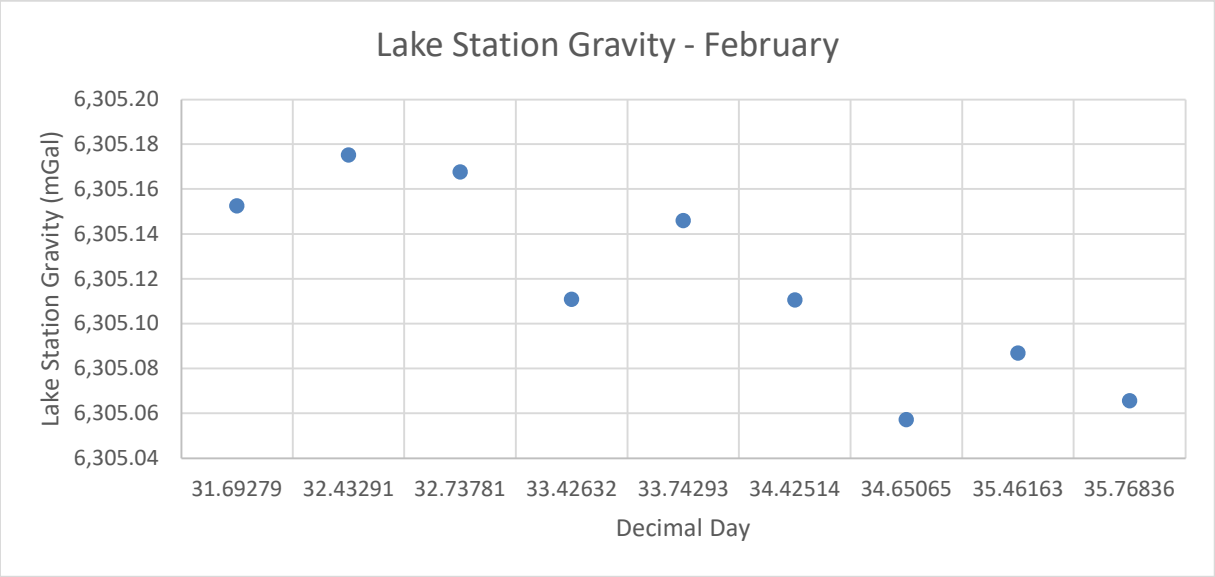


Figure 15: CG-5 check-in at control station 9990 for phase 1 in February 2022.

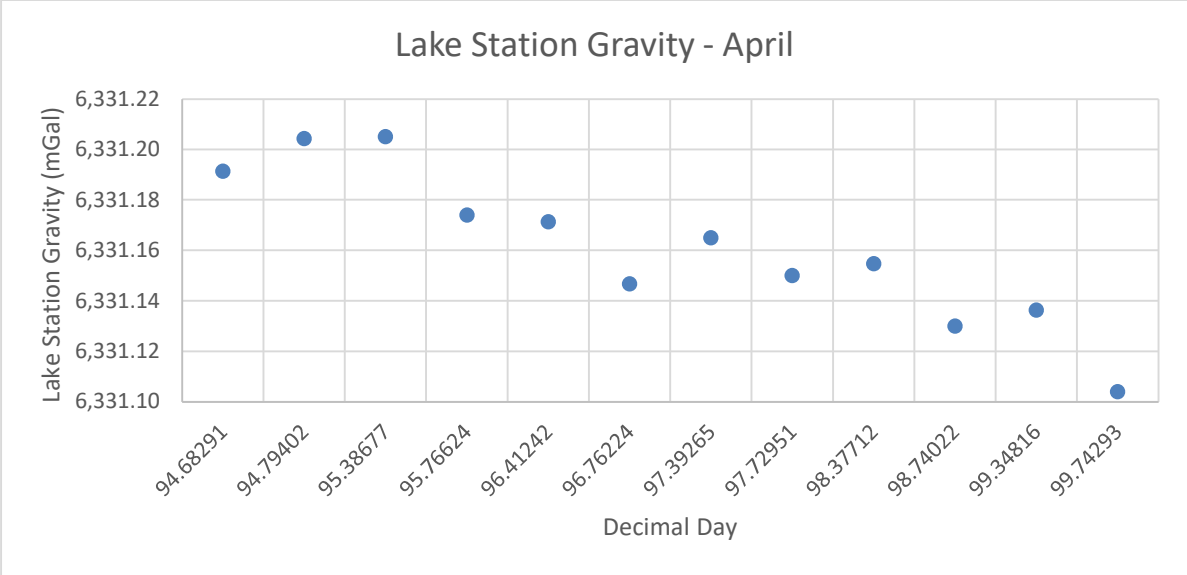


Figure 16: CG-5 check-in at control station 9990 for phase 2 in April 2022.

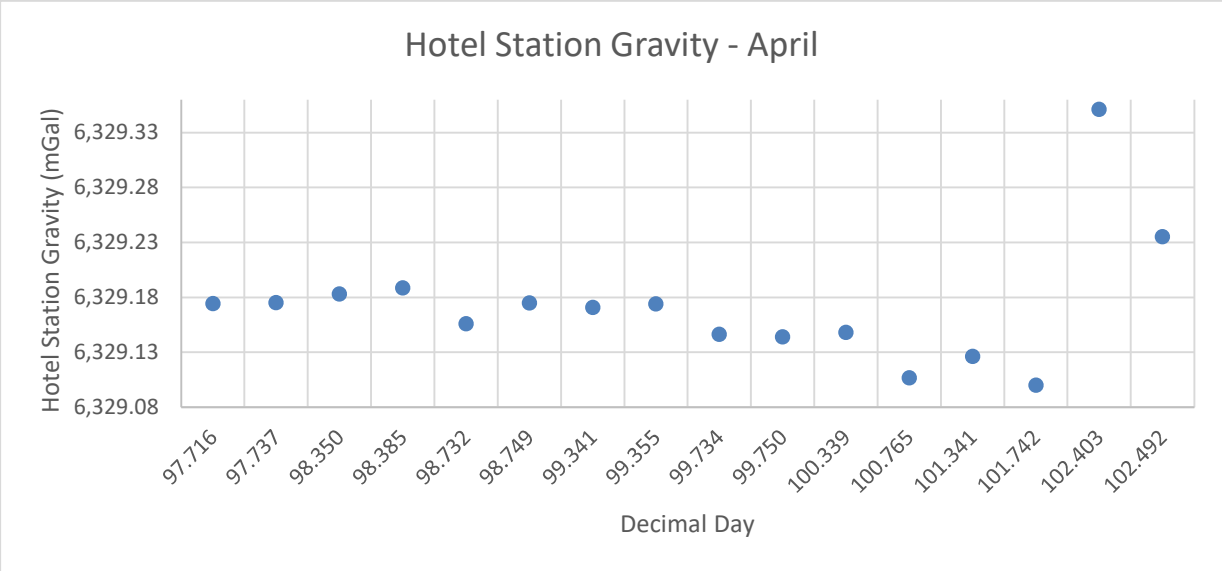


Figure 17: CG-5 check-in at control station 8880 for phase 2 in April 2022.

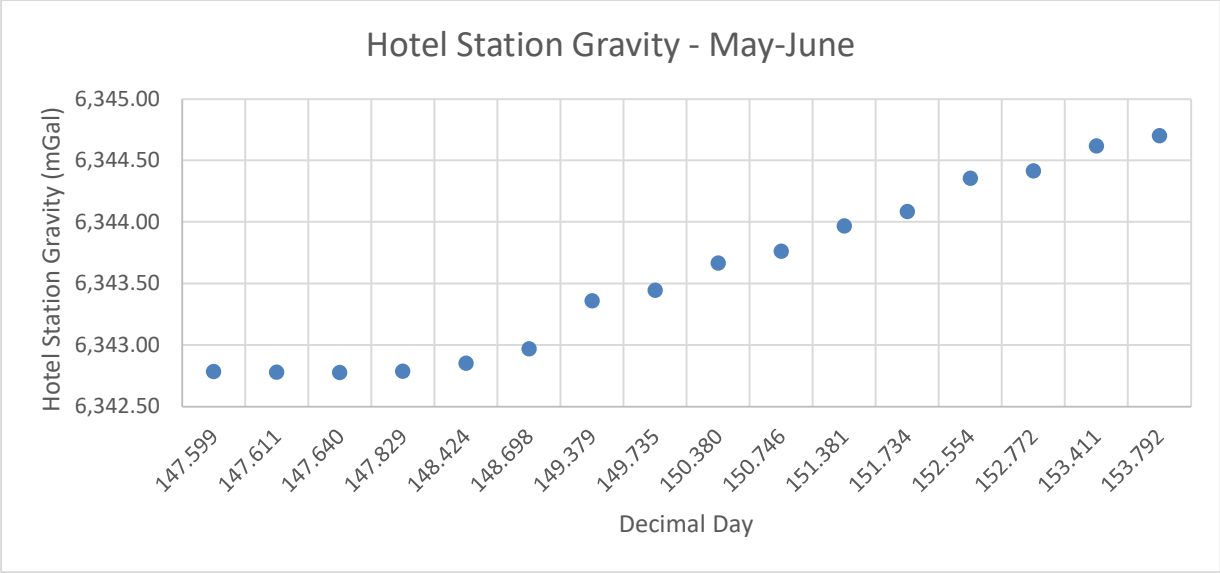


Figure 18: CG-5 check-in at control station 8880 for phase 3 in May & June, 2022 prior to the drift reset.

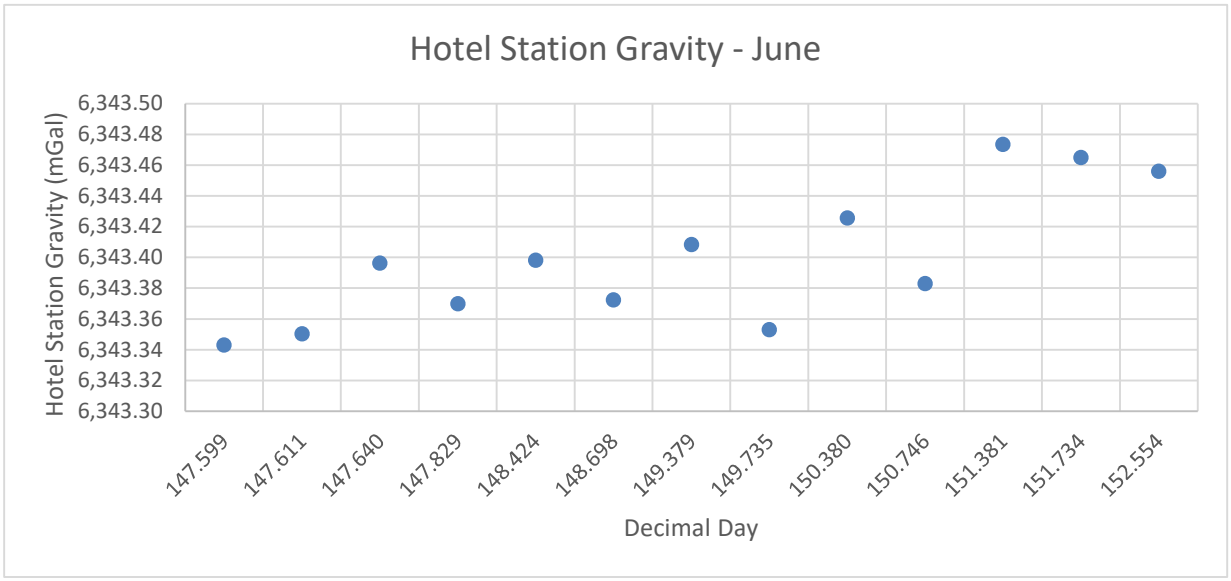


Figure 19: CG-5 check-in at control station 8880 for phase 3 in May & June, 2022 after the drift reset.

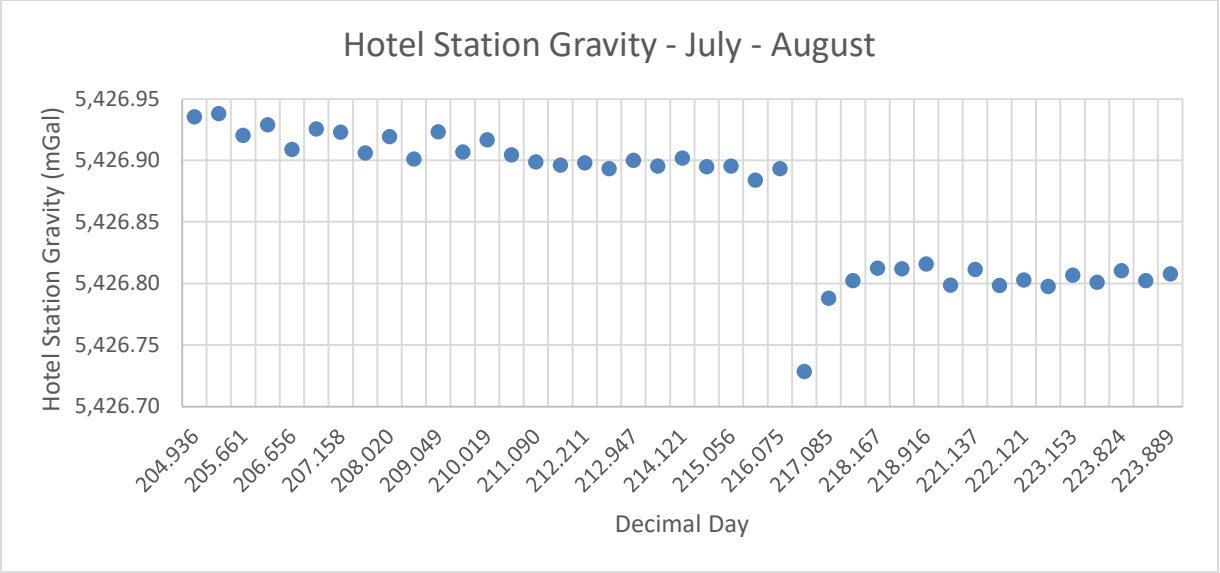


Figure 20: CG-6 check-in at control station 8880 for phase 4 in July & August, 2022.

5.2 GNSS

Control stations were established from which base station measurements were both broadcast via radio to the rover for RTK corrections and logged to disk for post-processing with rover data after the survey. Five locations were used in an attempt to mitigate radio communication problems; once set up the tripods were not moved for the duration that control station is used for the survey so the true position of the base station is very stable.

Several GNSS control station are over identical points but to avoid antenna height measurement errors, it is convenient to treat them as separate control stations.

A position for each GNSS control station is estimated when established and that same estimated position is consistently used every day that GNSS control station is occupied. The actual positions of the control stations are determined by Canadian Spatial Reference System Precise Point Positioning (CSRS-PPP). Submission of the base data to CSRS-PPP is delayed by at least two weeks after collection to ensure the most accurate ephemeris is available to produce the best possible position for the base. Several days of data are submitted (where possible) and the results averaged; an adjustment is then made to the GNSS data to correct for the difference between the estimated position that was broadcast via radio and the averaged final position as determined by CRSR-PPP. The estimated position, final positions and adjustments made to the rover GNSS data are outlined in Table 6, Table 7 and Table 8. The CSRS-PPP results are in Appendix I.

Table 6: Estimated to final GNSS control easting adjustments.

Reference Name	Broadcast Easting	Mean PPP Easting	Easting adjustment
Teslin Lake 1	626986.130	626987.345	1.215
Teslin Lake 2	626984.086	626987.345	3.258
Teslin Airport 1	625839.938	625841.232	1.295
Teslin East	630826.589	630828.138	1.549

Teslin Landfill	628897.044	628898.393	1.349
Teslin Cell Tower 1	621025.501	621027.808	2.307
Teslin Cell Tower 1	621026.651	621027.799	1.148
Teslin Airport 2	625839.938	625841.224	1.286
Teslin Airport 3	625839.938	625841.217	1.279

Table 7: Estimated to final GNSS control northing adjustments.

Reference Name	Broadcast Northing	Mean PPP Northing	Northing adjustment
Teslin Lake 1	6672057.511	6672057.949	0.438
Teslin Lake 2	6672058.973	6672057.949	-1.024
Teslin Airport 1	6672949.357	6672948.565	-0.792
Teslin East	6669380.695	6669381.297	0.602
Teslin Landfill	6670716.848	6670718.303	1.455
Teslin Cell Tower 1	6676872.059	6676872.317	0.258
Teslin Cell Tower 1	6676872.116	6676872.322	0.206
Teslin Airport 2	6672949.357	6672948.586	-0.771
Teslin Airport 3	6672949.357	6672948.597	-0.761

Table 8: Estimated to final GNSS control ellipsoid adjustments.

Reference Name	Broadcast Ellipsoid	Mean PPP Ellipsoid	Ellipsoid adjustment
Teslin Lake 1	683.177	686.970	3.793
Teslin Lake 2	689.600	686.970	-2.630
Teslin Airport 1	711.062	712.049	0.987
Teslin East	847.669	848.434	0.765
Teslin Landfill	789.611	792.894	3.283
Teslin Cell Tower 1	1087.696	1086.128	-1.568
Teslin Cell Tower 1	1085.091	1085.932	0.840
Teslin Airport 2	711.062	712.185	1.123
Teslin Airport 3	711.062	712.003	0.941

All post-processing solutions use the estimated position and therefore the adjustments are universally applied.

All GNSS data use the NAD83 (CSRS) ellipsoid. The transformation to orthometric height is described in Section 6.1.

6 DATA PROCESSING

6.1 GNSS Processing

The real time GNSS solutions calculated at the rover through the radio link with the base GNSS station are examined to identify any points that did not achieve a full phase-fixed solution. Additionally, points that are labelled with an RTK phase-fixed position but that have 3D Coordinate Quality (CQ3D) values greater than 0.025 m are identified.

The identified points are post-processed using Leica Infinity software based on the estimated location of the base as broadcast via radio link to the rover during data collection. The post-processed solutions are compared to the RTK solutions and the following decision protocol is used:

- If a single phase-fixed solution is available, that solution is chosen. If two phase-fixed solutions are available, the one with the lower CQ3D is chosen.
- If the phase-fixed solution with the lowest CQ3D exceeds 0.025 m, that solution is flagged with a non-dummy entry in the GNSS_Flag column of the database.
- If no phase-fixed solution is available but a float, phase xRTK or widelane-fixed solution or solutions are available – which all indicate that the number of phase ambiguities remained a tolerance level – the solution with the lower CQ3D is chosen and this solution is flagged.
- If only code solutions are available or the lowest CQ3D solution is greater than 0.75, no solution is accepted.

Some exceptions are made to this decision protocol; for example, post-processed solutions on a few days appeared to be approximately 20 cm lower than the RTK solution. For consistency, RTK phase-fixed solutions with good CQ3D are chosen over the post-processed solution in these cases even though the post-process phase-fixed solutions had lower CQ3D.

Labels on all GNSS points are checked against the expected position to ensure there are no mislabelling errors. One mislabelled point was identified and not corrected as it was consistent for both gravity and GNSS and was already carried through the processing workflow.

All positions are adjusted to account for the difference between the initial estimated position of the GNSS base and the final CSRS-PPP determined position as described in Section 5.2 .

The NRCAN GPS-H tool is used to transform GNSS ellipsoid heights into orthometric (metres above sea level) heights using the Canadian Gravimetric Geoid model CGG2013a.

6.2 Digital Elevation Model (DEM)

An elevation model is required for the terrain gravity corrections (see Section 6.4.5 and Section 6.4.6); three zones of DEMs are used to balance high resolution close to the gravity station and reasonable file size and computing time.

Far-station_1 correction uses a dense inner DEM covering the survey area and approximately 1 km beyond with a 2.0 m cell size. Far-station_2 correction uses an intermediate DEM that starts at the perimeter of the inner DEM and extends out to approximately 9.0 km beyond the survey area using a 20 m cell size. Far-station_3 correction uses a coarse outer DEM that starts at the perimeter of the intermediate DEM and extends to approximately 100 km beyond the survey area using a 100 m cell size.

The primary products for the inner DEM are a LiDAR data provided by the Yukon Geological Survey and the Arctic DEM[1] which is produced for areas above 60° N from high resolution WorldView and GeoEye satellite imagery. It is constructed from ~0.5 m data and is generally available as a 2 m grid. The LiDAR data came at a higher resolution than 2 m and is down-sampled for the inner DEM.

The LiDAR survey is the highest quality product but does not cover the entirety of the inner DEM and is supplemented with the Arctic DEM as first priority. However, the Arctic DEM also has holes in coverage over the inner DEM area and the Canadian Digital Elevation Model (CDEM) is used to complement the higher resolution LiDAR and Arctic DEMs. The CDEM comes at a resolution of approximately 10-15 m and is up-sampled for the inner DEM.

The data at the seams between the three products is not entirely consistent and a buffer zone is used to average adjacent DEMs to mitigate sharp steps. The mixing of the DEMs and resulting mismatches is not ideal but is not critical from a gravity reduction viewpoint as long as the inconsistencies are not close to any gravity stations; therefore the seams and overlaps between the three products are positioned between the gravity stations. All seams are in the 500 m X 500 m grid and not the detailed 100 m X 100 m grid which facilitated this process.

The intermediate DEM combines the Arctic DEM with the CDEM at a resolution of 20 m. The seams between the two are far from all gravity stations so no consideration is made to massage the data at the seams. The Canadian Digital Elevation Model (CDEM) is used to construct the outer 100 m DEM.

There are no data reported from the LiDAR or the Arctic DEM for the surface of Teslin Lake. These are added to the inner and intermediate DEMs through the direct measurement of the water surface, measured during the bathymetric survey at 683.78 MASL.

The outline of the inner DEM is removed from the intermediate DEM so that this area does not provide double terrain corrections when the second round of far-station terrain correction is calculated. Similarly, the outline of the intermediate DEM is removed from the outer DEM.

6.3 Bathymetric Processing

Two systems of bathymetry data collection were used during the survey due to some equipment failure.

The bulk of the raw sonar transducer altitude (height of transducer above lake bottom) readings are imported into SonarTRX software developed by Leraand Engineering Inc. (LEI). As a first order inspection, high-resolution lake bottom profiles generated in SonarTRX are analyzed for irregularities determined to be geologically unrealistic. The parts of profiles attributed with unrealistic irregularities are excluded from further processing.

Following first order inspection, the lake bottom profiles are resampled to readings every two metres and geographically registered profiles of water depths are exported to CSV format files. Water depth values are determined by applying the measured transducer-lake surface offset of 0.355 m to the recorded transducer altitudes. These depths are combined with the secondary bathymetric system and an offset determined by examination of coincident points of 1.35 m applied to bring the two datasets consistent with each other.

[1] https://www.pgc.umn.edu/data/arcticdem/

Line profiles of the decimated water depth data are imported into Geosoft's Oasis Montaj for final inspection and gridding of bathymetry data. Each line profile is inspected for discontinuous lake bottom gradients / spikes caused by resampling of the original profile. A non-linear filter is applied to each line profile of water depths to smooth over spikes and large lake bottom discontinuities, producing a profile more accurately reflecting the actual lake bottom profile.

The collected data are compared to the bathymetric measurements collected for the new Nisutlin Bay bridge[2] and an adjustment of 0.21 metres is made to the YG water depth data to make them consistent with the Aurora data.

The shoreline of the lake from NRCAN's Canvec hydrology layer is used to define the shoreline and is assigned a depth of zero. Contours of 15.24, 60.96, 91.44, 121.92 and 213.36 metres (corresponding to 50, 200, 300, 400 and 700 feet) are estimated outside of the survey area from a historic bathymetric map. The shoreline, estimated contours and surveyed data are all combined to produce a bathymetry map that encompasses the entire lake but with the required higher level of accuracy within and proximal to the gravity survey footprint.

A measurement of the elevation of the water surface (683.780 MASL) is made to transform the depth soundings into lake bottom elevations which are used in bathymetric gravity corrections described in Section 6.4.7.

An inner lake bottom DEM with a resolution of 2 m and an intermediate lake bottom DEM with a resolution of 20 m are constructed with exactly the same geographic bounds as those described above in Section 6.2.

Depths of the bathymetric products are in metres.

6.4 Gravity Corrections

A suite of corrections is applied to the raw gravity to produce the Bouguer anomaly. Tilt and temperature corrections are performed on-board the CG-5 and CG-6 gravimeters. Tidal corrections are also normally part of the on-board suite of corrections although in phase 4 the internal GNSS of the gravimeter malfunctioned and the errant corrections based on incorrect positions are replaced with externally calculated tidal corrections.

The Bouguer anomaly is calculated by adding the Bouguer, Bullard-B, near-station terrain and far-station terrain and bathymetric corrections – which are all directly proportional to density – to the free-air anomaly. A suite of densities (2.4 g/cm^3, 2.5 g/cm^3, 2.6 g/cm^3, 2.67 g/cm and 2.7 g/cm^3) is used to create a Bouguer anomaly (BA) for each density.

6.4.1 Drift

The drift correction removes the linear drift of the gravimeter between readings at the control stations prior and post every survey day. The datum is originally set arbitrarily and then later adjusted to reflect absolute gravity as described in Section 5.1.

[2] Hydraulic Study Report – Nisutlin Bay Bridge Replacement. Final report for Yukon Government Highways and Public Works – Transportation Engineering Branch. Project No 19M-01696-00, April 29, 2021.

6.4.2 Latitude

The earth's gravitational field varies with latitude because of centrifugal force and equatorial distension of the terrestrial spheroid. Gravitational acceleration consequently increases from the equator towards the poles. Somigliana's equation is used to determine the expected strength of the gravitational field at the latitude of every gravity station through:

$$G_\phi = G_e \frac{1 + \mathrm{k} \sin^2 \phi}{\sqrt{1 - e^2 \sin^2 \phi}}$$

Where G_ϕ is the expected gravitational field at latitude ϕ, $G_e$is the normal gravity at the equator (978932.67715 mGal), e is the eccentricity of the Earth (6.69438002290 X 10^{-3}) and k is an ellipsoidal parameter (1.931851353 X 10^{-3}).

6.4.3 Free-Air

The free-air correction corrects for the change in distance from the centre of the Earth through:

$$\Delta g_{FA} = H(2 \frac{G_\phi(1 + f + m - 2f \sin^2 \phi)}{a} - 3H \frac{G_\phi}{a^2})$$

where Δg_{FA} is the free-air correction, H is the geoid elevation of the point, G_ϕ is the expected gravitational field at latitude ϕ, a is the semi-major axis of the earth (637817 m), f is the flattening of the earth (3.35281068118 X 10^{-3}) and m is 3.44978600308 X 10^{-3}.

The free-air anomaly is calculated by subtracting G_ϕ from the observed gravity (which incorporates the on-board tilt and temperature corrections, tidal, drift and local datum corrections) and then adding Δg_{FA}.

The NRCAN data does not detail all these corrections and reports only the free-air anomaly.

6.4.4 Bouguer Slab and Bullard-B

The Bouguer slab correction compensates for the attraction of an infinite slab of material of density *ρ* located between mean sea level and the elevation *H* of the gravity station. The Bouguer slab correction (Δg_B) is:

$$\Delta g_B = -0.0419 * \rho * H$$

The Bullard-B correction accounts for the curvature of the earth and is applied to account for the finite nature of the crustal slab used in the Bouguer correction.

6.4.5 Near Terrain

The near-station terrain correction compensates for the effect of local differences in topography within 20 metres from a gravity station. DEMs are usually neither fine nor precise enough for this correction and instead gravity operators measure the average slope within six 60˚ sectors in a 20 m radius around the reading site. The slopes are converted to elevation differences which are used in the sector equation for the gravitational effect of a sector from a vertical cylinder:

$$\delta g_T = \gamma \rho \theta \left\{ (r_o - r_i) + \sqrt{r_i^2 + \Delta z^2} - \sqrt{r_o^2 + \Delta z^2} \right\}$$

where δg_T is the terrain correction required for a sector of angle θ with inner and outer radii equal to r_i and r_o , γ is the gravitational constant (6.67430 X 10^{-11}Nm²/kg²), terrain density equals ρ, and $\Delta z = |z_s - z_a|$ where z_s is the station elevation and z_a is the average terrain elevation in the sector. The single slope measurement made by the field crew is interpolated to make a calculation for a suite of cylindrical sectors with $r_o - r_i = 0.5$.

When LiDAR or the Arctic DEMS exist, the accuracy of these products can exceed the estimates made by only 6 slope measurement in the field and sampled values from the DEMs are used instead of measured values. When this method is used up to 180 sectors are used instead of six.

The final near terrain correction (Δg_{NT}) is the sum of the contributions from all individual sectors:

$$\Delta g_{NT} = \sum_r \sum_\theta \delta g_T(r, \theta)$$

6.4.6 Far Terrain

The far-station terrain correction compensates for terrain effects from 20 m to 100+ km outside the survey area.

Three zones of DEMs as described in Section 6.2 are used with the following formula to evaluate the vertical component of the gravitational attraction of a flat top prism:

$$\delta g_{FT}(x, y, z) = -\gamma\rho \int_{x-u_1}^{x-u_2} \int_{y-v_1}^{y-v_2} \int_{z-w_1}^{z-w_2} \frac{w}{\sqrt{(u^2 + v^2 + w^2)^2}} du\, dv\, dw$$

Each DEM node becomes the centre of a prism reaching halfway to the adjacent nodes and is combined with each gravity station location. For every gravity station, the sum of the contribution of all individual DEM nodes yields the far terrain correction (Δg_{FT}).

The elevation used at the station for the far-station terrain correction is the sampled elevation from the DEM instead of the actual measured GNSS elevation. This prevents artifacts from any remaining mismatch between the measured elevation and the DEM.

6.4.7 Bathymetric

The bathymetric correction compensates for the effect of the layer of water which is a different density than the terrain correction as described above. However, the methodology is almost identical. A terrain correction is implemented at density ρ for the surface of lake and then a terrain correction for the bottom of the lake calculated with $\rho - 1$ is subtracted. This results in a bathymetric correction that removes the effect of the water column.

Special consideration is made to the cell on which the station sits. A cylindrical calculation analogous to that done in Section 6.4.4 is made to correct for the column of water directly below the gravimeter.

6.5 Trend Removal

Trend removal is a common practice in gravity surveys to highlight features of interest that can be masked by large scale gravity trends – typically on a scale larger than the survey area. The data are gridded using a minimum curvature algorithm with a 50 m cell size and then several methods of trend removal are used.

For the first-order trend removal (FOTR), all points of the gridded data are used to calculate a best-fit plane which is then subtracted from the original grid.

For the second-order trend removal (SOTR), all points of the gridded data are used to calculate a best-fit second order polynomial which is then subtracted from the original grid.

The original gridded data are upward continued by 2500 metres; this process is a natural long-wavelength filter that is well-suited to gravity (potential field) data. The upward continued grid is subtracted from the Bouguer anomaly grid to produce a resultant grid with the long wavelengths removed; these are labelled up2500TR.

7 CANADIAN GEOSCIENCE DATA REPOSITORY

Proximal gravity stations are extracted from NRCAN's Canadian Geoscience Data Repository and are integrated with the data collected for this project. These points are shown as separate symbols in Figure 1. The original station numbers are preserved but all these points are assigned a line number of 9999.

The free-air anomalies from the NRCAN data are consistent with the free-air anomaly described in Section 6.4.3; no details are provided for the processing (e.g. tilt, temperature, tidal or drift corrections) prior to the free-air anomaly.

Bouguer slab, Bullard-B, near-station terrain, far-station terrain and bathymetric corrections are applied to the NRCAN data in an identical methodology as survey described in Sections 6.4.4 to 6.4.7.

8 RESULTS AND DISCUSSION

Details of all the remeasurements are shown in Table 9. As seen by the *Distance* column which is the (maximum) distance between the remeasurements only one station (8500,9000) shows a significant distance between the measurements but nonetheless shows good agreement with the Bouguer Anomaly. Two other sets of points - (7000,500) and (7500, 2500) - were labelled as remeasurement but in fact were both approximately 150 metres apart. These two sets of points are not included in Table 9 and the results are not averaged but left distinct. One remeasurement from (2500,7500) is mislabelled as line 3500. However, as it is consistently mislabelled in both GNSS and gravimeter, it is not of consequence and is left mislabelled in the final database. The remeasurements indicate that the overall error associated with the survey is on the order of 32 µGal.

Table 9: Results of all re-measurements.

Line	Station	Easting	Northing	Distance	Date	BA_267	Range	Mean
0	10000	630906.658	6669176.000	0.109	2022-05-30	-83.882	0.043	-83.861
0	10001	630906.614	6669175.900		2022-06-09	-83.839		
2500	7500	628270.088	6671524.100	0.200	2022-05-31	-80.119	0.033	-80.103
2500	7501	628270.098	6671524.300		2022-06-09	-80.086		
3400	5200	625983.792	6672372.100	0.027	2022-04-09	-81.324	0.019	-81.334
3400	5201	625983.819	6672372.100		2022-04-10	-81.343		

10000	9500	630007.325	6679070.500	0.152	2022-06-03	-96.140	0.018	-96.131
10000	9501	630007.439	6679070.400		2022-06-04	-96.122		
2800	5600	626405.305	6671778.200		2022-04-11	-82.899		
2801	5600	626405.445	6671778.100	0.789	2022-06-09	-82.867	0.032	-82.887
2802	5600	626404.682	6671778.000		2022-08-12	-82.894		
3100	5600	626390.162	6672090.200		2022-04-11	-82.147		
3101	5600	626389.937	6672089.100	1.283	2022-06-09	-82.131	0.016	-82.141
3102	5600	626389.708	6672090.300		2022-08-12	-82.145		
3900	5100	625861.823	6672868.200	1.345	2022-04-08	-79.290	0.044	-79.268
3901	5100	625862.822	6672867.300		2022-06-09	-79.246		
2500	7500	628270.088	6671524.100	2.007	2022-05-31	-80.119	0.038	-80.100
3502	7500	628269.915	6671522.100		2022-08-12	-80.081		
2000	7500	628316.236	6671039.700	2.413	2022-06-01	-78.406	0.061	-78.376
2001	7500	628317.948	6671038.000		2022-06-09	-78.345		
3300	5700	626473.846	6672285.600		2022-04-07	-81.821		
3301	5700	626473.105	6672288.500	3.125	2022-06-09	-81.804	0.025	-81.818
3302	5700	626472.683	6672286.400		2022-08-12	-81.829		
8500	9000	629549.299	6677590.000	30.567	2022-06-04	-92.683	0.025	-92.671
8501	9000	629519.231	6677584.500		2022-06-05	-92.658		
						Mean	0.032	
						Maximum	0.061	

The usefulness of incorporating the NRCAN data is questionable. The NRCAN reported error in most of the free-air anomalies range from 140 µGal to 930 µGal which greatly exceeds the estimated error in the surveyed data of 32 µGal from Table 9. When the Bouguer anomaly data is gridded without the NRCAN data and then the NRCAN data compared to the sampled grid, the standard deviation between these two is 370 µGal. These comparisons suggest the NRCAN data are not of sufficient quality or are not consistent enough with the surveyed data to be in a combined dataset. Additionally, the spatial distribution of the NRCAN points also do not significantly improve on the coverage of the survey other than along linear trends aligned with the highway.

For these reasons, the NRCAN data are excluded from the grids and products (other than the database) delivered with this report.

Figure 21 shows the Bouguer anomaly for a density of 2.67 g/cm³ and Figure 22 shows the same data but with a second-order trend removed.

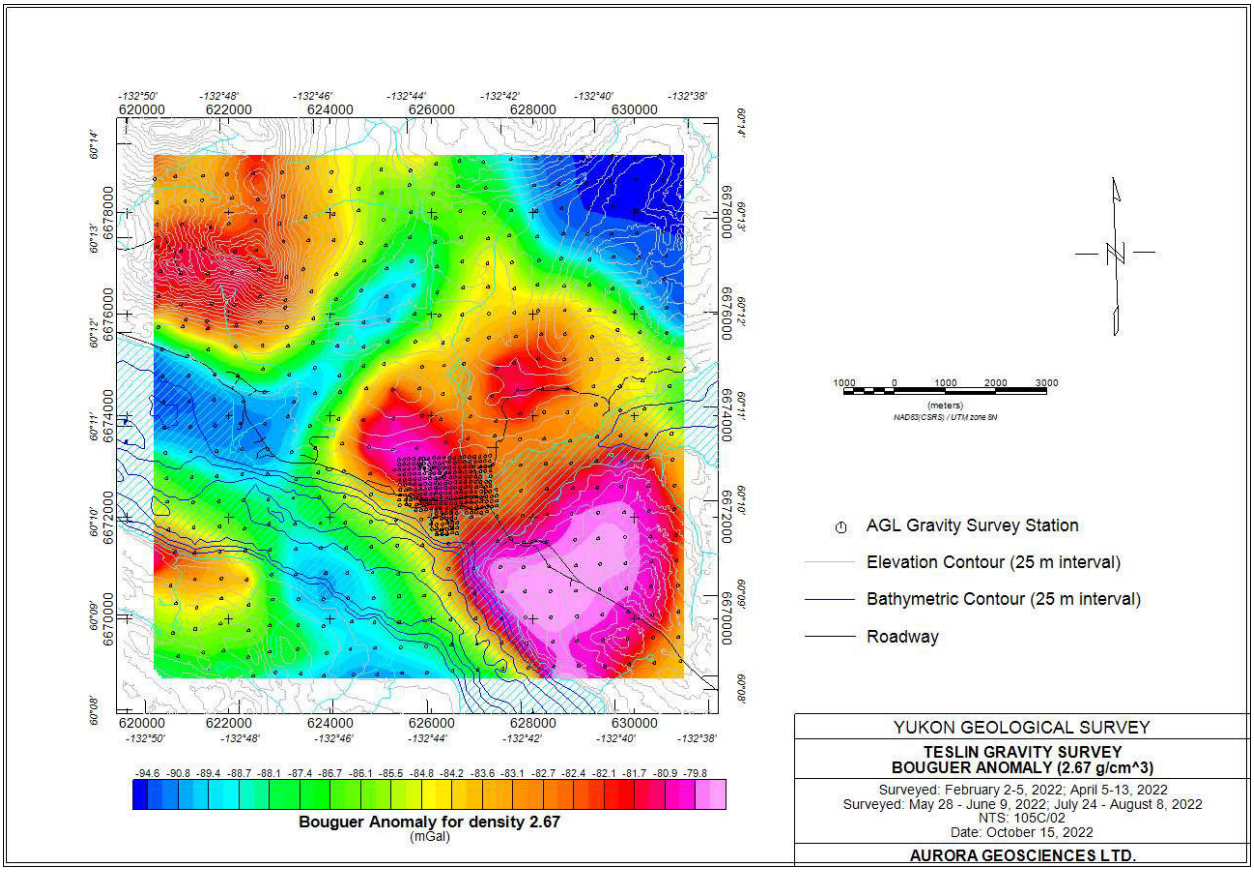


Figure 21: Bouguer anomaly for density of 2.67 g/cm³.

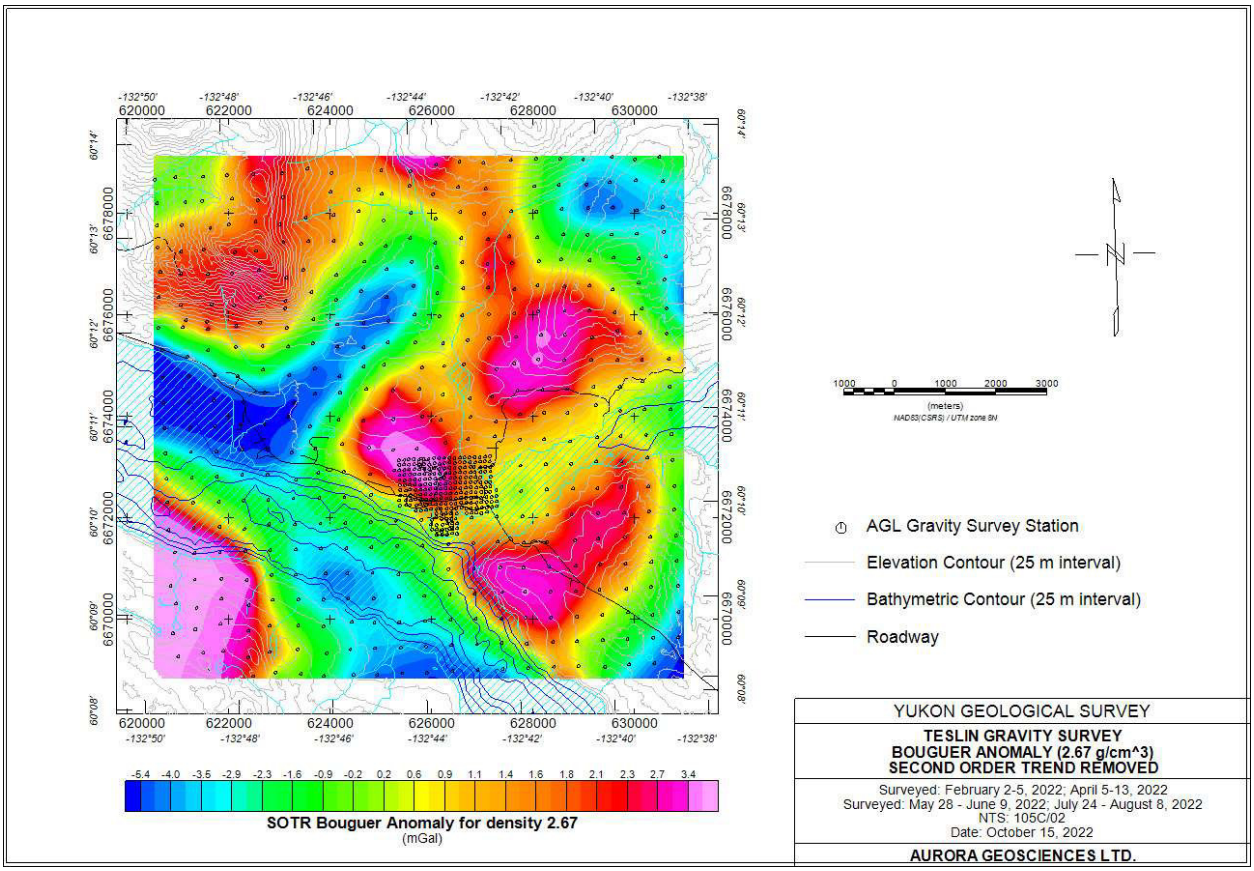


Figure 22: Bouguer anomaly for density of 2.67 g/cm³ with second order trend removed.

9 PRODUCTS

The channels in the databases are described in Table 10

Table 10: Database channel descriptions.

Channel	Description
Line	Local X coordinate (m)
Station	Local Y coordinate (m)
Time	HHMMSS of data collection
Date	Date of data collection
Final_UTME	Corrected easting in NAD83 UTM Zone 8 (m)
Final_UTMN	Corrected northing in NAD83 UTM Zone 8 (m)
Final_Geoid	Corrected orthometric elevation relative to the CGG2013 Geoid (m)
Inner_DEM	Value of Inner DEM sampled at station location.
Longitude	NAD83 (CSRS) longitude (decimal degrees)

Latitude	NAD83 (CSRS) latitude (decimal degrees)
Final_Ellipsoid	Corrected ellipsoid elevation (m)
GravRaw	Raw gravimeter reading with tilt, temperature, (+/- tidal) corrections (mGal)
SD	Standard deviation of • 5 Hz gravity measurement for CG-5(mGal) • 5 Hz gravity measurement for CG-6 (mGal)
TiltX	X-axis tilt of the gravity measurement (arcsec).
TiltY	Y-axis tilt of the gravity measurement (arcsec).
SensorTemp	Sensor temperature compared to its reference value (mK)
Tide_Cor	Tidal correction if not included in GravRaw (mGal)
Tilt_Cor	Internal tilt correction (mGal)
Temp_Cor	Internal temperature correction (mGal)
DriftInt_Cor	Internal drift correction (mGal)
Local_Datum_Cor	Correction between local gravity check-ins (mGal)
Drift_Cor	Drift correction from daily pre and post survey gravity control point measurements (mGal)
Grav_obs	Grav Raw with the 4 internal corrections (tidal, tilt, temperature and drift). CG-5 gravimeters do not report all individual corrections. (mGal)
MeasurDur	Duration of reading (s)
LatUser	Latitude used for tidal correction (decimal degrees)
LongUser	Longitude used for tidal correction (decimal degrees)
gravSerial	Short version of gravimeter serial number.
QAQC	Quality control for gravity readings (applied to BA channels)
Flag_GNSS	Flag for sub-optimal GNSS solution
QAQC_GNSS	Quality control for GNSS readings (applied to BA channels)
Grav_Lat	Expected gravity at latitude of reading (mGal)
FreeAir_Cor	Free air correction (mGal)
Line_Station_Drift_Cor	Drift correction of the instrument since previous occupation of a tie point at line_station (mGal)
Drift_Cor	Combined drift correction from all line_station control points. Brings the reading to a value of absolute gravity (mGal)

FreeAir_Anomaly	Grav_obs - Grav_Lat + FreeAir_Cor + Drift_Cor (mGal)
Bouguer_267_Cor	Bouguer slab correction for density of 2.67 (mGal)
BullB_267 Cor	Bullard-B correction for density of 2.67 (mGal)
NearStn_267_Cor	Near station terrain correction for density of 2.67 (mGal)
FarStn_1_267_Cor	Far station terrain correction for density of 2.67 using the inner DEM (mGal)
FarStn_2_267_Cor	Far station terrain correction for density of 2.67 using the intermediate DEM (mGal)
FarStn_3_267_Cor	Far station terrain correction for density of 2.67 using the outer DEM (mGal)
Bathy_1_167_Cor	Bathymetric correction for water density of 1.00 within the inner DEM (mGal)
Bathy_2_167_Cor	Bathymetric correction for water density of 1.00 within the intermediate DEM (mGal)
BA_267	Bouguer anomaly for density of 2.67 (mGal)
BA_267_avg	Averaged repeats for Bouguer anomaly for density of 2.67 (mGal)
BA_267_RepAvg	Re-measured points averaged for Bouguer anomaly for density of 2.67 (mGal)
BA_240	Re-measured points averaged for Bouguer anomaly for density of 2.40 (mGal)
BA_250	Re-measured points averaged for Bouguer anomaly for density of 2.50 (mGal)
BA_260	Re-measured points averaged for Bouguer anomaly for density of 2.60 (mGal)
BA_270	Re-measured points averaged for Bouguer anomaly for density of 2.70 (mGal)

Table 11 describes the products attached to the digital version of this report.

Table 11: Products.

Folder \ *File*	Description of Contents
YGS-20221020-Teslin Gravity Report.pdf	This report in PDF format.
Data*.gdb, *.xyz, *.csv*	Processed gravity databases in Geosoft format and ASCII format. GNSS data in csv format. Bathymetry data, in metresm is in csv format.

Figures\Geosoft Packed Maps\ *YGS-20221020-Teslin Gravity.map*	Figures in Geosoft packed map format. Not all of the grids are displayed on the packed map.
Figures\Grids*.grd	Full suite of Bouguer anomaly grids in Geosoft *.grd format at 50 m cell size. Suite of densities = 2.40 g/cm³, 2.50 g/cm³, 2.60 g/cm³, 2.67 g/cm³ and 2.70 g/cm³. Trend removal using FOTR, SOTR, up2500TR. NRCAN data are excluded.
Figures\Geotiffs*.tif	A selection of Bouguer anomaly grids in Geotiff *.tif format. Suite of densities = 2.40 g/cm³, 2.50 g/cm³, 2.60 g/cm³, 2.67 g/cm³ and 2.70 g/cm³. Trend removal using FOTR, SOTR and up2500TR.
Raw\	Daily archive of instrument and gps dump files.

Respectfully submitted,

Dave Hildes, Ph.D., P.Geo

Aurora Geosciences Ltd

Appendix I

CGSN Watson Lake Gravity Reference Station & PPP Reports

CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220202-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-02-02 17:34:00.00	2022-02-03 00:40:00.00	7:06:00
Processing Time		**Product Type**
20:15:20 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.494m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220202-GS15Base_decimatedRinex.yyo

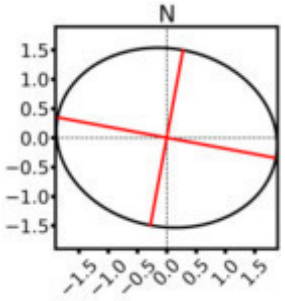
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.1)	60° 9' 56.27950"	-132° 42' 41.67389"	686.986 m
Sigmas(95%)	0.012 m	0.015 m	0.037 m
A priori*	60° 9' 56.30838"	-132° 42' 41.83794"	687.808 m
Estimated – A priori	-0.894 m	2.530 m	-0.822 m

Orthometric Height CGVD2013 (CGG2013a) (2022.1)

683.546 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 1.9 cm
semi-minor: 1.5 cm
semi-major azimuth: -79° 31' 34.89"

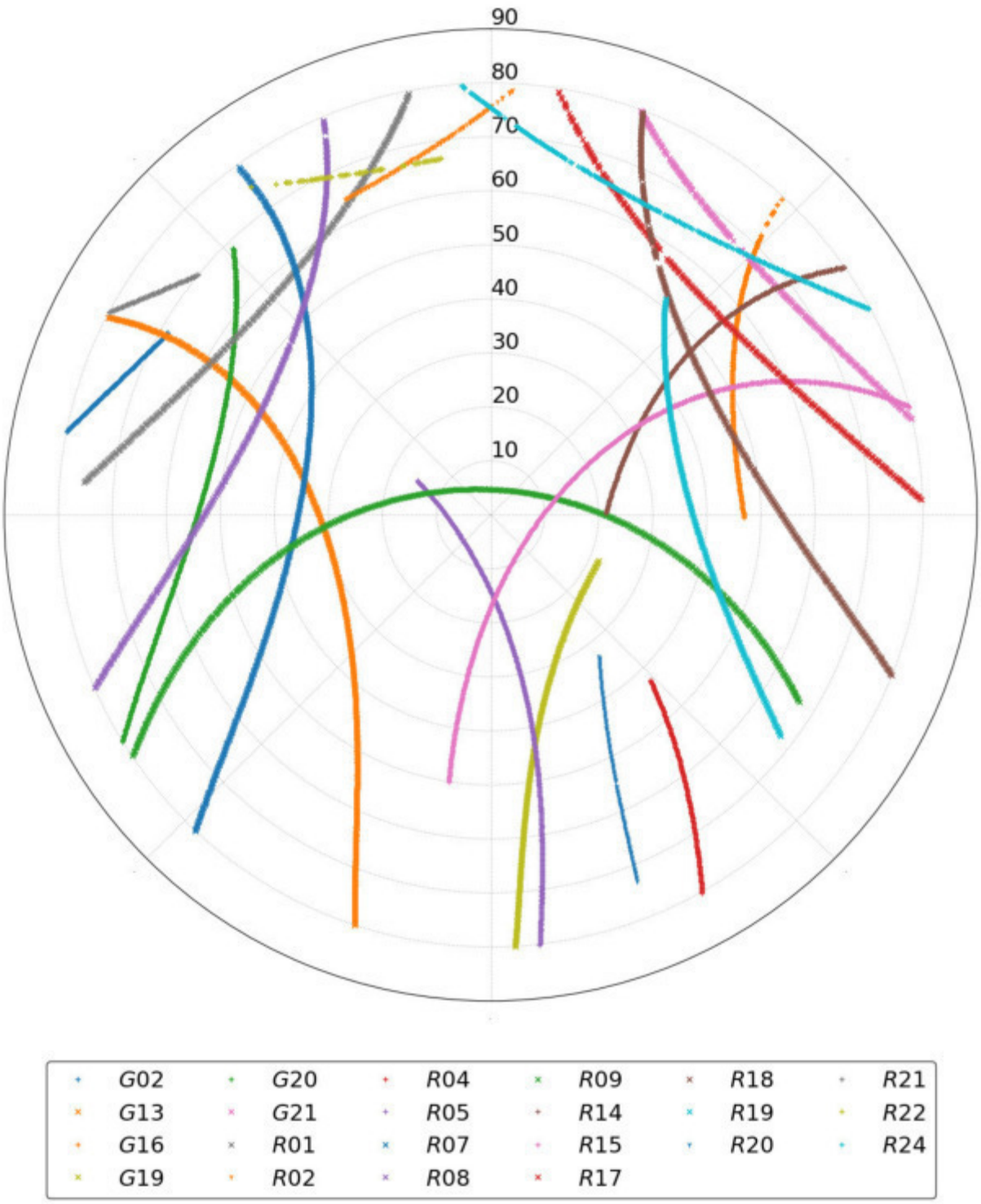


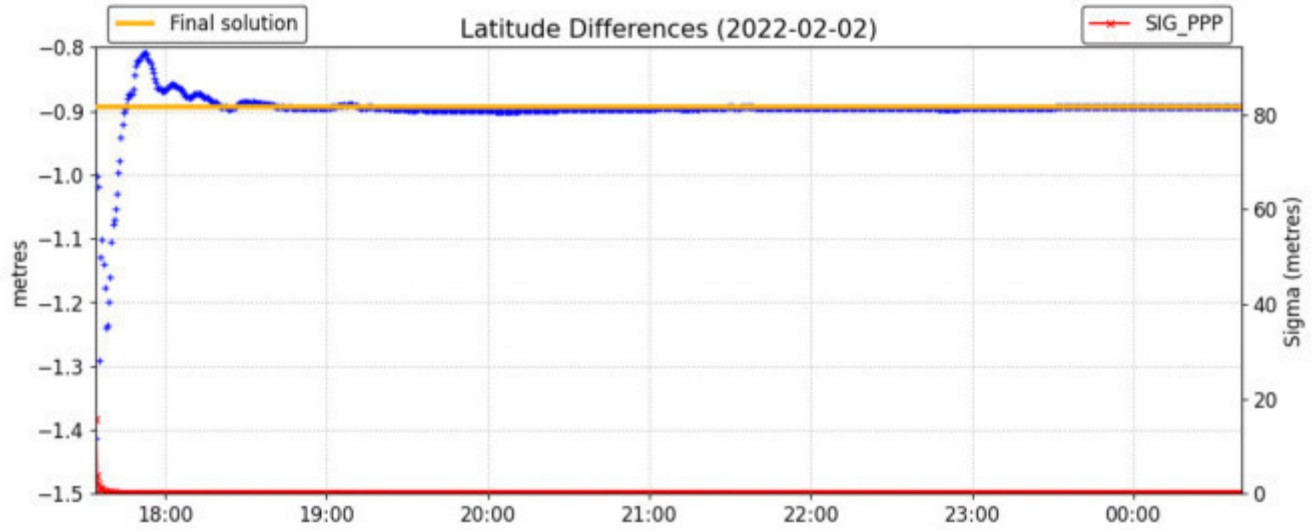
UTM (North) Zone 8

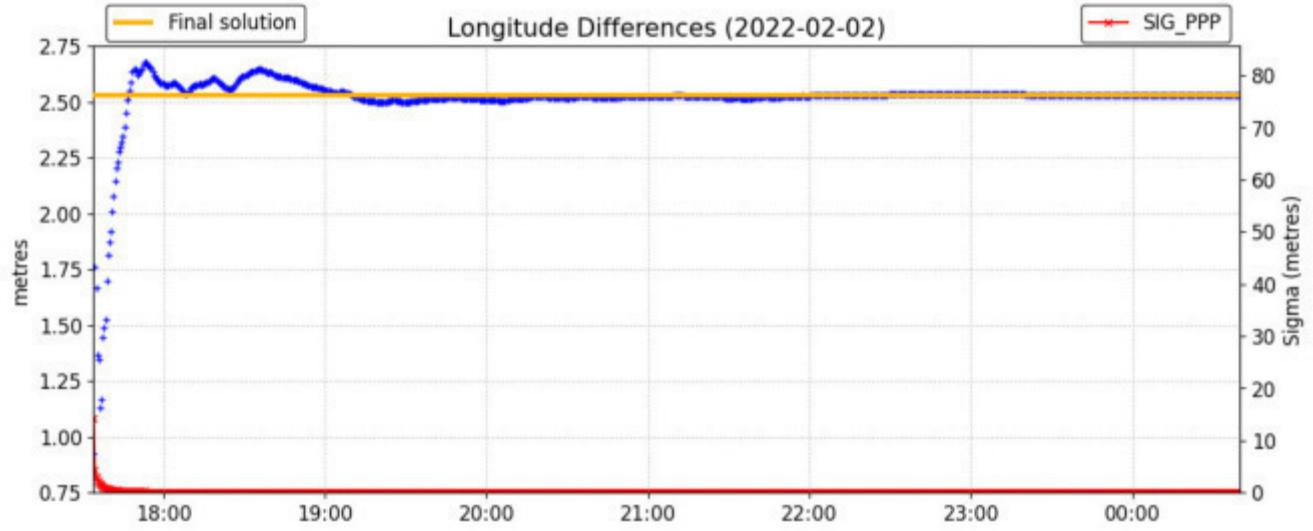
6672057.925 m (N)
626987.351 m (E)

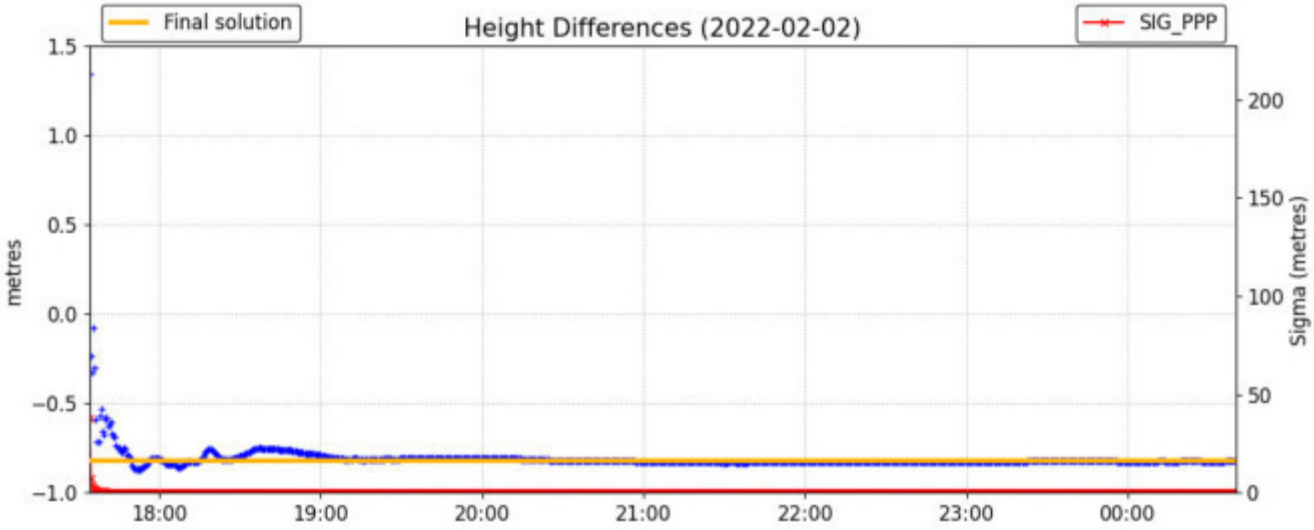
Scale Factors
0.99979762 (point)
0.99969012 (combined)

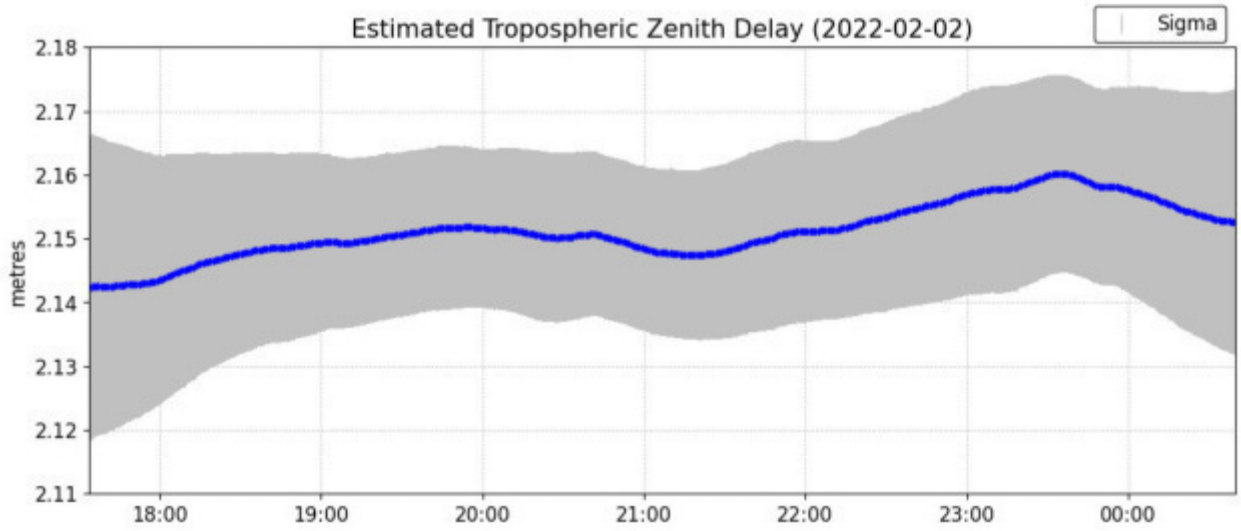
*(Coordinates from RINEX header used as a priori position)

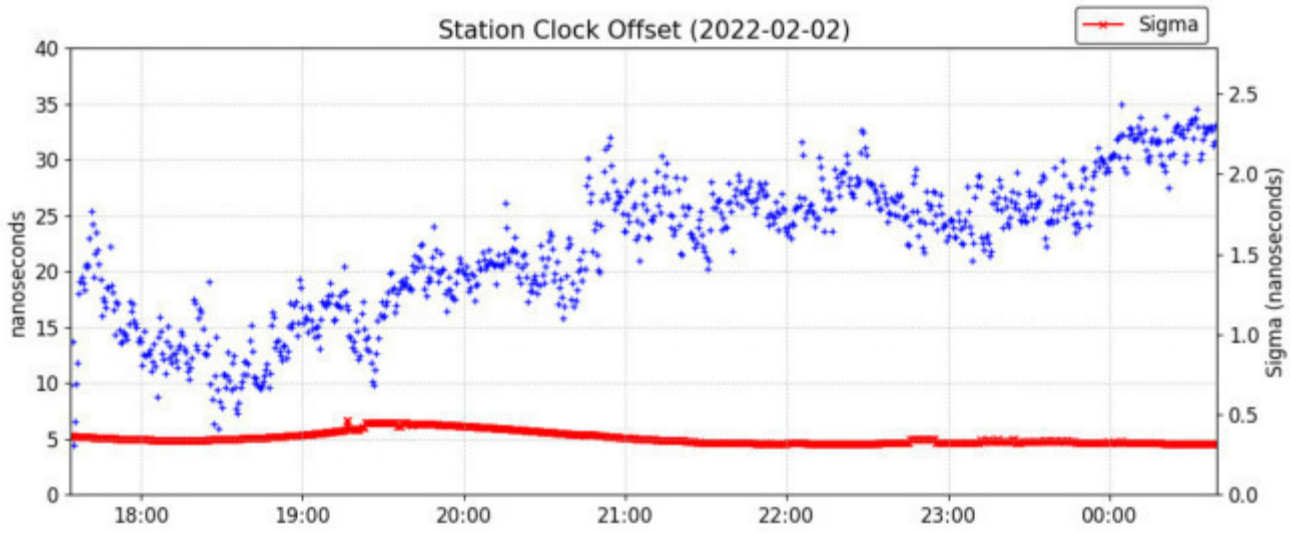

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G21
R01
R02
R04
R05
R07
R08
R09
R14
R15
R17
R18
R19
R20
R21
R22
R24

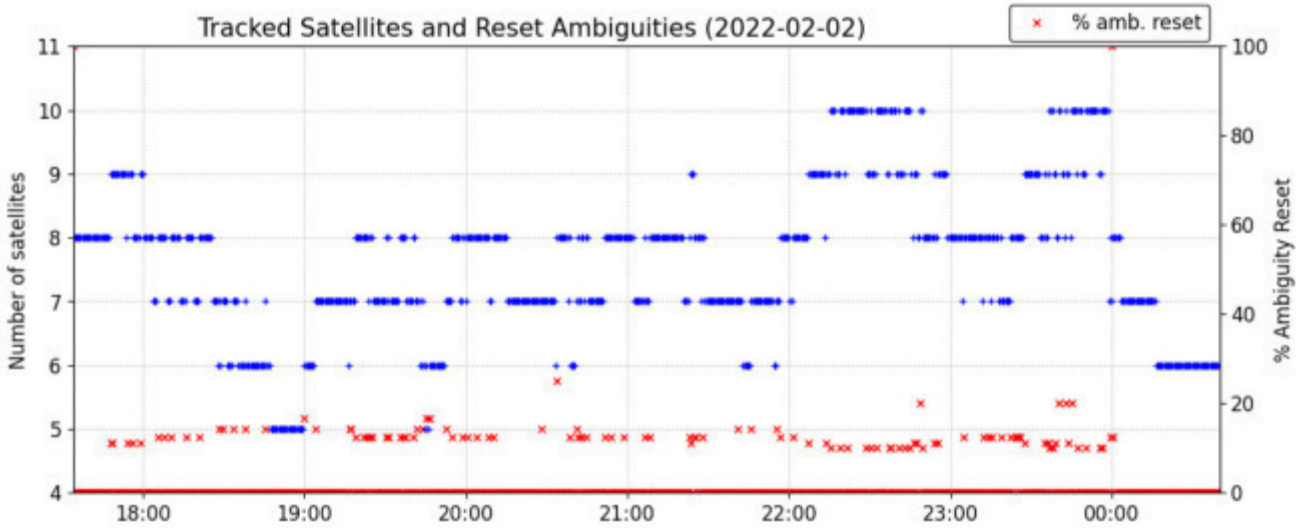

Final solution
Latitude Differences (2022-02-02)
SIG_PPP
metres
Sigma (metres)
−0.8
−0.9
−1.0
−1.1
−1.2
−1.3
−1.4
−1.5
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

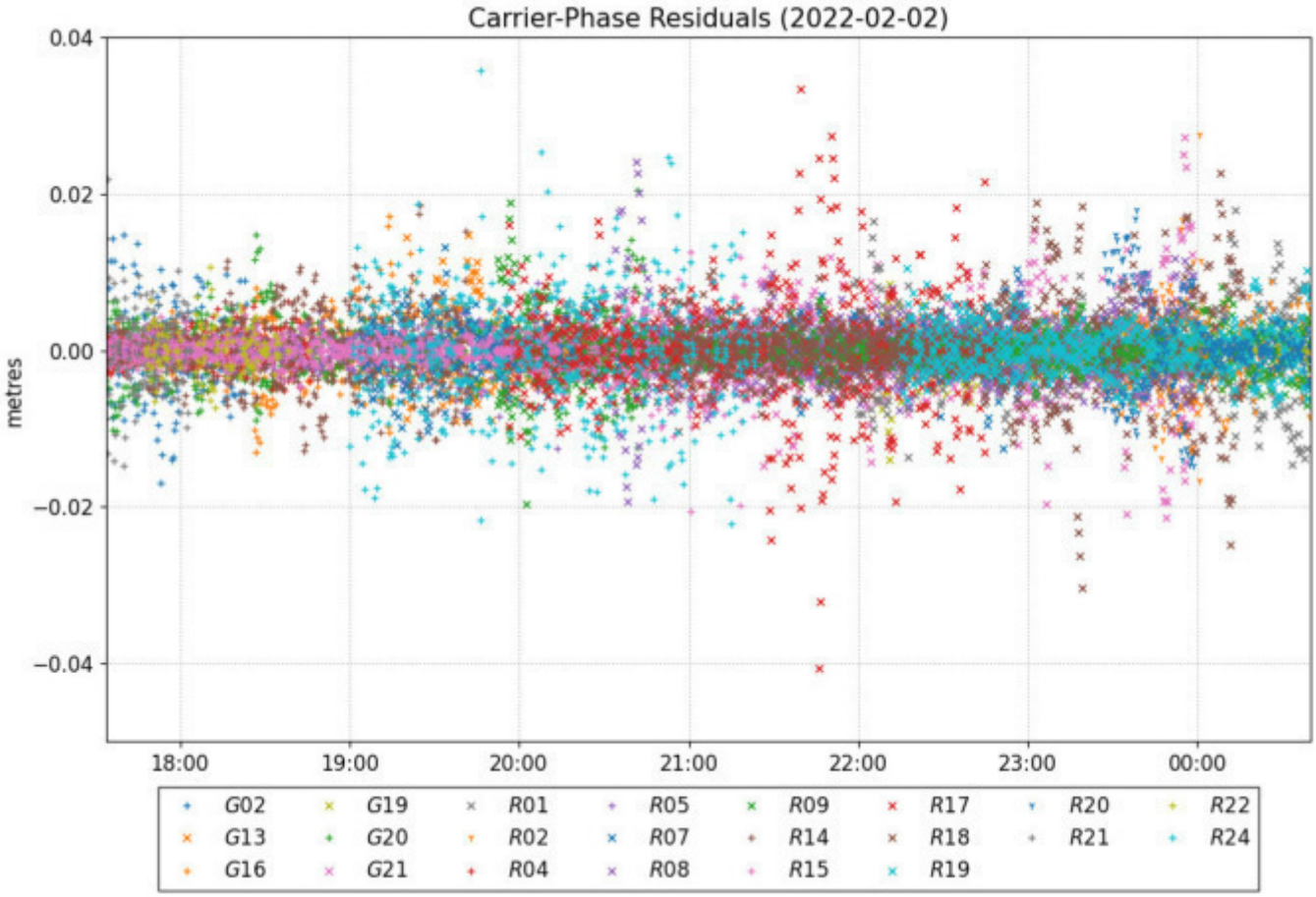

Final solution
Longitude Differences (2022-02-02)
SIG_PPP
metres
Sigma (metres)
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
80
70
60
50
40
30
20
10
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

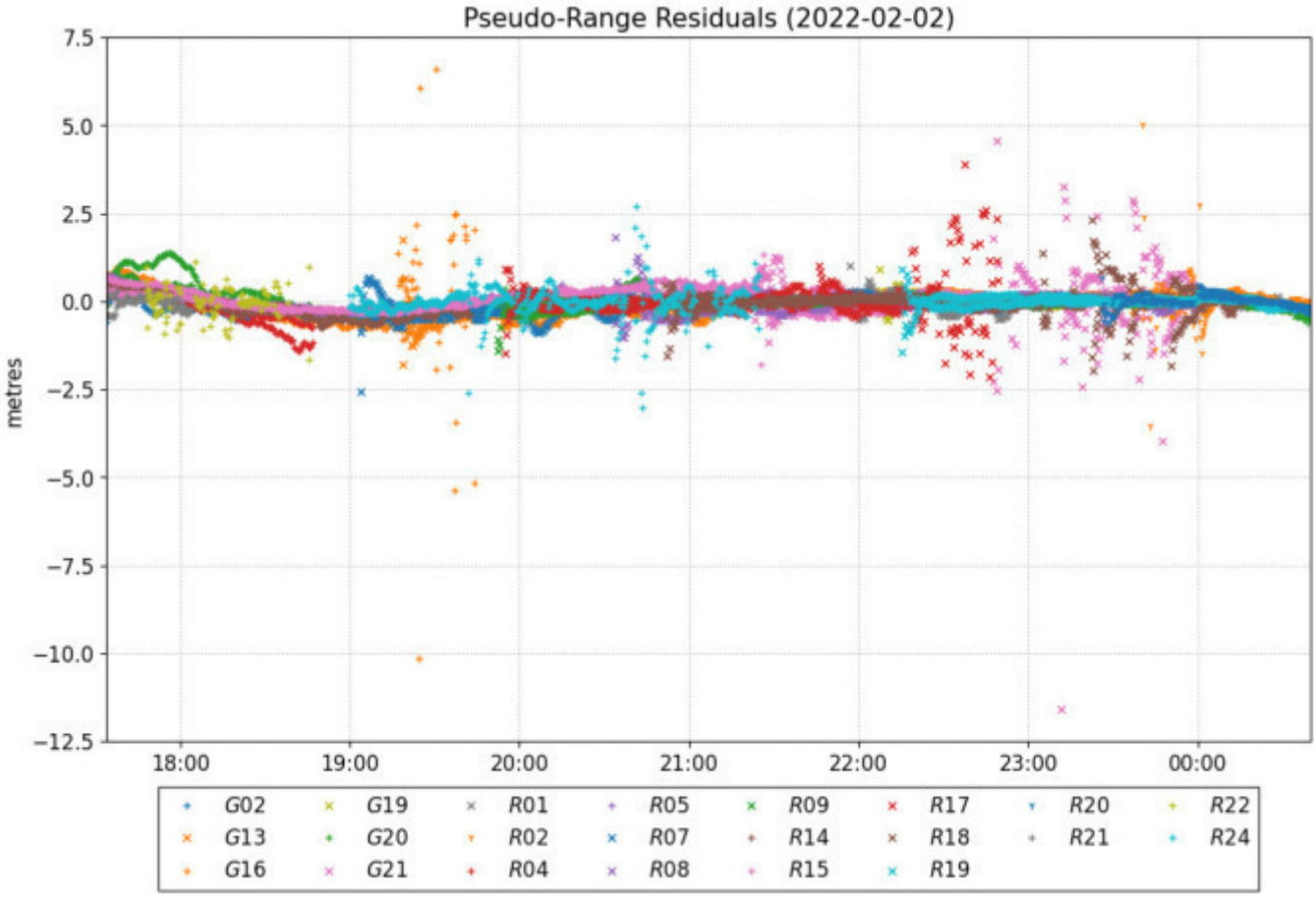

Final solution
Height Differences (2022-02-02)
SIG_PPP
metres
Sigma (metres)
1.5
1.0
0.5
0.0
−0.5
−1.0
200
150
100
50
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

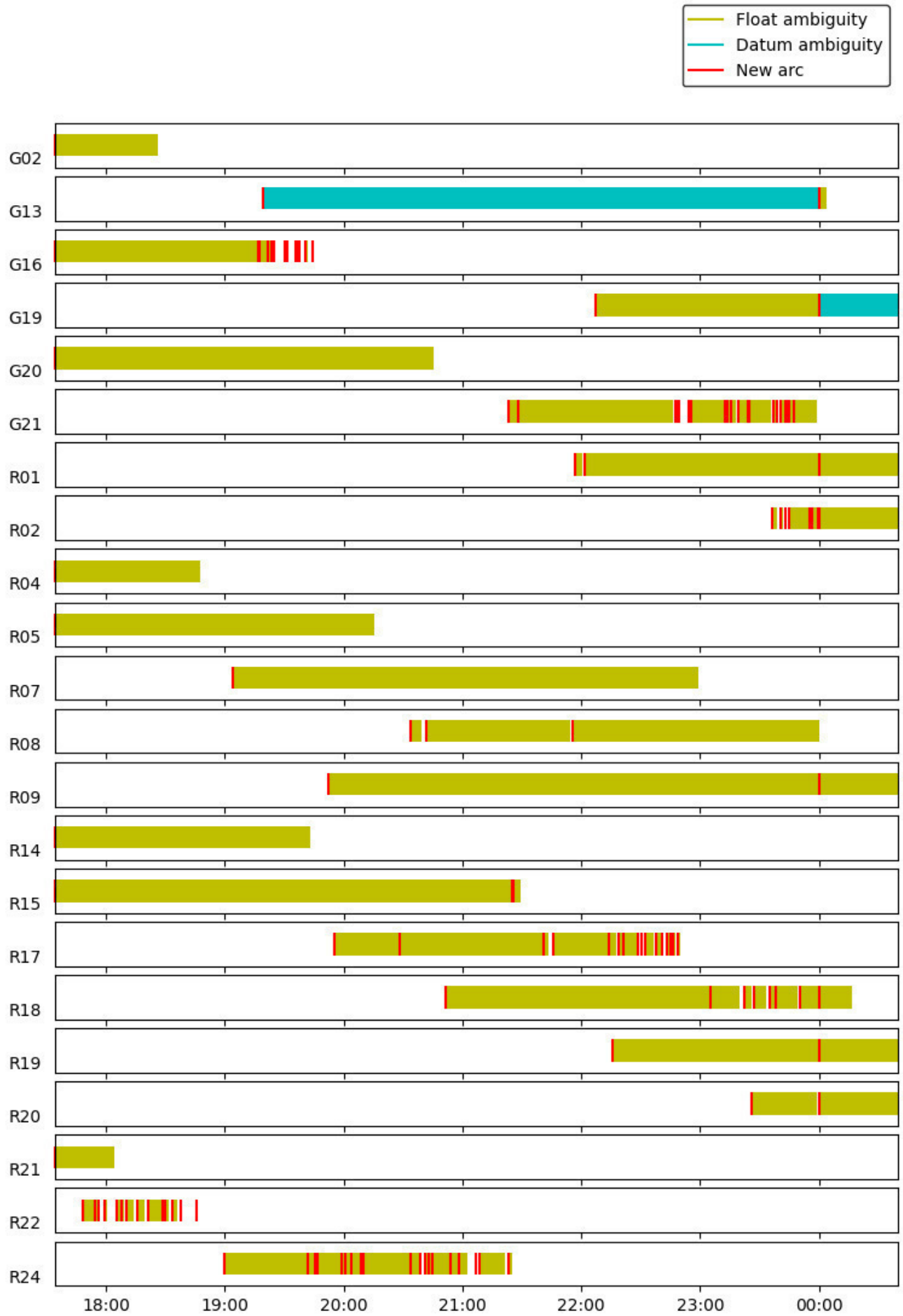

Estimated Tropospheric Zenith Delay (2022-02-02)
Sigma
metres
2.18
2.17
2.16
2.15
2.14
2.13
2.12
2.11
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-02-02)
Sigma
nanoseconds
Sigma (nanoseconds)
40
35
30
25
20
15
10
5
0
2.5
2.0
1.5
1.0
0.5
0.0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-02-02)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-02-02)
metres
0.04
0.02
0.00
−0.02
−0.04
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R05 R09 R17 R20 R22
G13 G20 R02 R07 R14 R18 R21 R24
G16 G21 R04 R08 R15 R19


Pseudo-Range Residuals (2022-02-02)
metres
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−12.5
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R05 R09 R17 R20 R22
G13 G20 R02 R07 R14 R18 R21 R24
G16 G21 R04 R08 R15 R19


Phase Ambiguity Status (2022-02-02)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
R01
R02
R04
R05
R07
R08
R09
R14
R15
R17
R18
R19
R20
R21
R22
R24
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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If you have any questions, please feel free to contact:
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588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220203-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-02-03 17:39:00.00	2022-02-04 00:46:00.00	7:07:00
Processing Time		**Product Type**
20:15:38 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.494m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220203-GS15Base_decimatedRinex.yyo

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.1)	60° 9' 56.27981"	-132° 42' 41.67401"	686.974 m
Sigmas(95%)	0.014 m	0.023 m	0.044 m
A priori*	60° 9' 56.29488"	-132° 42' 41.73958"	684.791 m
Estimated – A priori	-0.466 m	1.011 m	2.183 m

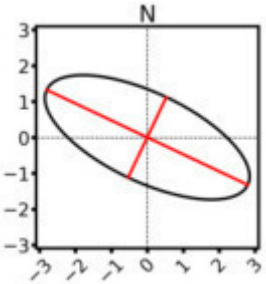
Orthometric Height CGVD2013 (CGG2013a) (2022.1)

683.534 m

(click for height reference information)

95% Error Ellipse (cm)

semi-major: 3.1 cm
semi-minor: 1.2 cm
semi-major azimuth: -64° 20' 28.1"

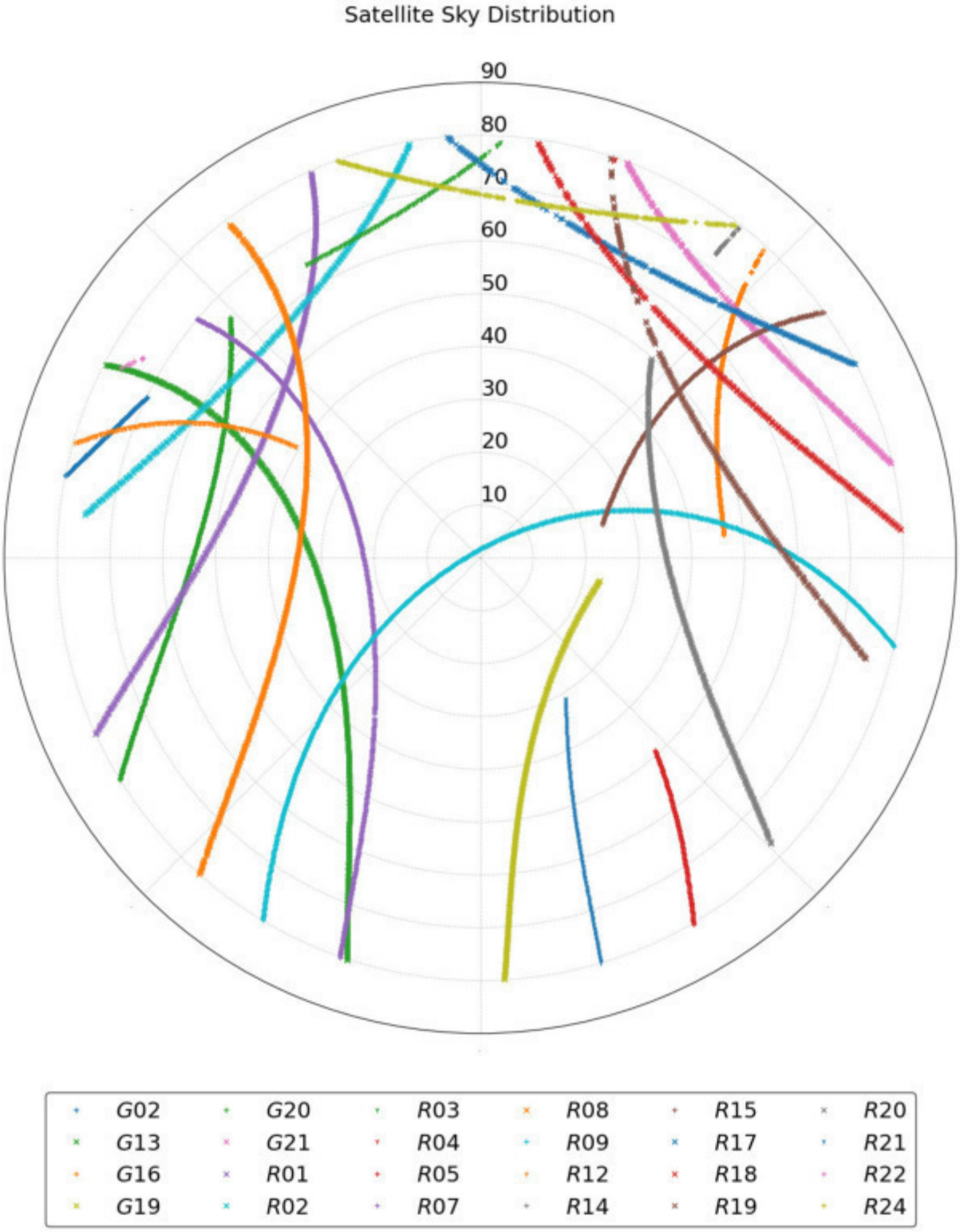


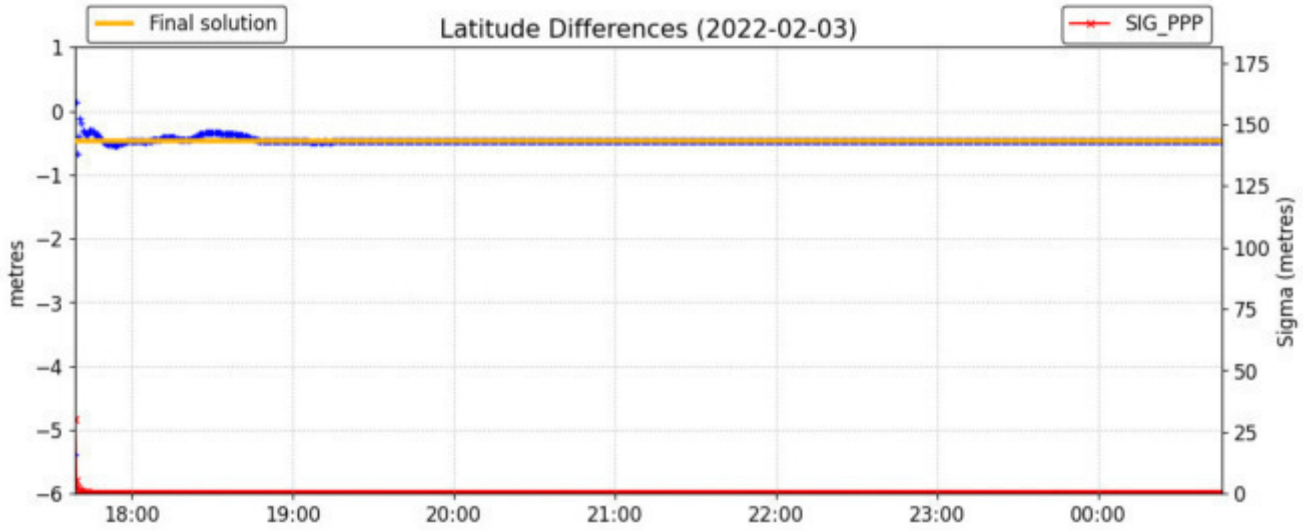
UTM (North) Zone 8

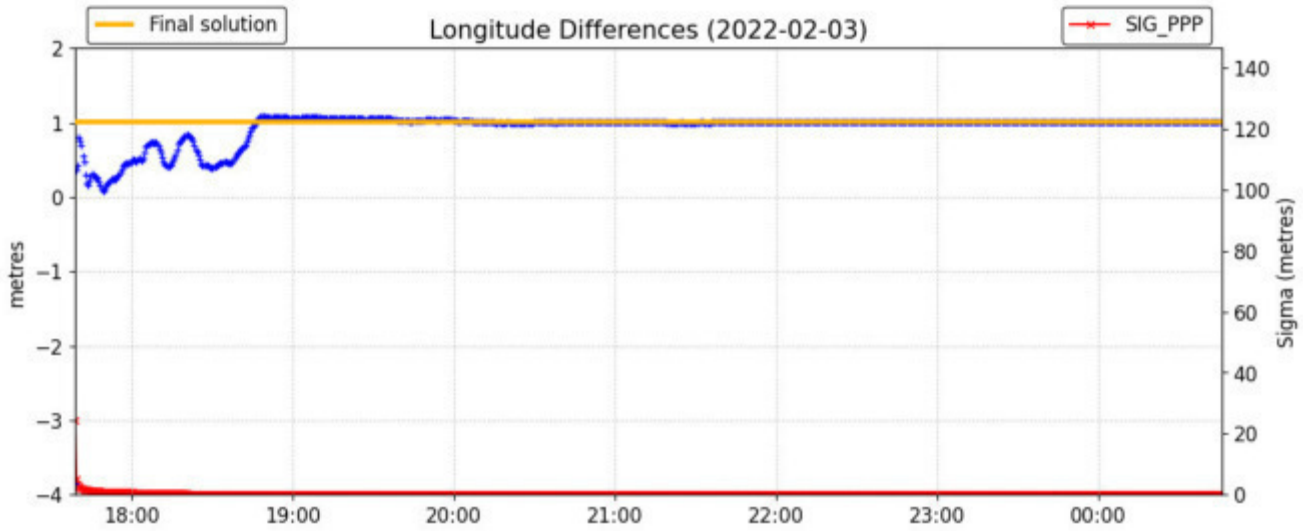
6672057.934 m (N)
626987.349 m (E)

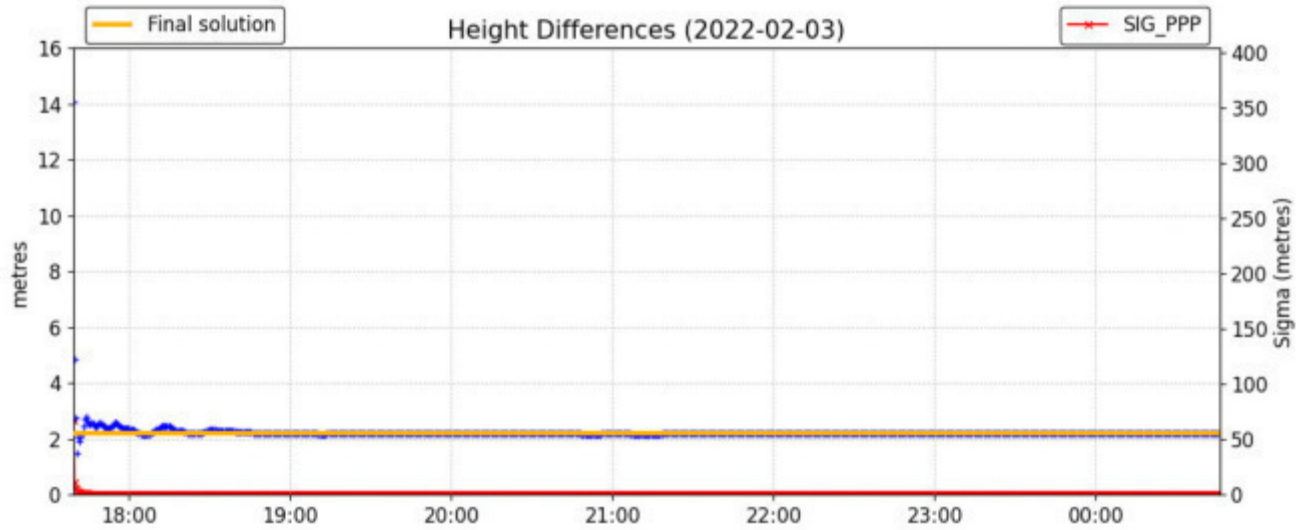
Scale Factors
0.99979762 (point)
0.99969012 (combined)

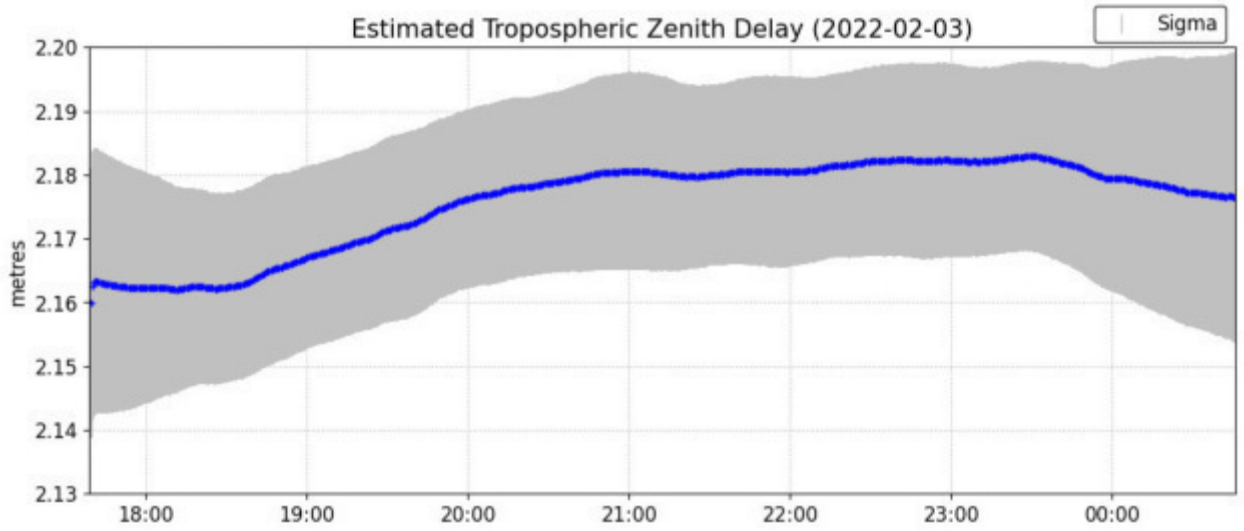
*(Coordinates from RINEX header used as a priori position)

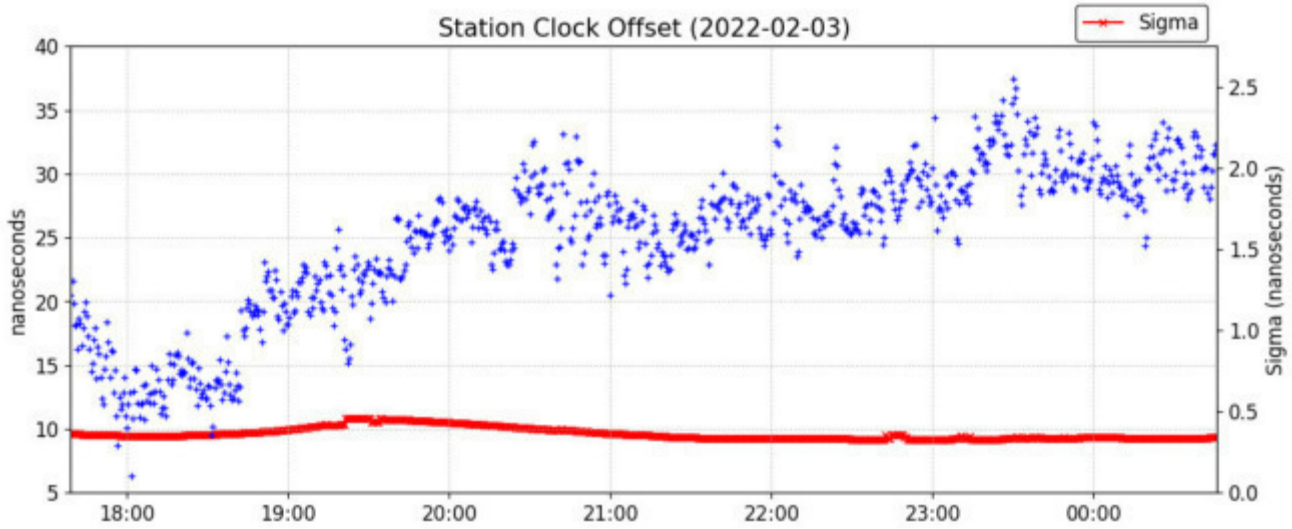

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G20
R03
R08
R15
R20
G13
G21
R04
R09
R17
R21
G16
R01
R05
R12
R18
R22
G19
R02
R07
R14
R19
R24

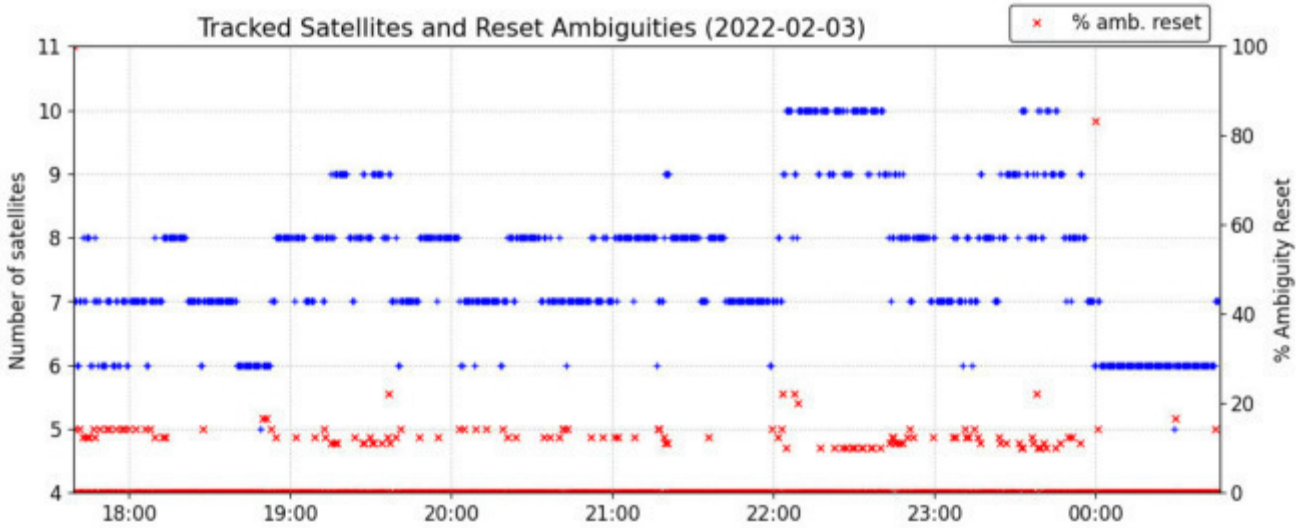

Final solution
Latitude Differences (2022-02-03)
SIG_PPP
metres
Sigma (metres)
1
0
−1
−2
−3
−4
−5
−6
175
150
125
100
75
50
25
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

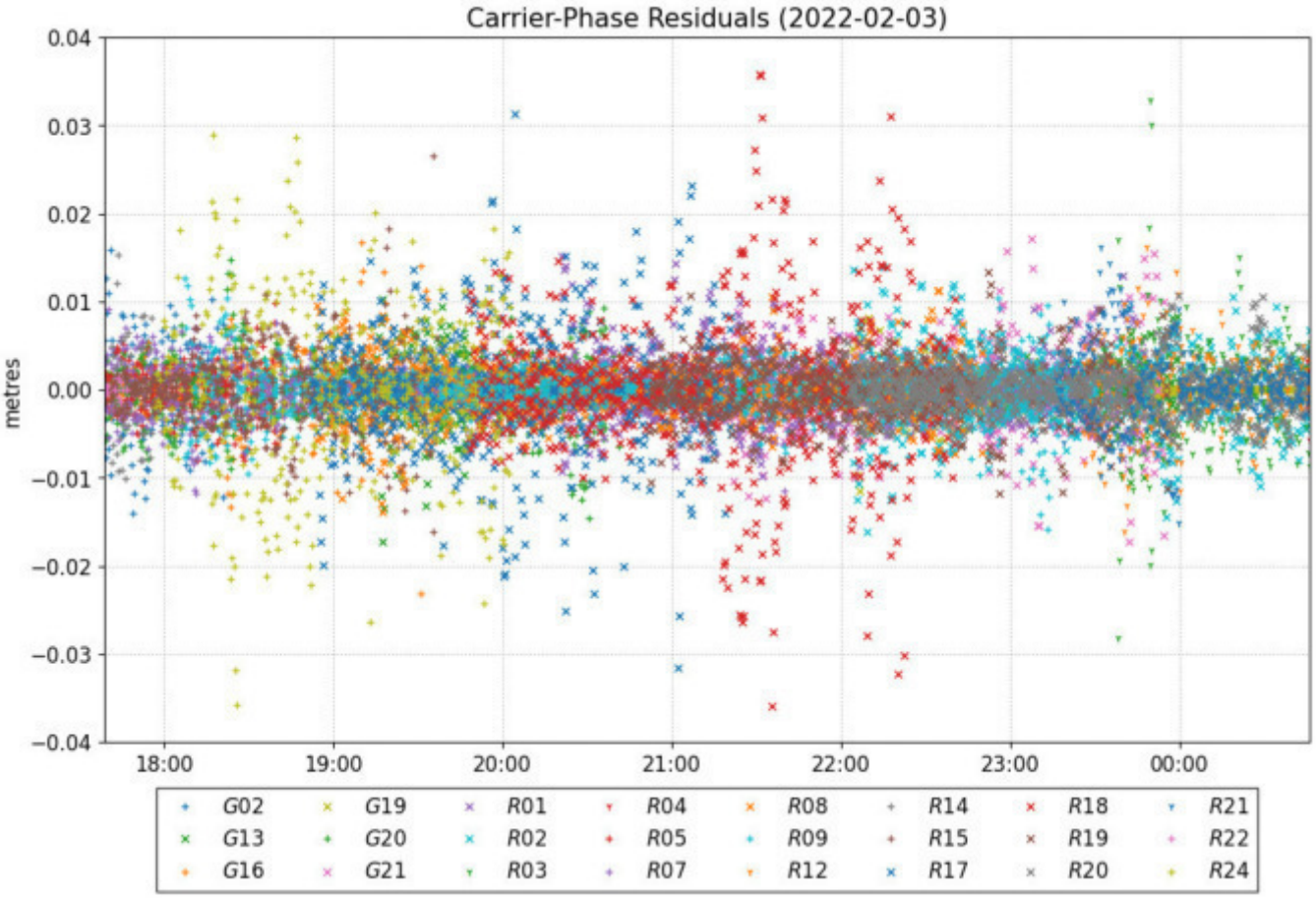

Final solution
Longitude Differences (2022-02-03)
SIG_PPP
metres
Sigma (metres)
2
1
0
−1
−2
−3
−4
140
120
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

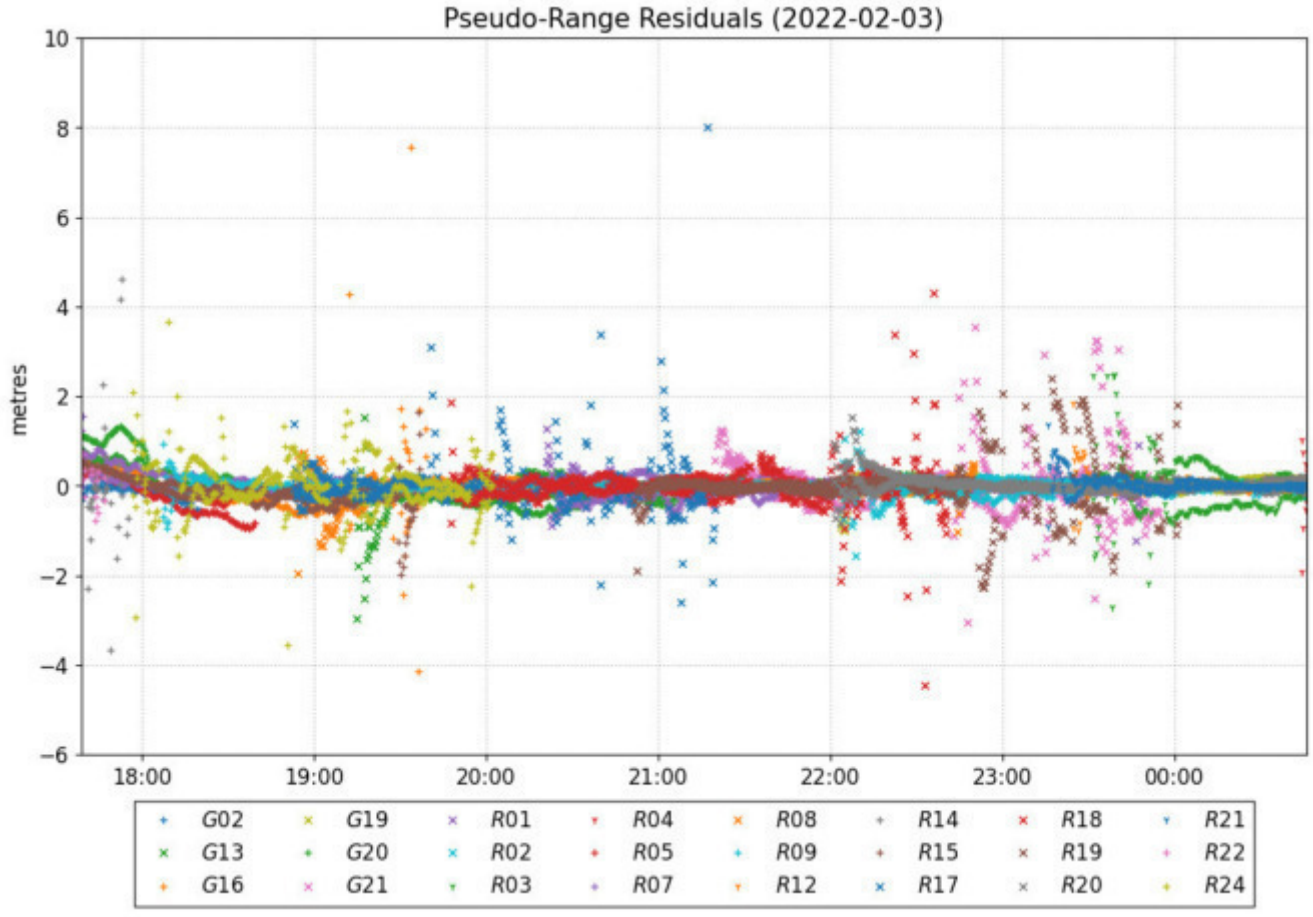

Final solution
Height Differences (2022-02-03)
SIG_PPP
metres
Sigma (metres)
16
14
12
10
8
6
4
2
0
400
350
300
250
200
150
100
50
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

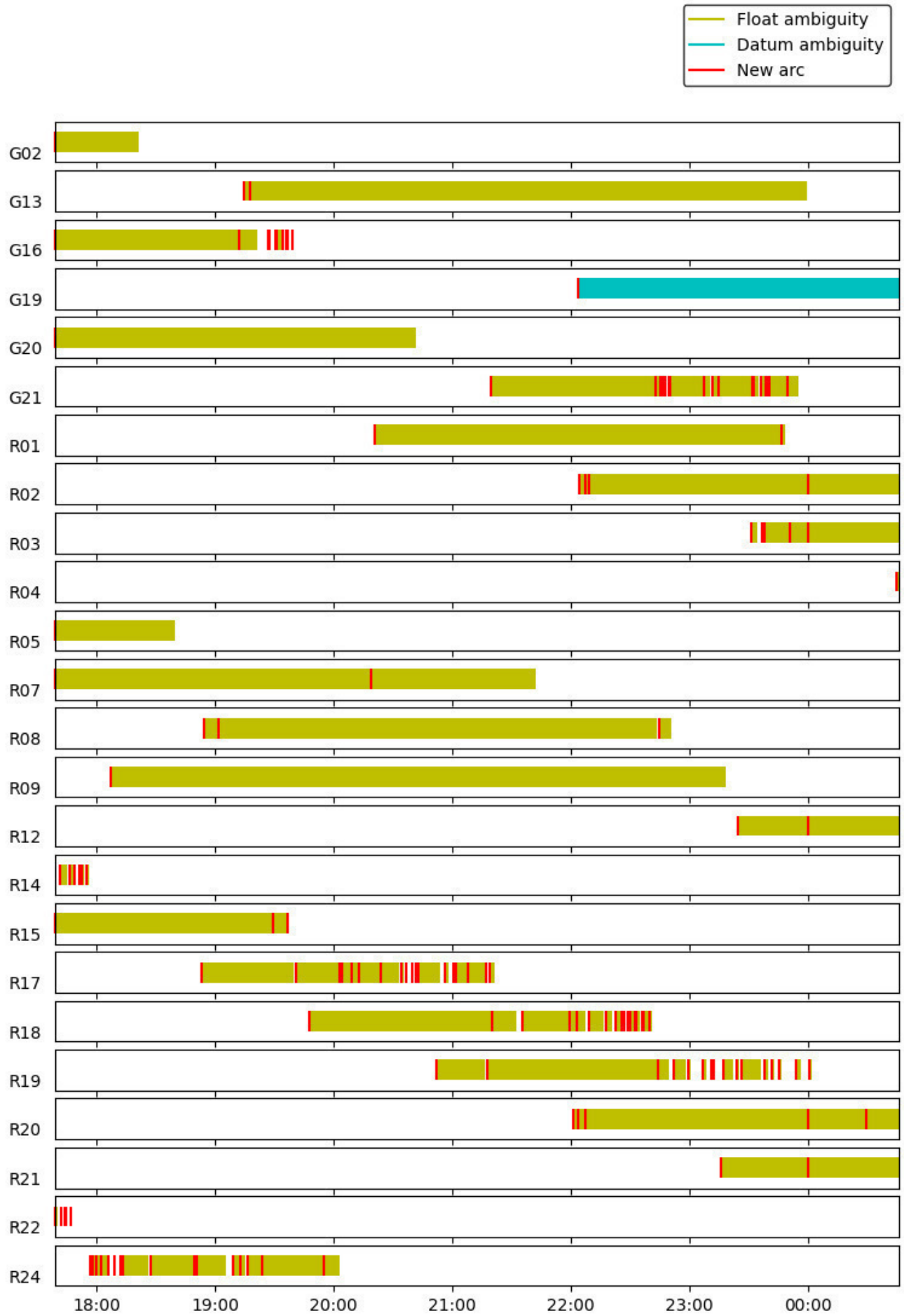

Estimated Tropospheric Zenith Delay (2022-02-03)
Sigma
metres
2.20
2.19
2.18
2.17
2.16
2.15
2.14
2.13
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-02-03)
Sigma
nanoseconds
Sigma (nanoseconds)
40
35
30
25
20
15
10
5
2.5
2.0
1.5
1.0
0.5
0.0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-02-03)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-02-03)
metres
0.04
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R04 R08 R14 R18 R21
G13 G20 R02 R05 R09 R15 R19 R22
G16 G21 R03 R07 R12 R17 R20 R24


Pseudo-Range Residuals (2022-02-03)
metres
10
8
6
4
2
0
−2
−4
−6
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R04 R08 R14 R18 R21
G13 G20 R02 R05 R09 R15 R19 R22
G16 G21 R03 R07 R12 R17 R20 R24


Phase Ambiguity Status (2022-02-03)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
R01
R02
R03
R04
R05
R07
R08
R09
R12
R14
R15
R17
R18
R19
R20
R21
R22
R24
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220204-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-02-04 17:18:00.00	2022-02-04 22:34:00.00	5:16:00
Processing Time		**Product Type**
20:15:52 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.494m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220204-GS15Base_decimatedRinex.yyo

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.1)	60° 9' 56.27980"	-132° 42' 41.67551"	686.953 m
Sigmas(95%)	0.018 m	0.056 m	0.053 m
A priori*	60° 9' 56.26481"	-132° 42' 41.83338"	686.897 m
Estimated – A priori	0.464 m	2.435 m	0.056 m

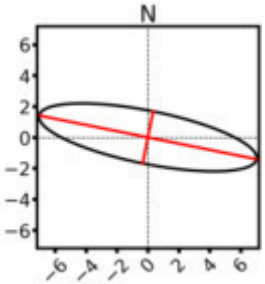
Orthometric Height CGVD2013 (CGG2013a) (2022.1)

683.512 m

(click for height reference information)

95% Error Ellipse (cm)

semi-major: 7.2 cm
semi-minor: 1.7 cm
semi-major azimuth: -78° 21' 49.93"

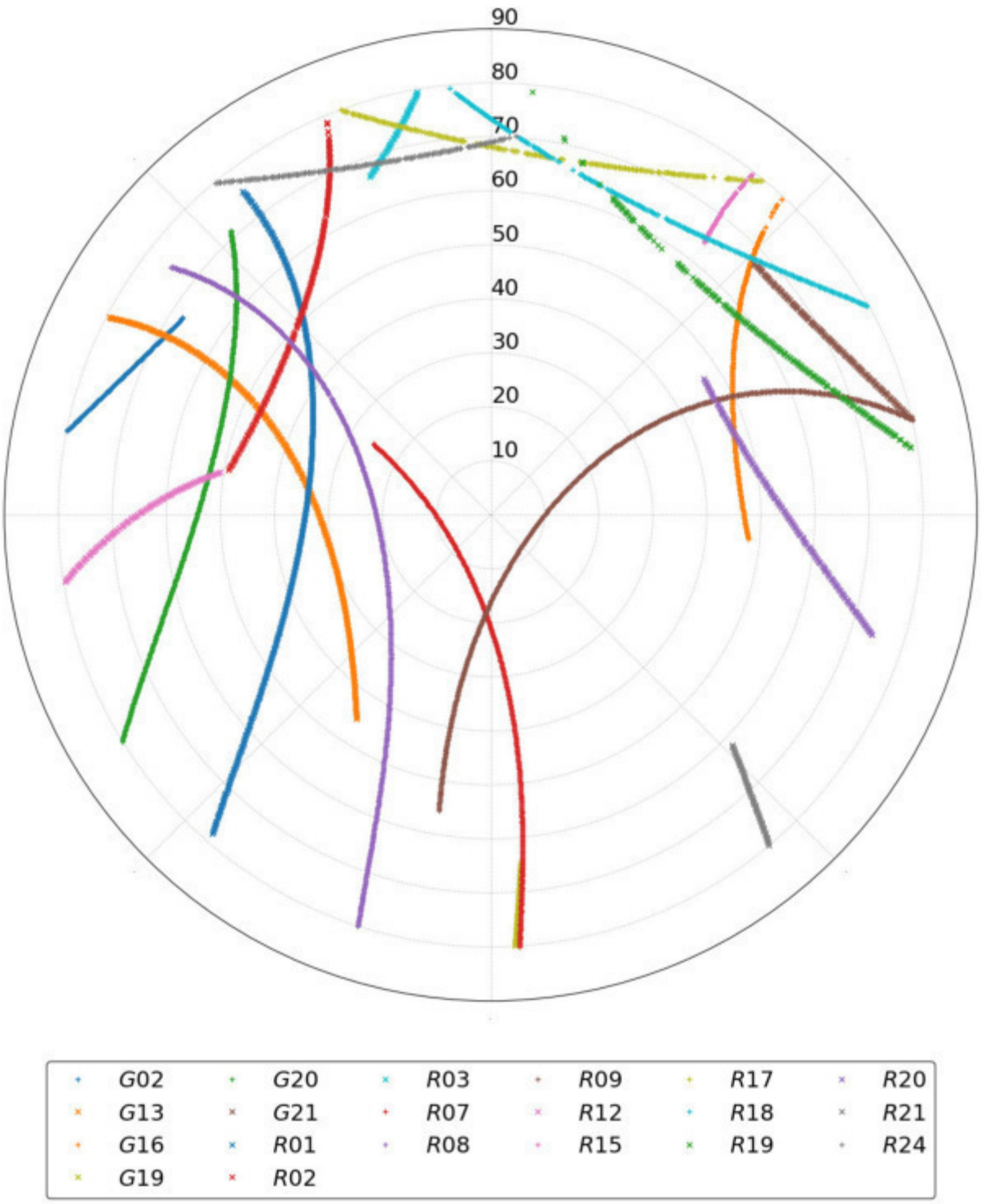


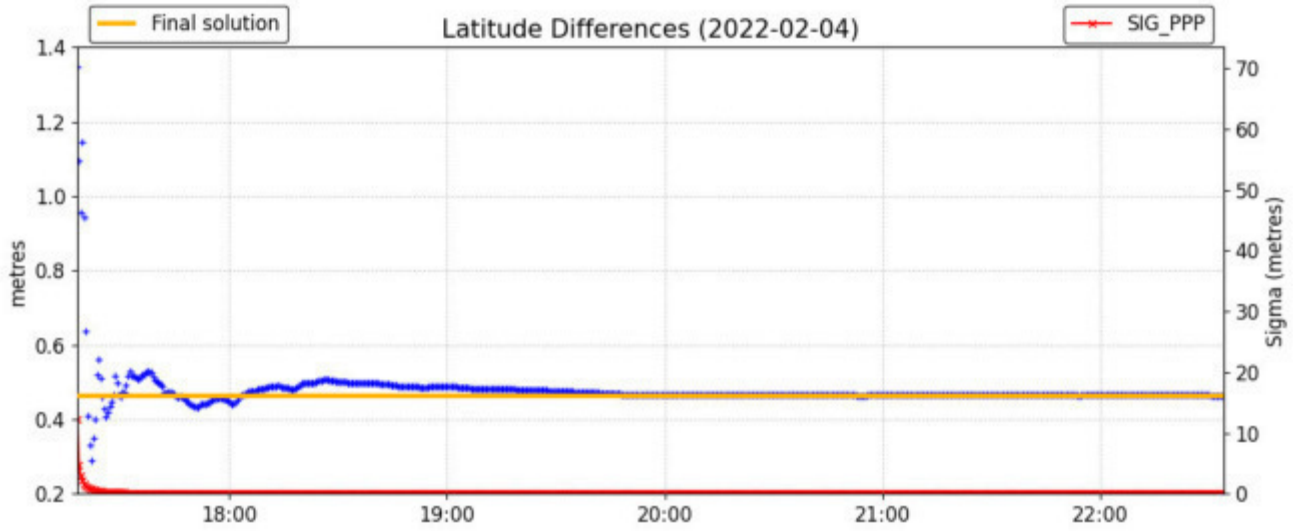
UTM (North) Zone 8

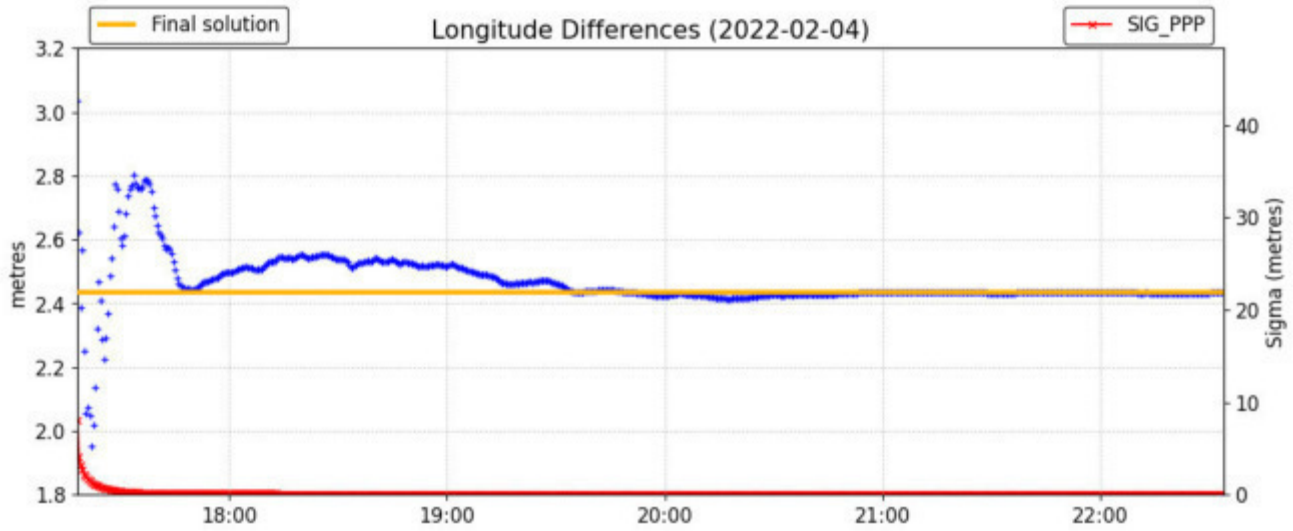
6672057.933 m (N)
626987.326 m (E)

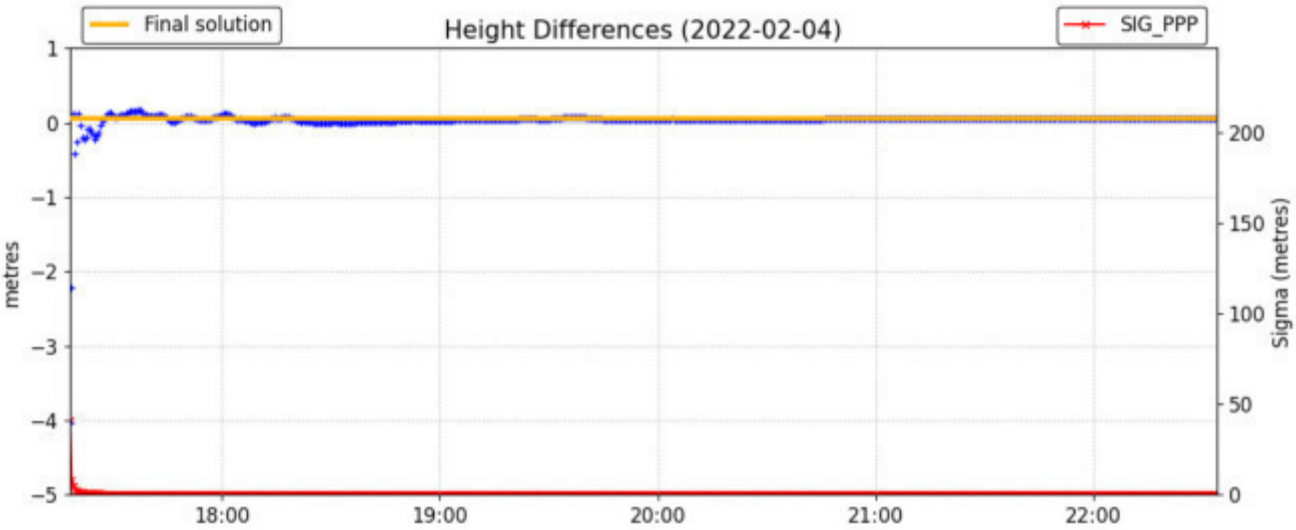
Scale Factors
0.99979762 (point)
0.99969013 (combined)

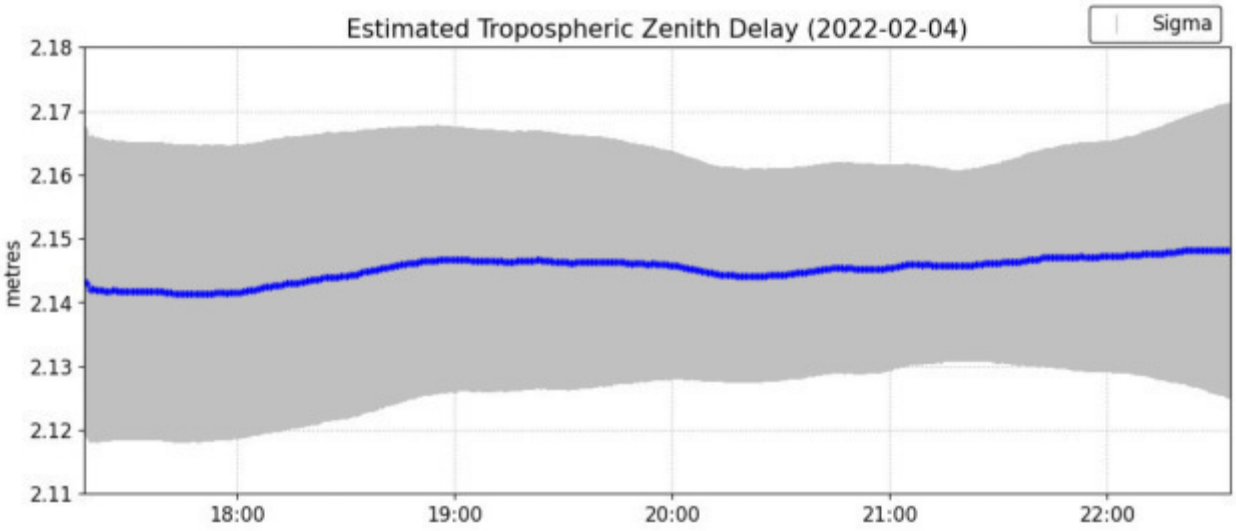
*(Coordinates from RINEX header used as a priori position)

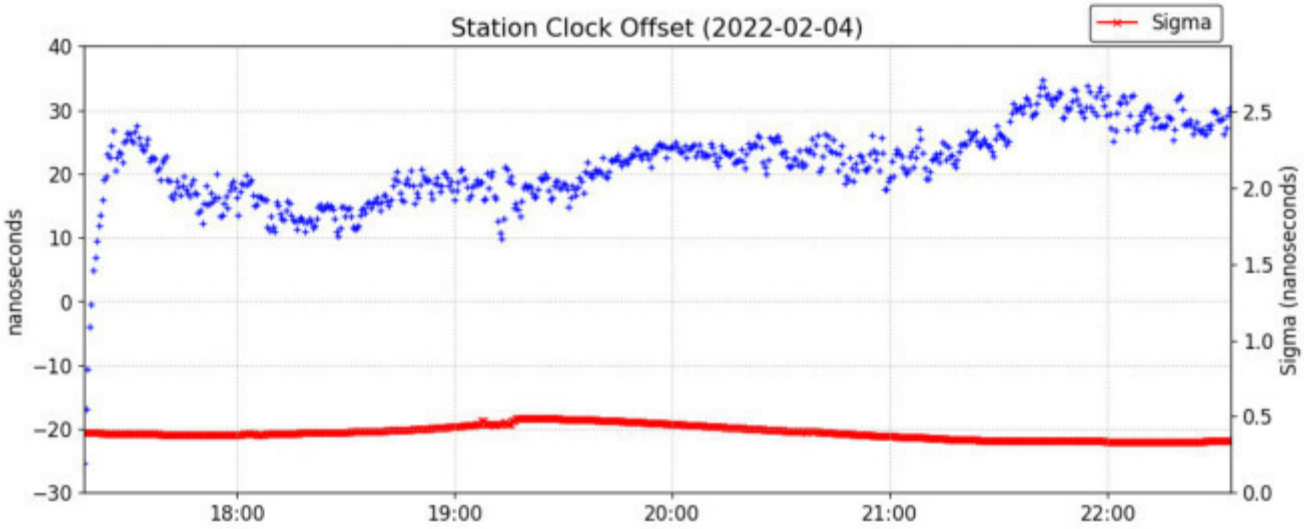

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G21
R01
R02
R03
R07
R08
R09
R12
R15
R17
R18
R19
R20
R21
R24

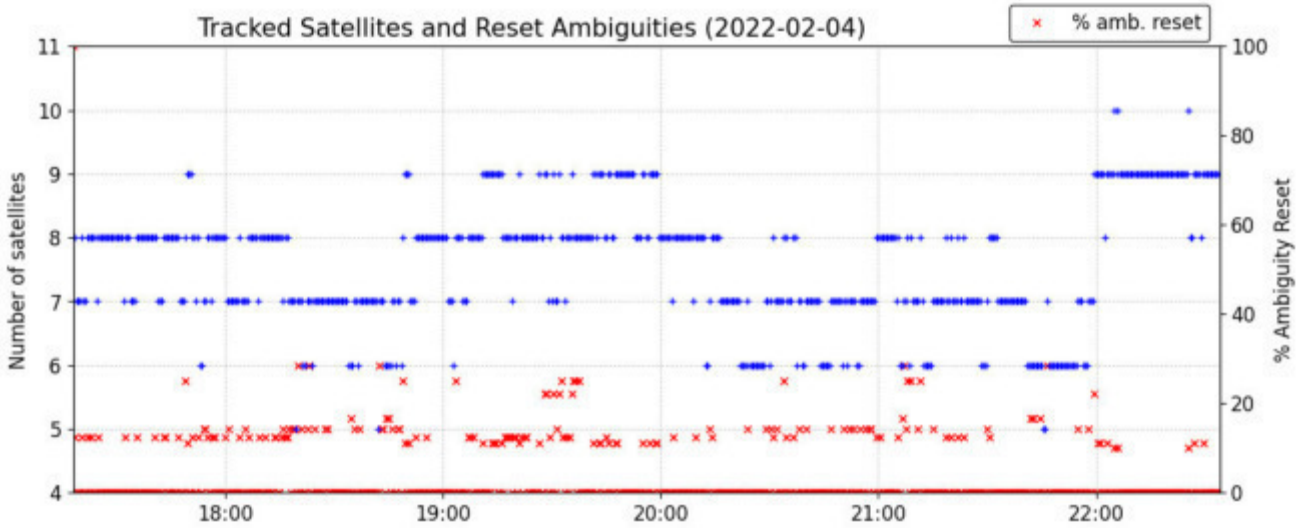

Final solution
Latitude Differences (2022-02-04)
SIG_PPP
metres
Sigma (metres)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
70
60
50
40
30
20
10
0
18:00
19:00
20:00
21:00
22:00

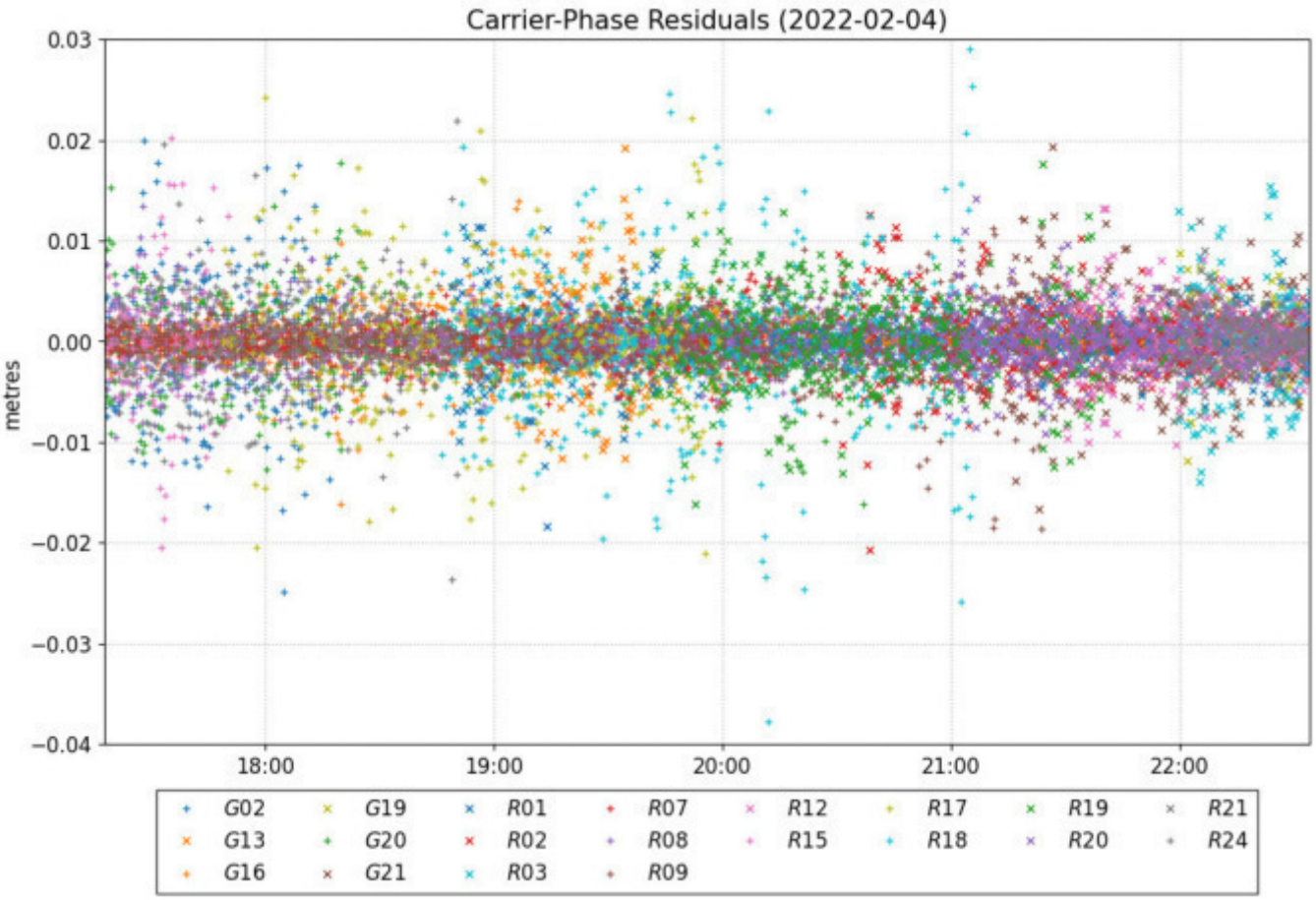

Final solution
Longitude Differences (2022-02-04)
SIG_PPP
metres
Sigma (metres)
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
40
30
20
10
0
18:00
19:00
20:00
21:00
22:00

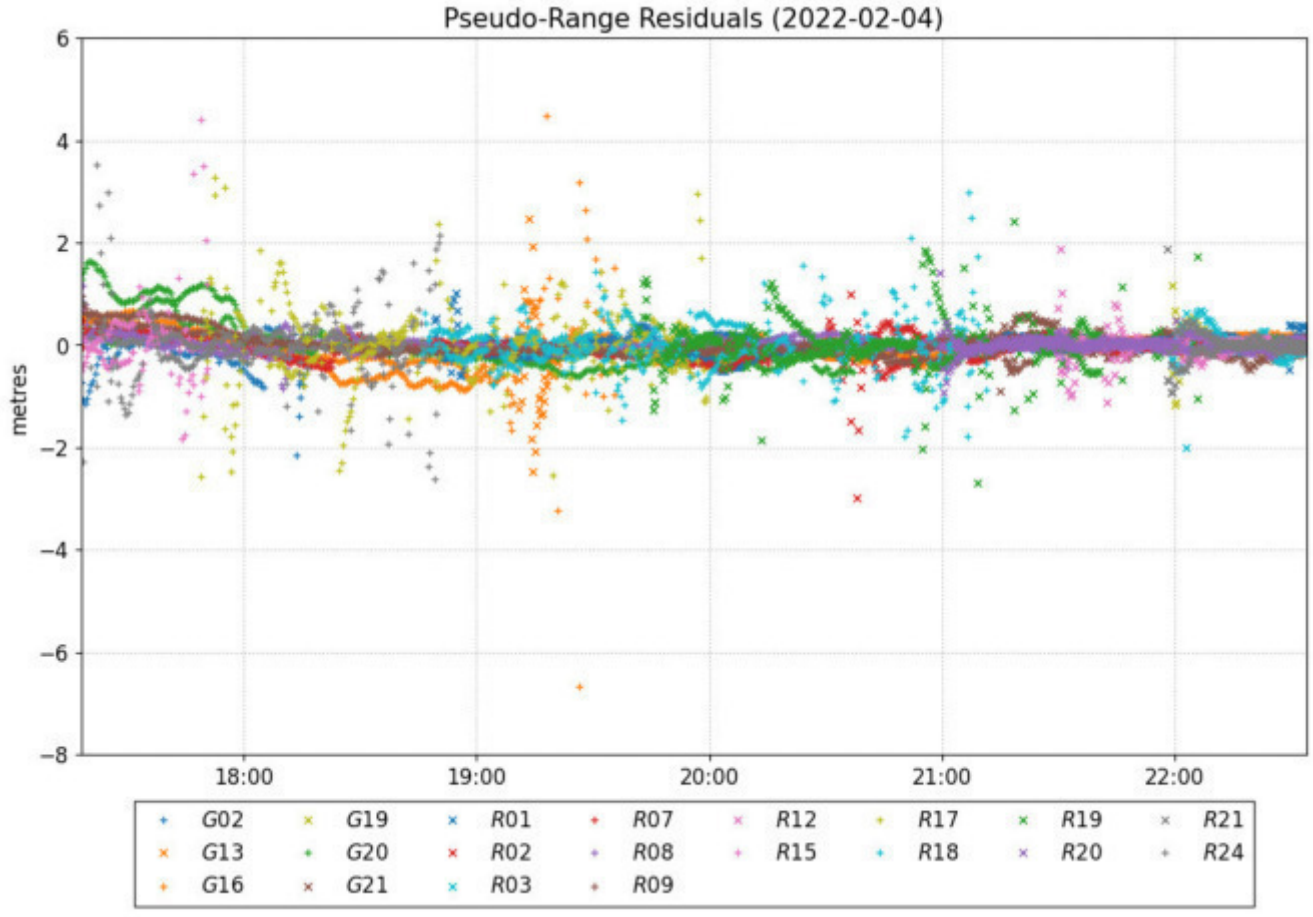

Final solution
Height Differences (2022-02-04)
SIG_PPP
metres
Sigma (metres)
1
0
−1
−2
−3
−4
−5
200
150
100
50
0
18:00
19:00
20:00
21:00
22:00


Estimated Tropospheric Zenith Delay (2022-02-04)
Sigma
metres
2.18
2.17
2.16
2.15
2.14
2.13
2.12
2.11
18:00
19:00
20:00
21:00
22:00


Station Clock Offset (2022-02-04)
Sigma
nanoseconds
Sigma (nanoseconds)
40
30
20
10
0
−10
−20
−30
2.5
2.0
1.5
1.0
0.5
0.0
18:00
19:00
20:00
21:00
22:00


Tracked Satellites and Reset Ambiguities (2022-02-04)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00


Carrier-Phase Residuals (2022-02-04)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
18:00
19:00
20:00
21:00
22:00
G02 G19 R01 R07 R12 R17 R19 R21
G13 G20 R02 R08 R15 R18 R20 R24
G16 G21 R03 R09


Pseudo-Range Residuals (2022-02-04)
metres
6
4
2
0
−2
−4
−6
−8
18:00
19:00
20:00
21:00
22:00
G02 G19 R01 R07 R12 R17 R19 R21
G13 G20 R02 R08 R15 R18 R20 R24
G16 G21 R03 R09


Phase Ambiguity Status (2022-02-04)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
R01
R02
R03
R07
R08
R09
R12
R15
R17
R18
R19
R20
R21
R24
18:00
19:00
20:00
21:00
22:00

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If you have any questions, please feel free to contact:
Geodetic Integrated Services
Canadian Geodetic Survey
Surveyor General Branch
Natural Resources Canada
Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220205-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-02-05 18:11:30.00	2022-02-06 01:26:30.00	7:15:00
Processing Time		**Product Type**
20:16:10 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.23 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.494m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220205-GS15Base_decimatedRinex.yyo

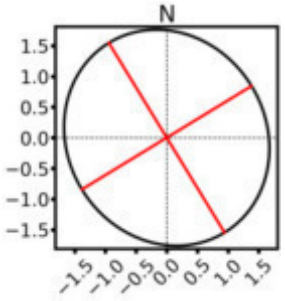
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.1)	60° 9' 56.27979"	-132° 42' 41.67310"	686.956 m
Sigmas(95%)	0.014 m	0.013 m	0.032 m
A priori*	60° 9' 56.27066"	-132° 42' 41.73585"	684.221 m
Estimated – A priori	0.283 m	0.968 m	2.735 m

Orthometric Height CGVD2013 (CGG2013a) (2022.1)

683.515 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 1.8 cm
semi-minor: 1.6 cm
semi-major azimuth: -31° 37' 34.33"



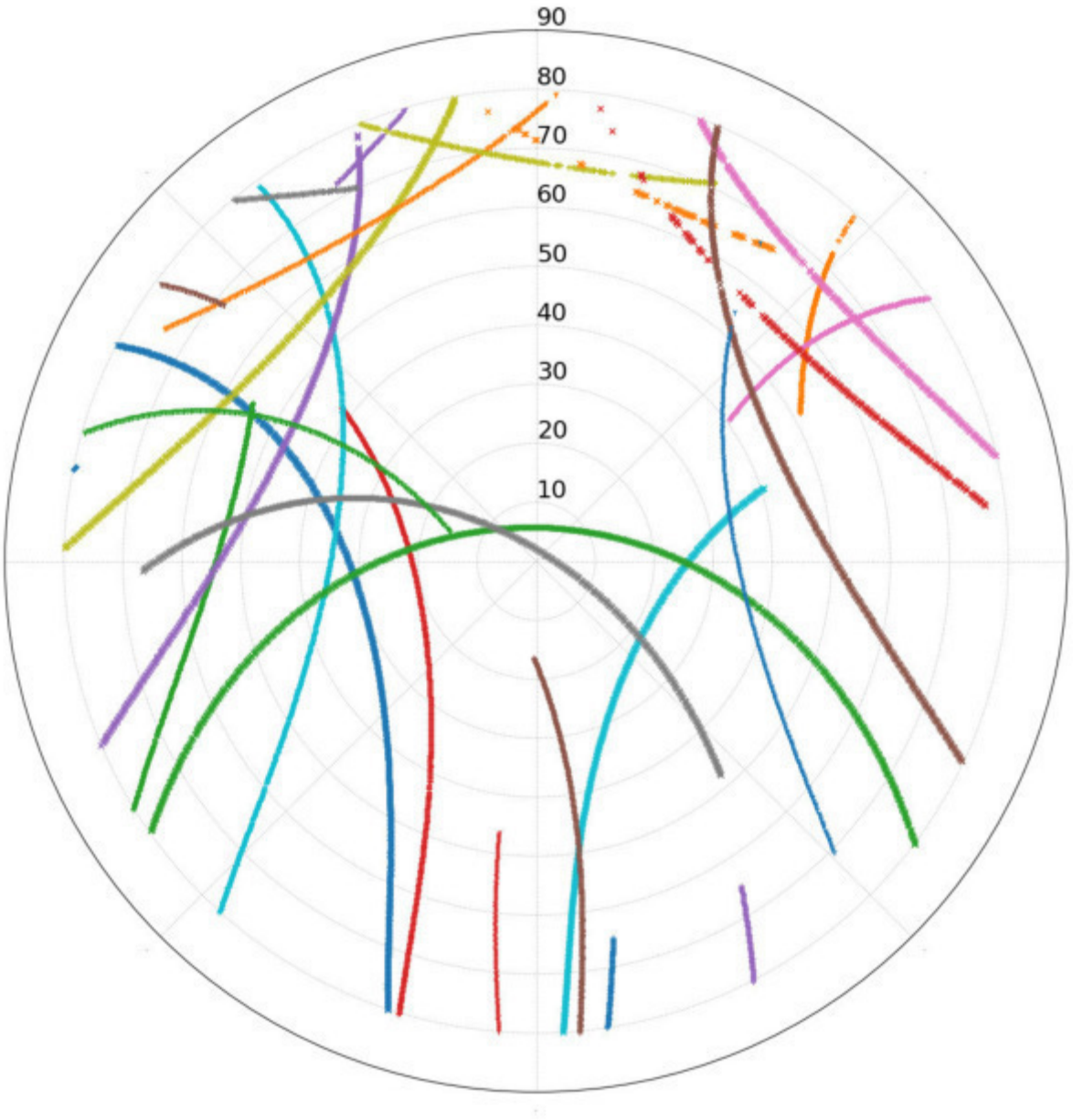
UTM (North) Zone 8

6672057.934 m (N)
626987.363 m (E)

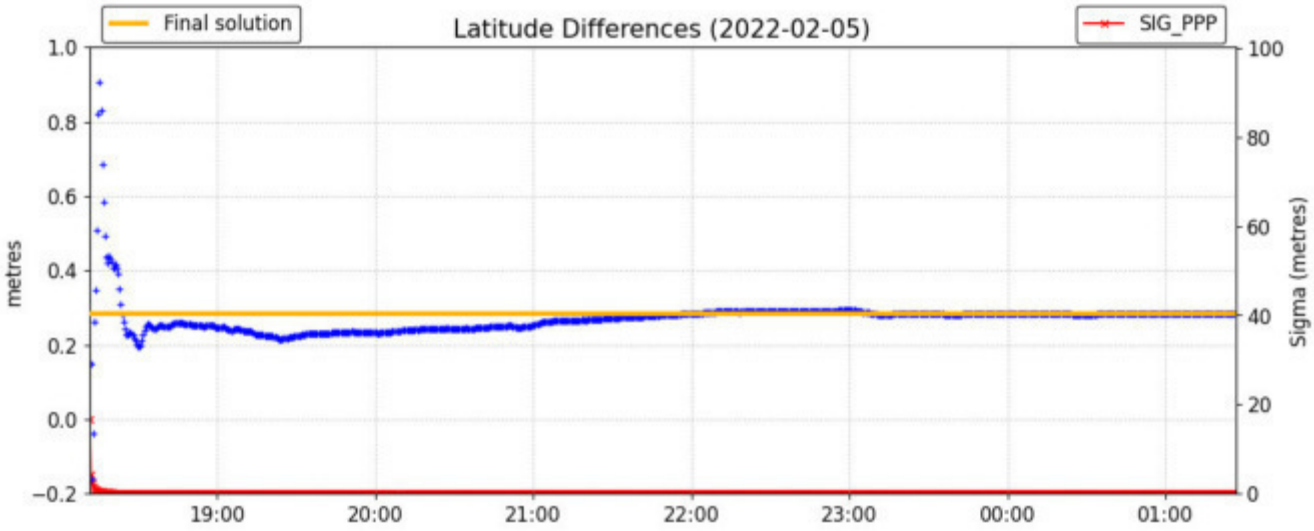
Scale Factors
0.99979762 (point)
0.99969013 (combined)

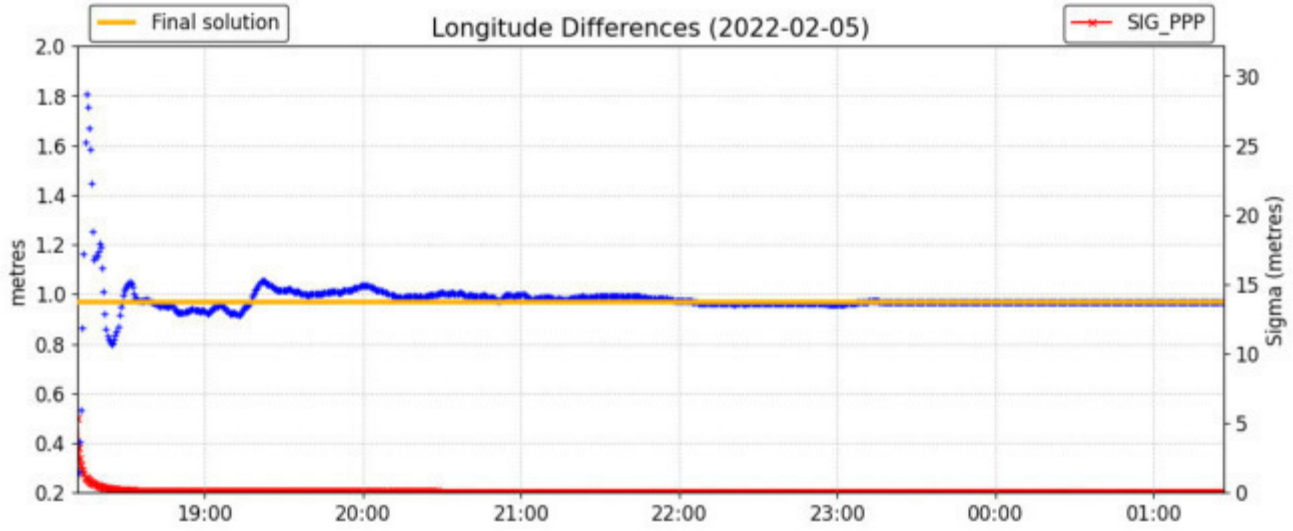
*(Coordinates from RINEX header used as a priori position)

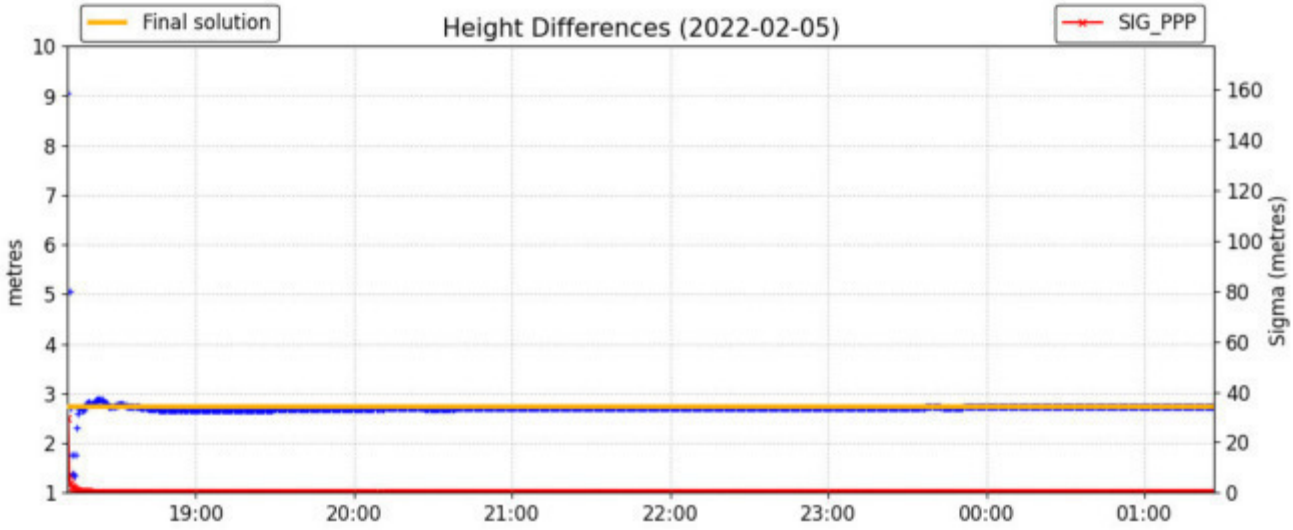
Satellite Sky Distribution

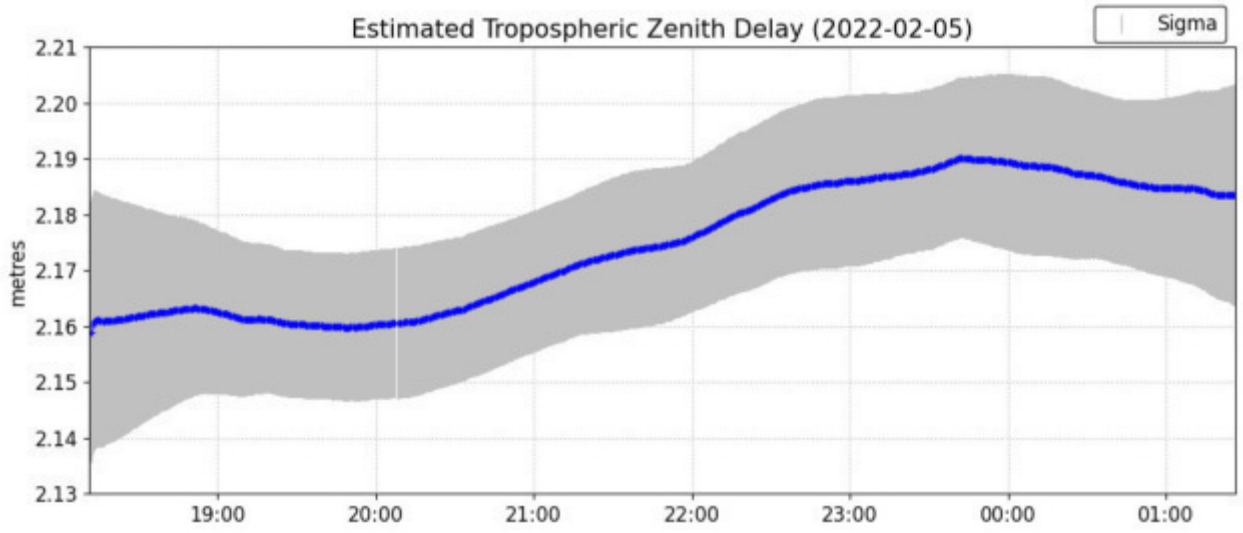


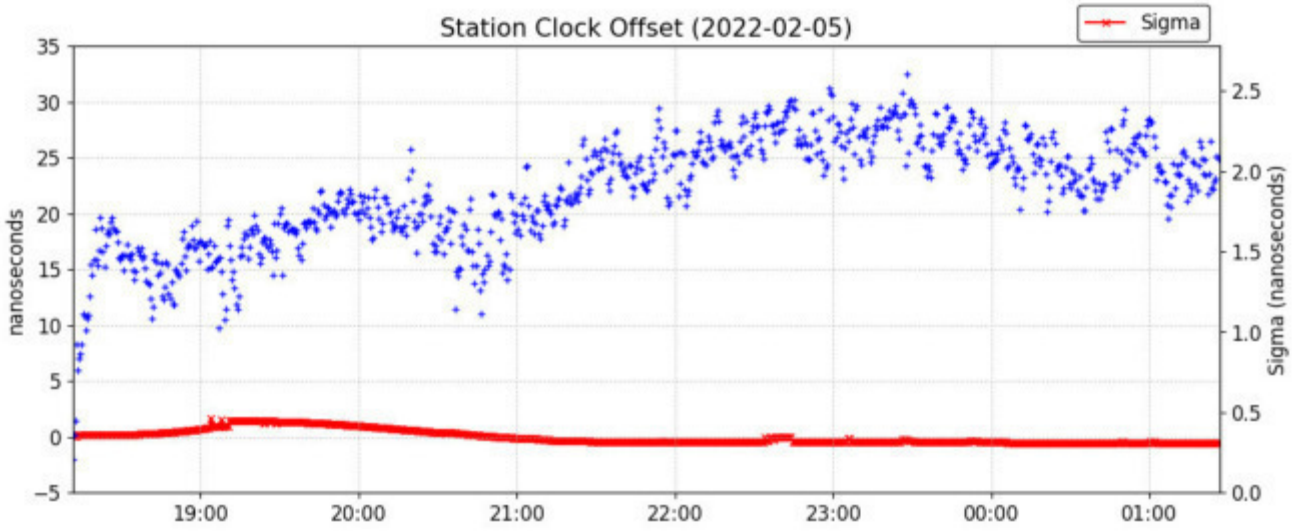
G02	G21	R04	R09	R15	R20
G13	G22	R05	R12	R17	R21
G16	R01	R07	R13	R18	R22
G19	R02	R08	R14	R19	R24
G20	R03				

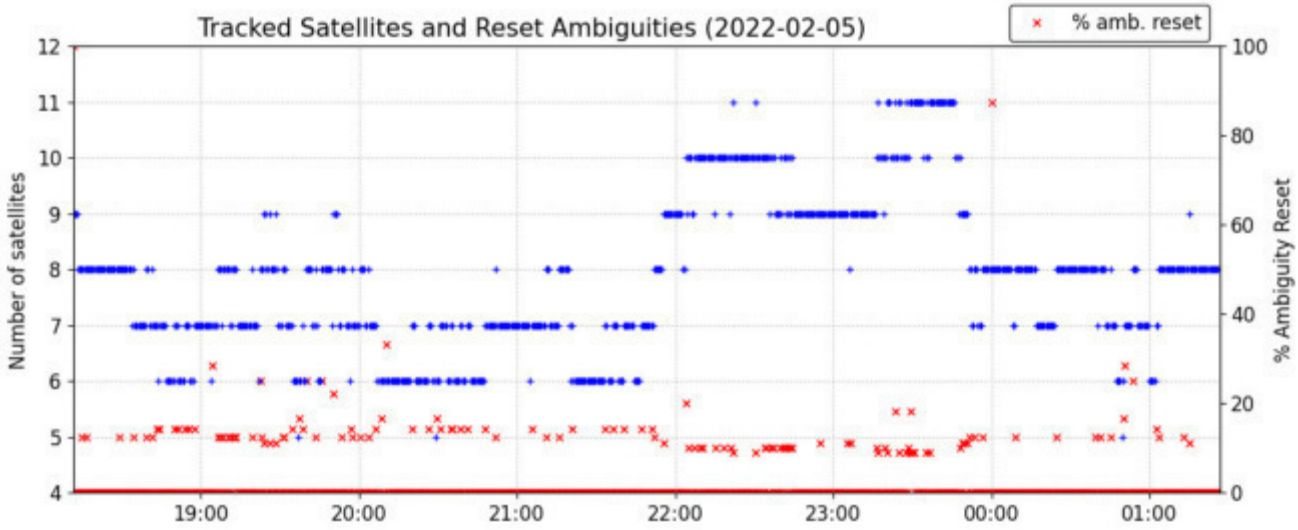

Final solution
Latitude Differences (2022-02-05)
SIG_PPP
metres
Sigma (metres)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
100
80
60
40
20
0
19:00
20:00
21:00
22:00
23:00
00:00
01:00

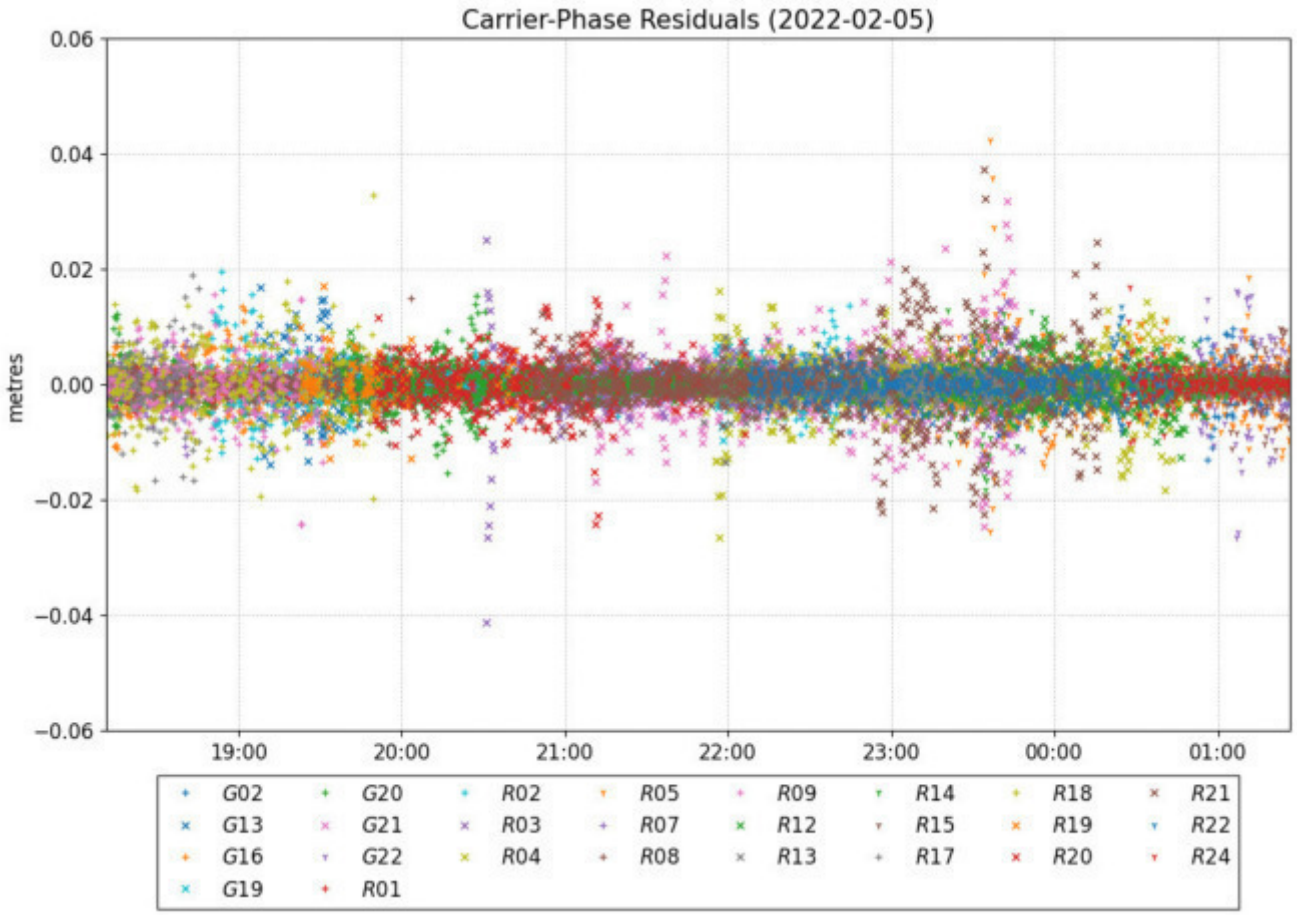

Final solution
Longitude Differences (2022-02-05)
SIG_PPP
metres
Sigma (metres)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
30
25
20
15
10
5
0
19:00
20:00
21:00
22:00
23:00
00:00
01:00

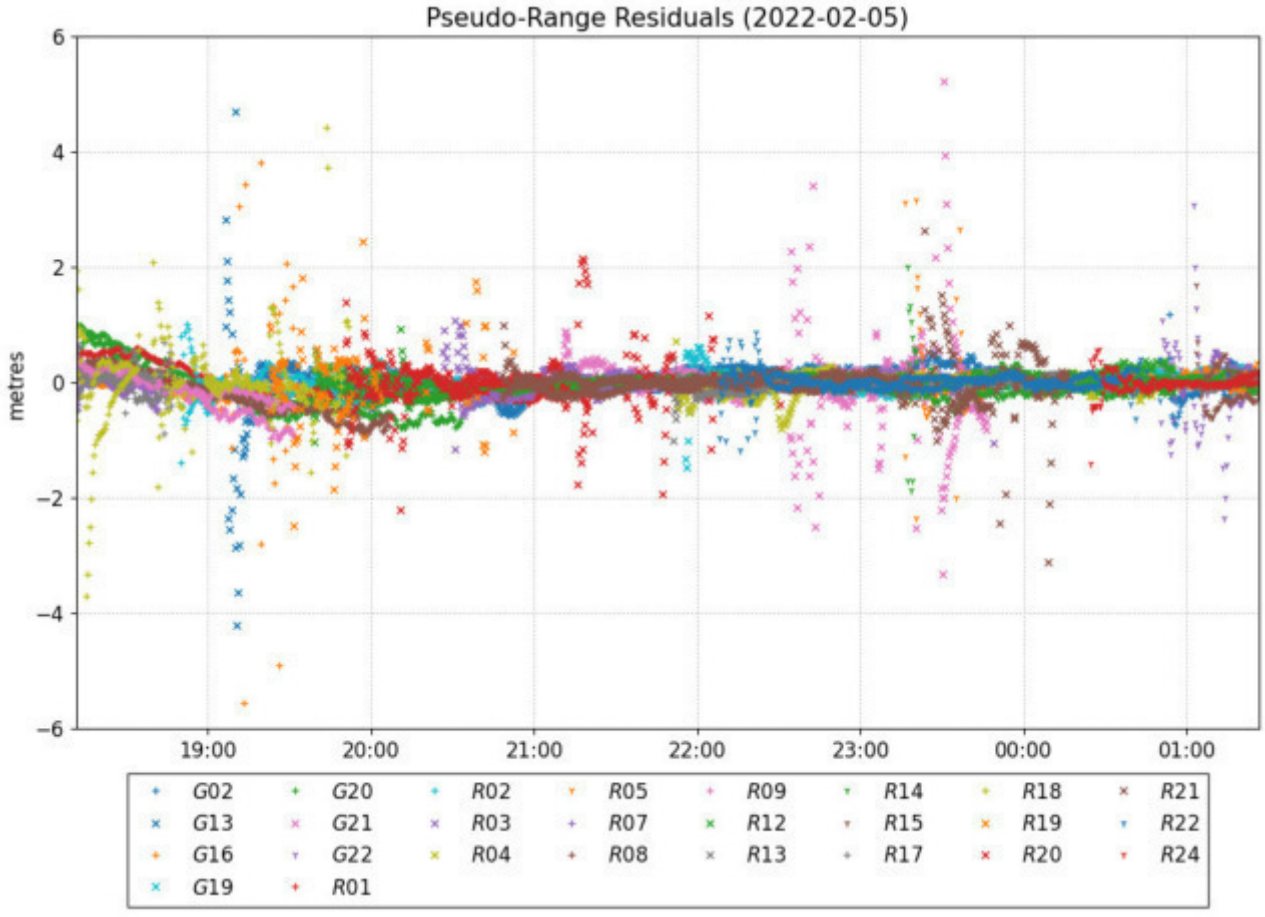

Final solution
Height Differences (2022-02-05)
SIG_PPP
metres
Sigma (metres)
10
9
8
7
6
5
4
3
2
1
160
140
120
100
80
60
40
20
0
19:00
20:00
21:00
22:00
23:00
00:00
01:00

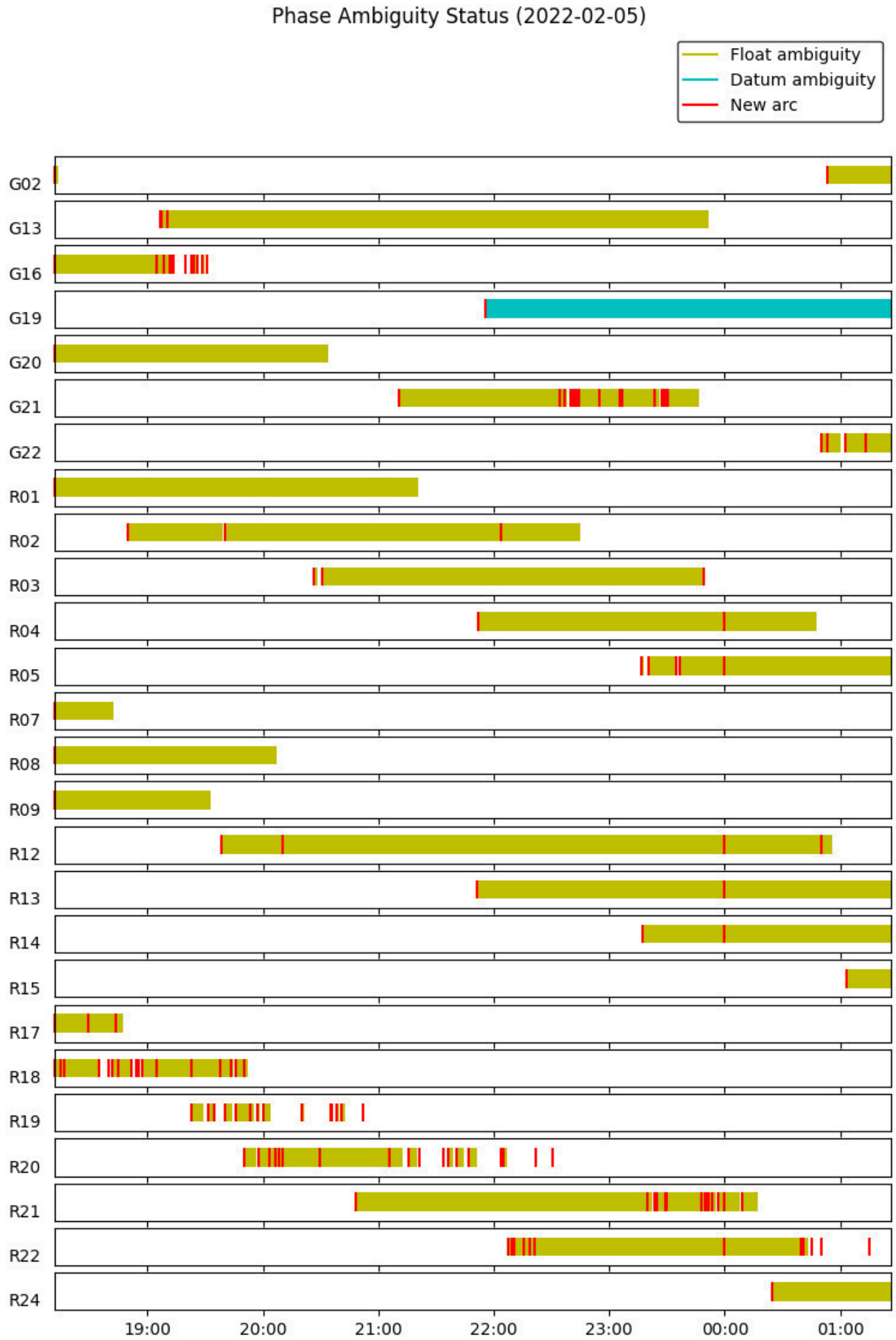

Estimated Tropospheric Zenith Delay (2022-02-05)
Sigma
metres
2.21
2.20
2.19
2.18
2.17
2.16
2.15
2.14
2.13
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-02-05)
Sigma
nanoseconds
Sigma (nanoseconds)
35
30
25
20
15
10
5
0
−5
2.5
2.0
1.5
1.0
0.5
0.0
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-02-05)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-02-05)
metres
0.06
0.04
0.02
0.00
−0.02
−0.04
−0.06
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G21 R03 R07 R12 R15 R19 R22
G16 G22 R04 R08 R13 R17 R20 R24
G19 R01


Pseudo-Range Residuals (2022-02-05)
metres
6
4
2
0
−2
−4
−6
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G21 R03 R07 R12 R15 R19 R22
G16 G22 R04 R08 R13 R17 R20 R24
G19 R01


Phase Ambiguity Status (2022-02-05)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220405-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-05 23:30:30.00	2022-04-06 02:01:30.00	2:31:00
Processing Time		**Product Type**
20:16:26 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.530m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220405-GS15Base_decimatedRinex.yyo

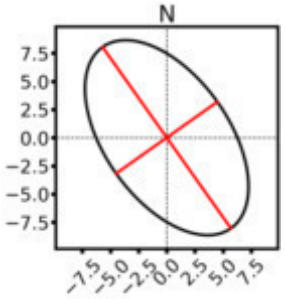
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 9' 56.28118"	-132° 42' 41.67255"	686.997 m
Sigmas(95%)	0.069 m	0.058 m	0.083 m
A priori*	60° 9' 56.28838"	-132° 42' 41.85788"	687.737 m
Estimated − A priori	-0.223 m	2.858 m	-0.740 m

Orthometric Height CGVD2013 (CGG2013a) (2022.3)

683.557 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 9.9 cm
semi-minor: 5.5 cm
semi-major azimuth: -35° 42' 55.86"

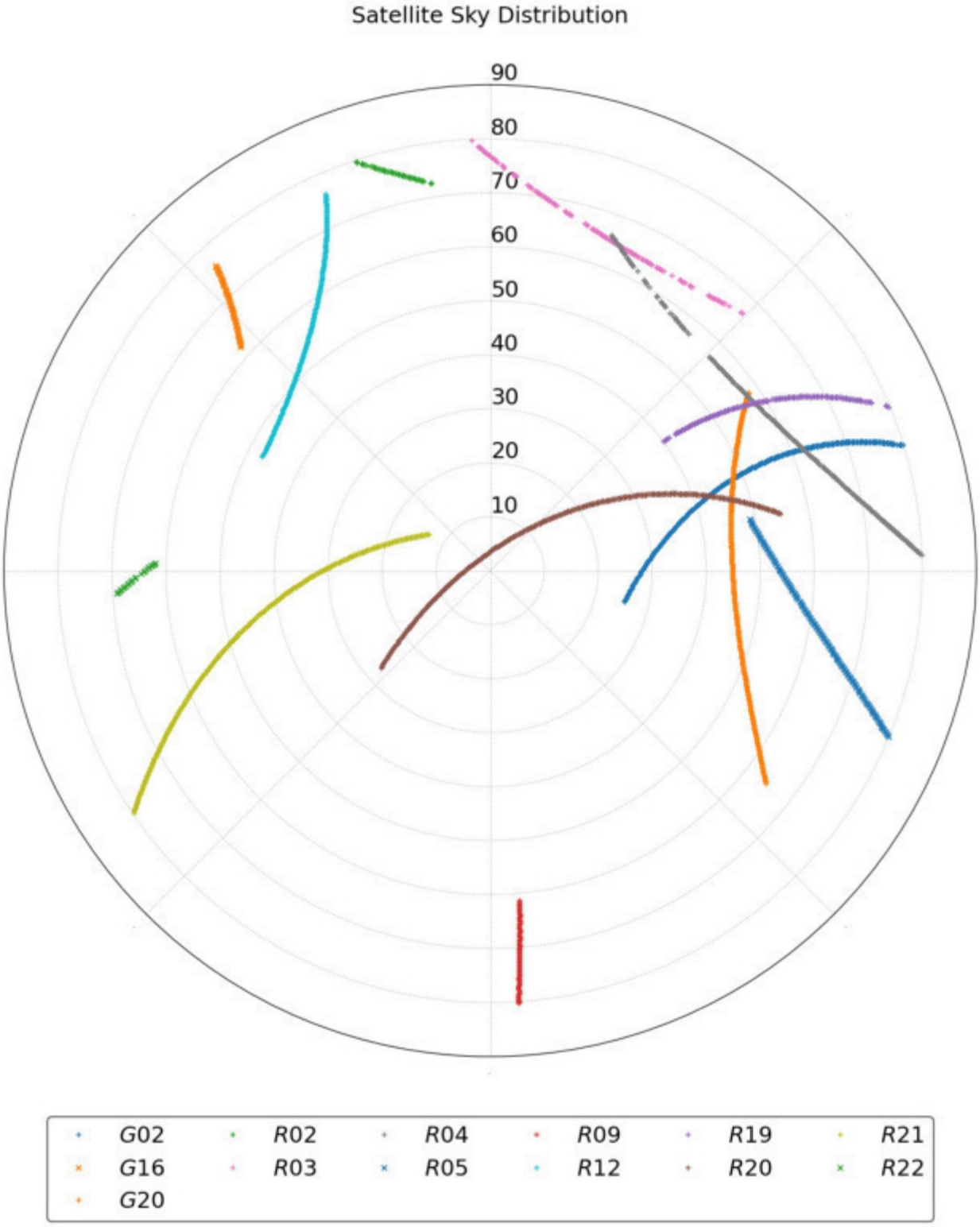


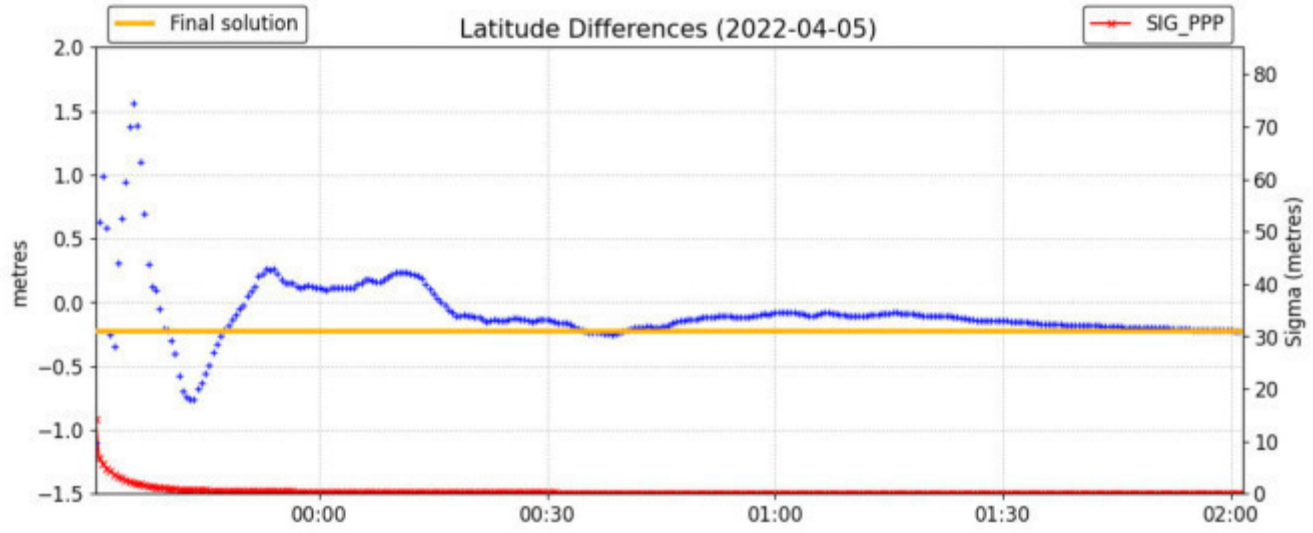
UTM (North) Zone 8

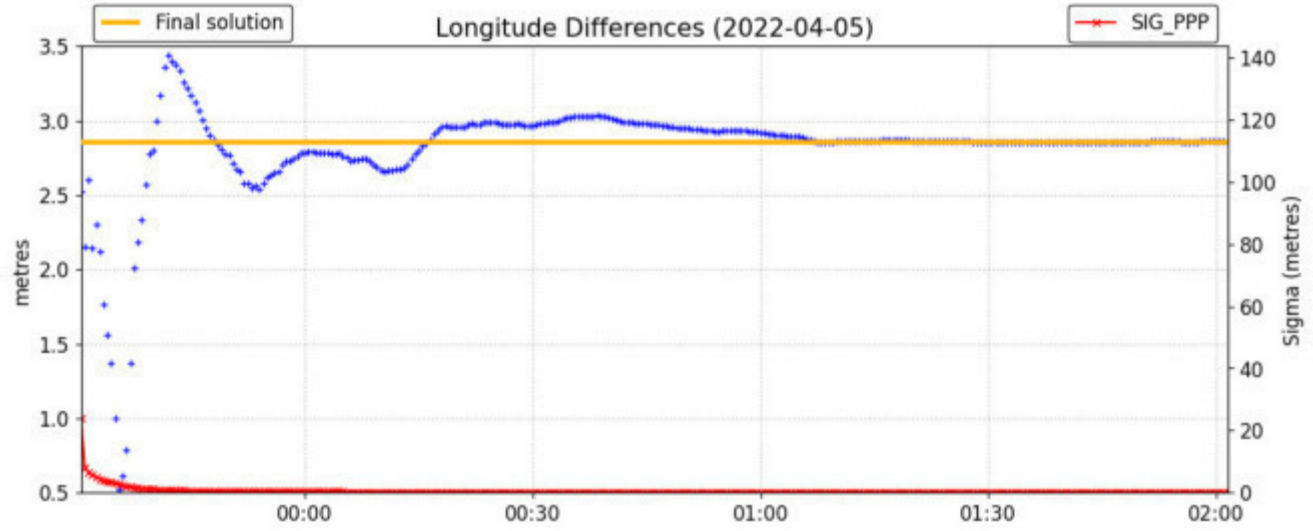
6672057.977 m (N)
626987.370 m (E)

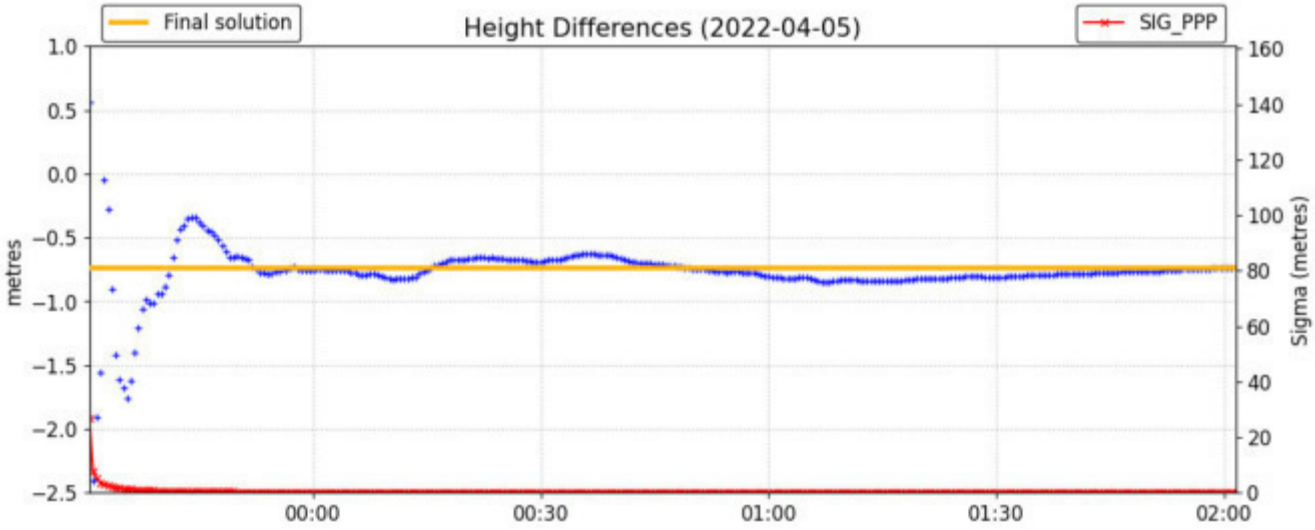
Scale Factors
0.99979762 (point)
0.99969012 (combined)

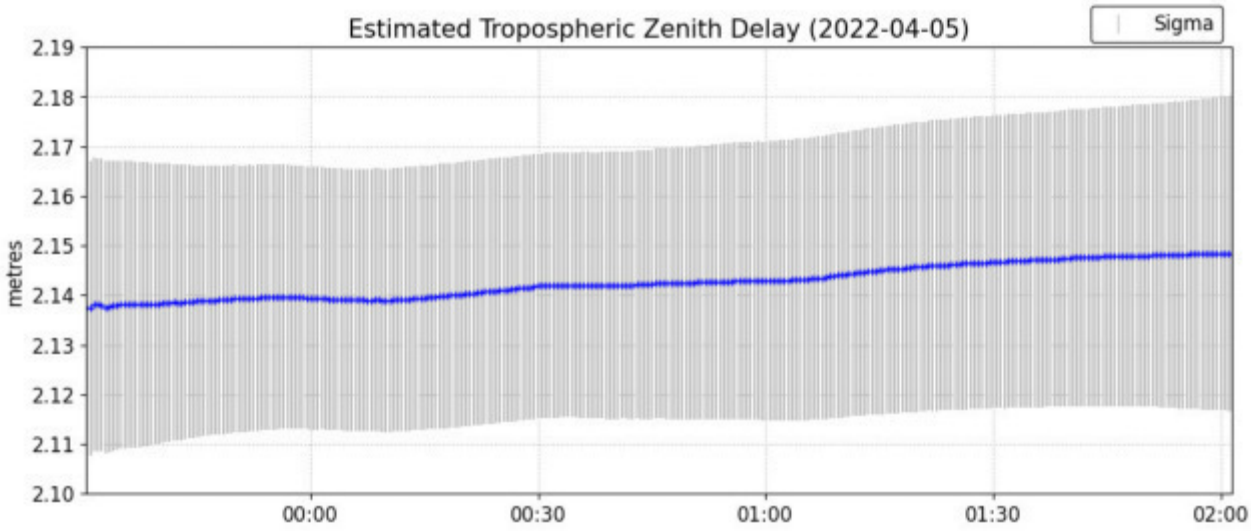
*(Coordinates from RINEX header used as a priori position)

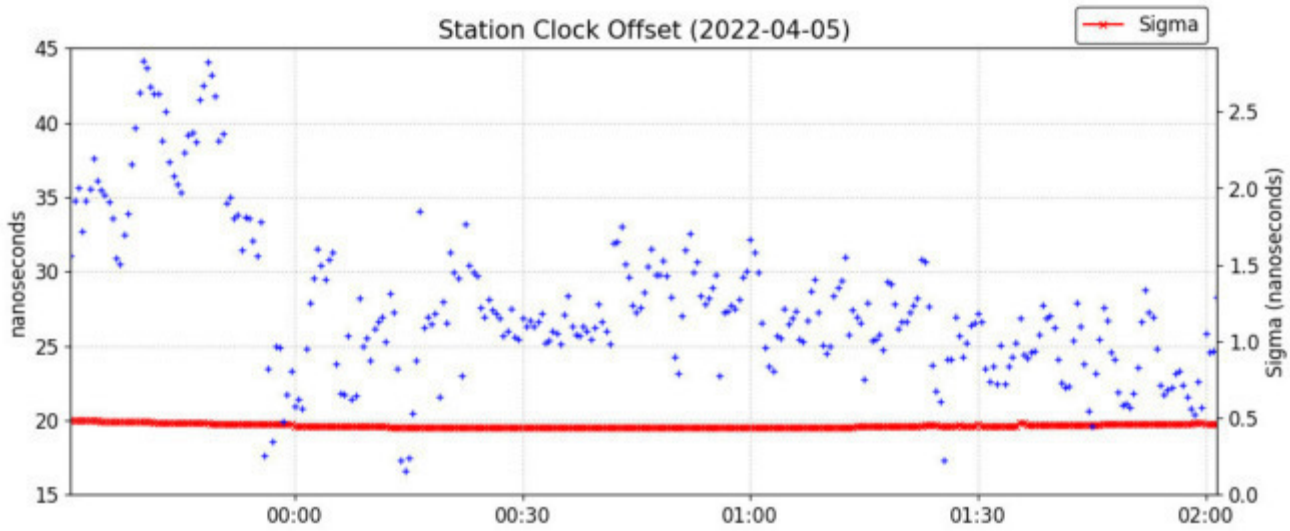

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G16
G20
R02
R03
R04
R05
R09
R12
R19
R20
R21
R22

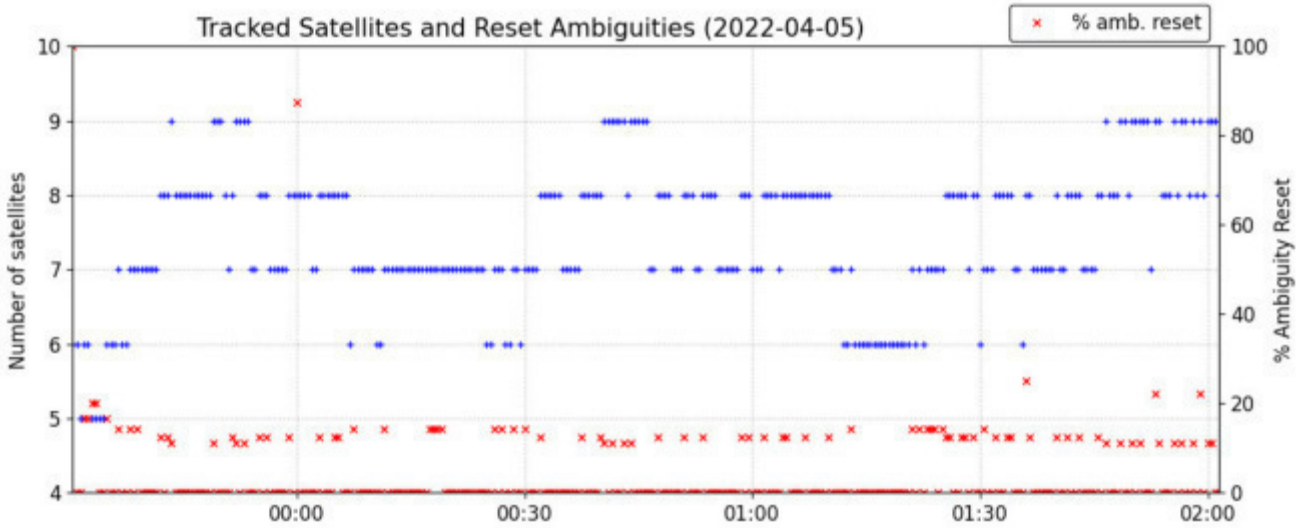

Final solution
Latitude Differences (2022-04-05)
SIG_PPP
metres
Sigma (metres)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
80
70
60
50
40
30
20
10
0
00:00
00:30
01:00
01:30
02:00

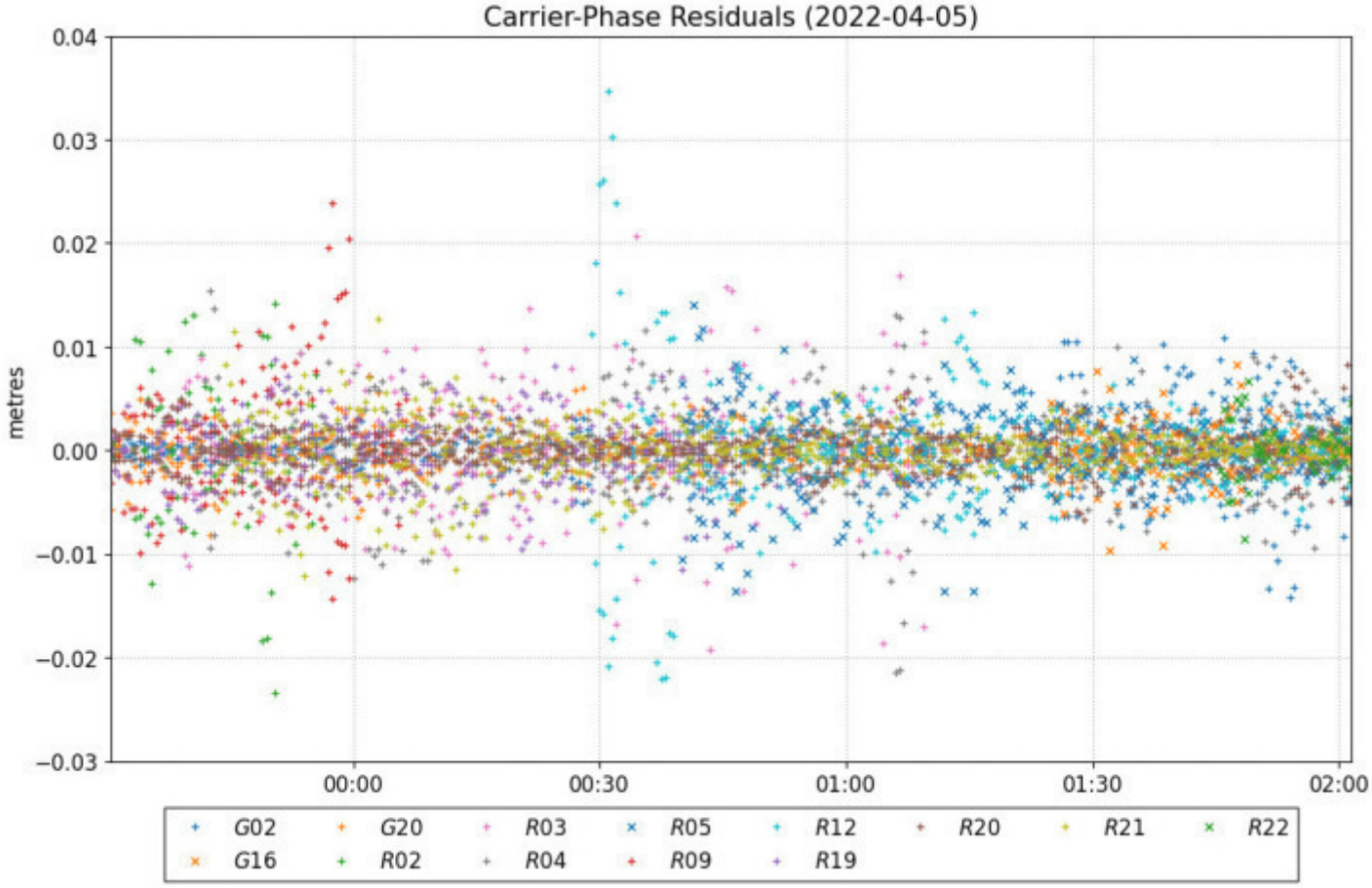

Final solution
Longitude Differences (2022-04-05)
SIG_PPP
metres
Sigma (metres)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
140
120
100
80
60
40
20
0
00:00
00:30
01:00
01:30
02:00

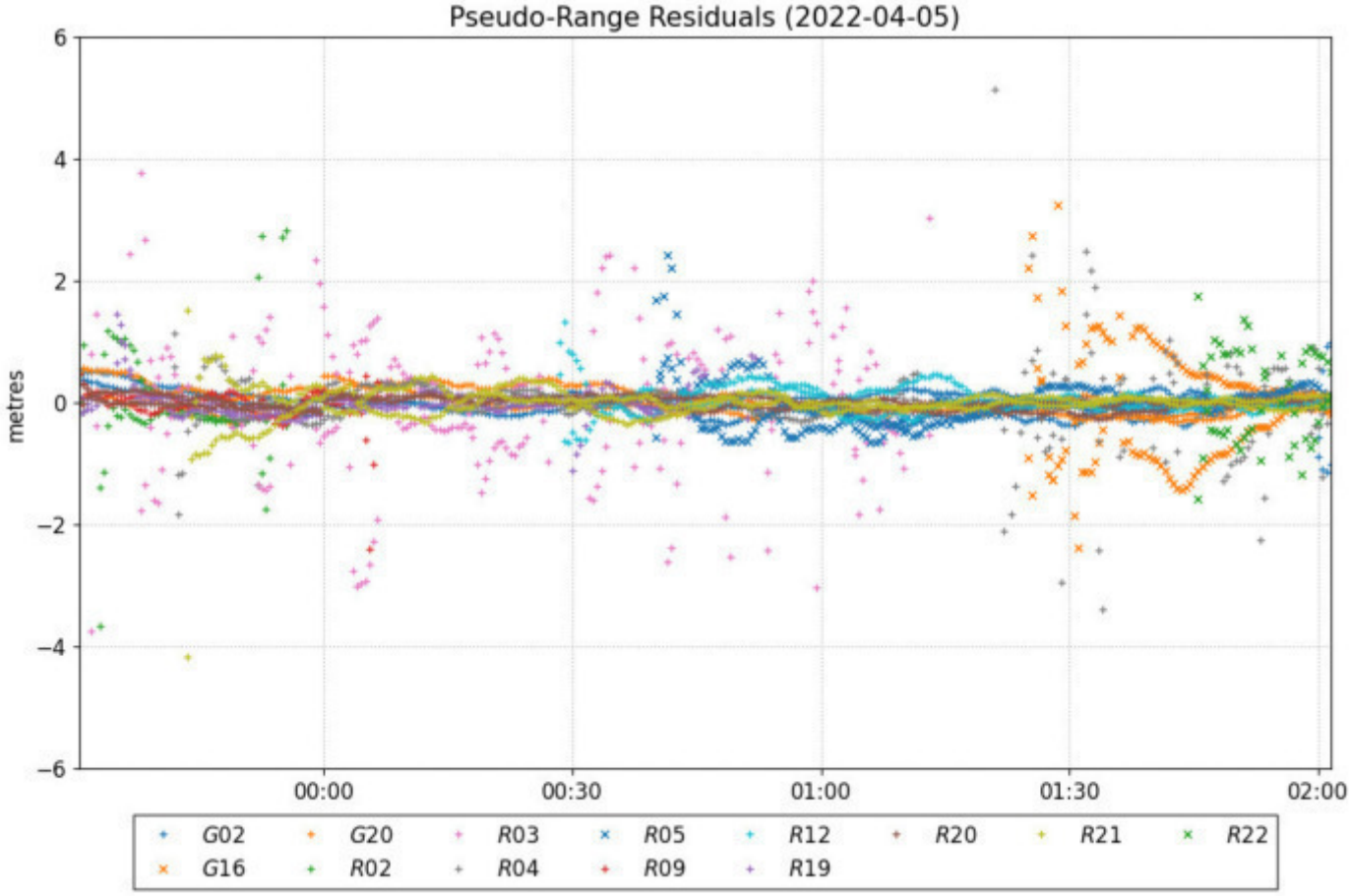

Final solution
Height Differences (2022-04-05)
SIG_PPP
metres
Sigma (metres)
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
160
140
120
100
80
60
40
20
0
00:00
00:30
01:00
01:30
02:00

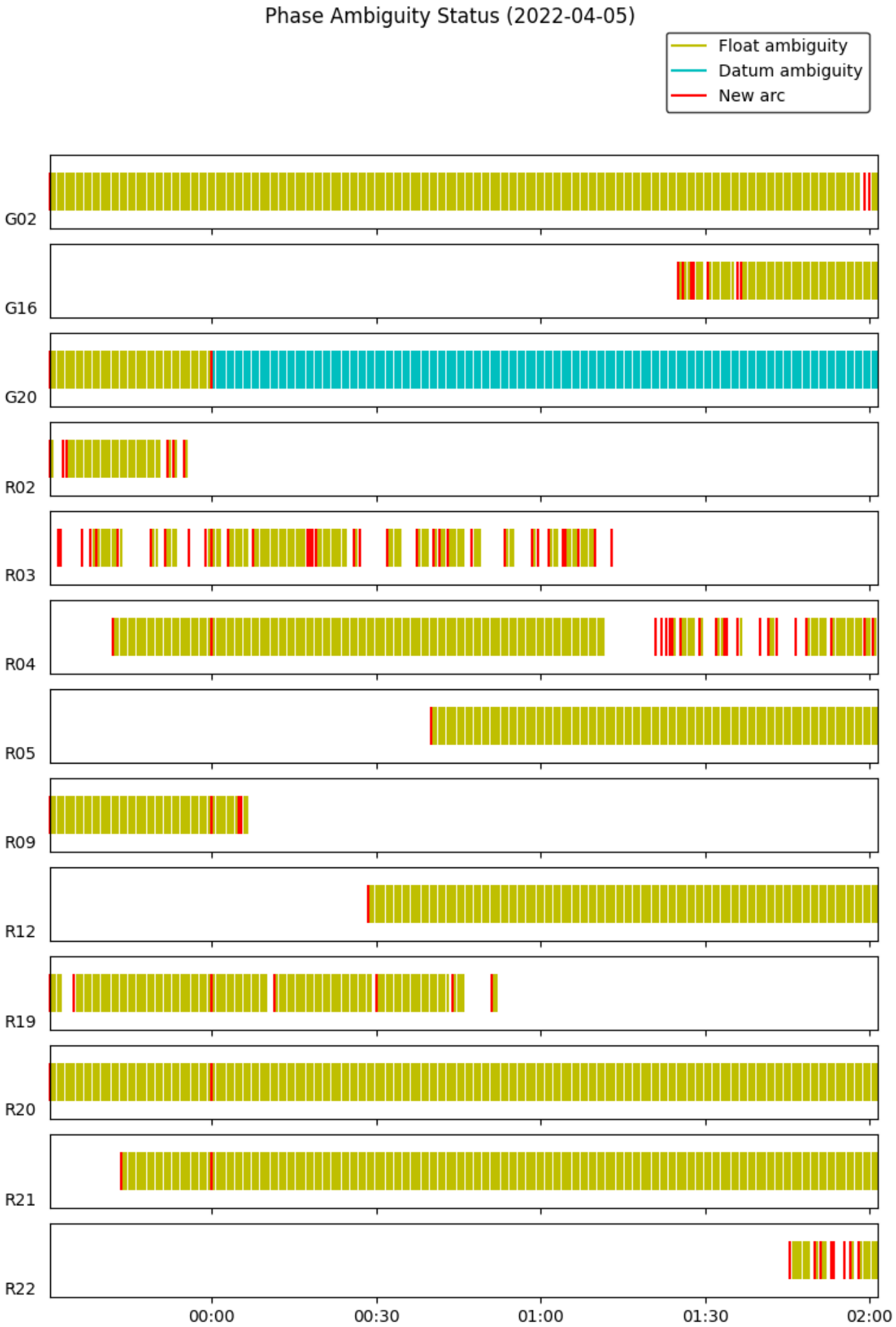

Estimated Tropospheric Zenith Delay (2022-04-05)
Sigma
metres
2.19
2.18
2.17
2.16
2.15
2.14
2.13
2.12
2.11
2.10
00:00
00:30
01:00
01:30
02:00


Station Clock Offset (2022-04-05)
Sigma
nanoseconds
Sigma (nanoseconds)
45
40
35
30
25
20
15
2.5
2.0
1.5
1.0
0.5
0.0
00:00
00:30
01:00
01:30
02:00


Tracked Satellites and Reset Ambiguities (2022-04-05)
% amb. reset
Number of satellites
% Ambiguity Reset
10
9
8
7
6
5
4
100
80
60
40
20
0
00:00
00:30
01:00
01:30
02:00


Carrier-Phase Residuals (2022-04-05)
metres
0.04
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
00:00
00:30
01:00
01:30
02:00
G02
G20
R03
R05
R12
R20
R21
R22
G16
R02
R04
R09
R19


Pseudo-Range Residuals (2022-04-05)
metres
6
4
2
0
−2
−4
−6
00:00
00:30
01:00
01:30
02:00
G02
G20
R03
R05
R12
R20
R21
R22
G16
R02
R04
R09
R19


Phase Ambiguity Status (2022-04-05)
Float ambiguity
Datum ambiguity
New arc
G02
G16
G20
R02
R03
R04
R05
R09
R12
R19
R20
R21
R22
00:00
00:30
01:00
01:30
02:00

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If you have any questions, please feel free to contact:
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Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
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Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220406-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-06 16:22:00.00	2022-04-07 01:21:00.00	8:59:00
Processing Time		**Product Type**
20:17:13 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.83 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.530m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220406-GS15Base_decimatedRinex.yyo

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 9' 56.28172"	-132° 42' 41.67647"	686.953 m
Sigmas(95%)	0.013 m	0.017 m	0.043 m
A priori*	60° 9' 56.22524"	-132° 42' 41.80005"	689.424 m
Estimated – A priori	1.748 m	1.906 m	-2.471 m

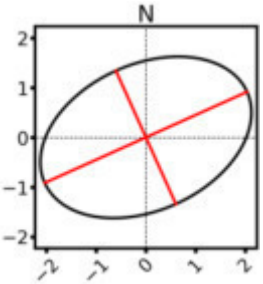
Orthometric Height CGVD2013 (CGG2013a) (2022.3)

683.512 m

(click for height reference information)

95% Error Ellipse (cm)

semi-major: 2.2 cm
semi-minor: 1.5 cm
semi-major azimuth: 65° 46' 34.71"

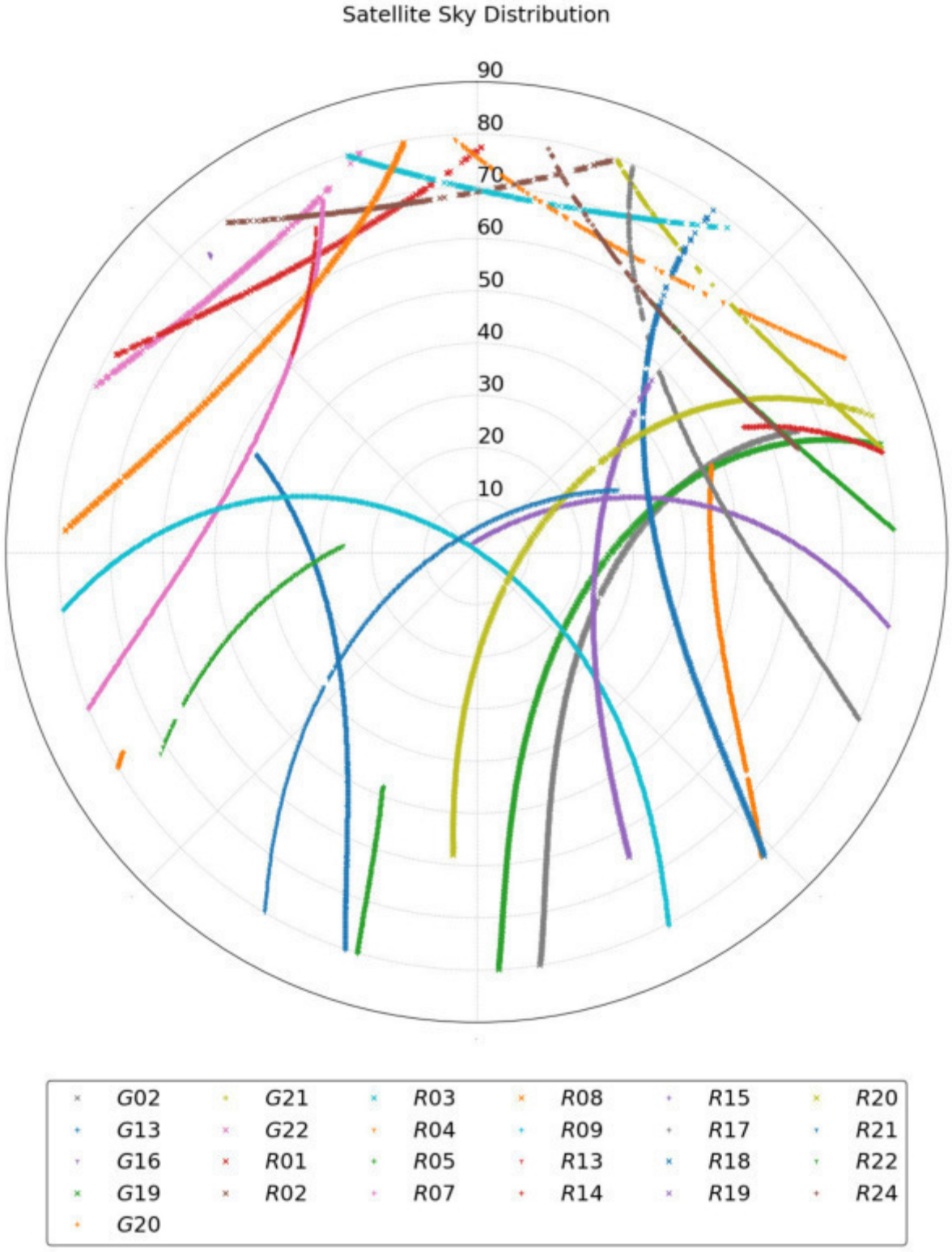


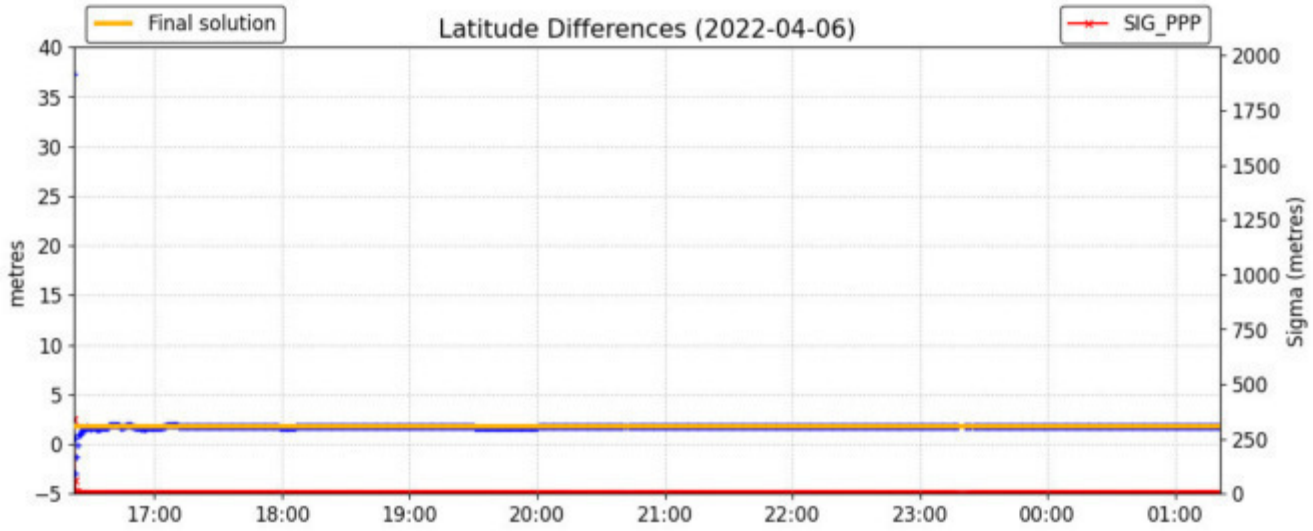
UTM (North) Zone 8

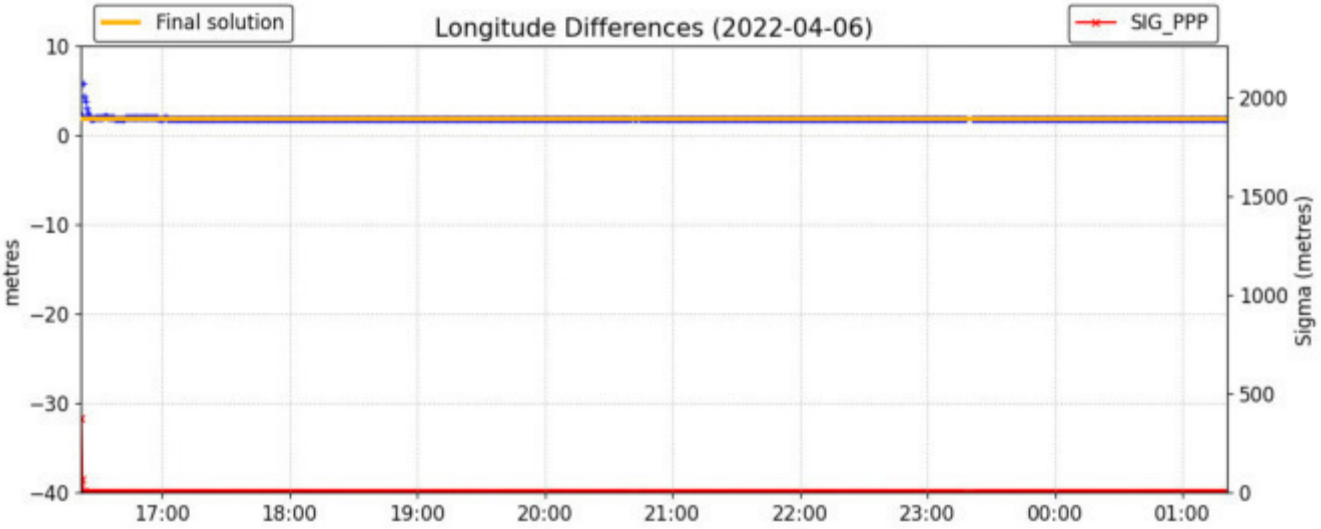
6672057.992 m (N)
626987.309 m (E)

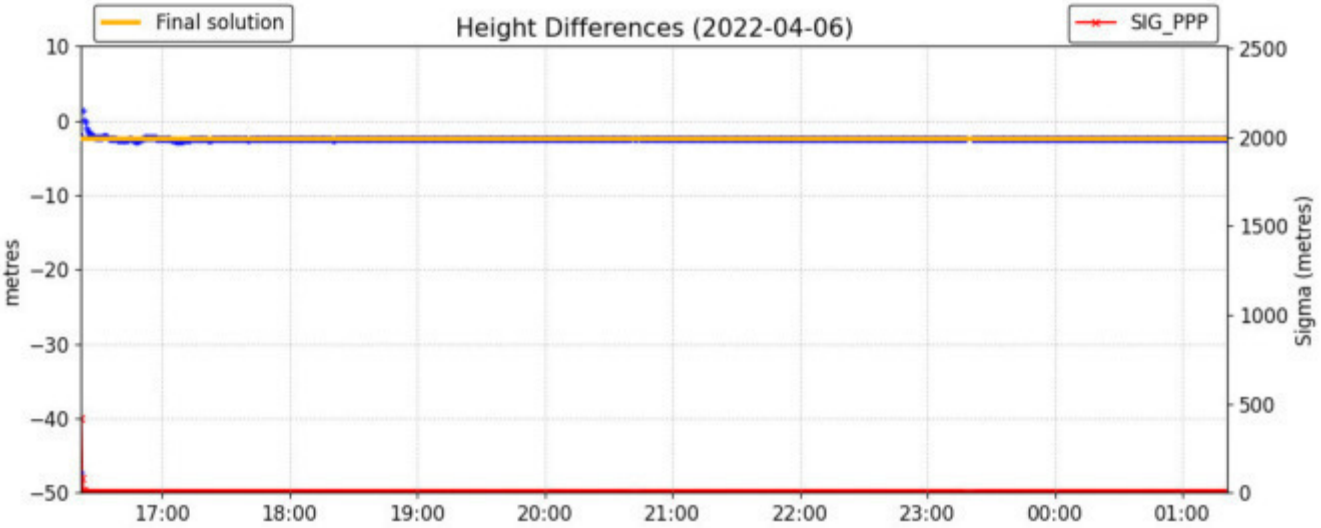
Scale Factors
0.99979761 (point)
0.99969013 (combined)

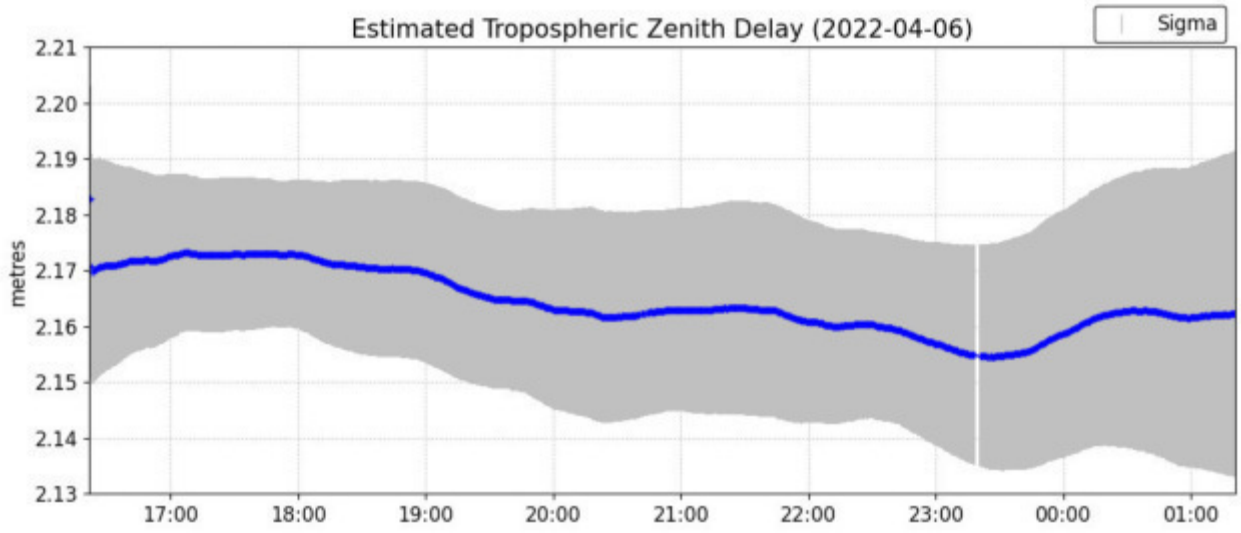
*(Coordinates from RINEX header used as a priori position)

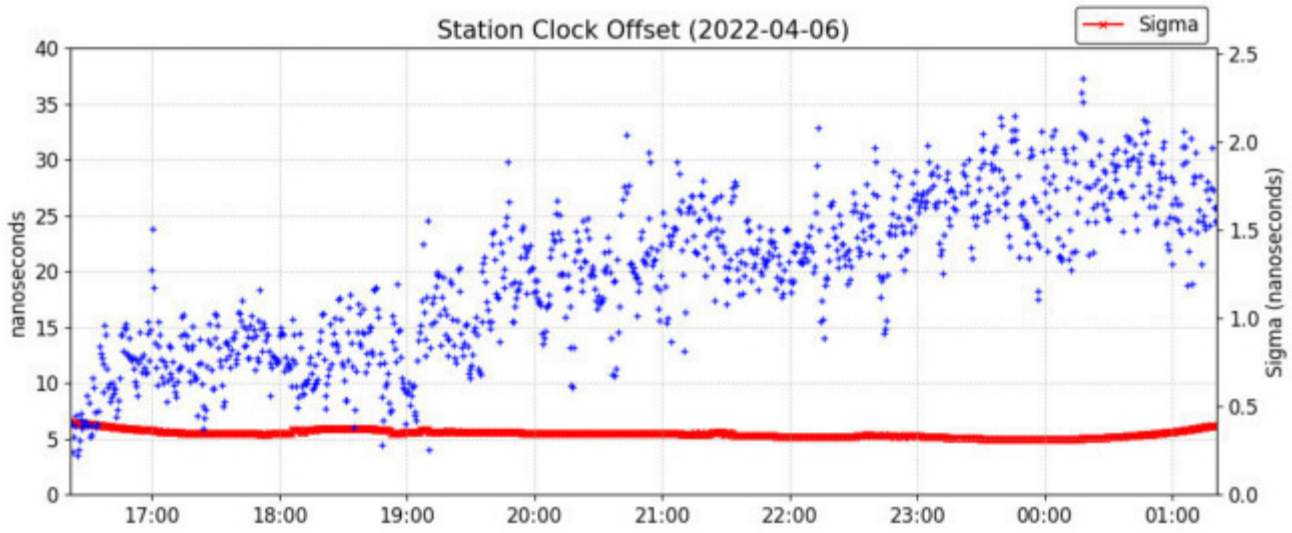

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24

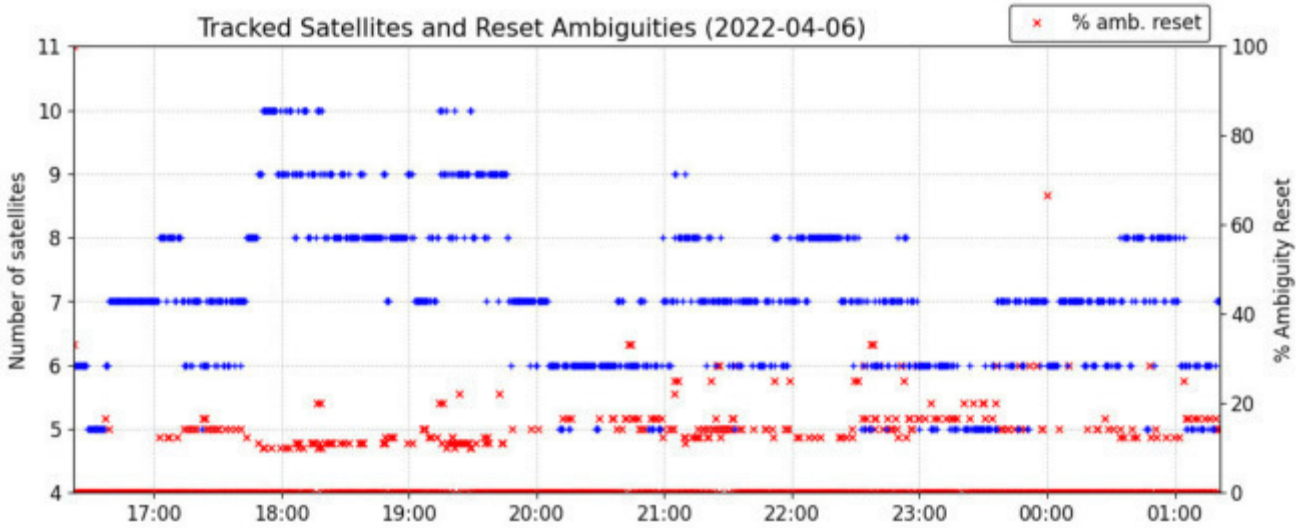

Final solution
Latitude Differences (2022-04-06)
SIG_PPP
metres
Sigma (metres)
40
35
30
25
20
15
10
5
0
−5
2000
1750
1500
1250
1000
750
500
250
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

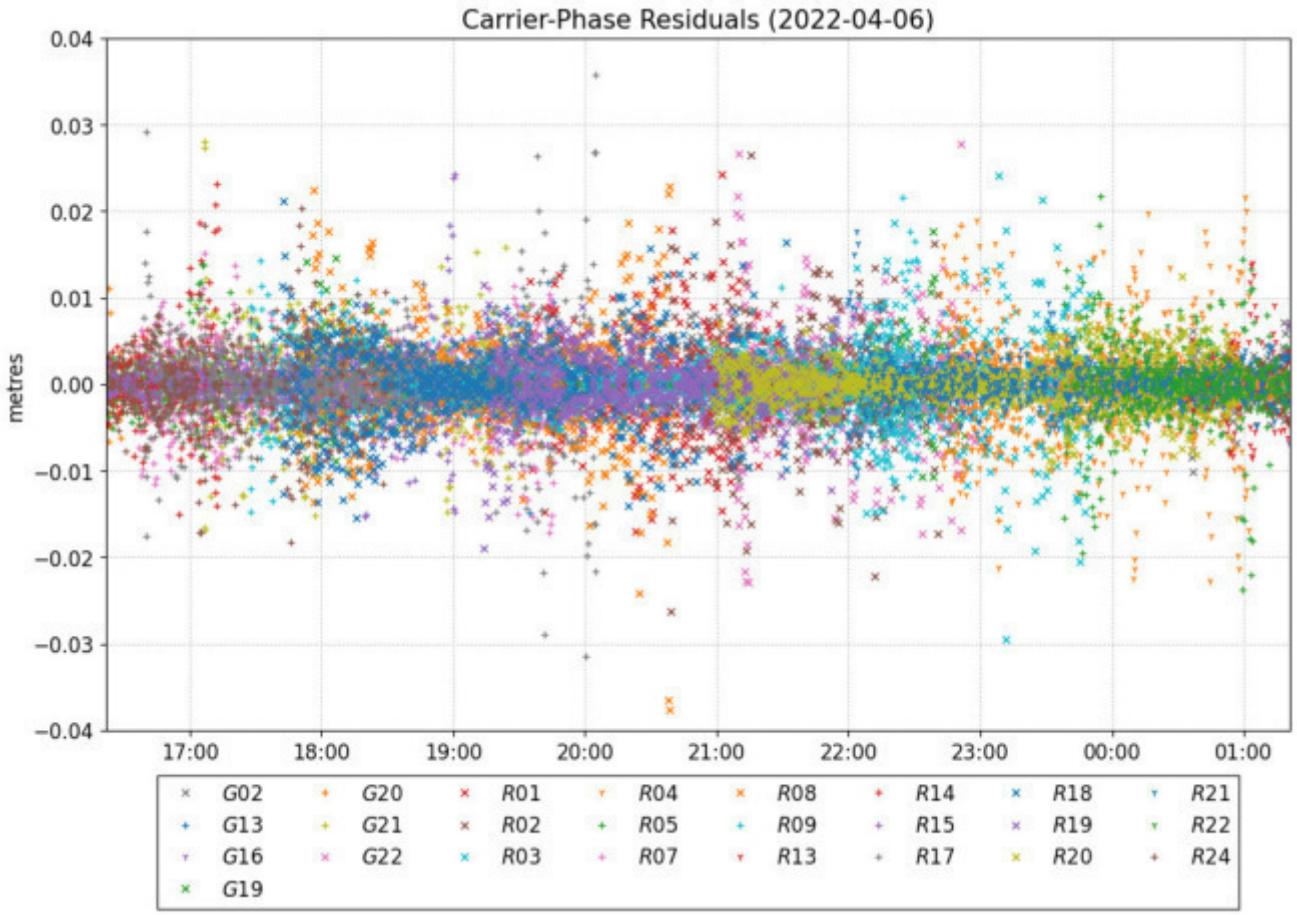

Final solution
Longitude Differences (2022-04-06)
SIG_PPP
metres
Sigma (metres)
10
0
−10
−20
−30
−40
2000
1500
1000
500
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

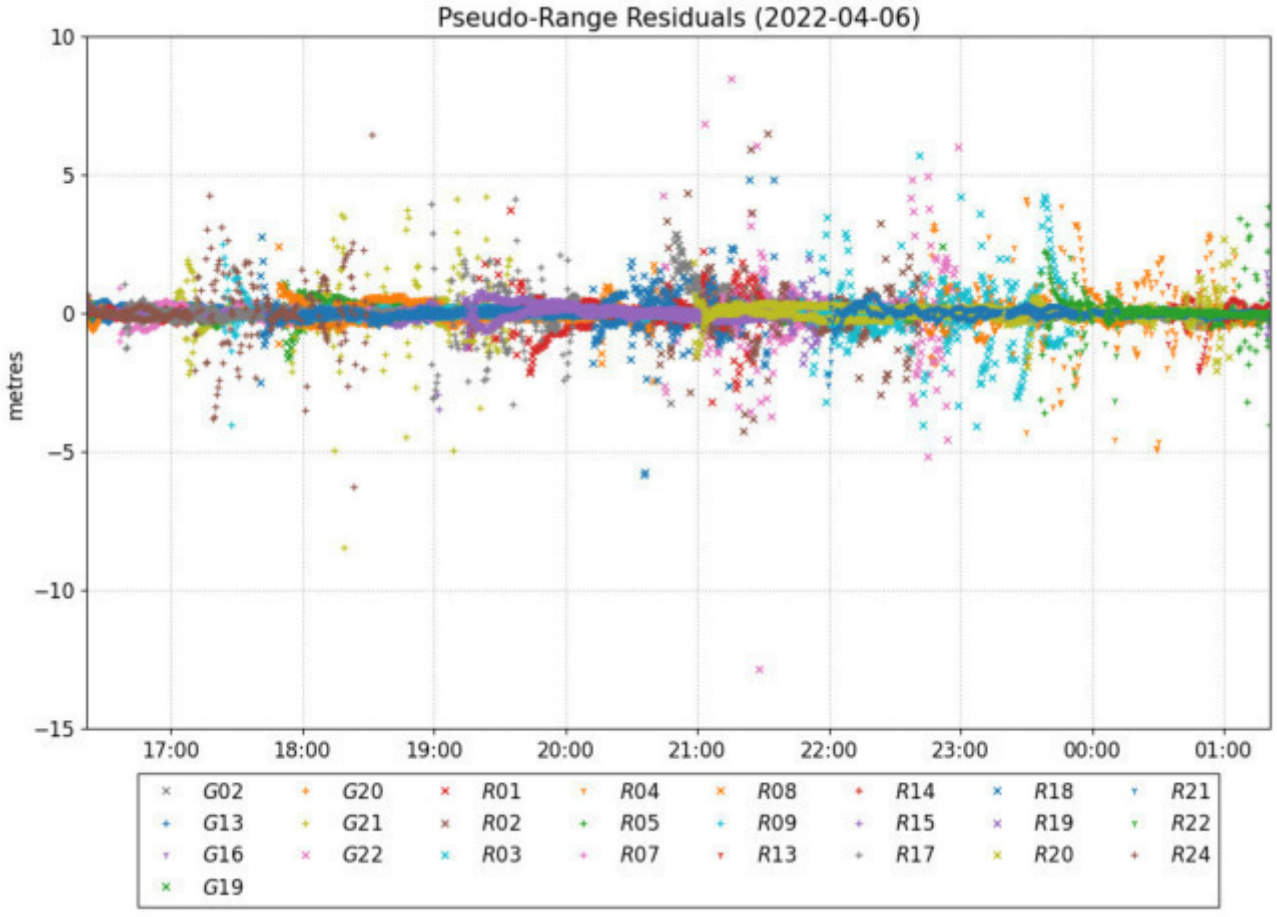

Final solution
Height Differences (2022-04-06)
SIG_PPP
metres
Sigma (metres)
10
0
−10
−20
−30
−40
−50
2500
2000
1500
1000
500
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

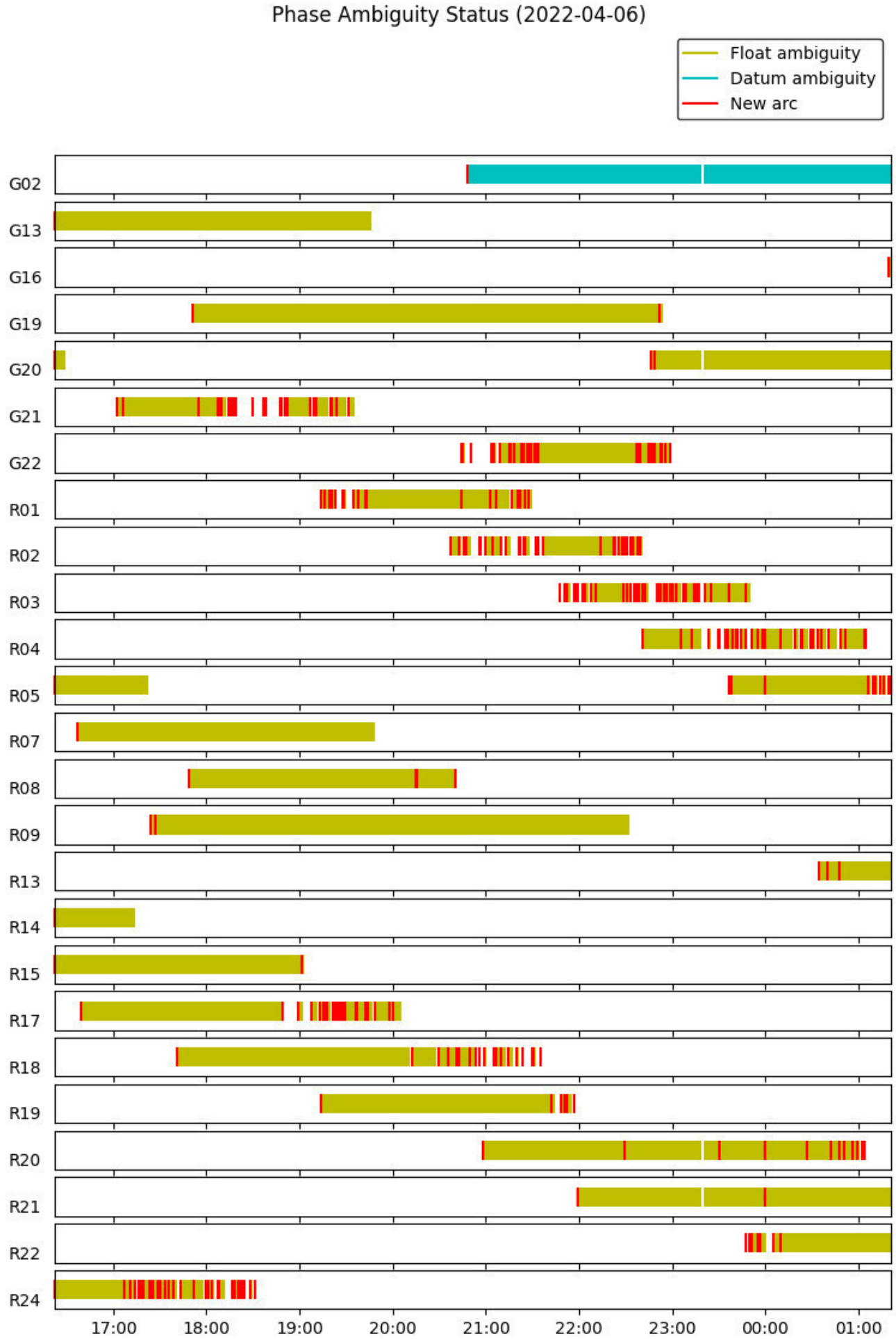

Estimated Tropospheric Zenith Delay (2022-04-06)
Sigma
metres
2.21
2.20
2.19
2.18
2.17
2.16
2.15
2.14
2.13
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-04-06)
Sigma
nanoseconds
Sigma (nanoseconds)
40
35
30
25
20
15
10
5
0
2.5
2.0
1.5
1.0
0.5
0.0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-04-06)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-04-06)
metres
0.04
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R01 R04 R08 R14 R18 R21
G13 G21 R02 R05 R09 R15 R19 R22
G16 G22 R03 R07 R13 R17 R20 R24
G19


Pseudo-Range Residuals (2022-04-06)
metres
10
5
0
−5
−10
−15
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R01 R04 R08 R14 R18 R21
G13 G21 R02 R05 R09 R15 R19 R22
G16 G22 R03 R07 R13 R17 R20 R24
G19


Phase Ambiguity Status (2022-04-06)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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If you have any questions, please feel free to contact:
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588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220408-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-08 16:54:00.00	2022-04-09 00:44:00.00	7:50:00
Processing Time		**Product Type**
20:17:27 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.496m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220408-GS15Base_decimatedRinex.yyo

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32330"	-132° 43' 53.97581"	712.036 m
Sigmas(95%)	0.009 m	0.024 m	0.033 m
A priori*	60° 10' 26.35618"	-132° 43' 54.08216"	711.417 m
Estimated – A priori	-1.018 m	1.640 m	0.619 m

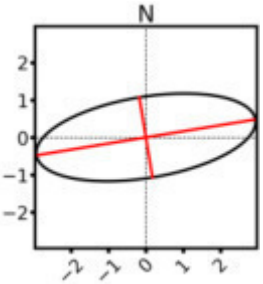
Orthometric Height CGVD2013 (CGG2013a) (2022.3)

708.557 m

(click for height reference information)

95% Error Ellipse (cm)

semi-major: 3.0 cm
semi-minor: 1.1 cm
semi-major azimuth: 80° 42' 14.47"



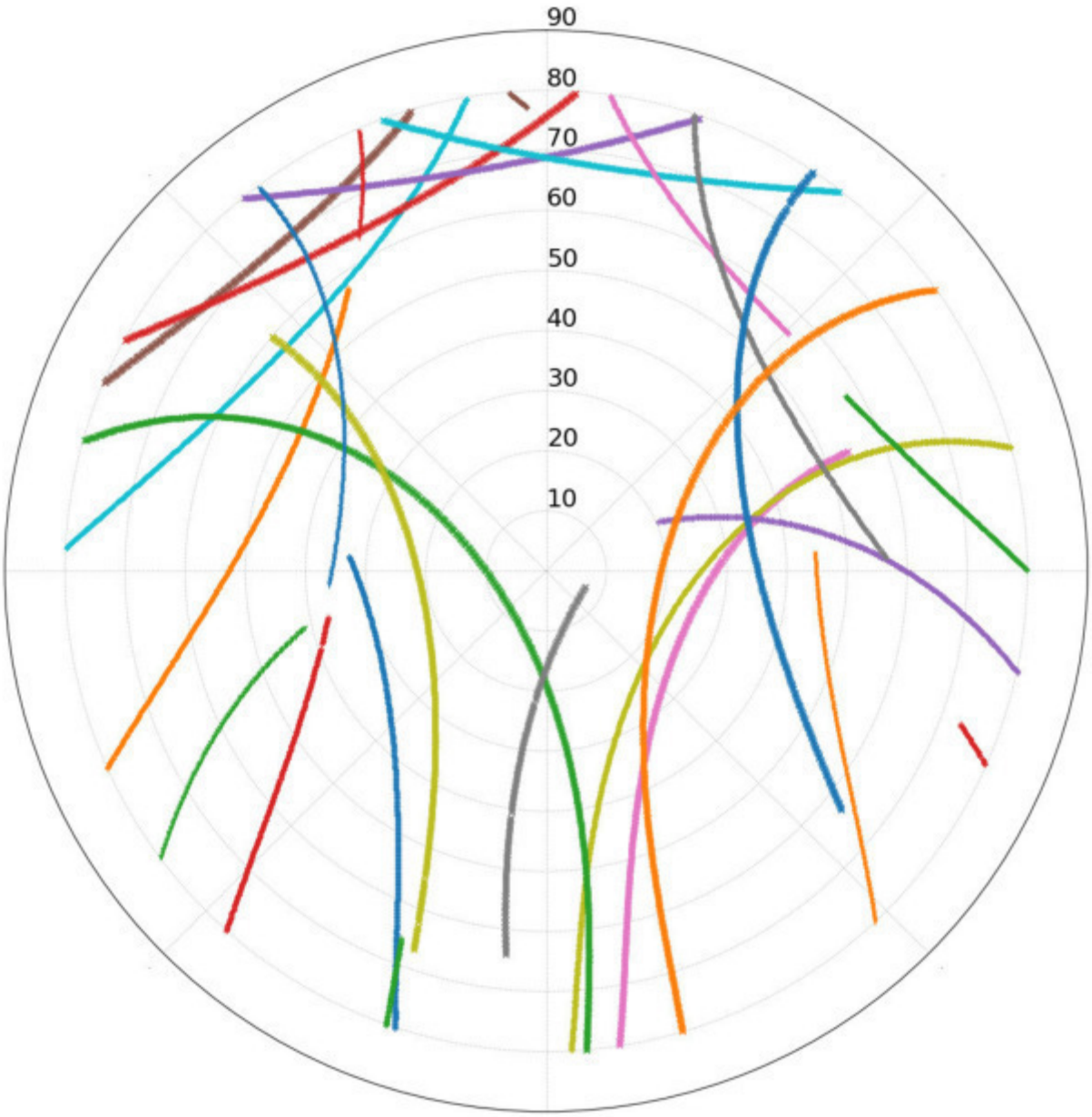
UTM (North) Zone 8

6672948.546 m (N)
625841.244 m (E)

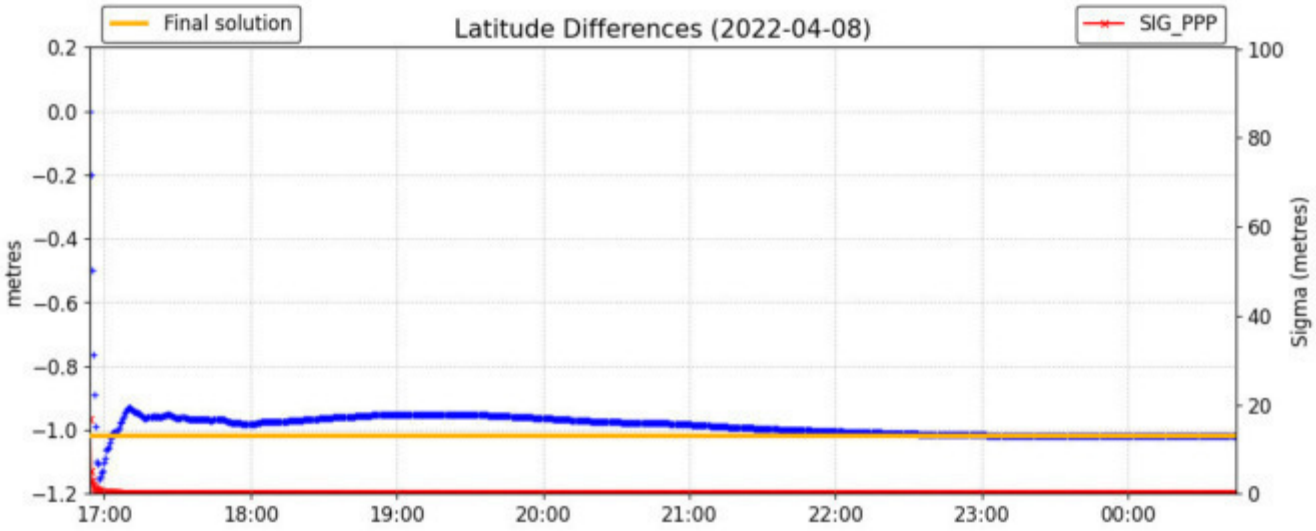
Scale Factors
0.99979406 (point)
0.99968265 (combined)

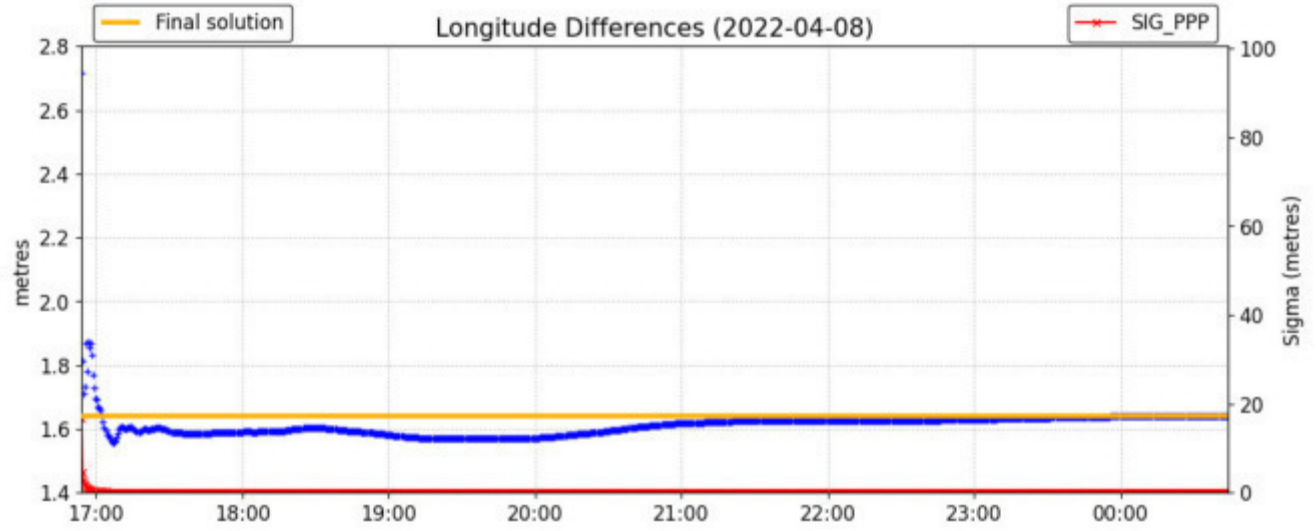
*(Coordinates from RINEX header used as a priori position)

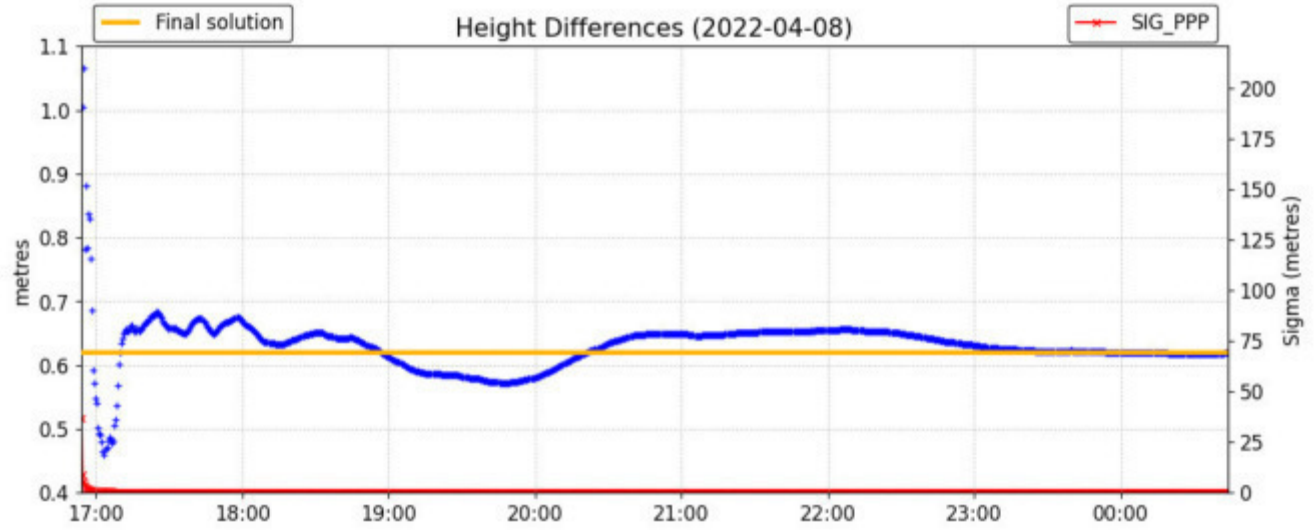
Satellite Sky Distribution

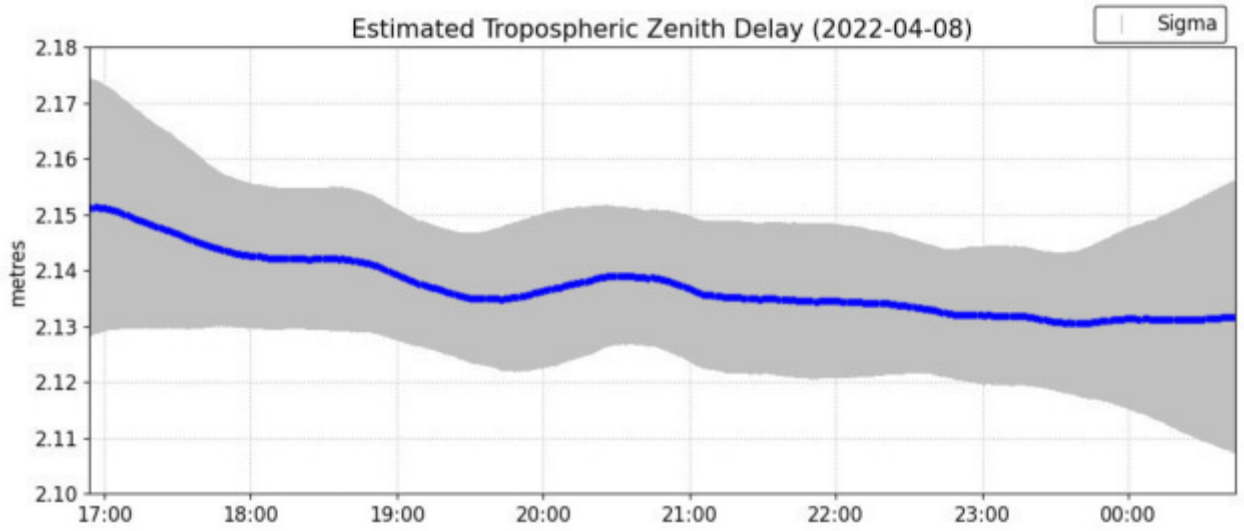


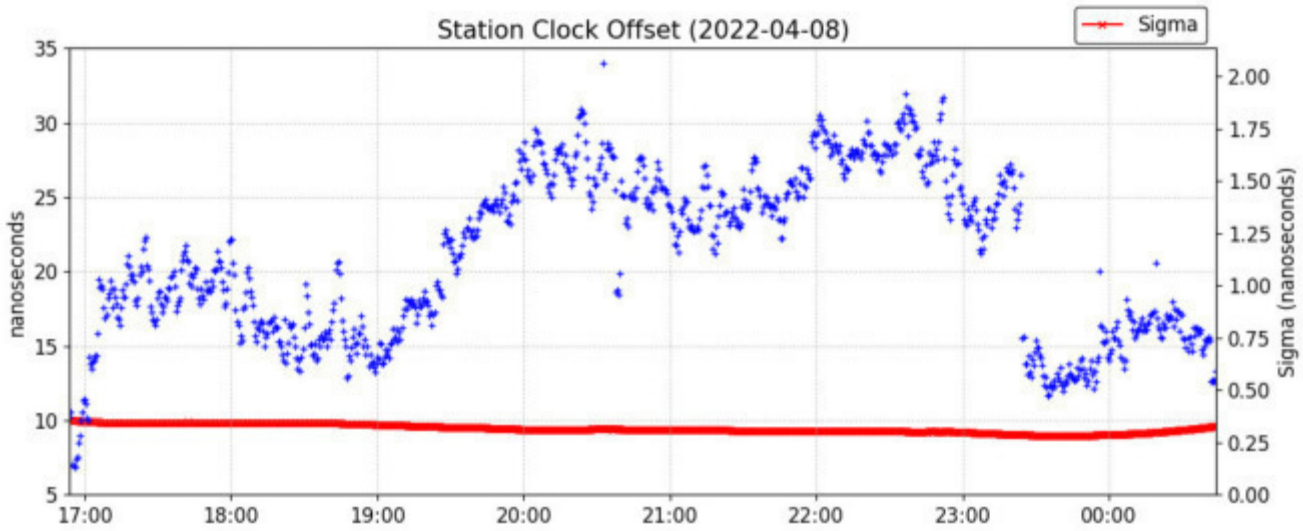
G02	G22	R04	R09	R15	R20
G13	R01	R05	R12	R17	R21
G19	R02	R07	R13	R18	R22
G20	R03	R08	R14	R19	R24

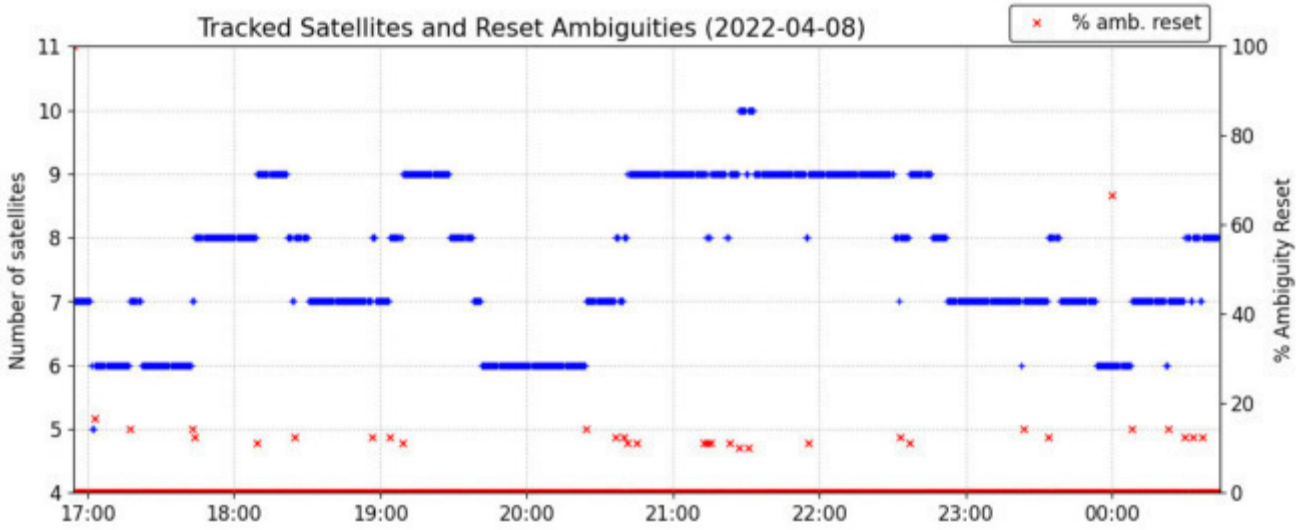

Final solution
Latitude Differences (2022-04-08)
SIG_PPP
metres
Sigma (metres)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

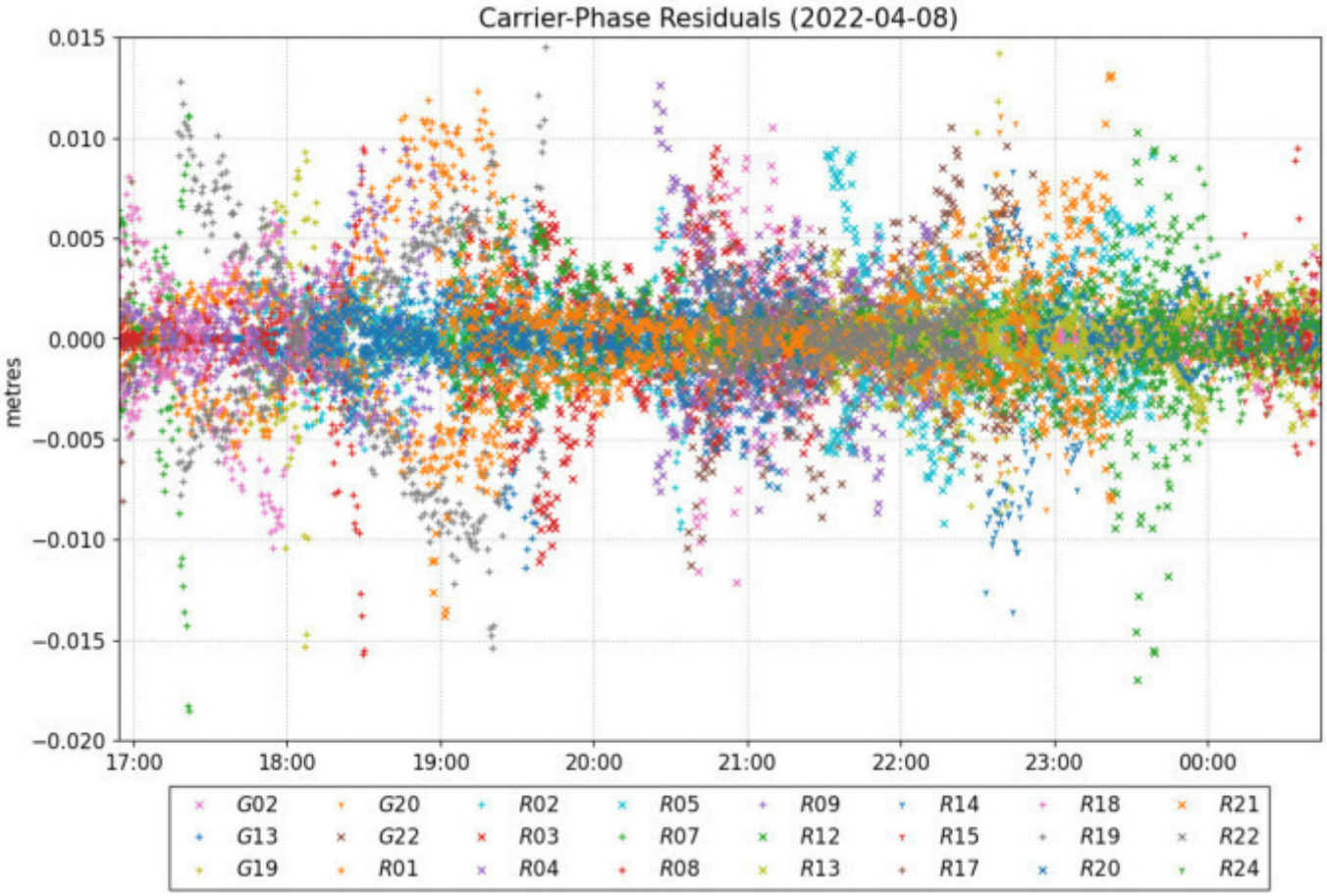

Final solution
Longitude Differences (2022-04-08)
SIG_PPP
metres
Sigma (metres)
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

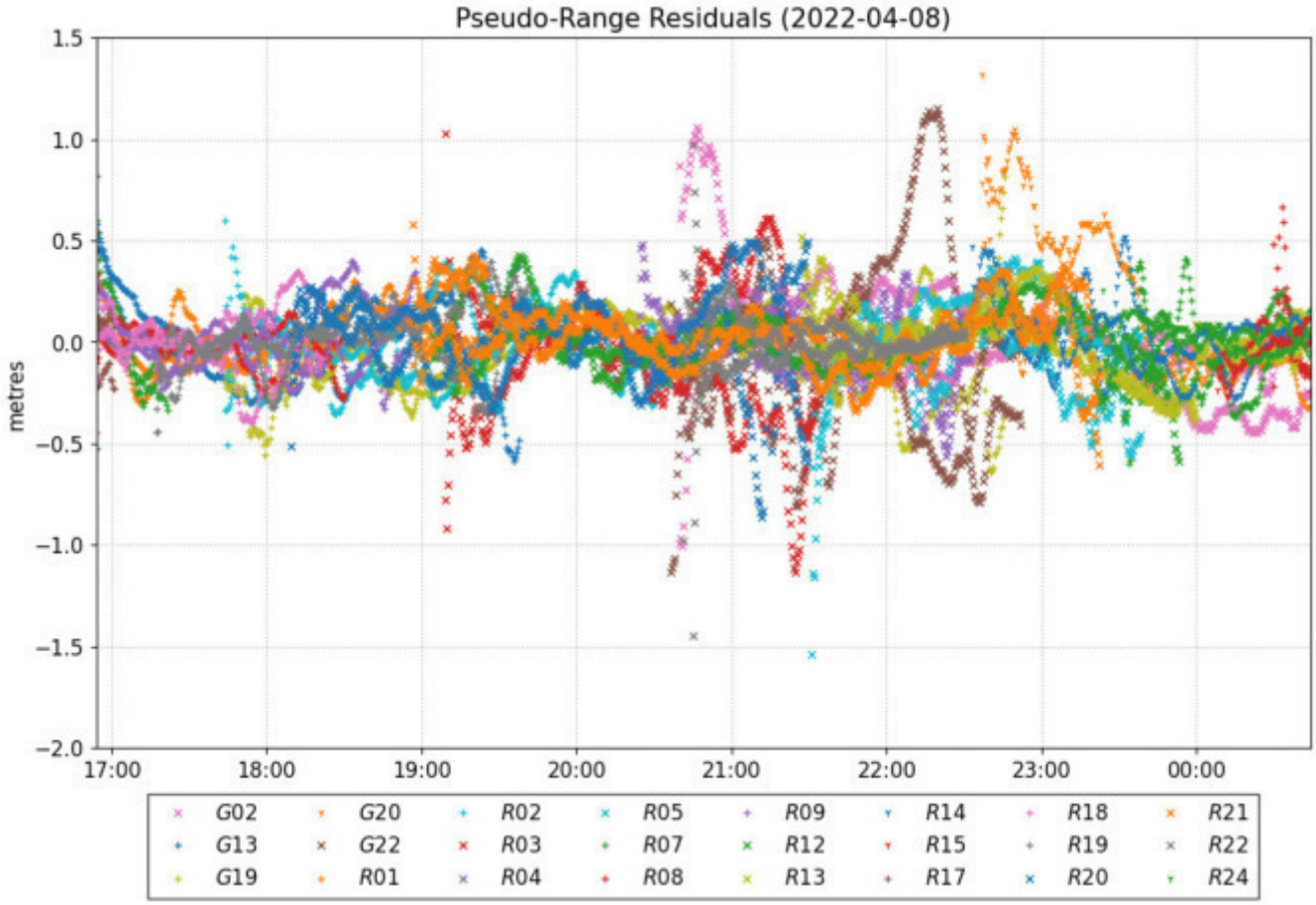

Final solution
Height Differences (2022-04-08)
SIG_PPP
metres
Sigma (metres)
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
200
175
150
125
100
75
50
25
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

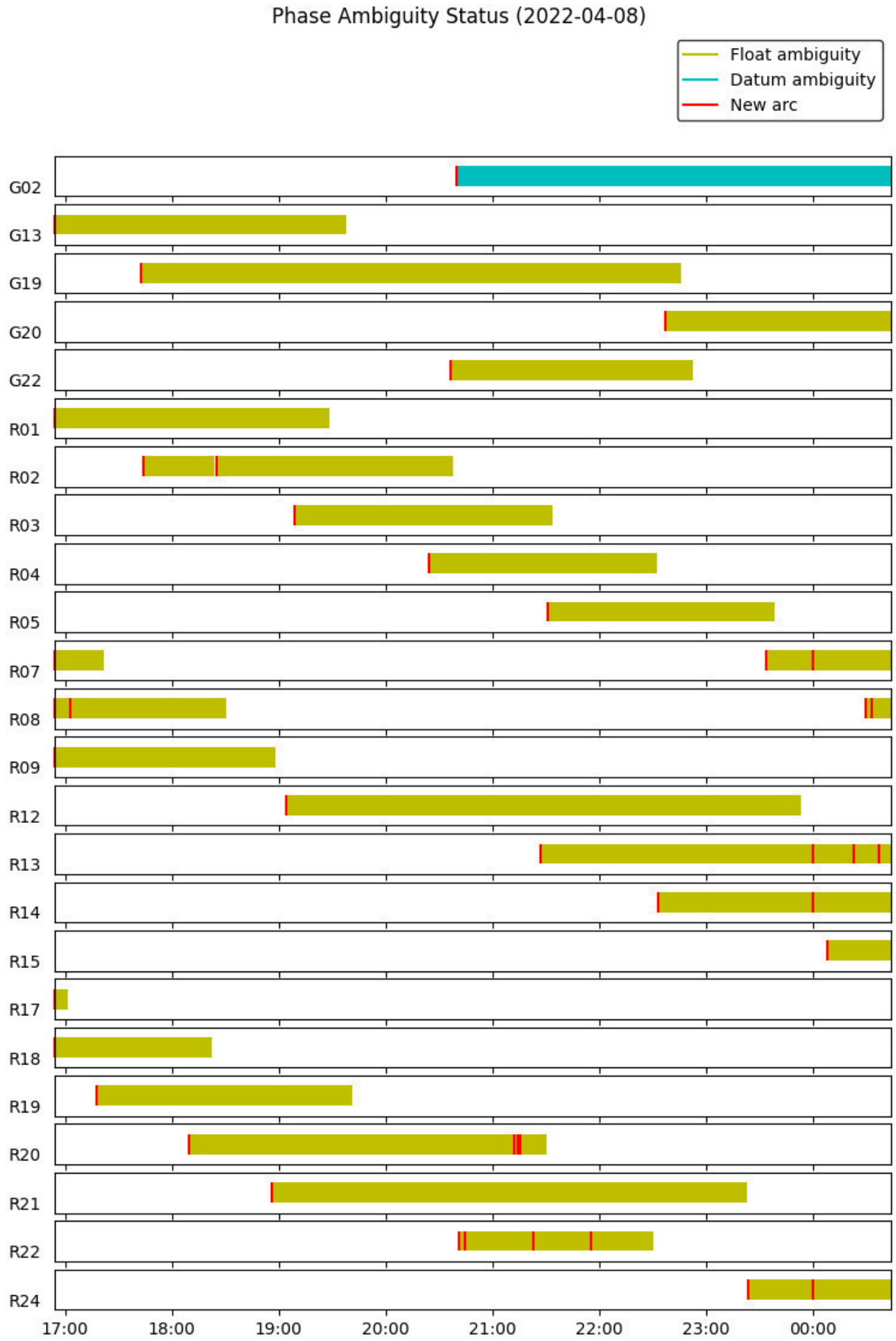

Estimated Tropospheric Zenith Delay (2022-04-08)
Sigma
metres
2.18
2.17
2.16
2.15
2.14
2.13
2.12
2.11
2.10
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-04-08)
Sigma
nanoseconds
Sigma (nanoseconds)
35
30
25
20
15
10
5
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-04-08)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-04-08)
metres
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
−0.020
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G22 R03 R07 R12 R15 R19 R22
G19 R01 R04 R08 R13 R17 R20 R24


Pseudo-Range Residuals (2022-04-08)
metres
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G22 R03 R07 R12 R15 R19 R22
G19 R01 R04 R08 R13 R17 R20 R24


Phase Ambiguity Status (2022-04-08)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G19
G20
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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Canadian Geodetic Survey
Surveyor General Branch
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Government of Canada
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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220409-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-09 16:42:00.00	2022-04-10 00:24:00.00	7:42:00
Processing Time		**Product Type**
20:17:43 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.457m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220409-GS15Base_decimatedRinex.yyo

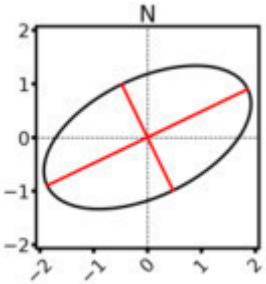
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32375"	-132° 43' 53.97819"	712.056 m
Sigmas(95%)	0.011 m	0.015 m	0.030 m
A priori*	60° 10' 26.36786"	-132° 43' 54.10642"	712.916 m
Estimated – A priori	-1.365 m	1.977 m	-0.860 m

Orthometric Height CGVD2013 (CGG2013a) (2022.3)

708.576 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 2.1 cm
semi-minor: 1.1 cm
semi-major azimuth: 64° 15' 26.76"



UTM (North) Zone 8

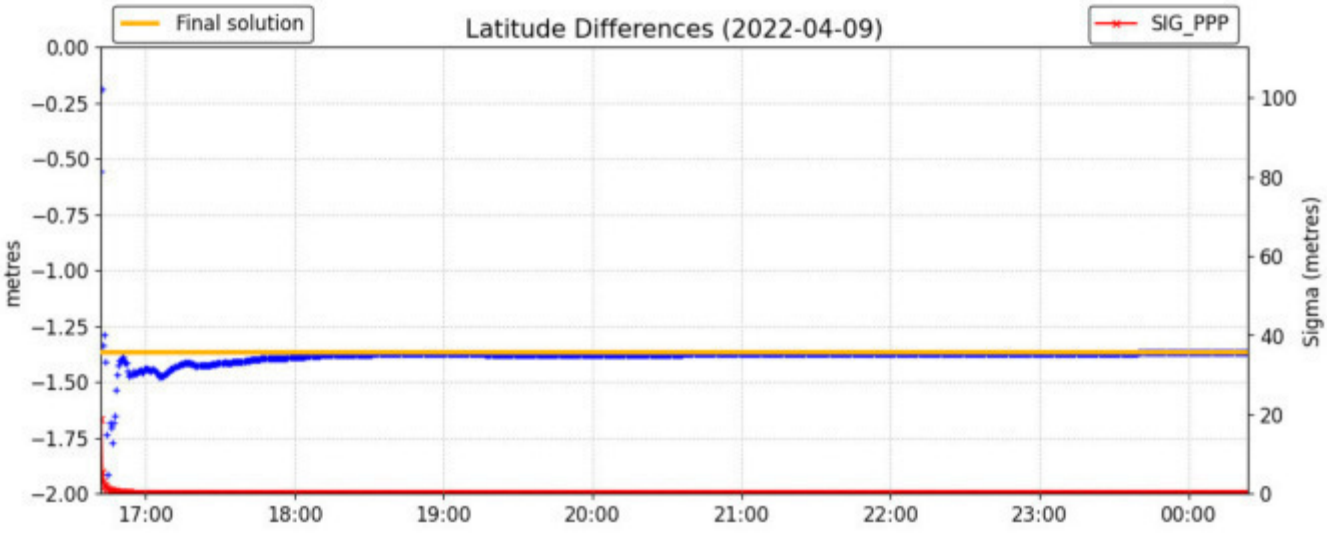
6672948.559 m (N)
625841.206 m (E)

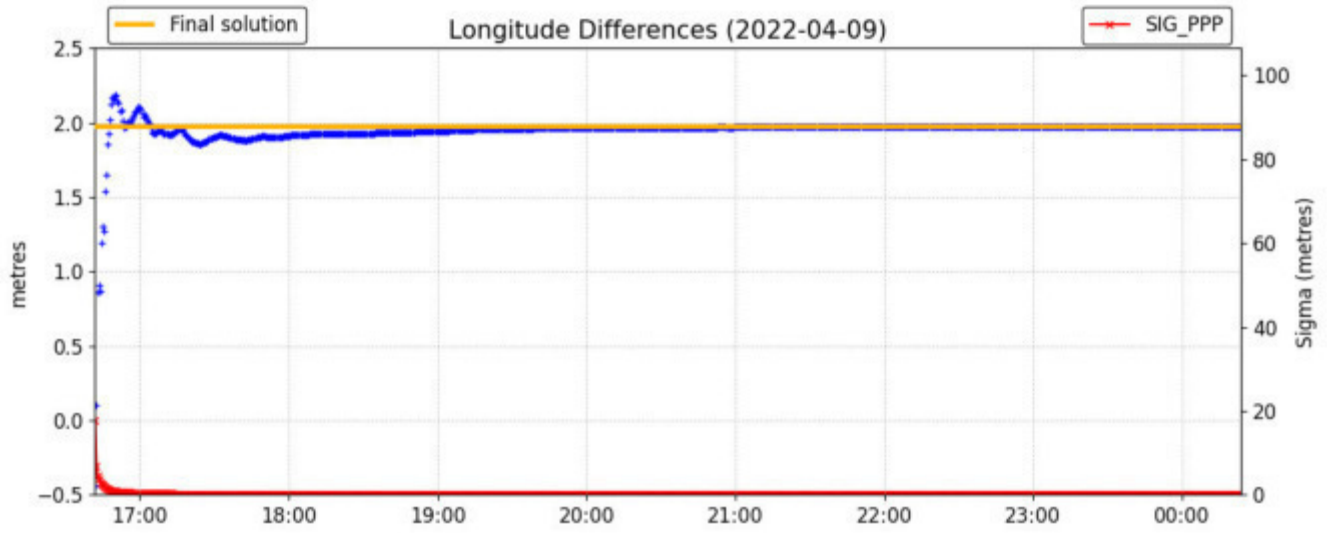
Scale Factors
0.99979406 (point)
0.99968265 (combined)

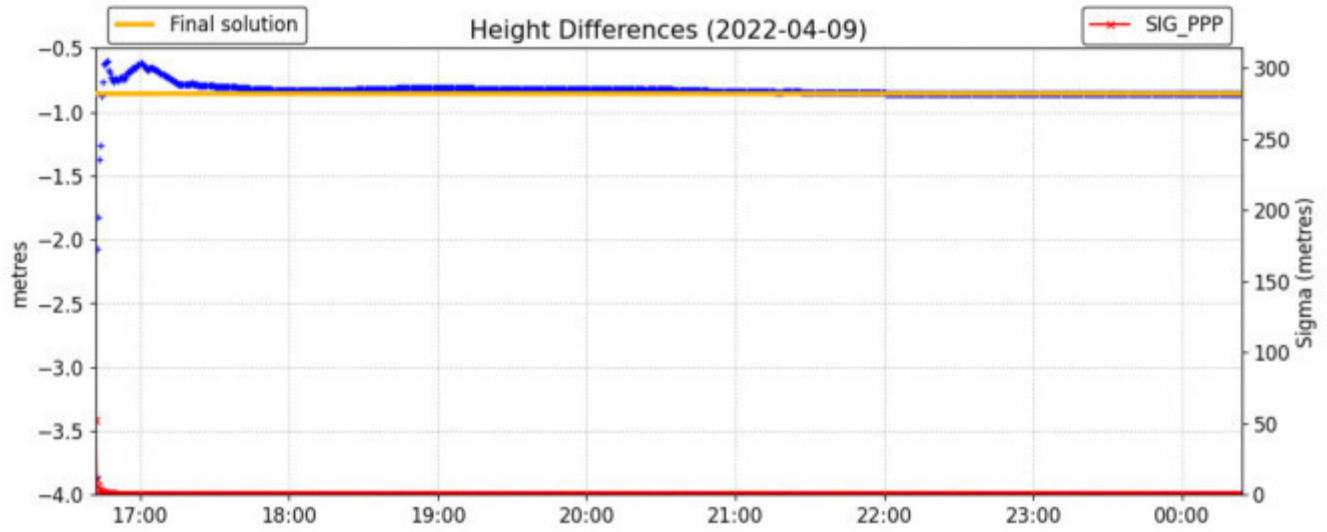
*(Coordinates from RINEX header used as a priori position)

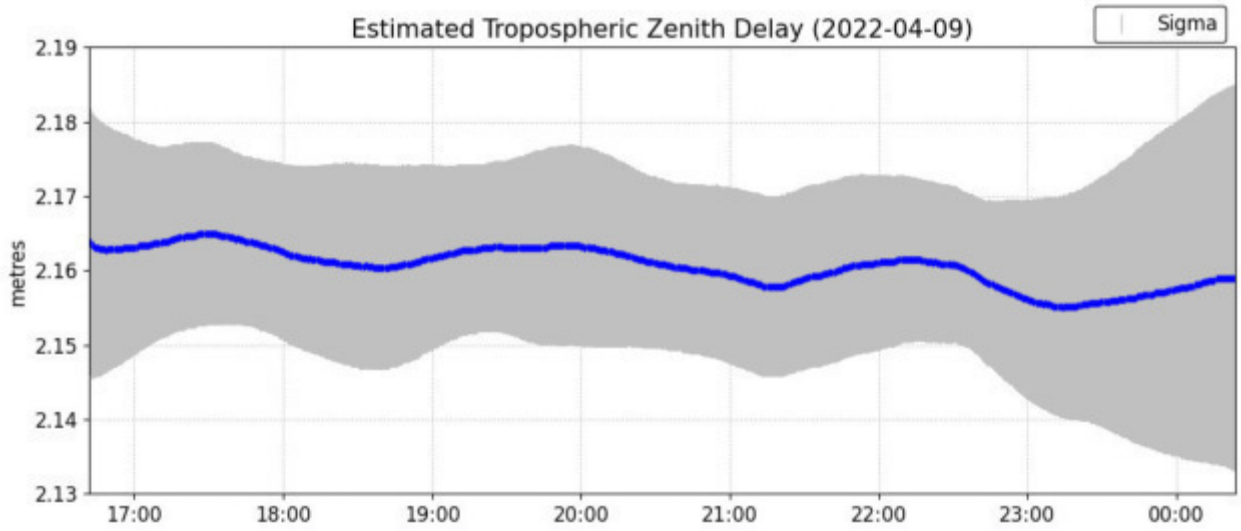
Satellite Sky Distribution

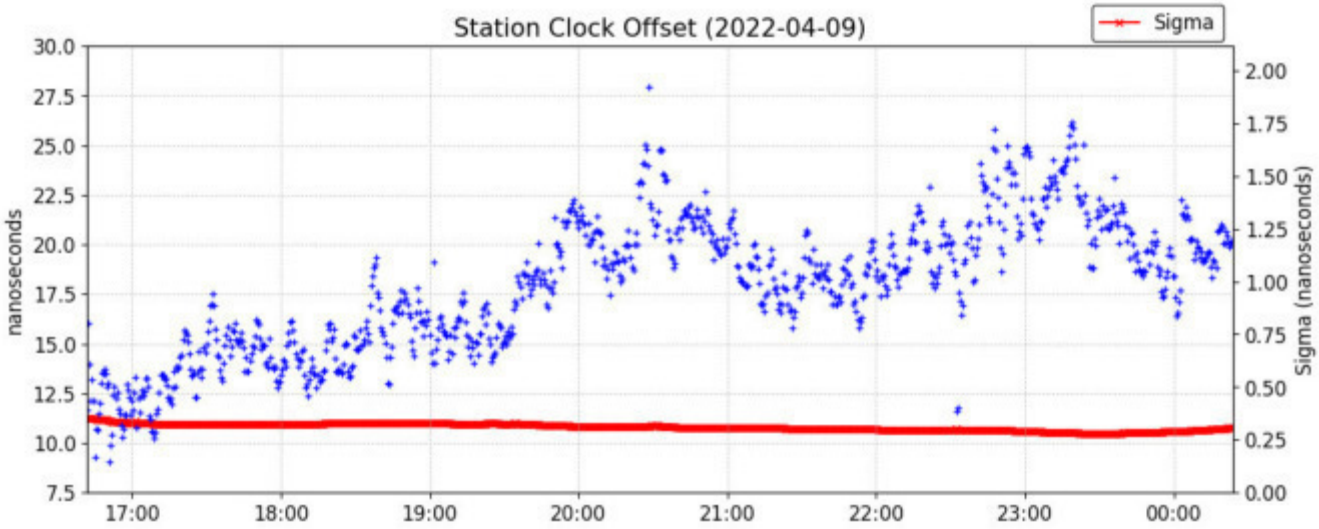
G02	G21	R03	R08	R14	R19
G13	G22	R04	R09	R15	R20
G19	R01	R05	R12	R17	R21
G20	R02	R07	R13	R18	R24

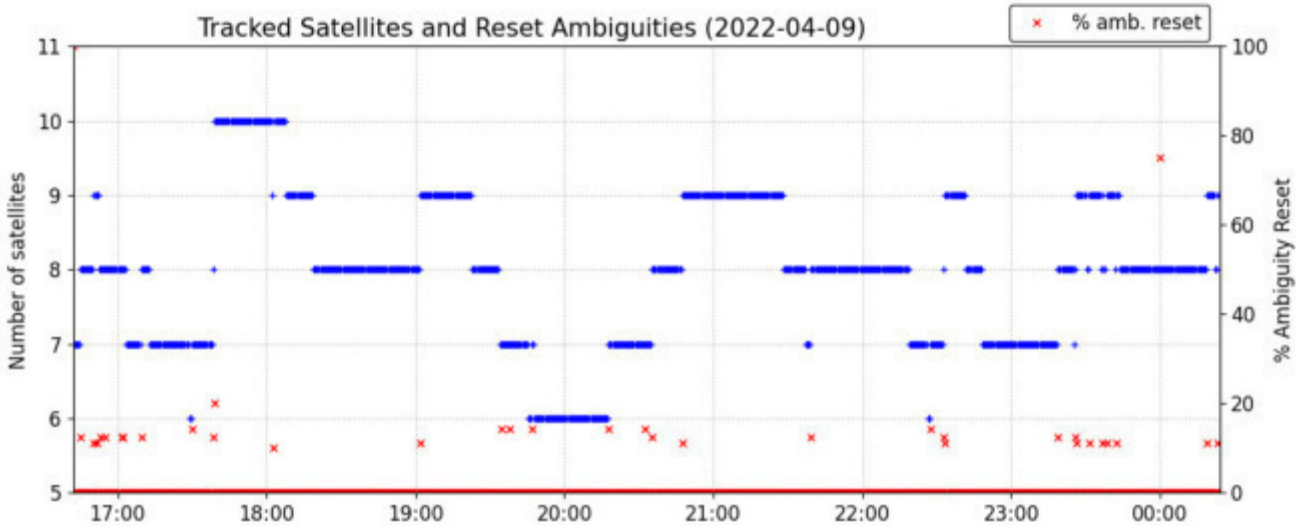

Final solution
Latitude Differences (2022-04-09)
SIG_PPP
metres
Sigma (metres)
0.00
−0.25
−0.50
−0.75
−1.00
−1.25
−1.50
−1.75
−2.00
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

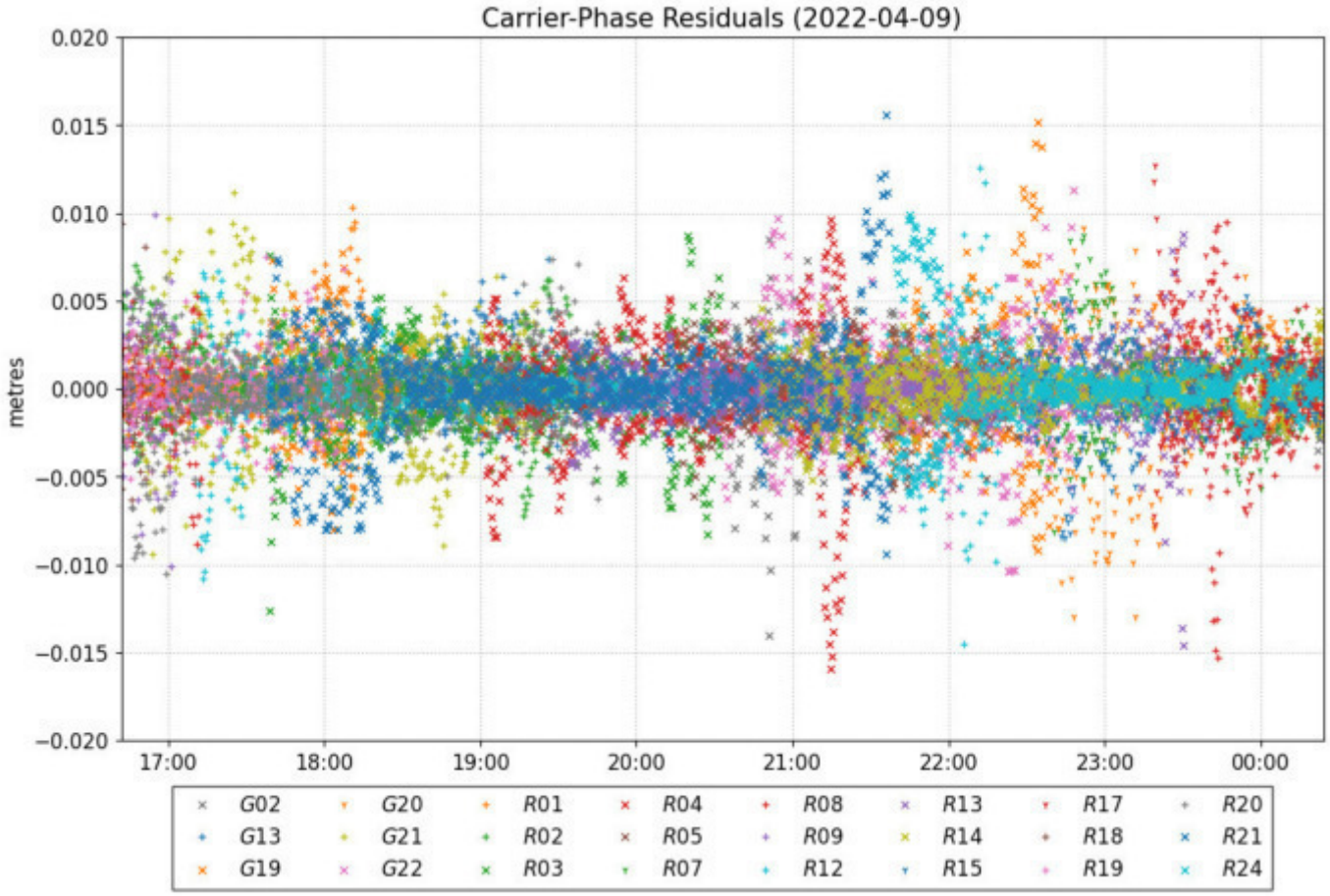

Final solution
Longitude Differences (2022-04-09)
SIG_PPP
metres
Sigma (metres)
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

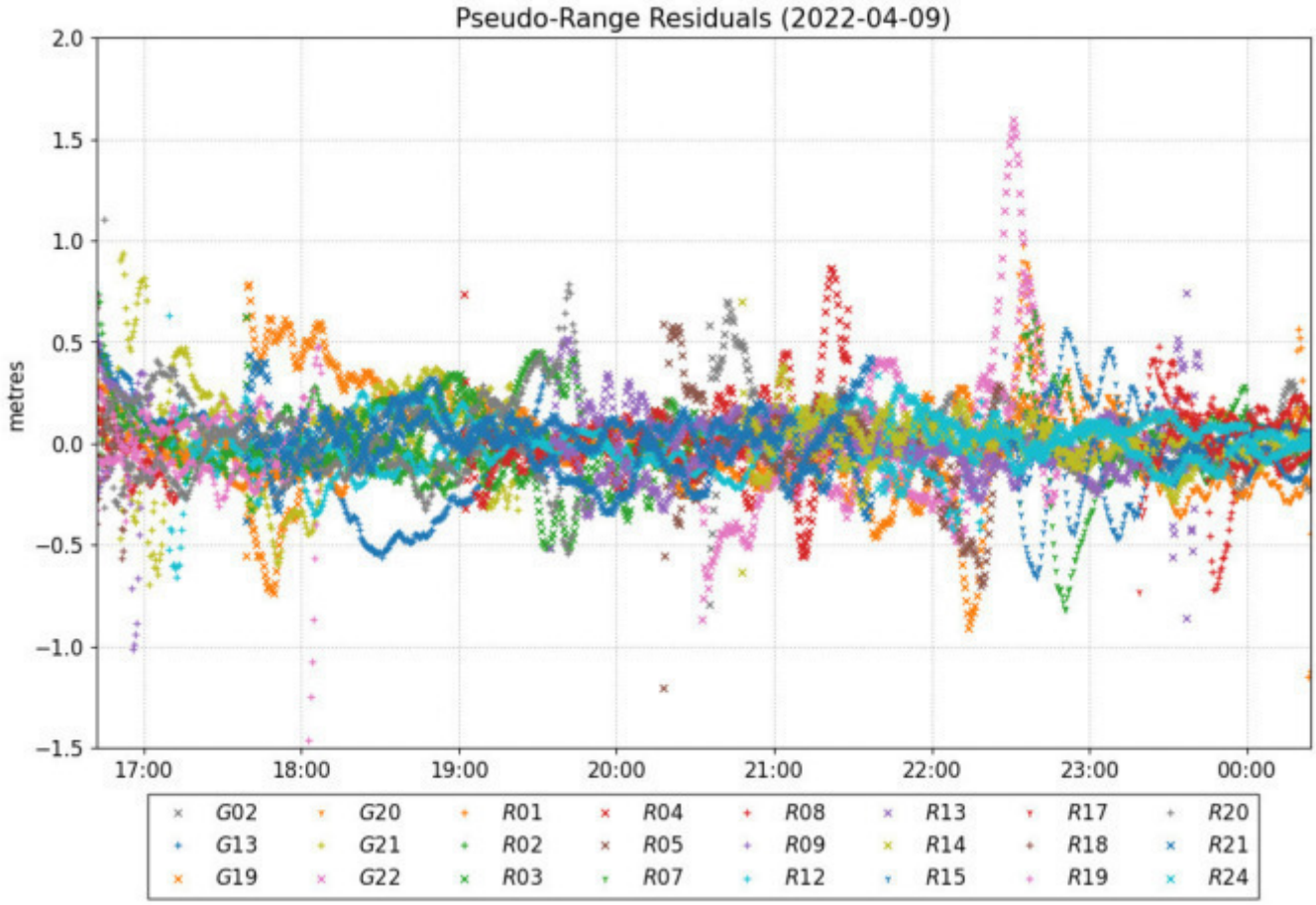

Final solution
Height Differences (2022-04-09)
SIG_PPP
metres
Sigma (metres)
−0.5
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
300
250
200
150
100
50
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

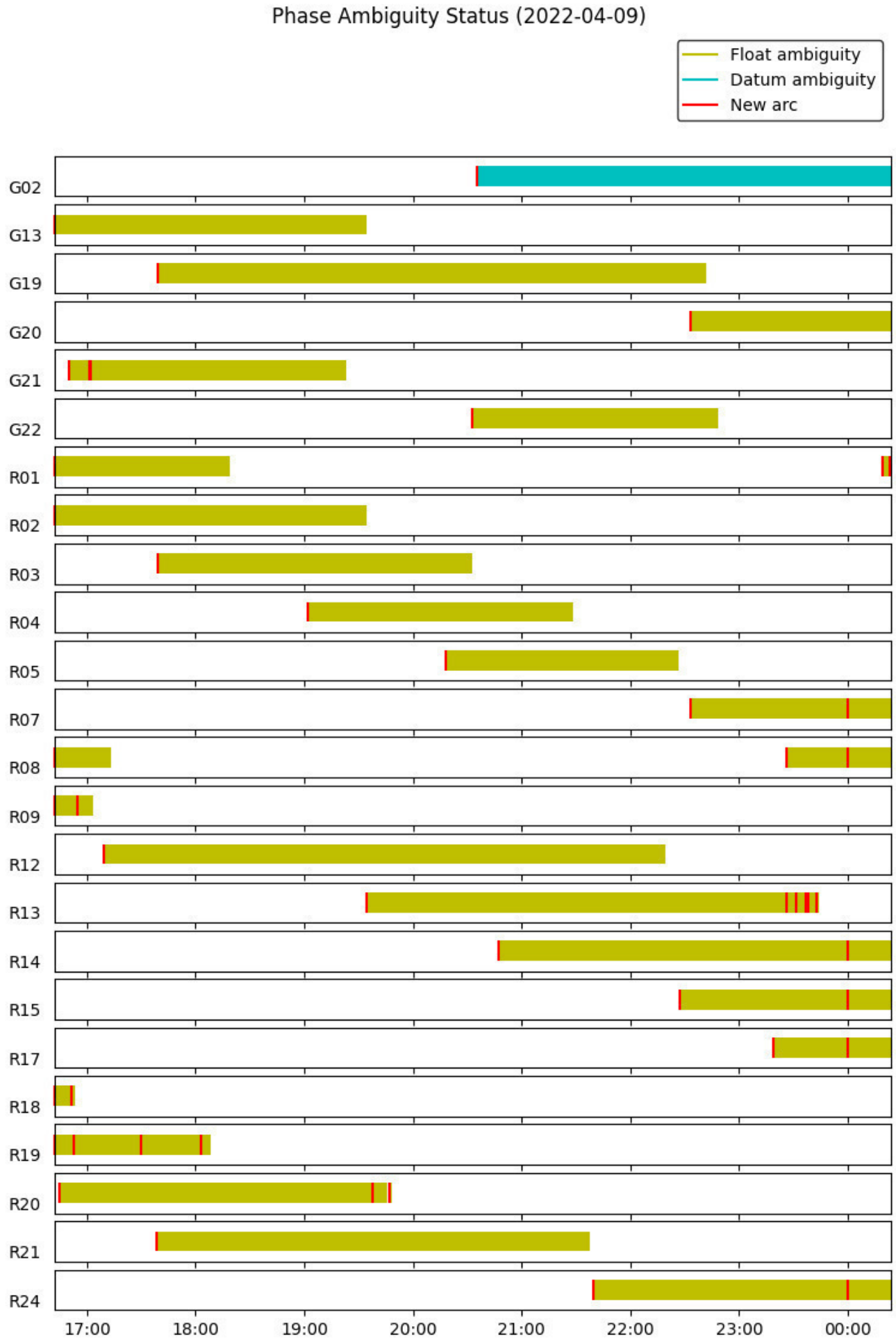

Estimated Tropospheric Zenith Delay (2022-04-09)
Sigma
metres
2.19
2.18
2.17
2.16
2.15
2.14
2.13
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-04-09)
Sigma
nanoseconds
Sigma (nanoseconds)
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-04-09)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-04-09)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
−0.020
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R01 R04 R08 R13 R17 R20
G13 G21 R02 R05 R09 R14 R18 R21
G19 G22 R03 R07 R12 R15 R19 R24


Pseudo-Range Residuals (2022-04-09)
metres
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R01 R04 R08 R13 R17 R20
G13 G21 R02 R05 R09 R14 R18 R21
G19 G22 R03 R07 R12 R15 R19 R24


Phase Ambiguity Status (2022-04-09)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220410-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-10 15:48:00.00	2022-04-11 01:06:30.00	9:18:30
Processing Time		**Product Type**
20:18:14 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.54 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.457m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220410-GS15Base_decimatedRinex.yyo

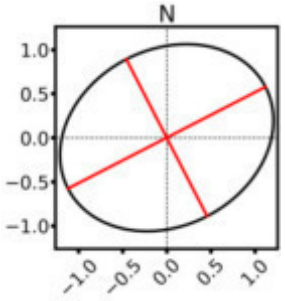
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32391"	-132° 43' 53.97726"	712.067 m
Sigmas(95%)	0.009 m	0.010 m	0.023 m
A priori*	60° 10' 26.32581"	-132° 43' 54.05225"	712.436 m
Estimated – A priori	-0.059 m	1.156 m	-0.369 m

Orthometric Height CGVD2013 (CGG2013a) (2022.3)

708.587 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 1.3 cm
semi-minor: 1.0 cm
semi-major azimuth: 62° 45' 47.17"

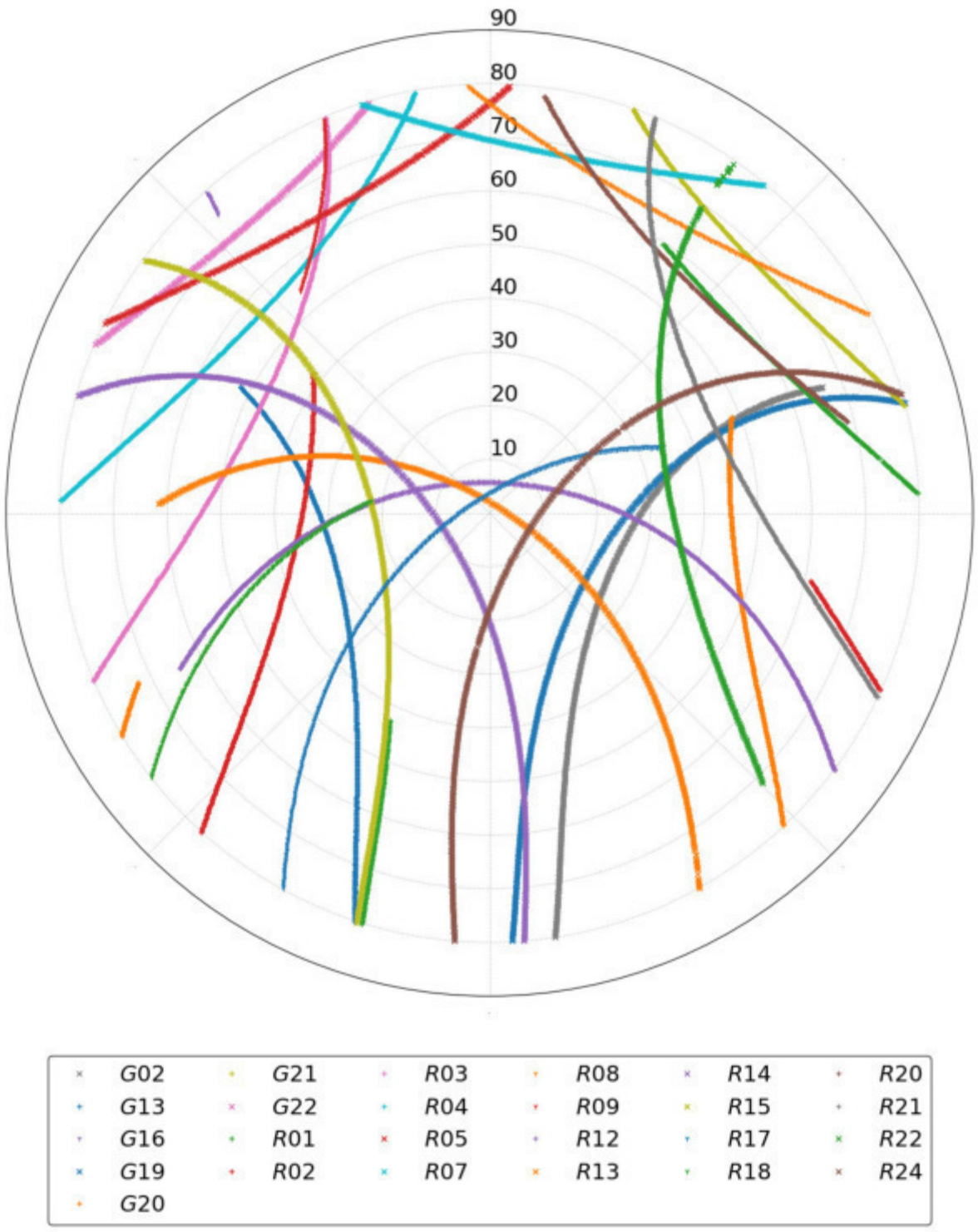


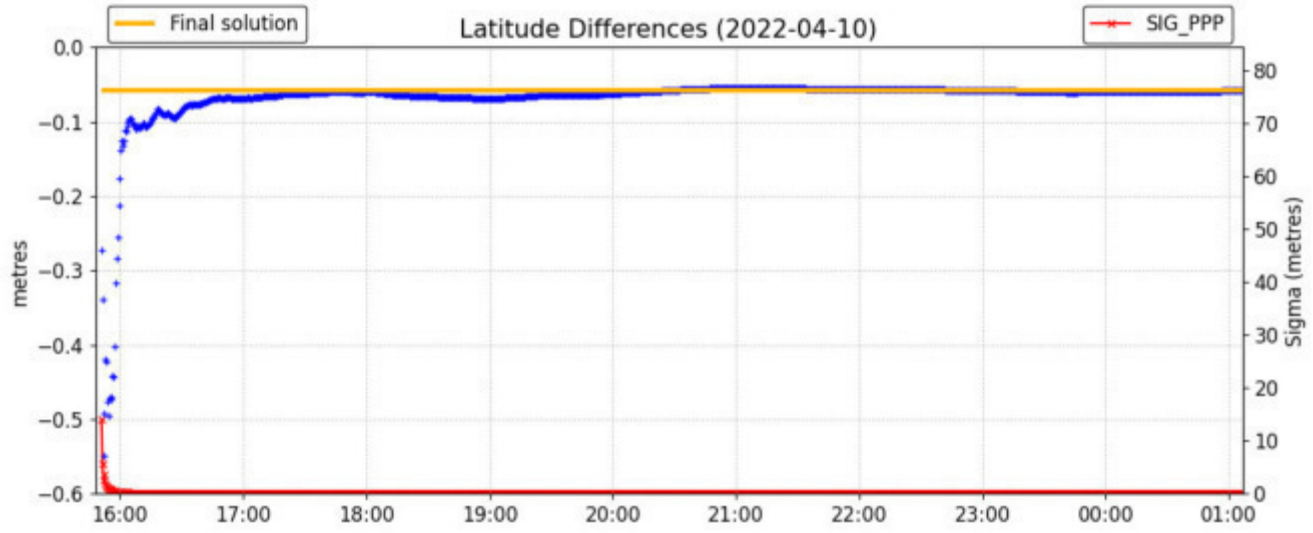
UTM (North) Zone 8

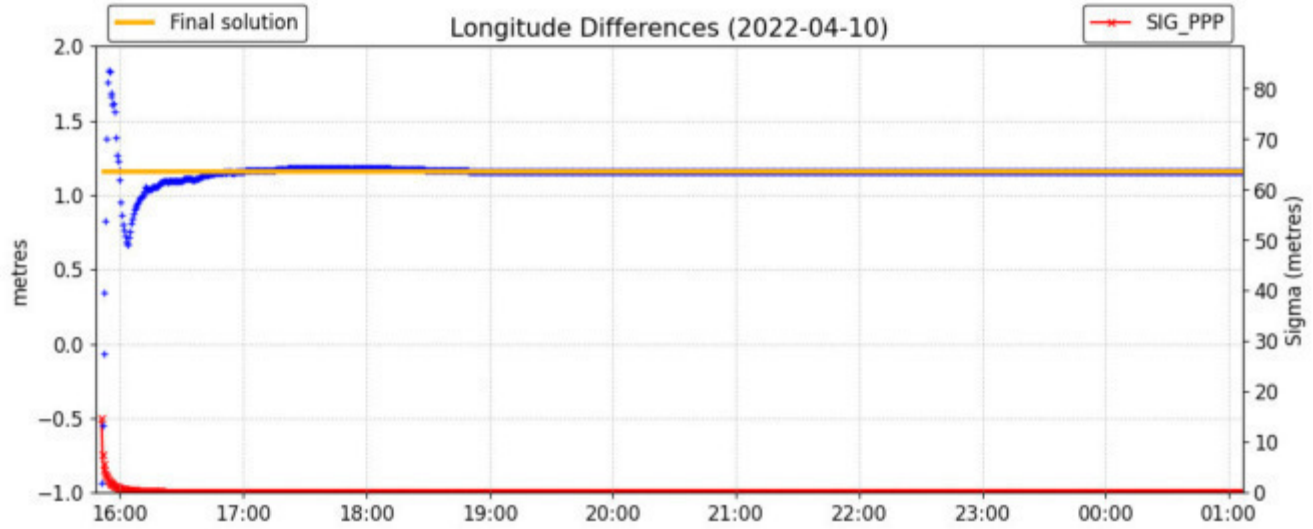
6672948.564 m (N)
625841.221 m (E)

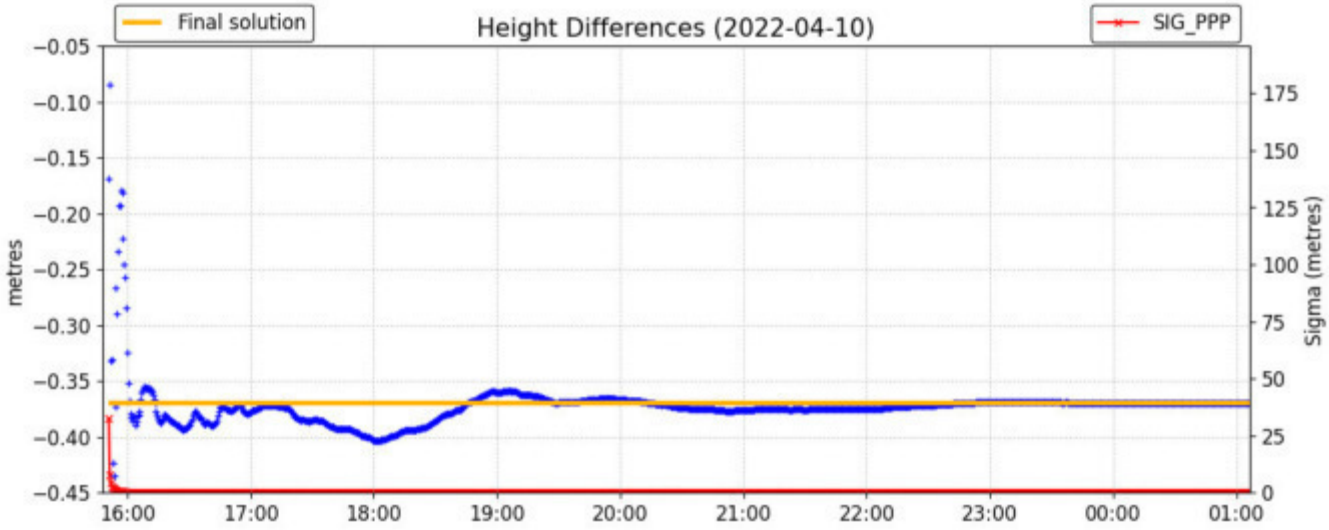
Scale Factors
0.99979406 (point)
0.99968265 (combined)

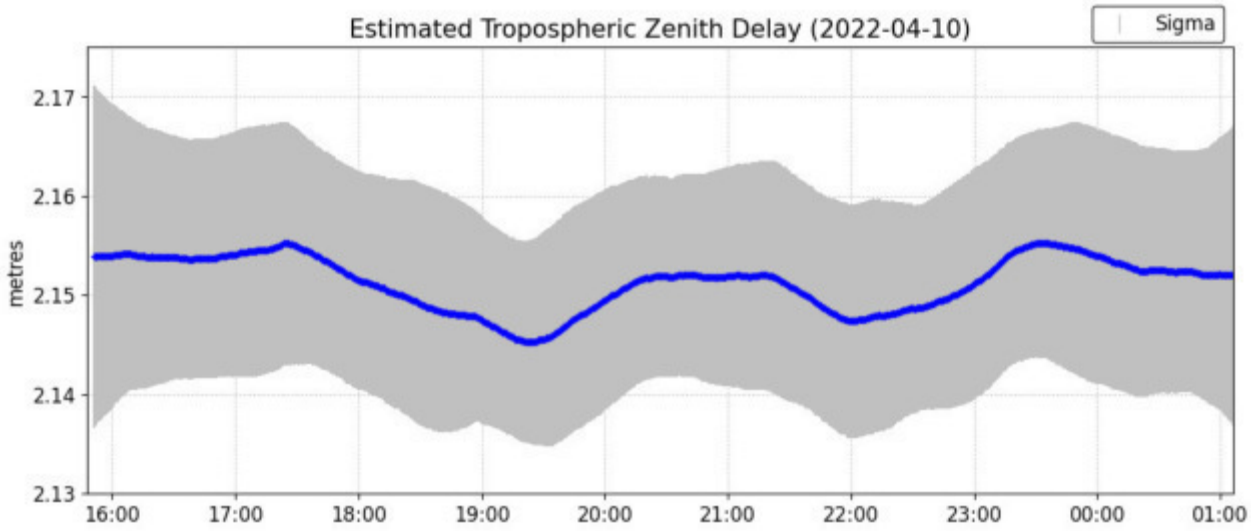
*(Coordinates from RINEX header used as a priori position)

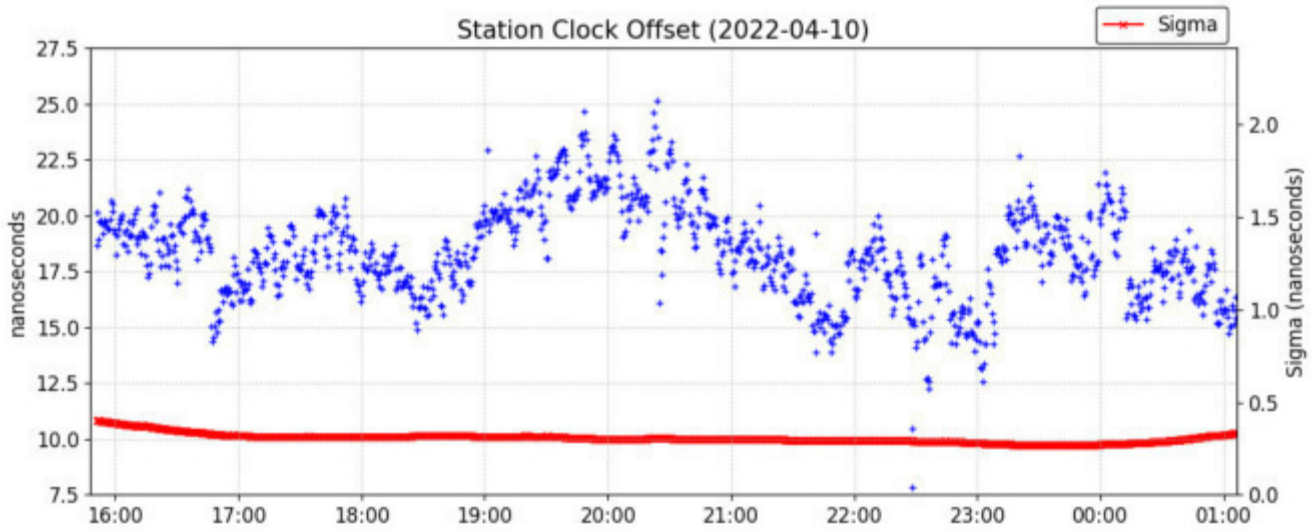

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R20
R21
R22
R24

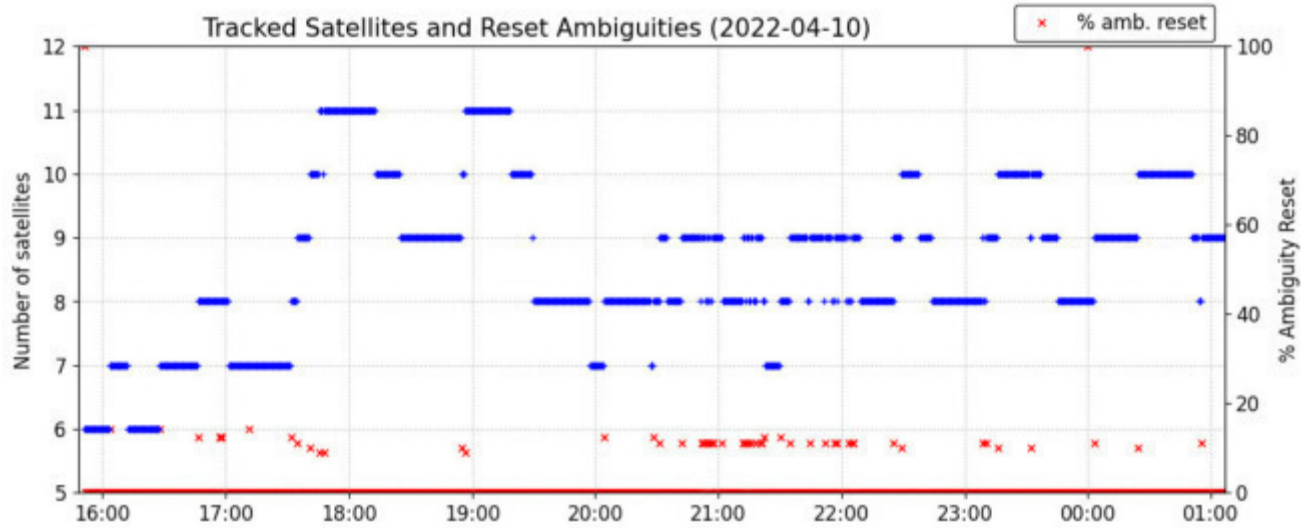

Final solution
Latitude Differences (2022-04-10)
SIG_PPP
metres
Sigma (metres)
0.0
−0.1
−0.2
−0.3
−0.4
−0.5
−0.6
80
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

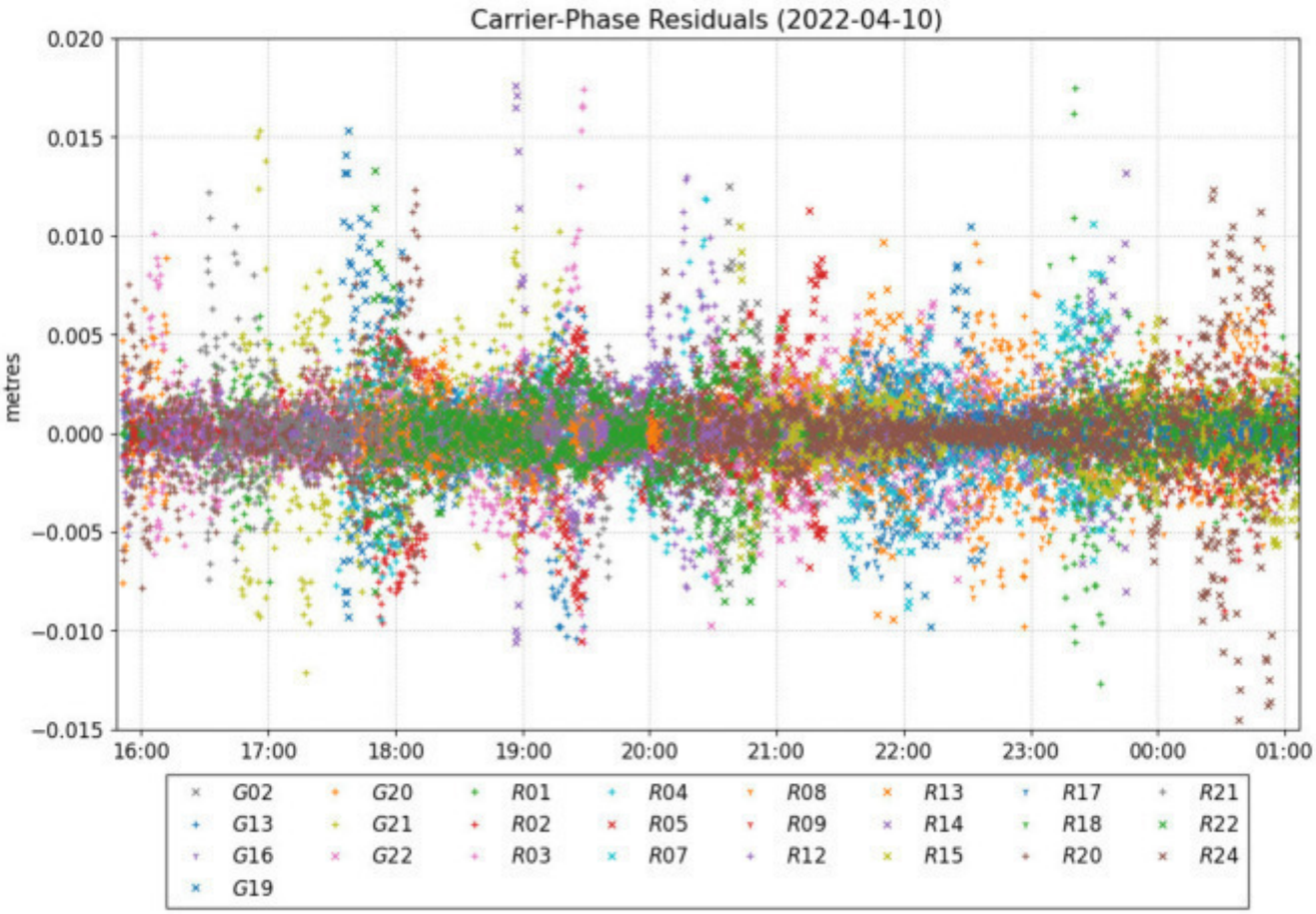

Final solution
Longitude Differences (2022-04-10)
SIG_PPP
metres
Sigma (metres)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
80
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

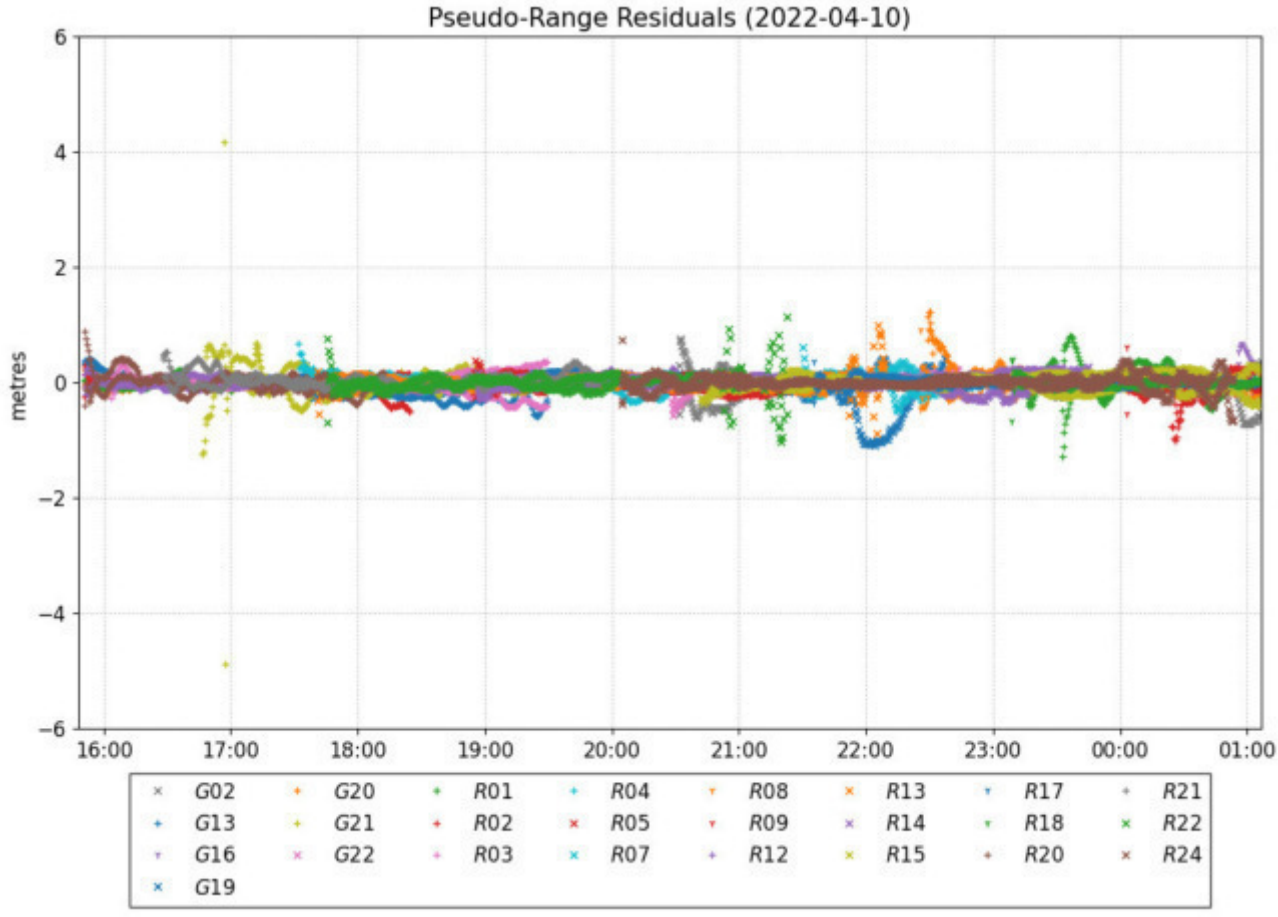

Final solution
Height Differences (2022-04-10)
SIG_PPP
metres
Sigma (metres)
−0.05
−0.10
−0.15
−0.20
−0.25
−0.30
−0.35
−0.40
−0.45
175
150
125
100
75
50
25
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

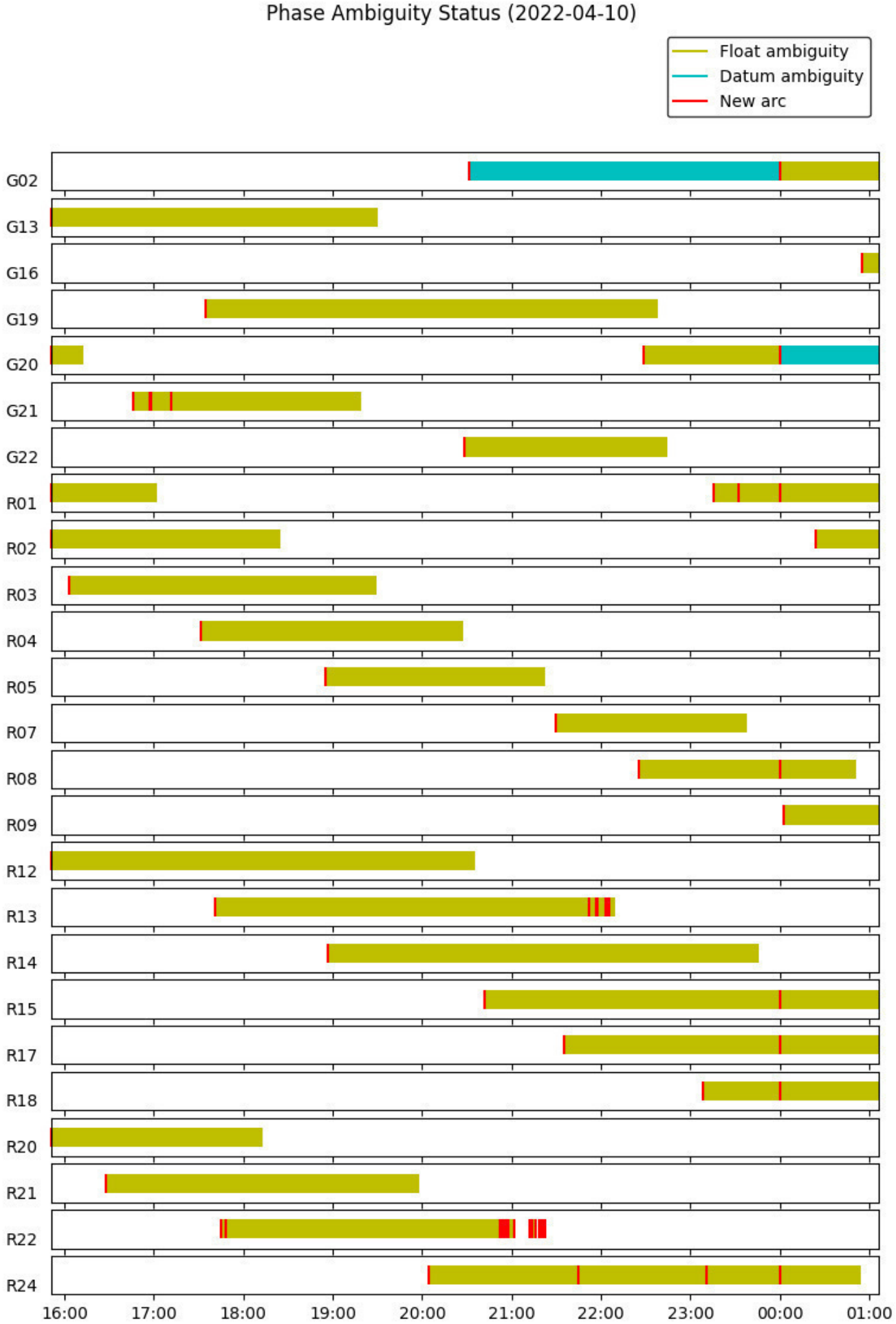

Estimated Tropospheric Zenith Delay (2022-04-10)
Sigma
metres
2.17
2.16
2.15
2.14
2.13
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-04-10)
Sigma
nanoseconds
Sigma (nanoseconds)
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
2.0
1.5
1.0
0.5
0.0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-04-10)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-04-10)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R01 R04 R08 R13 R17 R21
G13 G21 R02 R05 R09 R14 R18 R22
G16 G22 R03 R07 R12 R15 R20 R24
G19


Pseudo-Range Residuals (2022-04-10)
metres
6
4
2
0
−2
−4
−6
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R01 R04 R08 R13 R17 R21
G13 G21 R02 R05 R09 R14 R18 R22
G16 G22 R03 R07 R12 R15 R20 R24
G19


Phase Ambiguity Status (2022-04-10)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R20
R21
R22
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220411-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-11 15:23:30.00	2022-04-12 01:13:30.00	9:50:00
Processing Time		**Product Type**
20:18:32 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	56.06 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.457m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220411-GS15Base_decimatedRinex.yyo

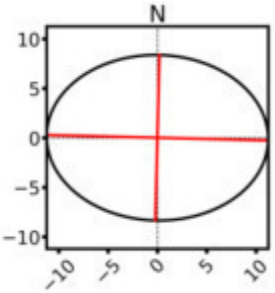
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32366"	-132° 43' 53.97659"	712.060 m
Sigmas(95%)	0.007 m	0.009 m	0.020 m
A priori*	60° 10' 26.30502"	-132° 43' 54.08863"	710.602 m
Estimated – A priori	0.577 m	1.727 m	1.458 m

Orthometric Height
CGVD2013
(CGG2013a)
(2022.3)

708.581 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 11 mm
semi-minor: 8 mm
semi-major azimuth: -88° 23' 44.86"



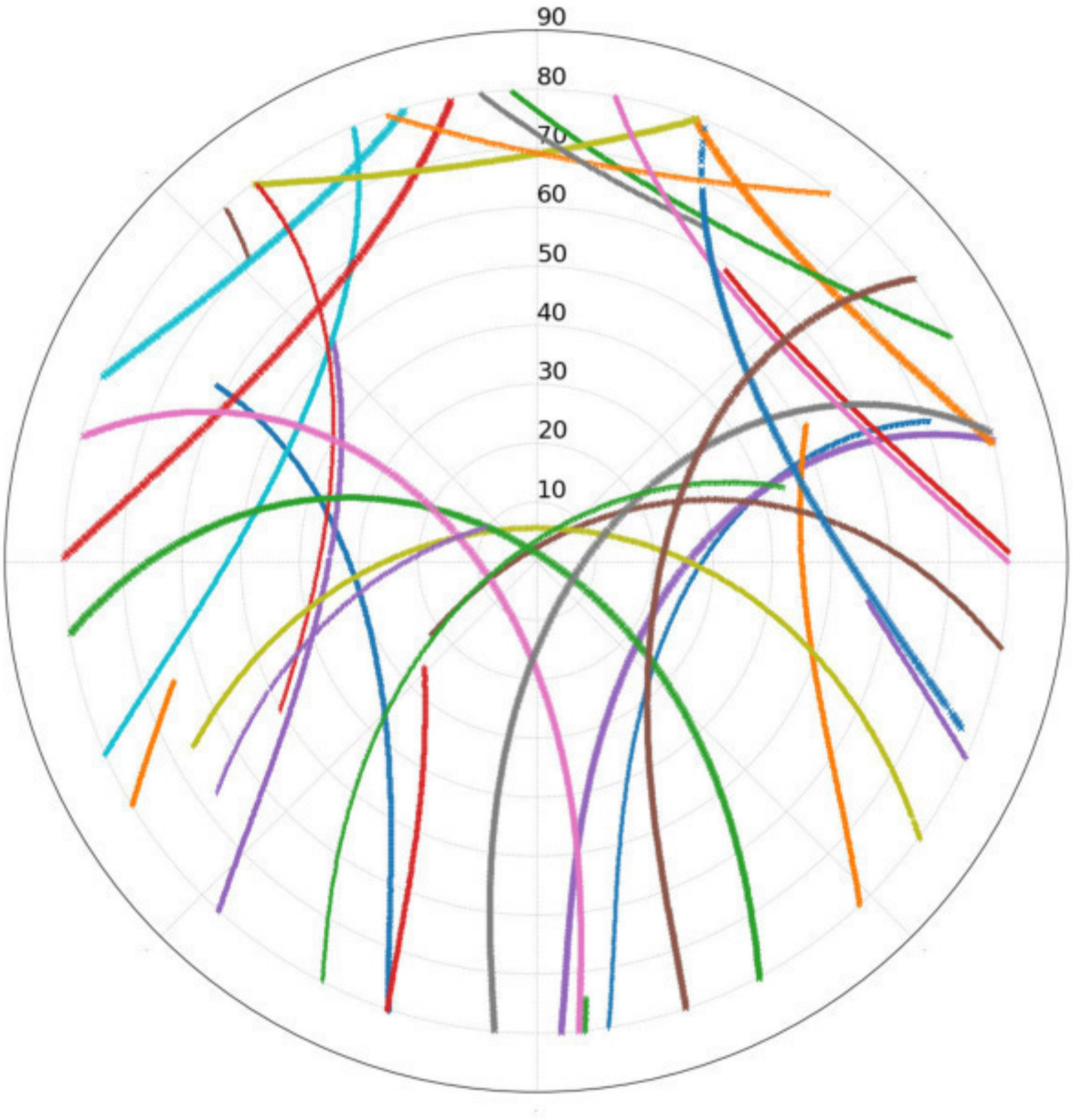
UTM (North)
Zone 8

6672948.557 m (N)
625841.231 m (E)

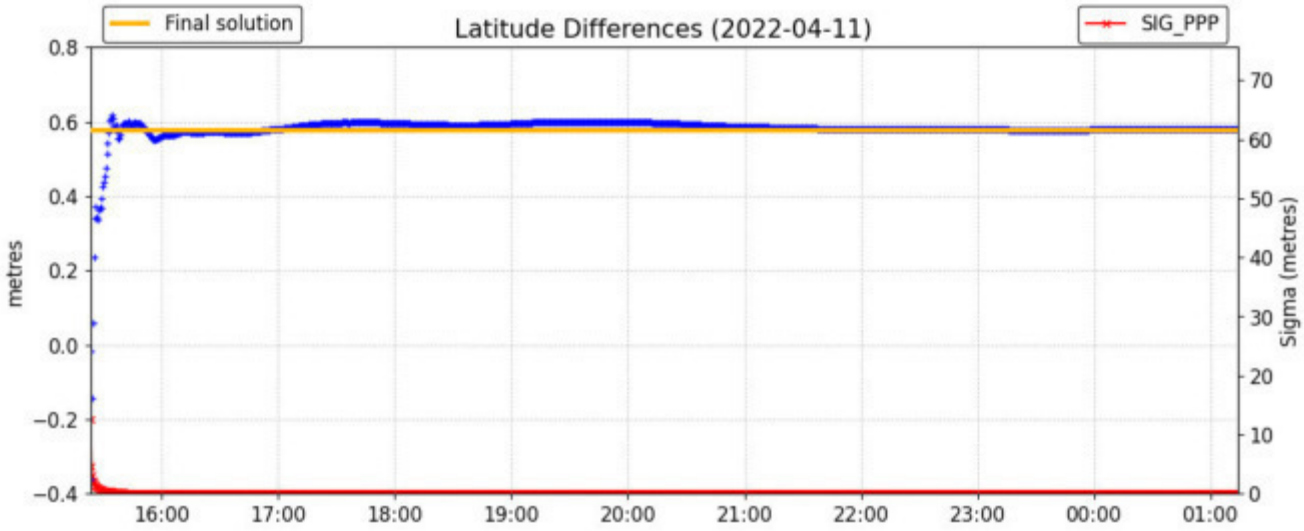
Scale Factors
0.99979406 (point)
0.99968265 (combined)

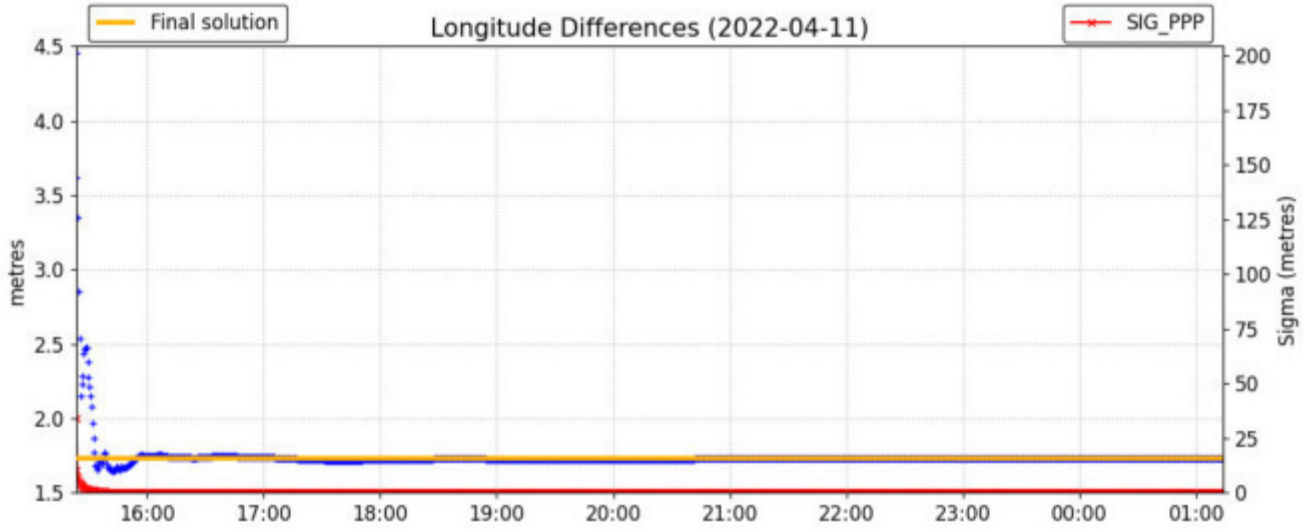
*(Coordinates from RINEX header used as a priori position)

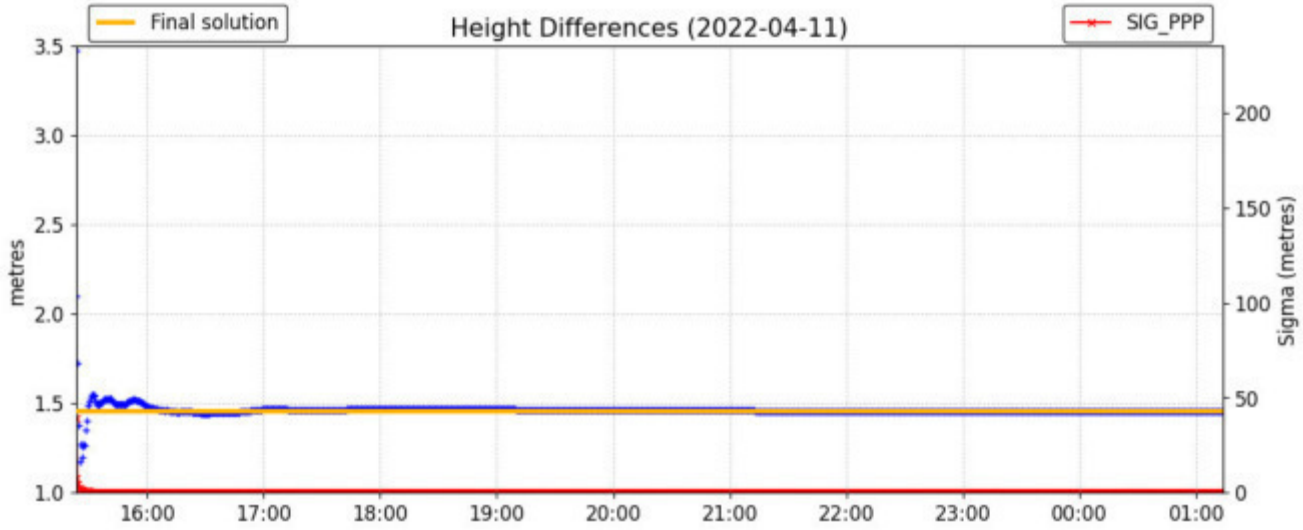
Satellite Sky Distribution

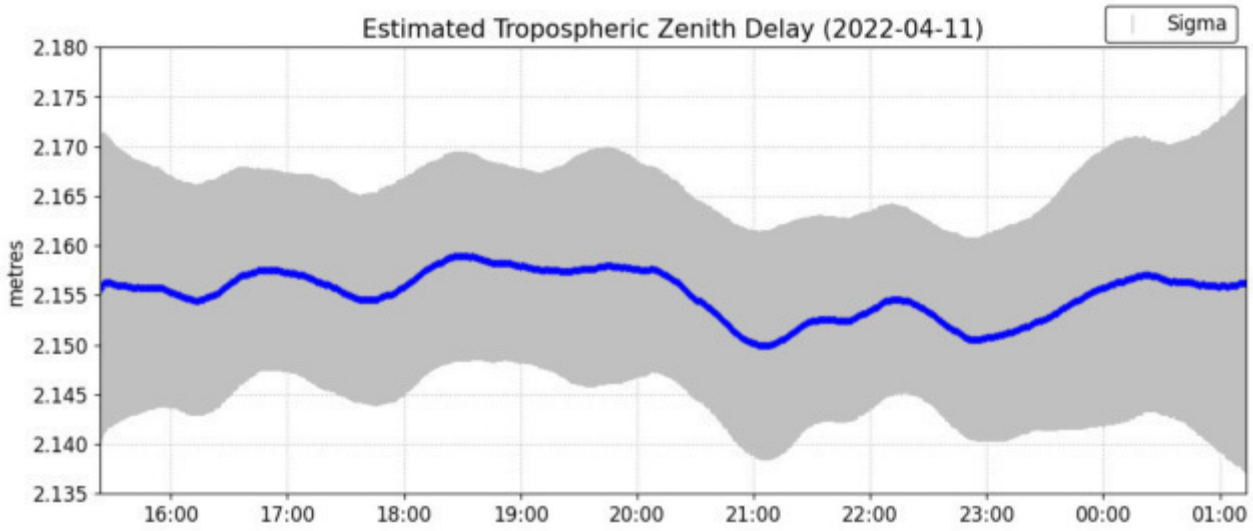


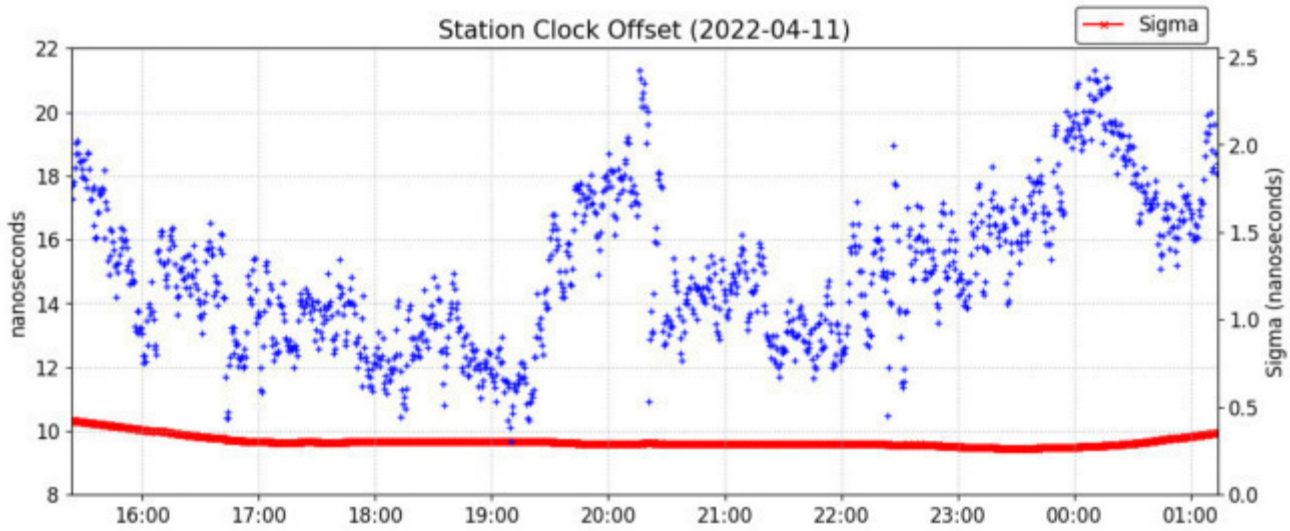
G02	G21	R04	R09	R15	R20
G13	G22	R05	R12	R17	R21
G16	R01	R07	R13	R18	R22
G19	R02	R08	R14	R19	R24
G20	R03				

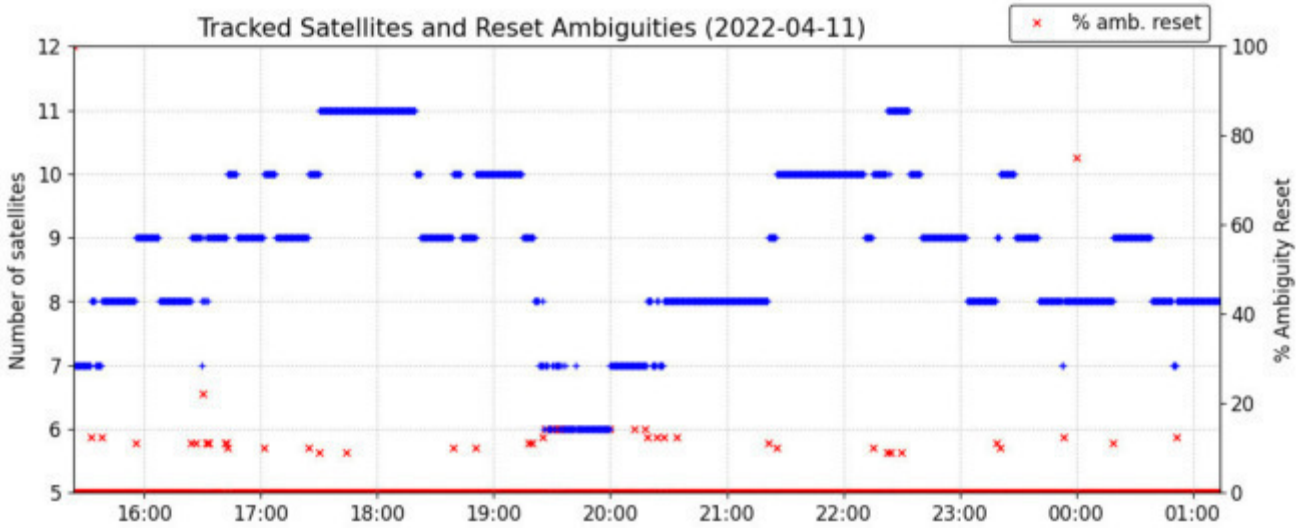

Final solution
Latitude Differences (2022-04-11)
SIG_PPP
metres
Sigma (metres)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

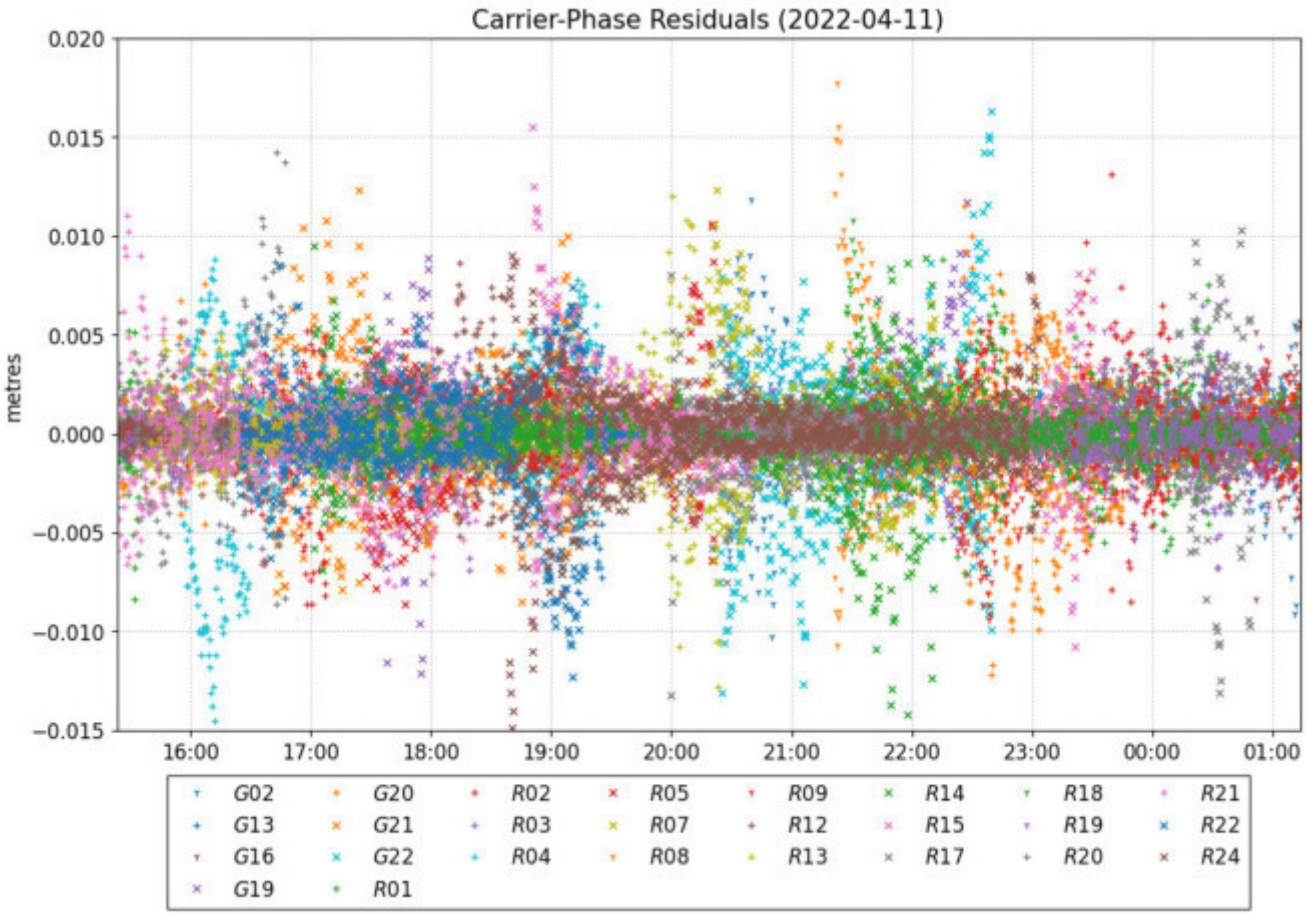

Final solution
Longitude Differences (2022-04-11)
SIG_PPP
metres
Sigma (metres)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
200
175
150
125
100
75
50
25
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

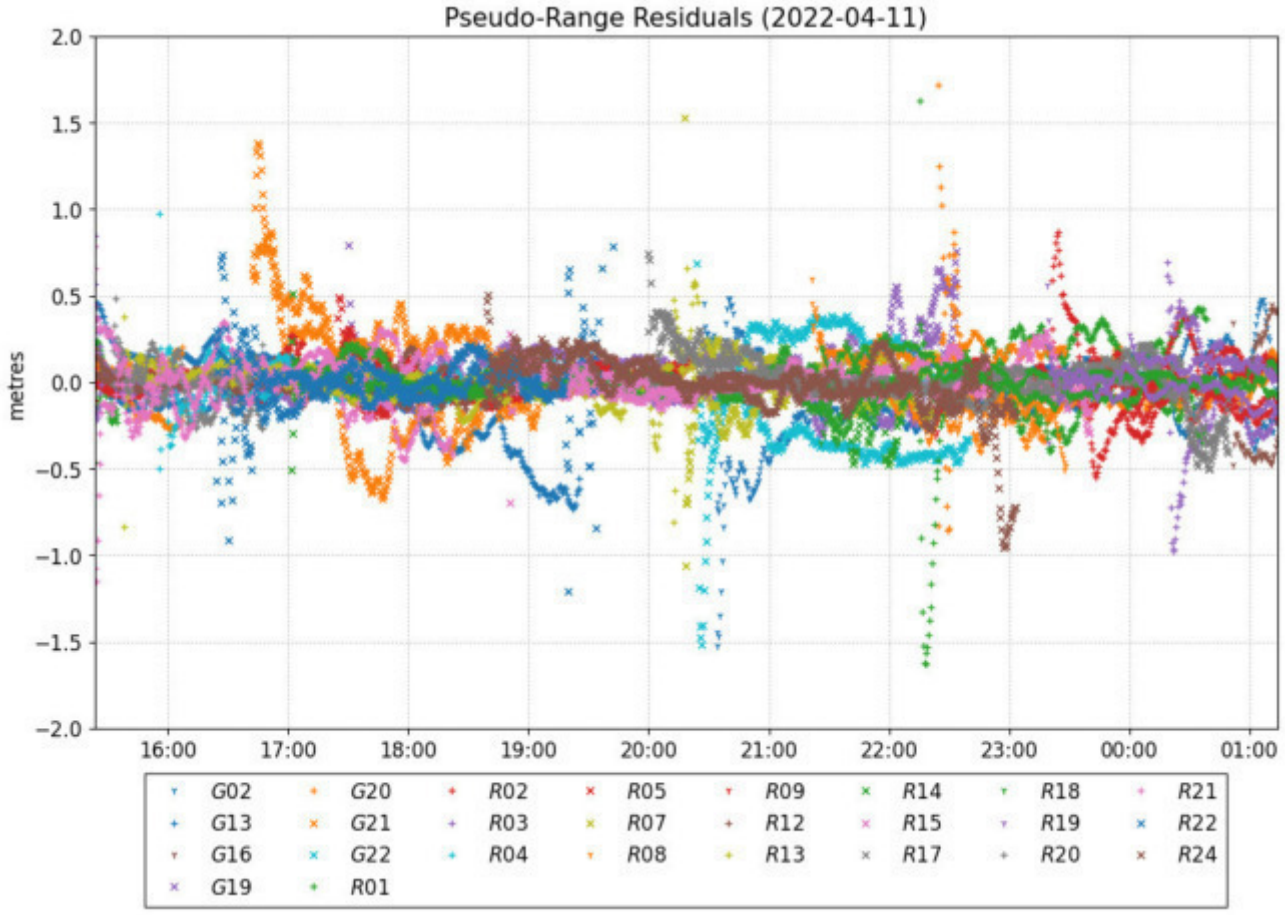

Final solution
Height Differences (2022-04-11)
SIG_PPP
metres
Sigma (metres)
3.5
3.0
2.5
2.0
1.5
1.0
200
150
100
50
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

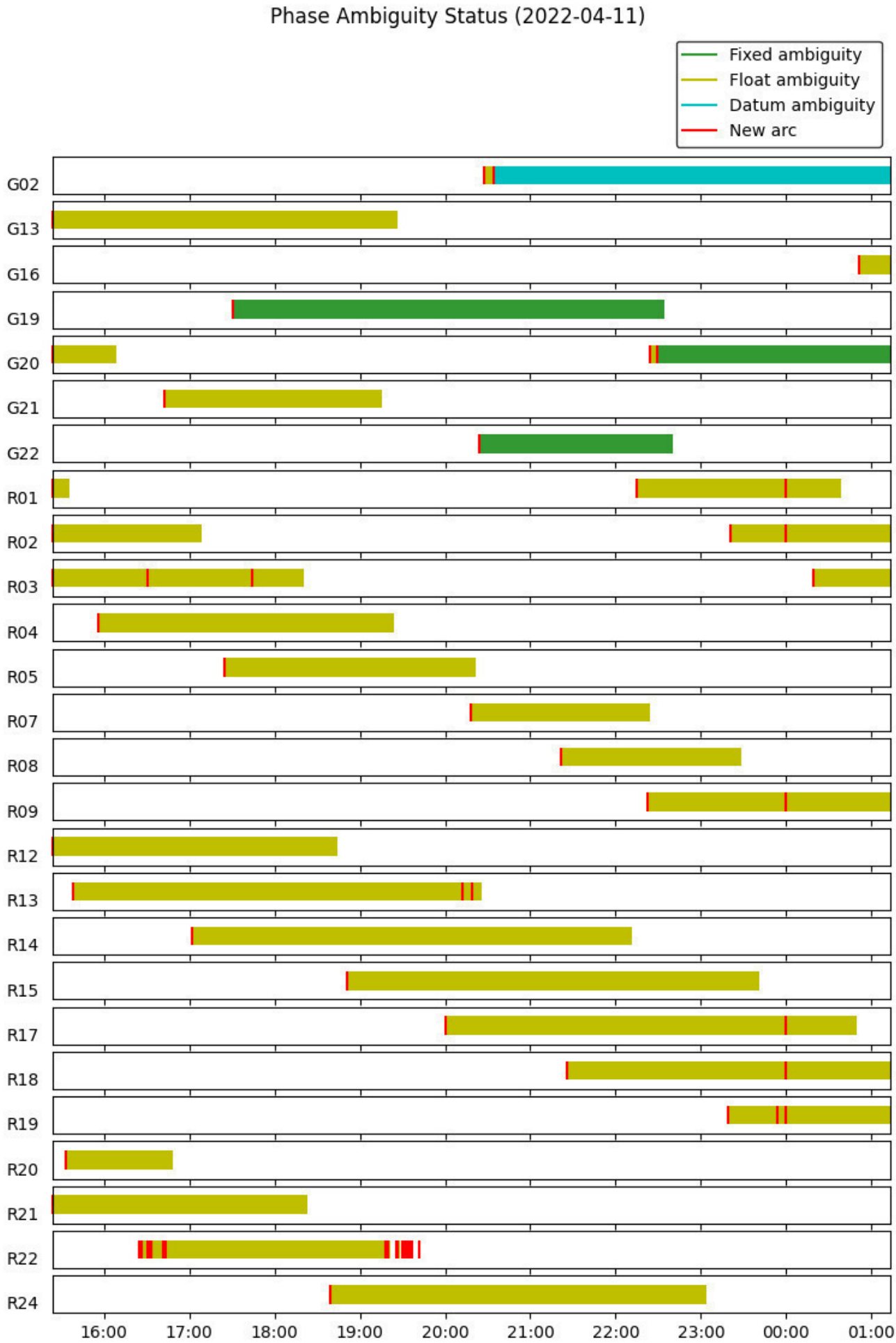

Estimated Tropospheric Zenith Delay (2022-04-11)
Sigma
metres
2.180
2.175
2.170
2.165
2.160
2.155
2.150
2.145
2.140
2.135
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-04-11)
Sigma
nanoseconds
Sigma (nanoseconds)
22
20
18
16
14
12
10
8
2.5
2.0
1.5
1.0
0.5
0.0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-04-11)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-04-11)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G21 R03 R07 R12 R15 R19 R22
G16 G22 R04 R08 R13 R17 R20 R24
G19 R01


Pseudo-Range Residuals (2022-04-11)
metres
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R14 R18 R21
G13 G21 R03 R07 R12 R15 R19 R22
G16 G22 R04 R08 R13 R17 R20 R24
G19 R01


Phase Ambiguity Status (2022-04-11)
Fixed ambiguity
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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Canadian Geodetic Survey
Surveyor General Branch
Natural Resources Canada
Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

Natural Resources Canada | Ressources naturelles Canada

Canada

CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220412-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-12 15:30:30.00	2022-04-13 00:39:00.00	9:08:30
Processing Time		**Product Type**
20:18:56 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.457m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220412-GS15Base_decimatedRinex.yyo

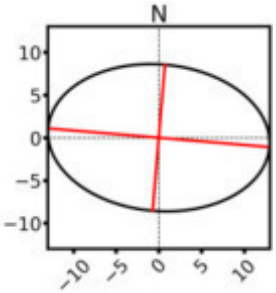
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32374"	-132° 43' 53.97592"	712.055 m
Sigmas(95%)	0.007 m	0.010 m	0.022 m
A priori*	60° 10' 26.33719"	-132° 43' 54.10673"	711.090 m
Estimated – A priori	-0.416 m	2.017 m	0.965 m

Orthometric Height CGVD2013 (CGG2013a) (2022.3)

708.576 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 13 mm
semi-minor: 9 mm
semi-major azimuth: -85° 48' 57.56"



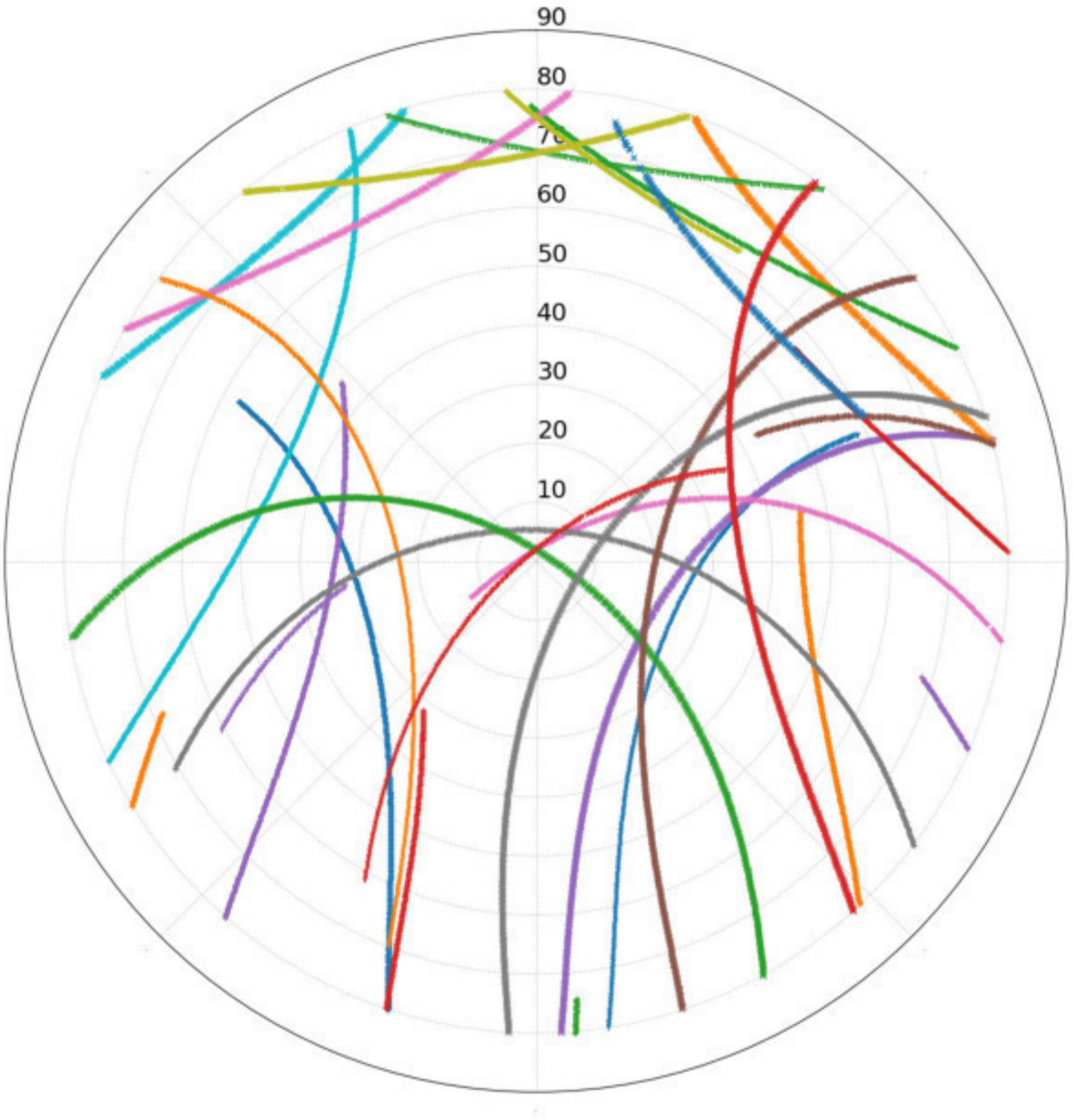
UTM (North) Zone 8

6672948.560 m (N)
625841.241 m (E)

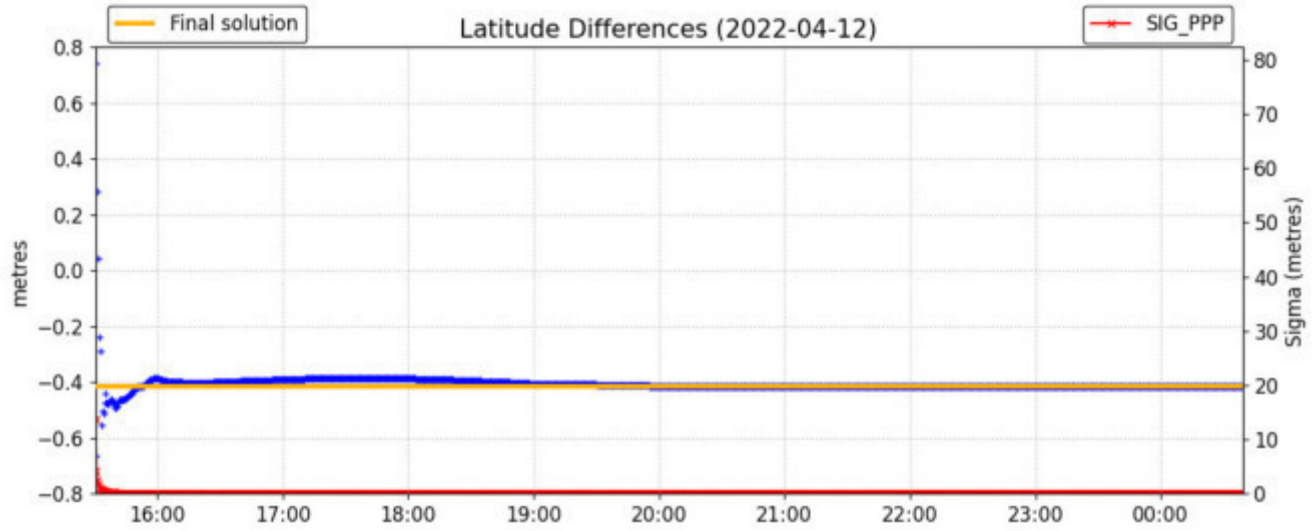
Scale Factors
0.99979406 (point)
0.99968265 (combined)

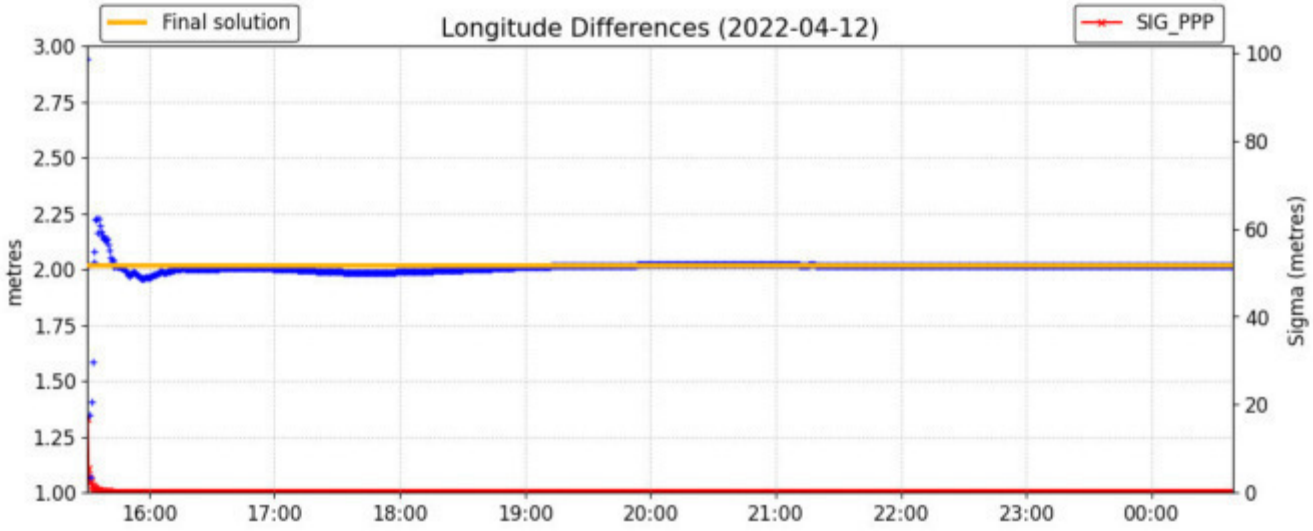
*(Coordinates from RINEX header used as a priori position)

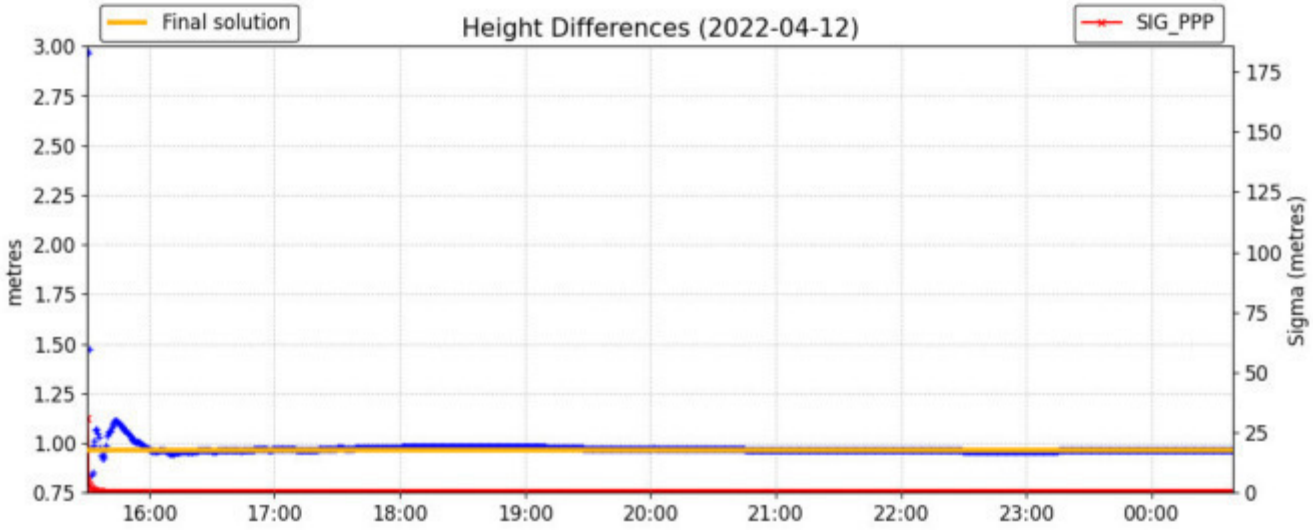
Satellite Sky Distribution

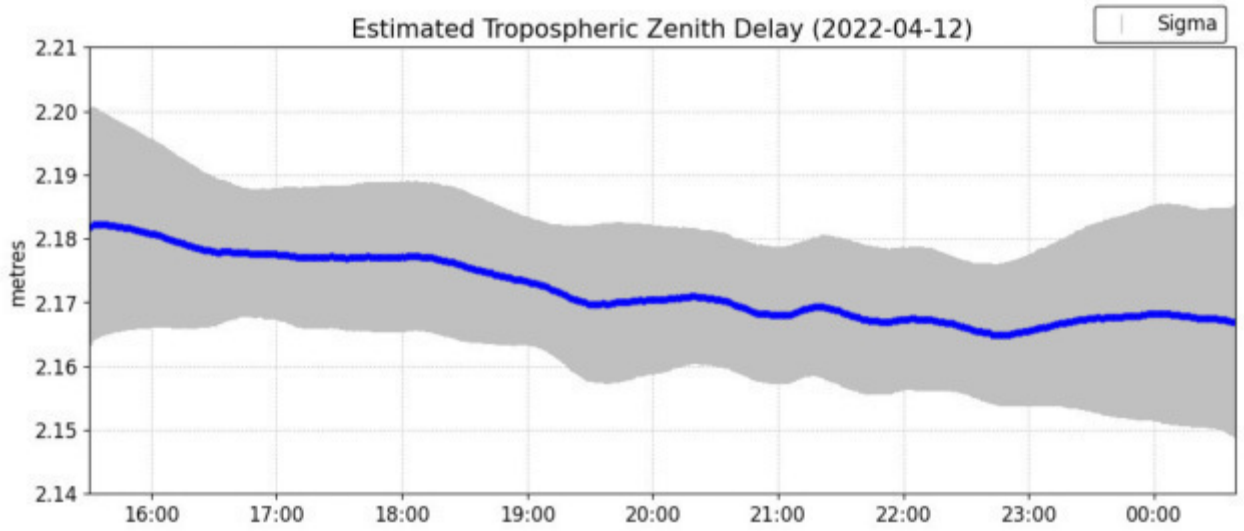


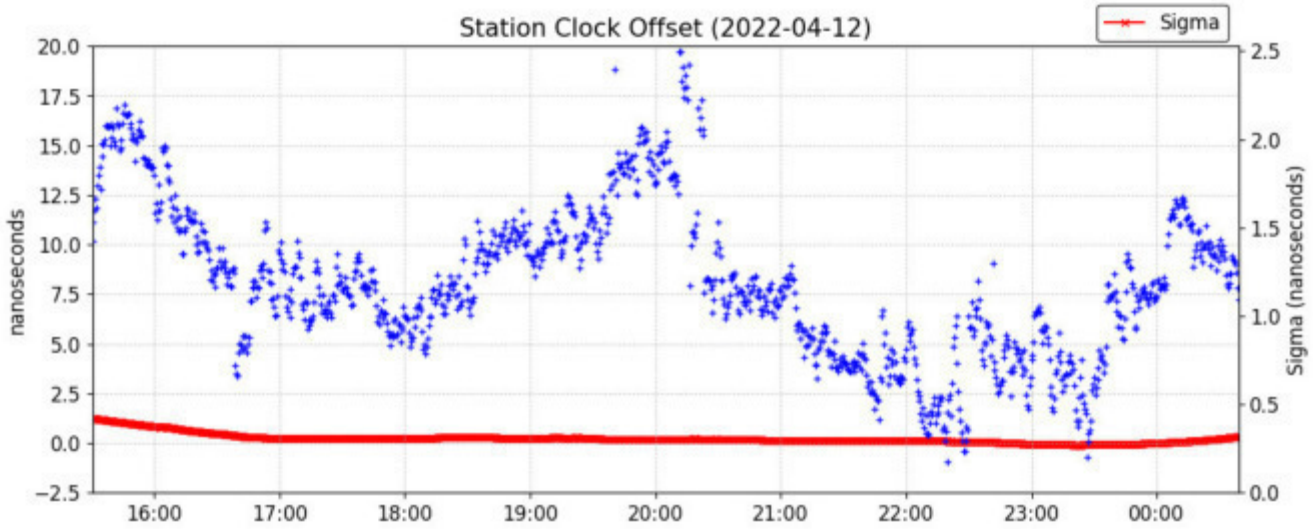
G02	G22	R04	R09	R15	R20
G13	R01	R05	R12	R17	R21
G19	R02	R07	R13	R18	R22
G20	R03	R08	R14	R19	R24
G21					

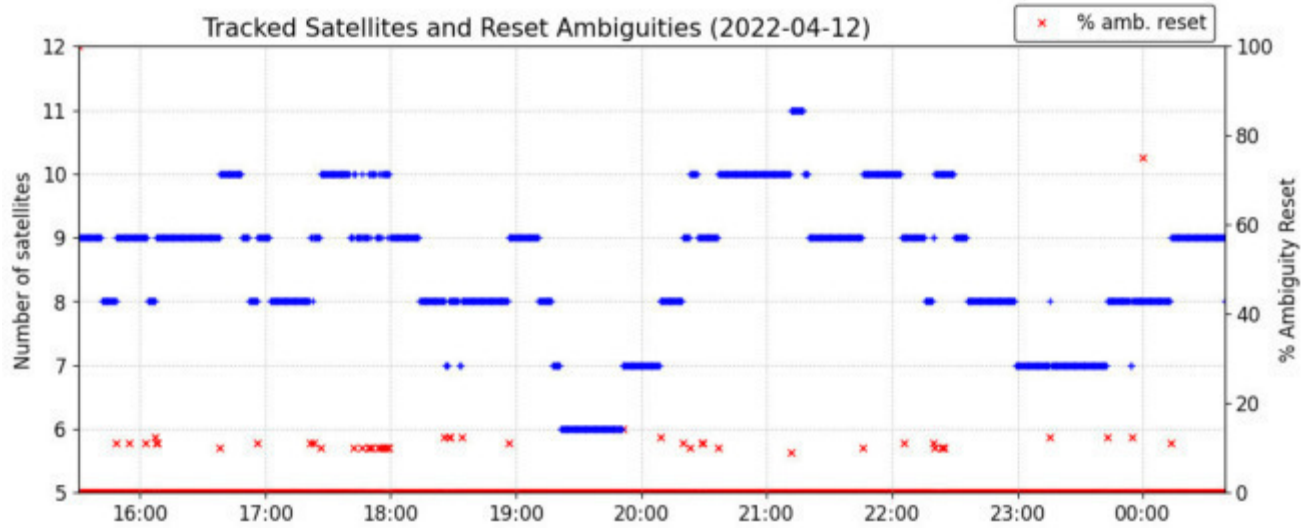

Final solution
Latitude Differences (2022-04-12)
SIG_PPP
metres
Sigma (metres)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
80
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

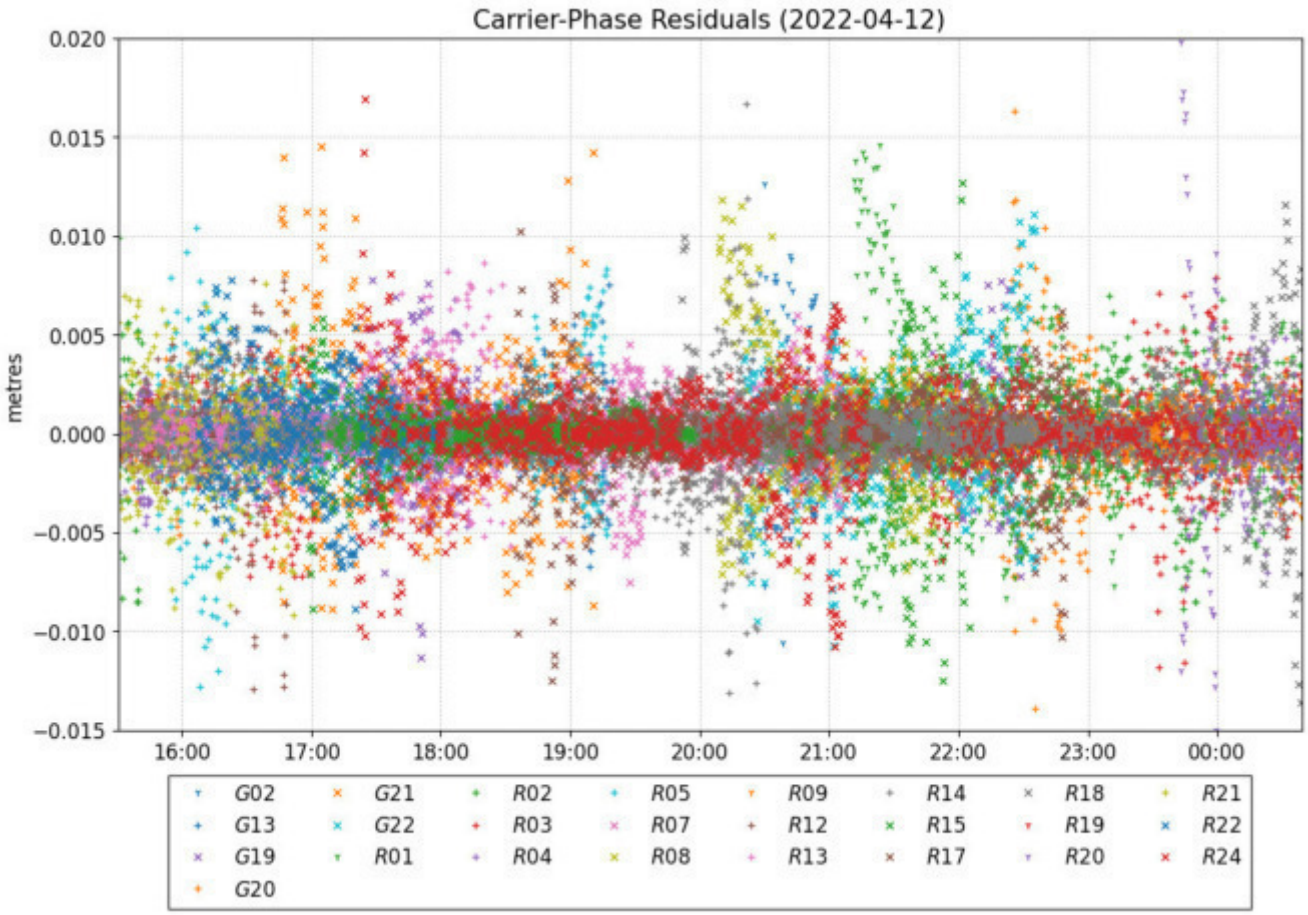

Final solution
Longitude Differences (2022-04-12)
SIG_PPP
metres
Sigma (metres)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

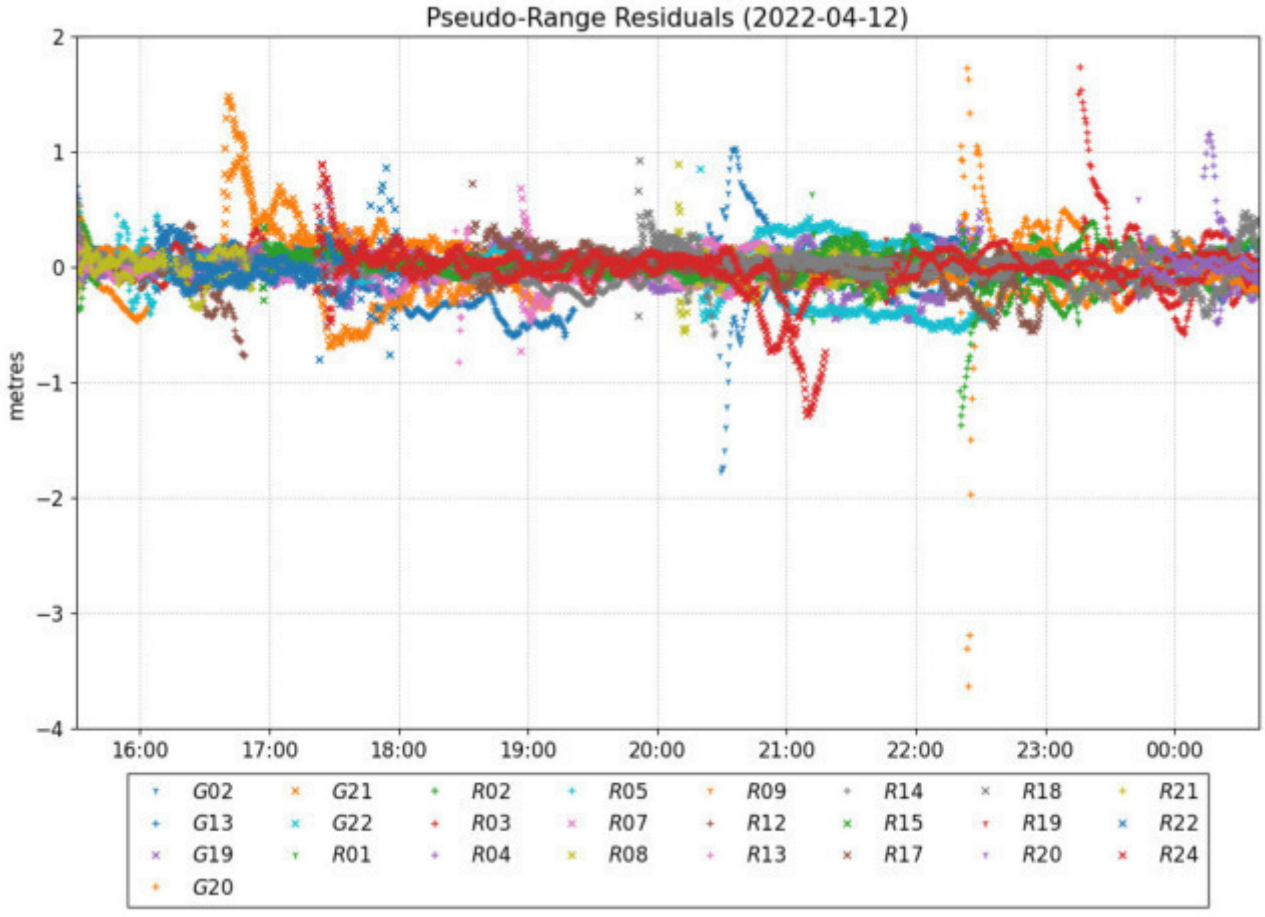

Final solution
Height Differences (2022-04-12)
SIG_PPP
metres
Sigma (metres)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
175
150
125
100
75
50
25
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

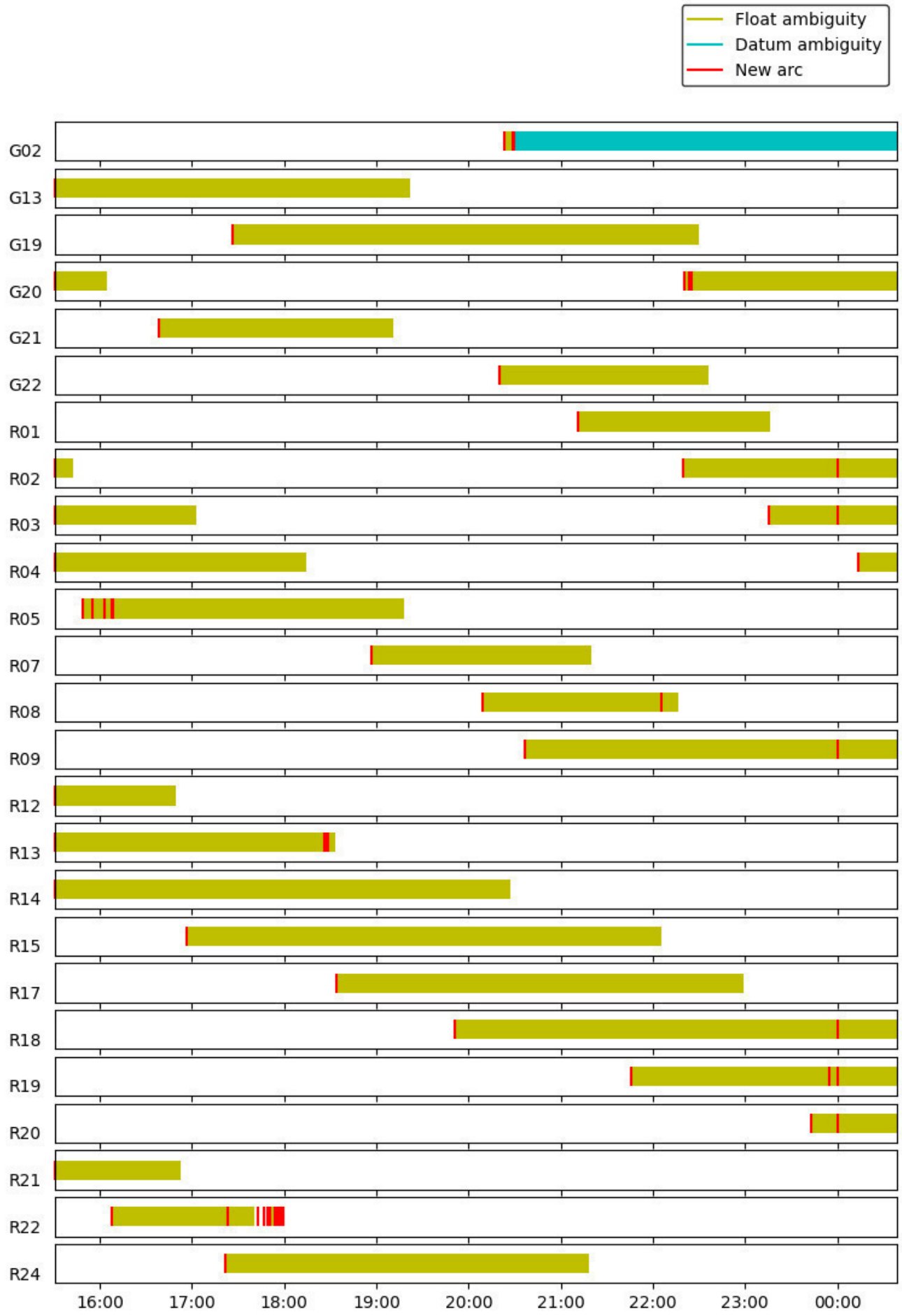

Estimated Tropospheric Zenith Delay (2022-04-12)
Sigma
metres
2.21
2.20
2.19
2.18
2.17
2.16
2.15
2.14
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-04-12)
Sigma
nanoseconds
Sigma (nanoseconds)
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
2.5
2.0
1.5
1.0
0.5
0.0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-04-12)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-04-12)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G21 R02 R05 R09 R14 R18 R21
G13 G22 R03 R07 R12 R15 R19 R22
G19 R01 R04 R08 R13 R17 R20 R24
G20


Pseudo-Range Residuals (2022-04-12)
metres
2
1
0
−1
−2
−3
−4
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G21 R02 R05 R09 R14 R18 R21
G13 G22 R03 R07 R12 R15 R19 R22
G19 R01 R04 R08 R13 R17 R20 R24
G20


Phase Ambiguity Status (2022-04-12)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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CSRS-PPP 3.50.2 (2021-12-08)

YGS-20220413-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-04-13 17:06:30.00	2022-04-13 18:32:30.00	1:26:00
Processing Time		**Product Type**
20:18:53 UTC 2022/05/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.457m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220413-GS15Base_decimatedRinex.yyo

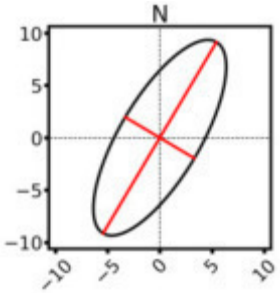
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.3)	60° 10' 26.32522"	-132° 43' 53.97520"	712.019 m
Sigmas(95%)	0.075 m	0.051 m	0.141 m
A priori*	60° 10' 26.32272"	-132° 43' 54.13463"	711.302 m
Estimated – A priori	0.077 m	2.458 m	0.717 m

Orthometric Height CGVD2013 (CGG2013a) (2022.3)

708.539 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 10.6 cm
semi-minor: 3.8 cm
semi-major azimuth: 30° 40' 56.64"

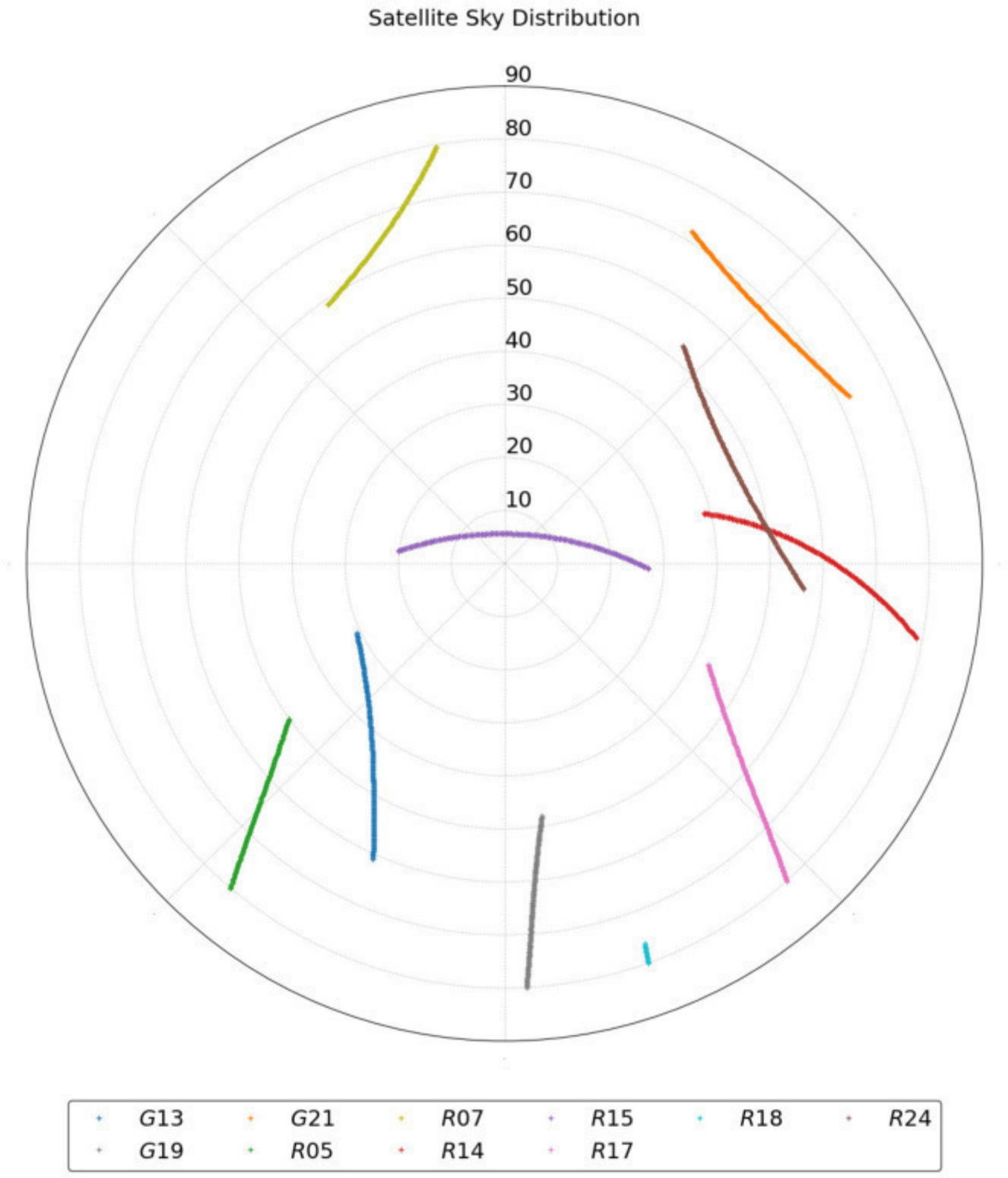


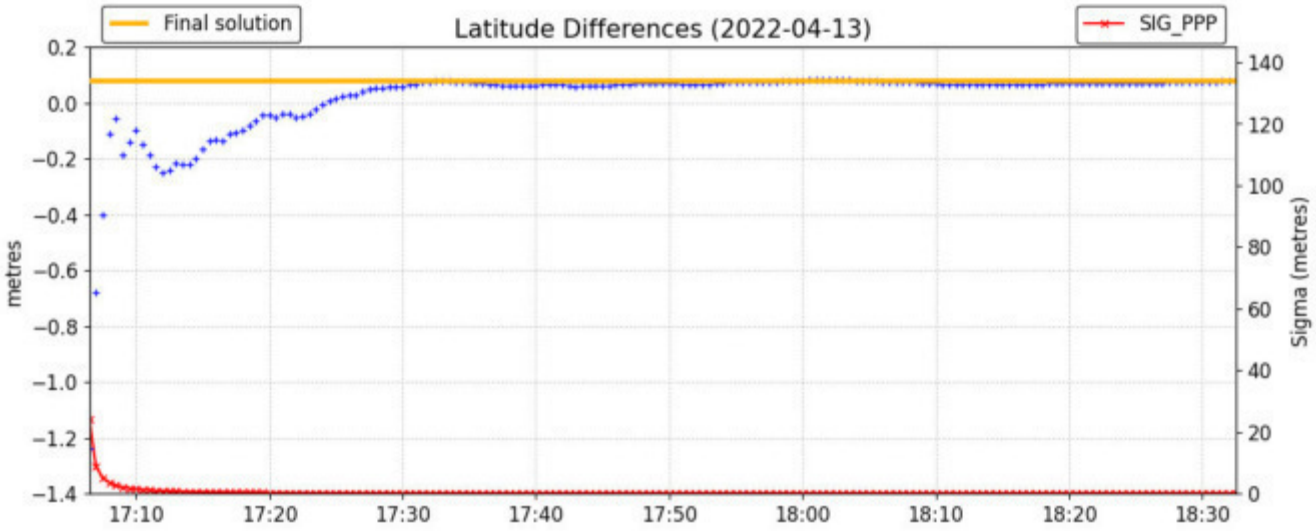
UTM (North) Zone 8

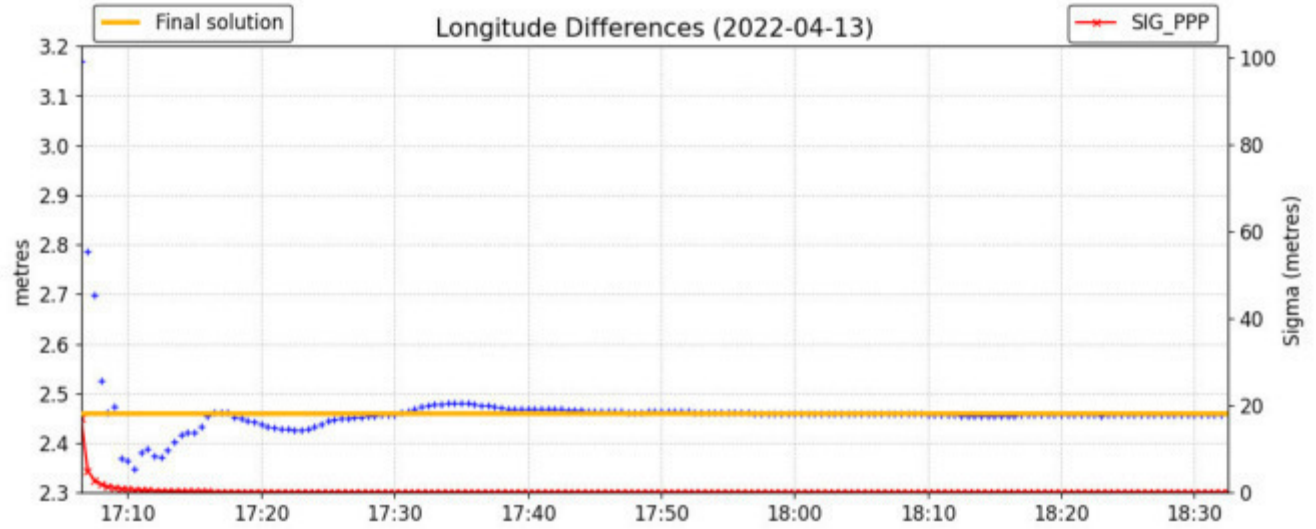
6672948.606 m (N)
625841.251 m (E)

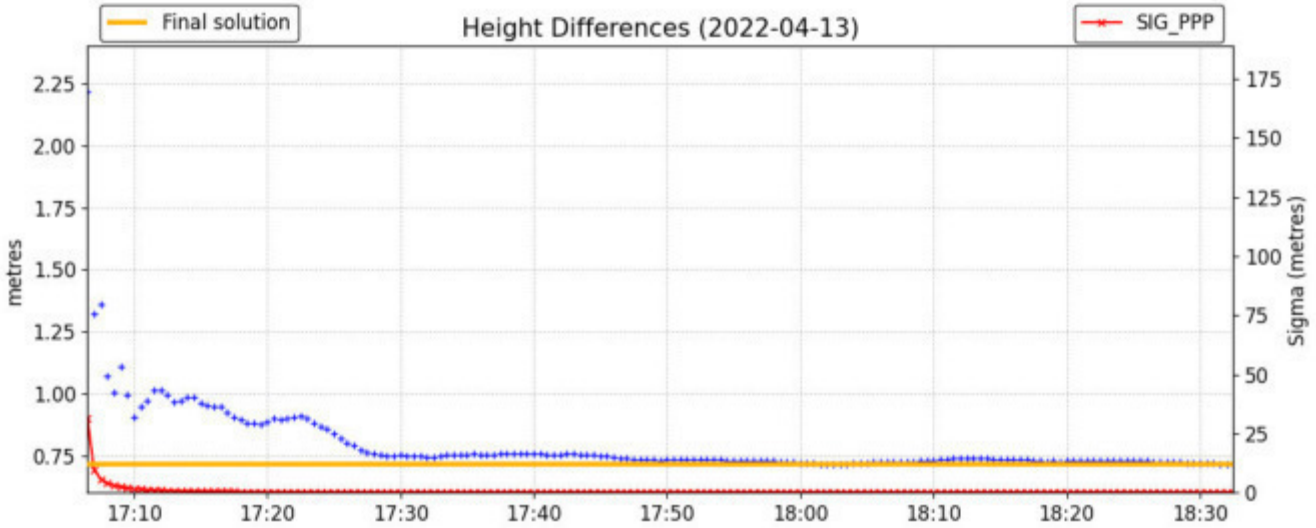
Scale Factors
0.99979406 (point)
0.99968265 (combined)

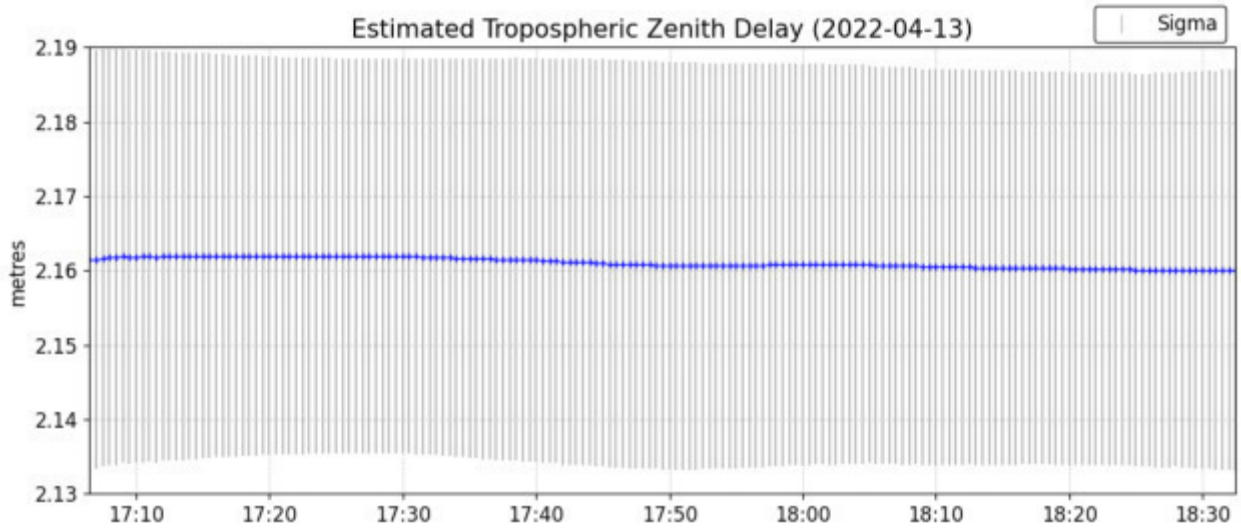
*(Coordinates from RINEX header used as a priori position)

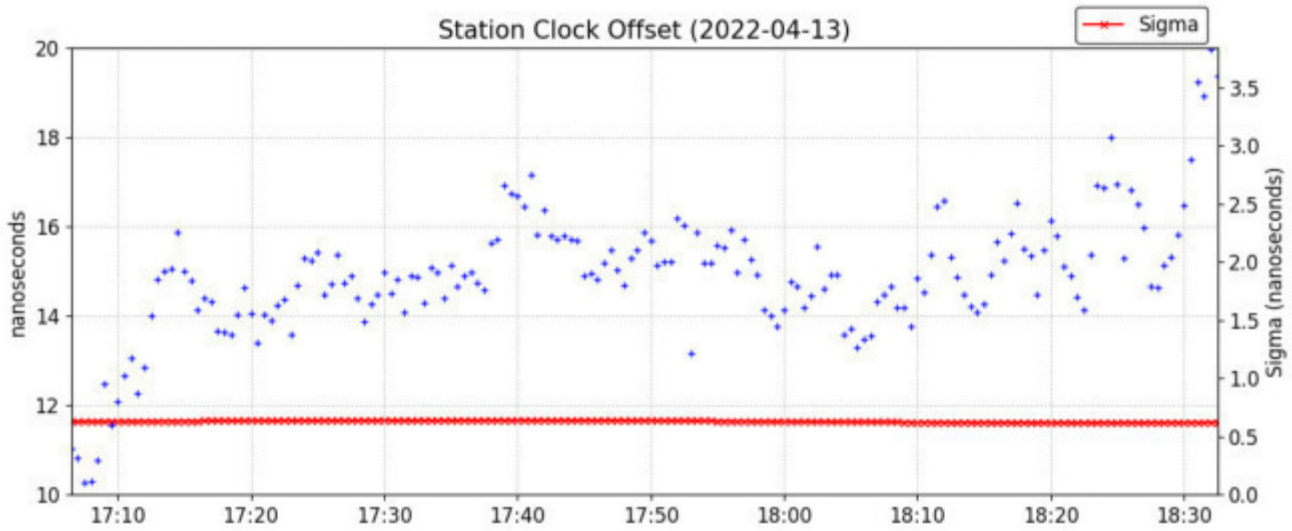

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G13
G21
R07
R15
R18
R24
G19
R05
R14
R17

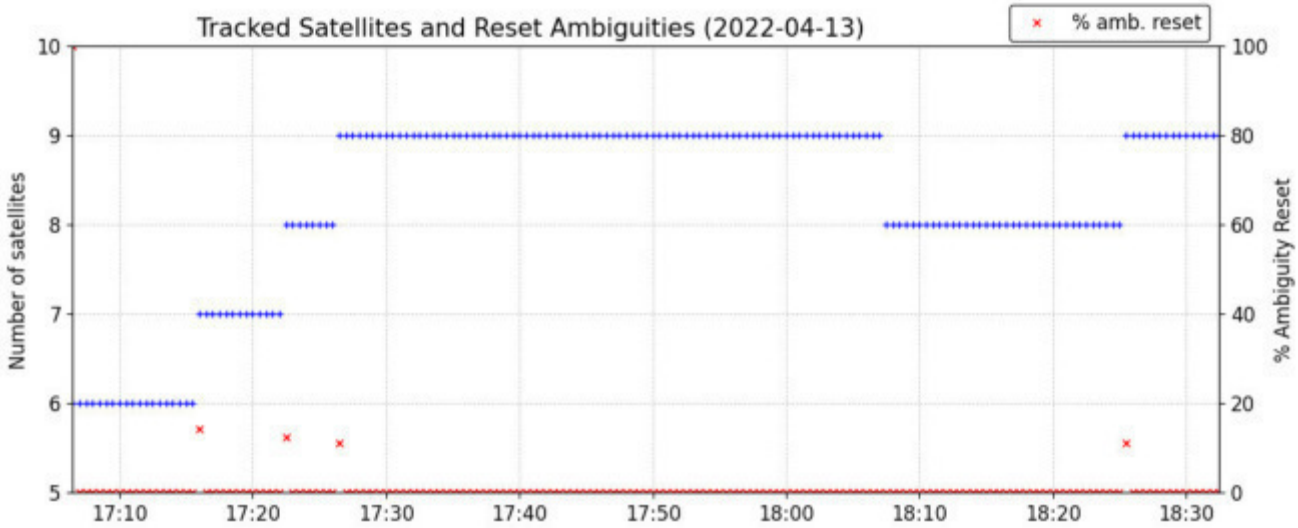

Final solution
Latitude Differences (2022-04-13)
SIG_PPP
metres
Sigma (metres)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
−1.4
140
120
100
80
60
40
20
0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30

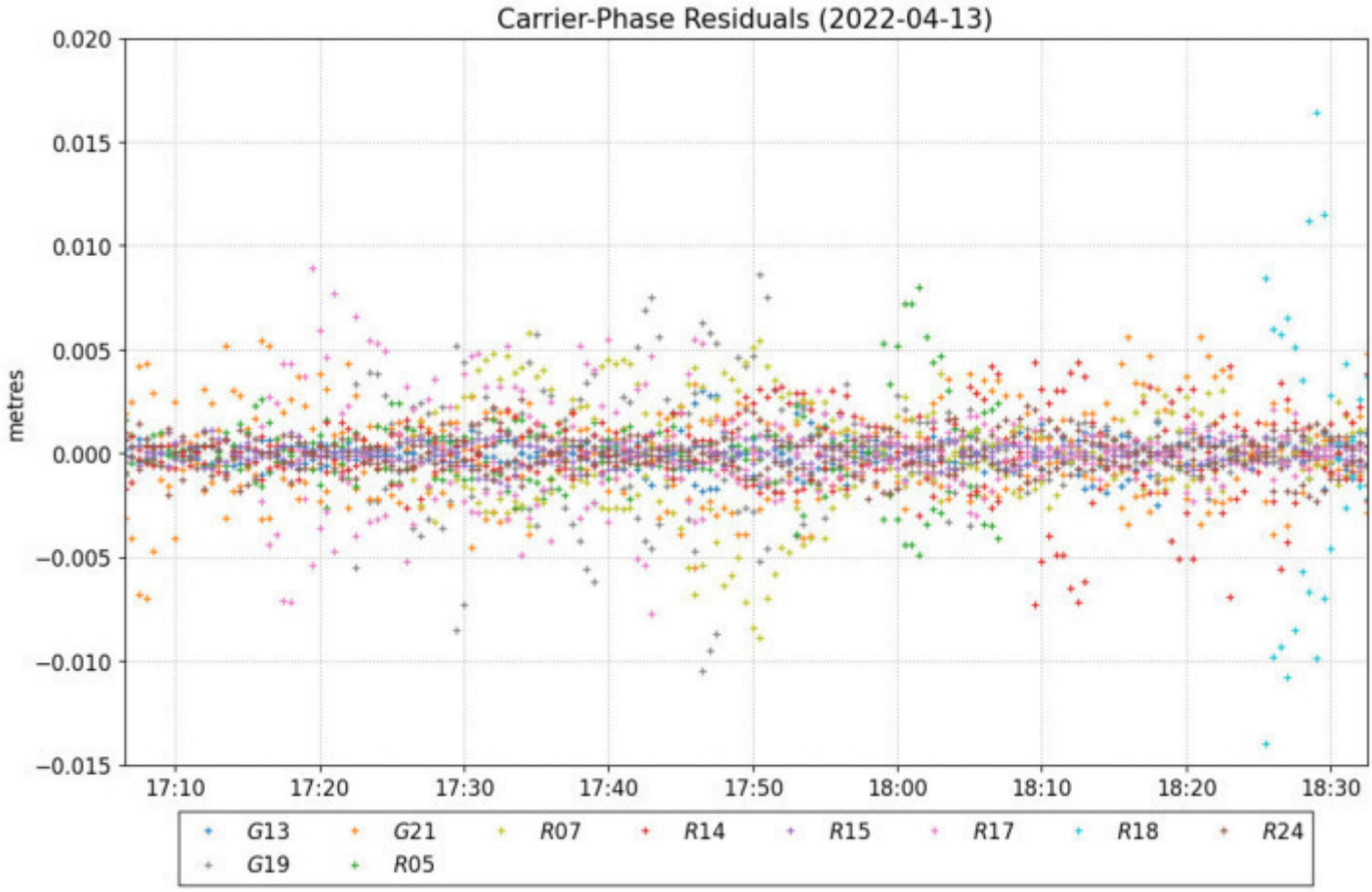

Final solution
Longitude Differences (2022-04-13)
SIG_PPP
metres
Sigma (metres)
3.2
3.1
3.0
2.9
2.8
2.7
2.6
2.5
2.4
2.3
100
80
60
40
20
0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30

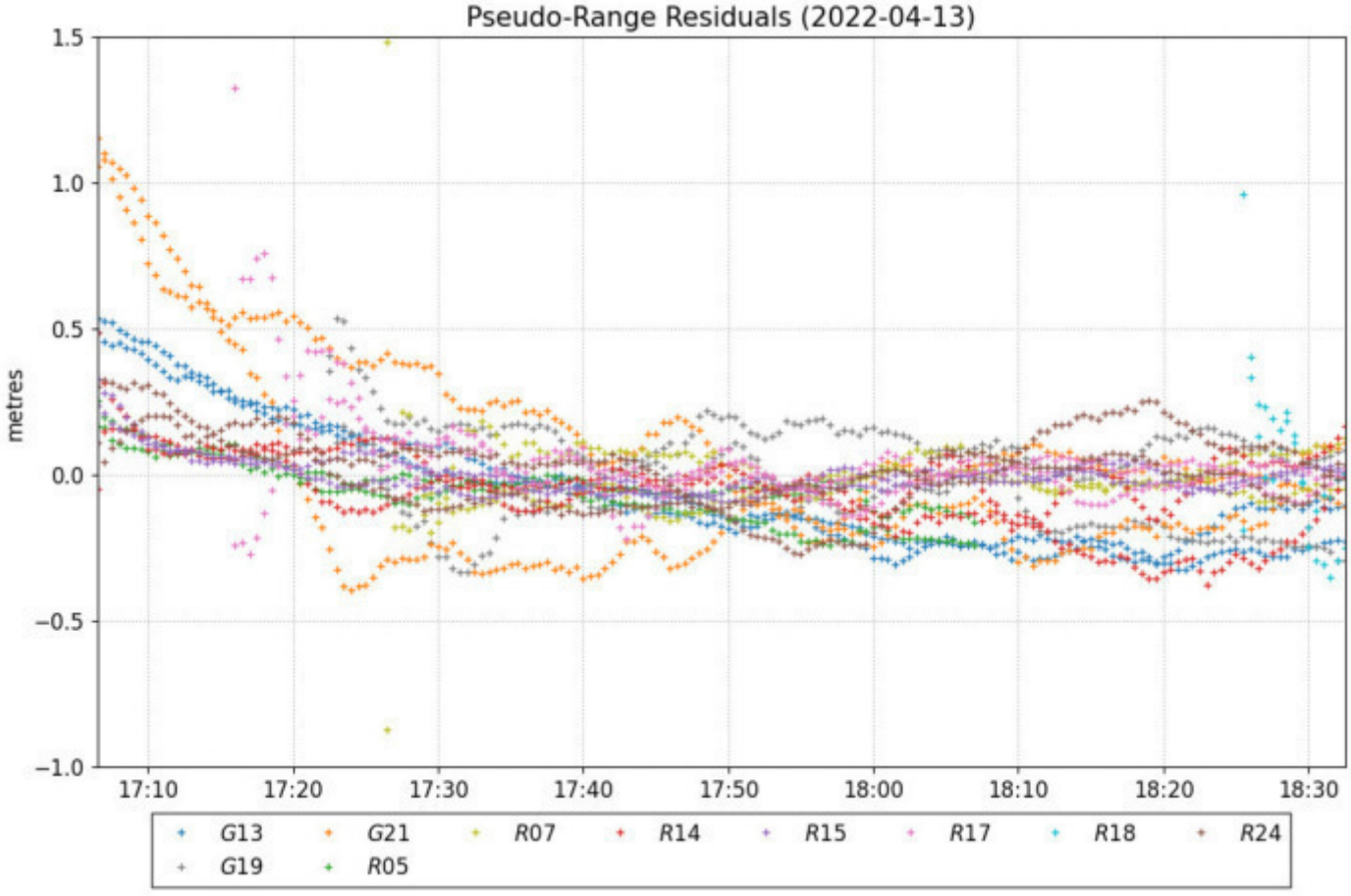

Final solution
Height Differences (2022-04-13)
SIG_PPP
metres
Sigma (metres)
2.25
2.00
1.75
1.50
1.25
1.00
0.75
175
150
125
100
75
50
25
0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30

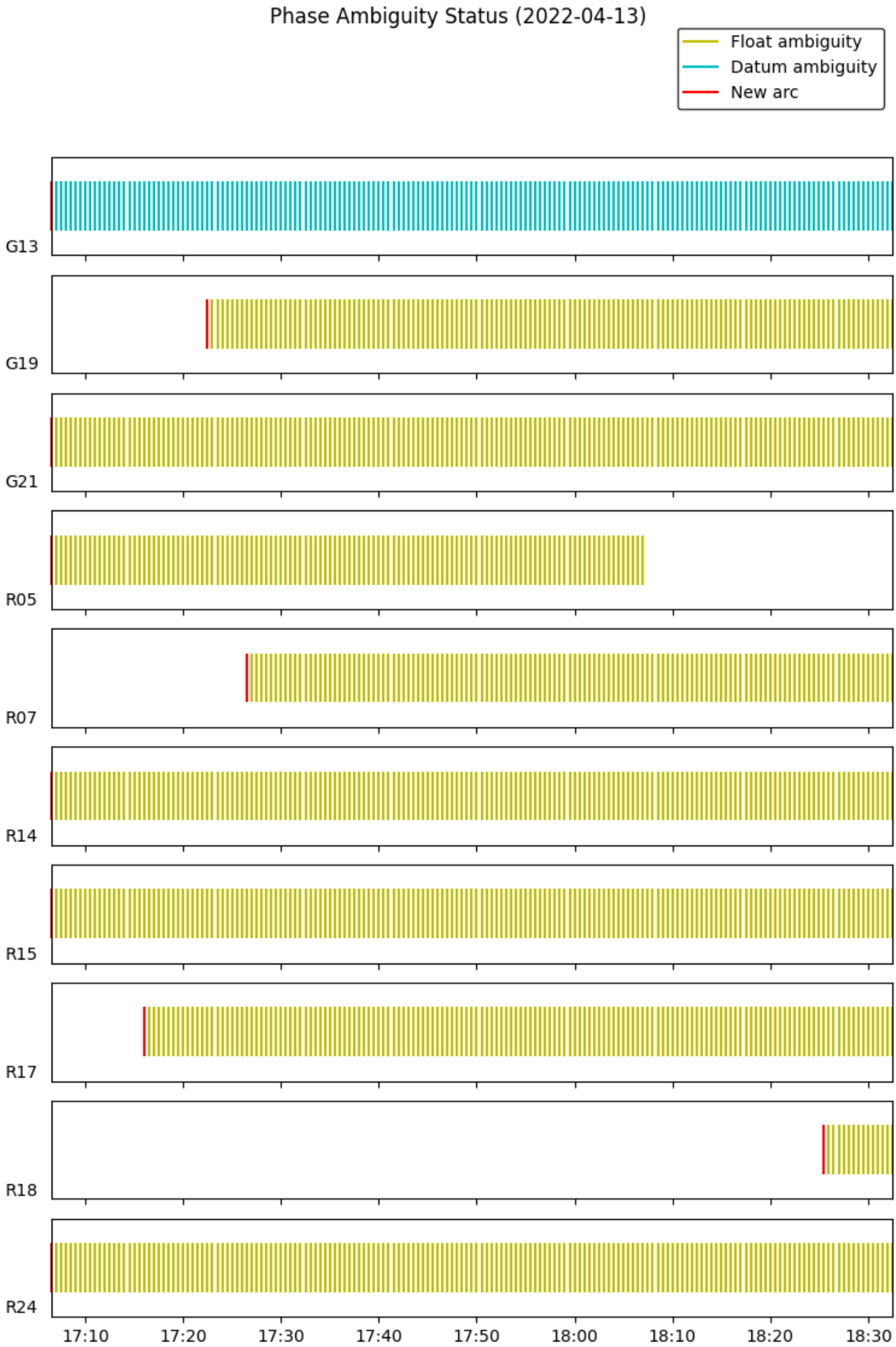

Estimated Tropospheric Zenith Delay (2022-04-13)
Sigma
metres
2.19
2.18
2.17
2.16
2.15
2.14
2.13
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30


Station Clock Offset (2022-04-13)
Sigma
nanoseconds
Sigma (nanoseconds)
20
18
16
14
12
10
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30


Tracked Satellites and Reset Ambiguities (2022-04-13)
% amb. reset
Number of satellites
% Ambiguity Reset
10
9
8
7
6
5
100
80
60
40
20
0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30


Carrier-Phase Residuals (2022-04-13)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30
G13
G21
R07
R14
R15
R17
R18
R24
G19
R05


Pseudo-Range Residuals (2022-04-13)
metres
1.5
1.0
0.5
0.0
−0.5
−1.0
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30
G13
G21
R07
R14
R15
R17
R18
R24
G19
R05


Phase Ambiguity Status (2022-04-13)
Float ambiguity
Datum ambiguity
New arc
G13
G19
G21
R05
R07
R14
R15
R17
R18
R24
17:10
17:20
17:30
17:40
17:50
18:00
18:10
18:20
18:30

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If you have any questions, please feel free to contact:
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Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220530-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-05-30 17:26:30.00	2022-05-31 00:51:00.00	7:24:30
Processing Time		**Product Type**
05:14:24 UTC 2022/06/08		NRCan Rapid
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.234m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220530-GS15Base_decimatedRinex.yyo

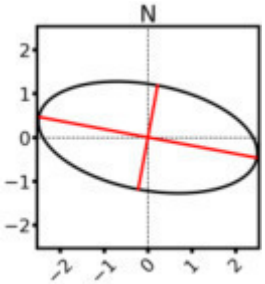
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.4)	60° 8' 25.46655"	-132° 38' 38.93503"	848.434 m
Sigmas(95%)	0.010 m	0.020 m	0.037 m
A priori*	60° 8' 25.44273"	-132° 38' 39.04307"	847.706 m
Estimated – A priori	0.737 m	1.668 m	0.728 m

Orthometric Height
CGVD2013
(CGG2013a)
(2022.4)

845.141 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 2.5 cm
semi-minor: 1.2 cm
semi-major azimuth: -79° 35' 52.45"



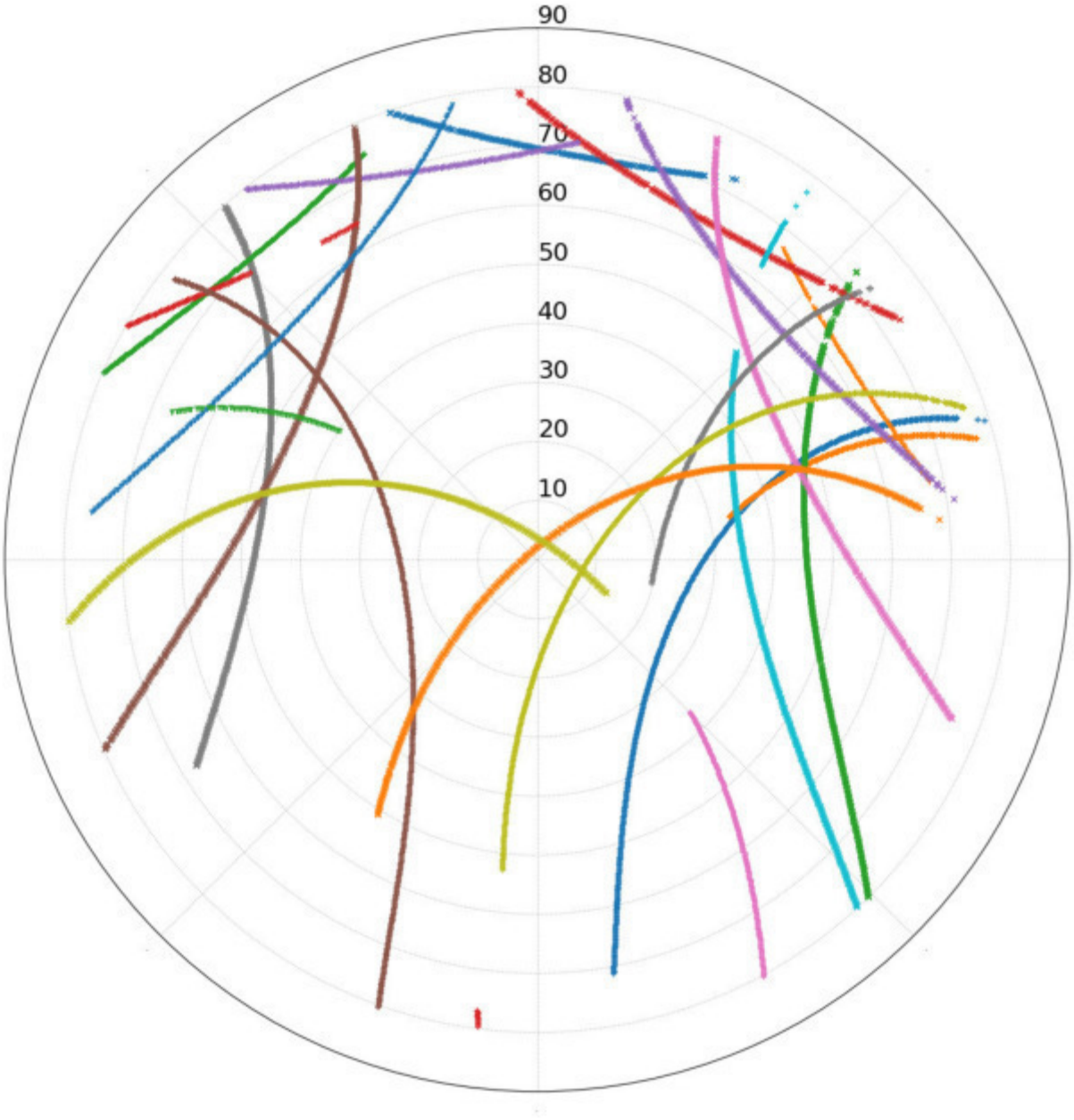
UTM (North)
Zone 8

6669381.297 m (N)
630828.138 m (E)

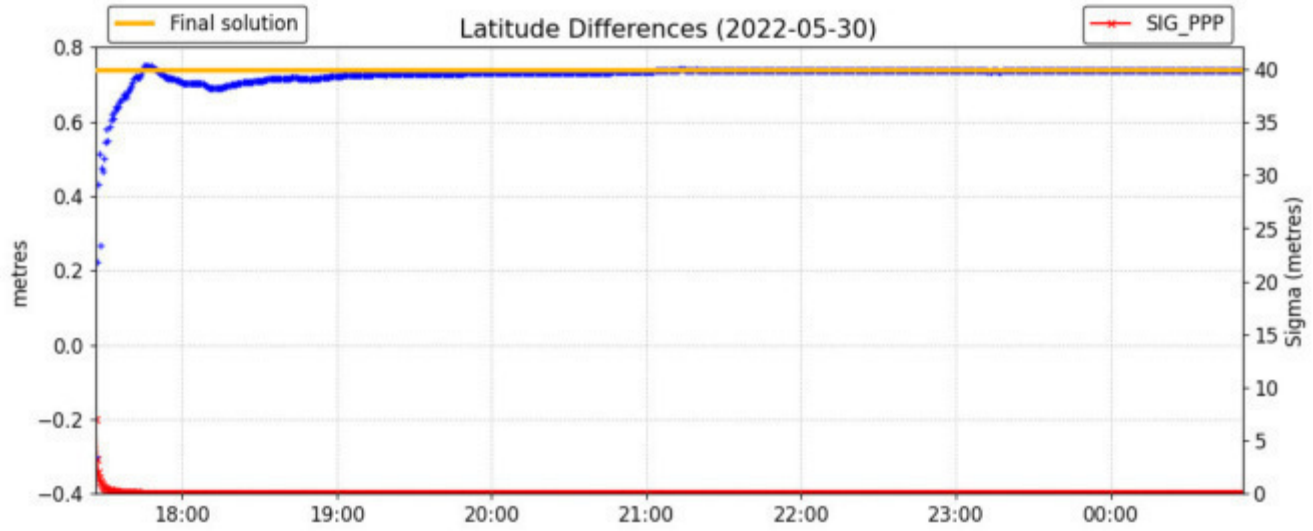
Scale Factors
0.99980975 (point)
0.99967700 (combined)

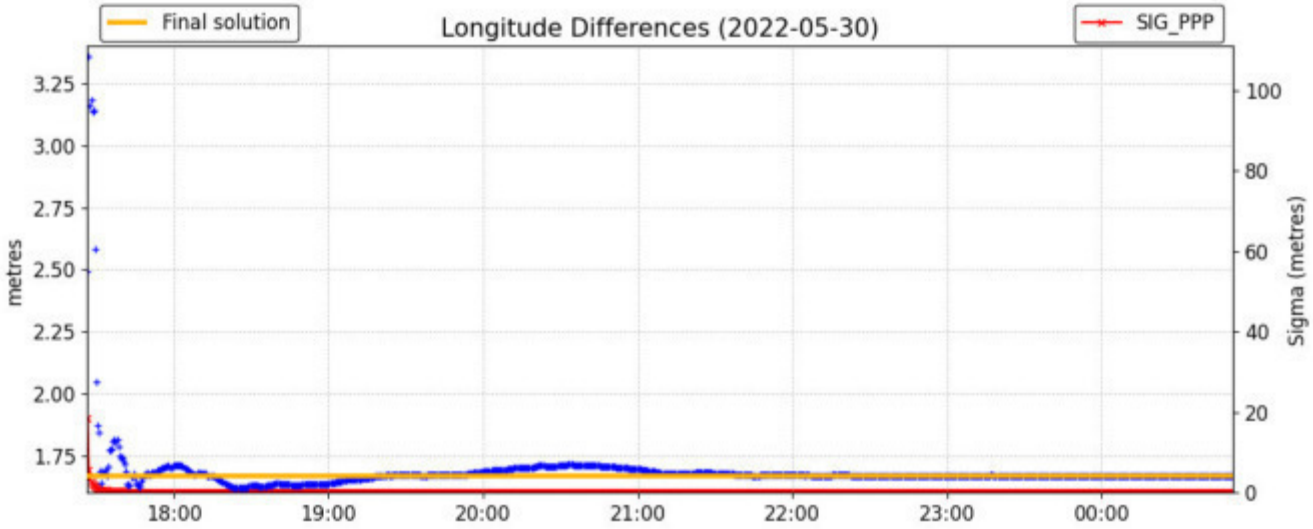
*(Coordinates from RINEX header used as a priori position)

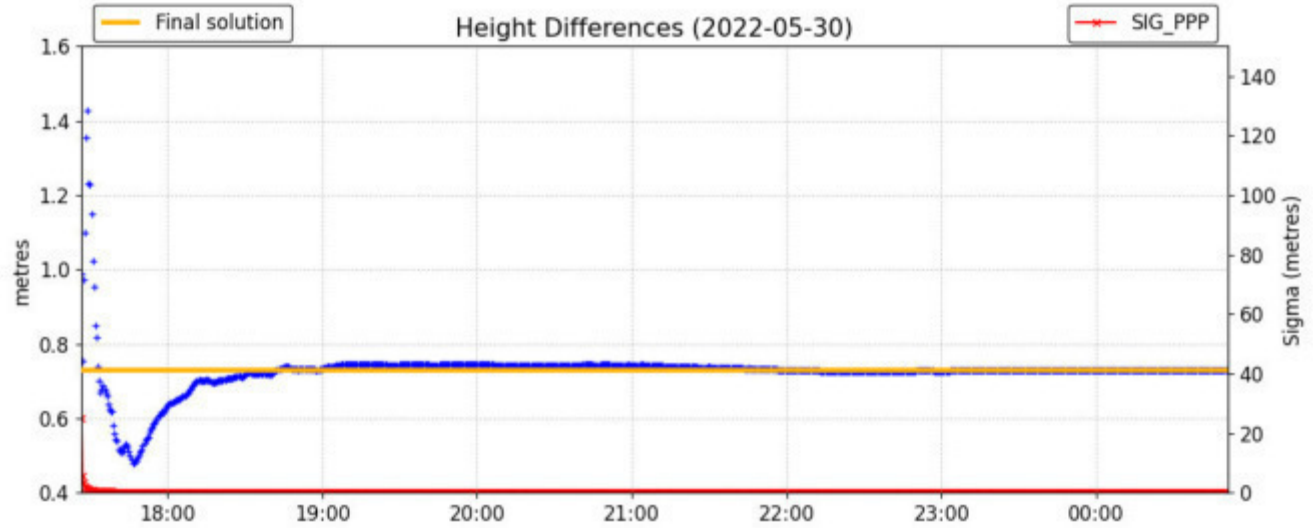
Satellite Sky Distribution

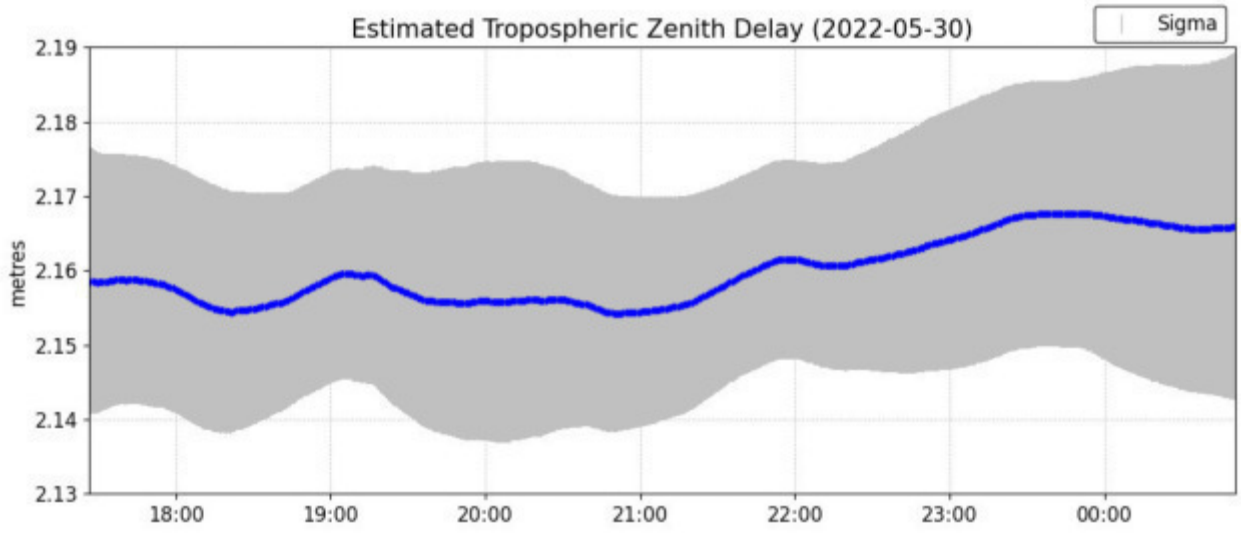


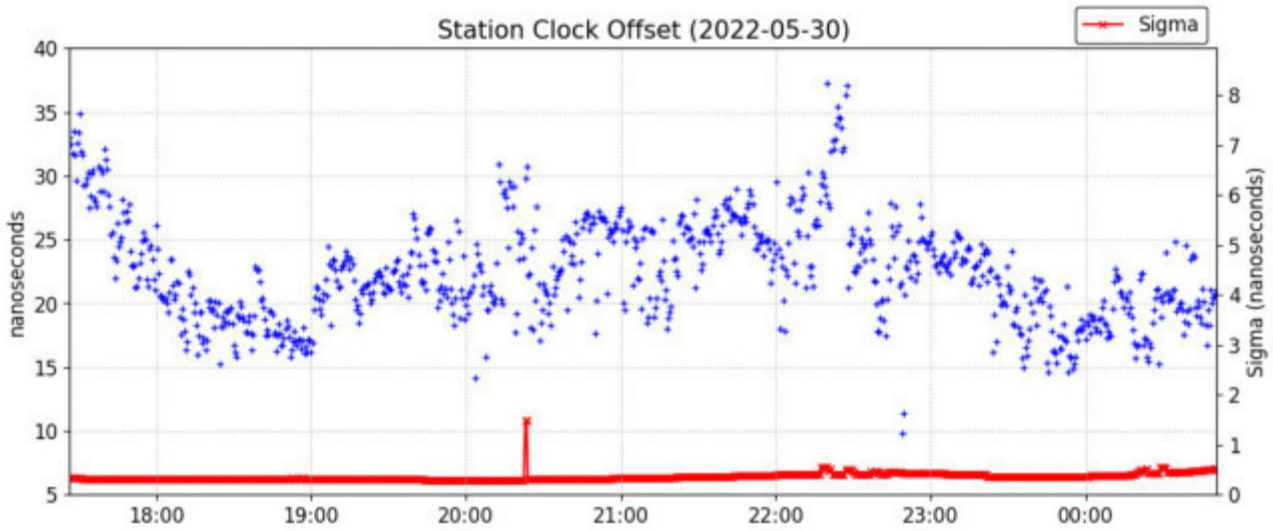
G02	G20	R03	R08	R13	R19
G13	G22	R04	R09	R15	R21
G16	R01	R05	R11	R17	R22
G19	R02	R07	R12	R18	R24

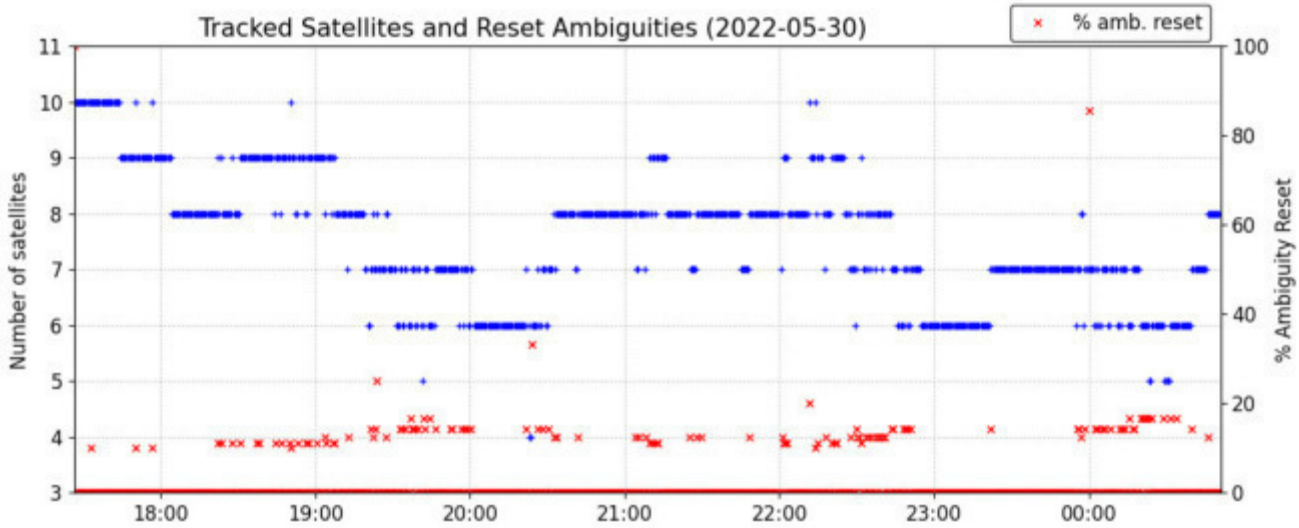

Final solution
Latitude Differences (2022-05-30)
SIG_PPP
metres
Sigma (metres)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
40
35
30
25
20
15
10
5
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

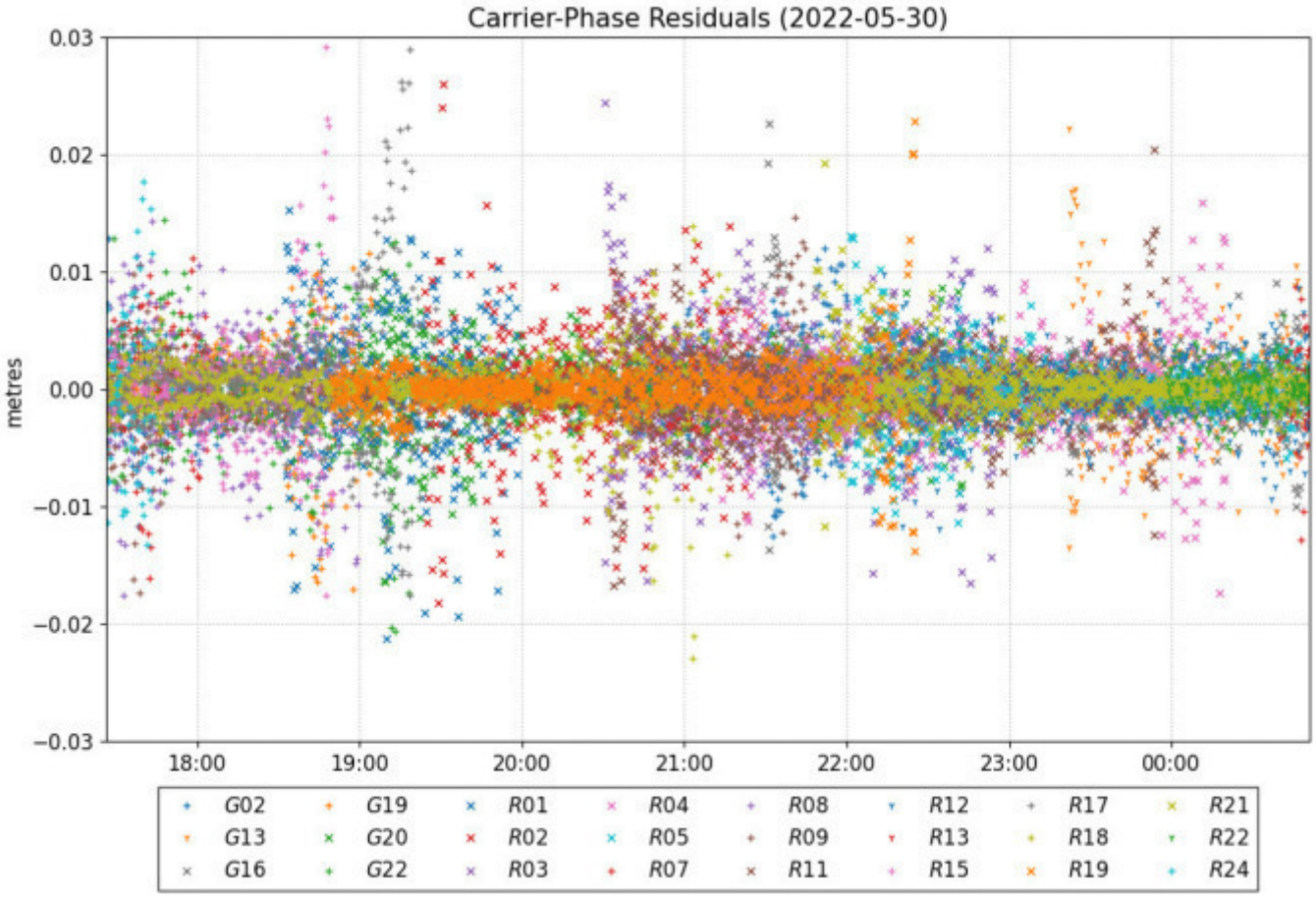

Final solution
Longitude Differences (2022-05-30)
SIG_PPP
metres
Sigma (metres)
3.25
3.00
2.75
2.50
2.25
2.00
1.75
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

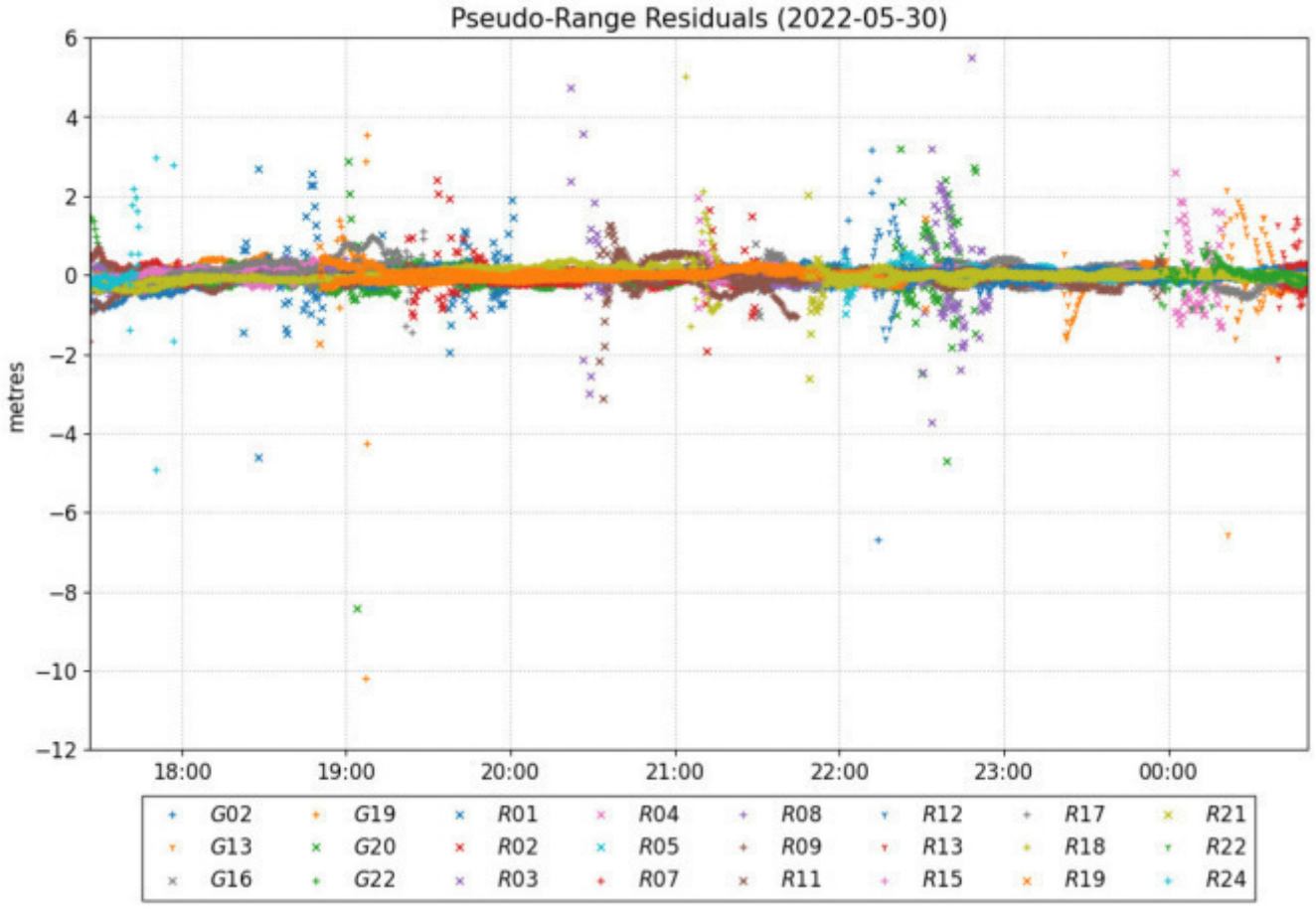

Final solution
Height Differences (2022-05-30)
SIG_PPP
metres
Sigma (metres)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
140
120
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00

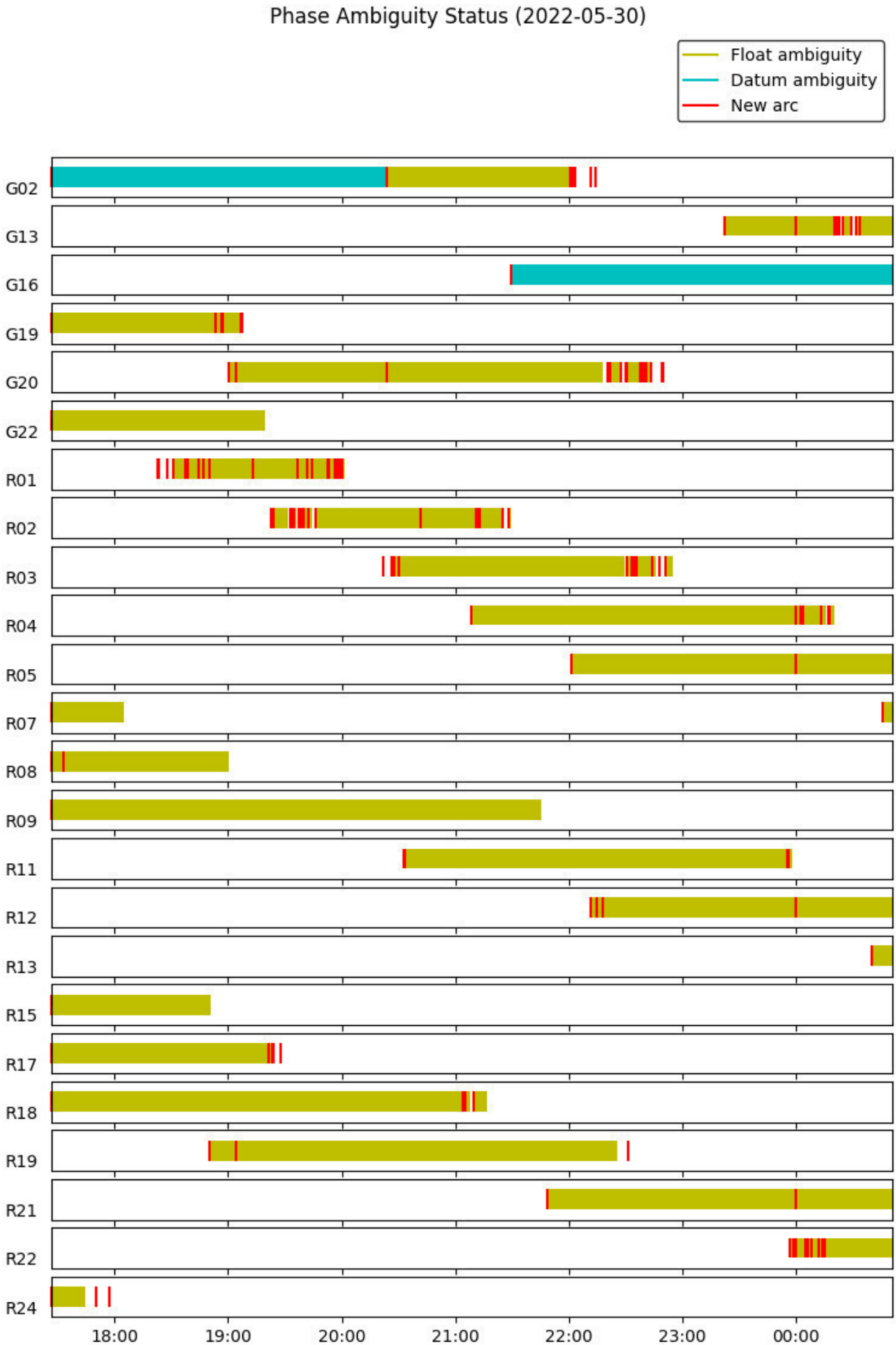

Estimated Tropospheric Zenith Delay (2022-05-30)
Sigma
metres
2.19
2.18
2.17
2.16
2.15
2.14
2.13
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-05-30)
Sigma
nanoseconds
Sigma (nanoseconds)
40
35
30
25
20
15
10
5
8
7
6
5
4
3
2
1
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-05-30)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
3
100
80
60
40
20
0
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-05-30)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R04 R08 R12 R17 R21
G13 G20 R02 R05 R09 R13 R18 R22
G16 G22 R03 R07 R11 R15 R19 R24


Pseudo-Range Residuals (2022-05-30)
metres
6
4
2
0
−2
−4
−6
−8
−10
−12
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G19 R01 R04 R08 R12 R17 R21
G13 G20 R02 R05 R09 R13 R18 R22
G16 G22 R03 R07 R11 R15 R19 R24


Phase Ambiguity Status (2022-05-30)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R15
R17
R18
R19
R21
R22
R24
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220531-GS15Base_decimatedRinex.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-05-31 16:36:30.00	2022-06-01 00:57:00.00	8:20:30
Processing Time		**Product Type**
13:40:46 UTC 2022/06/08		NRCan Rapid
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.380m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220531-GS15Base_decimatedRinex.yyo

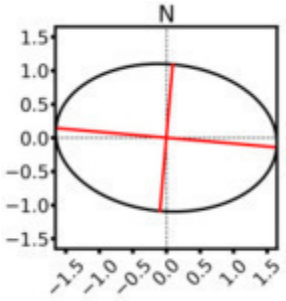
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.4)	60° 9' 10.85664"	-132° 40' 40.86663"	792.900 m
Sigmas(95%)	0.009 m	0.013 m	0.034 m
A priori*	60° 9' 10.80465"	-132° 40' 40.95361"	790.037 m
Estimated – A priori	1.609 m	1.342 m	2.863 m

Orthometric Height
CGVD2013
(CGG2013a)
(2022.4)

789.529 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 1.7 cm
semi-minor: 1.1 cm
semi-major azimuth: -85° 57' 19.22"

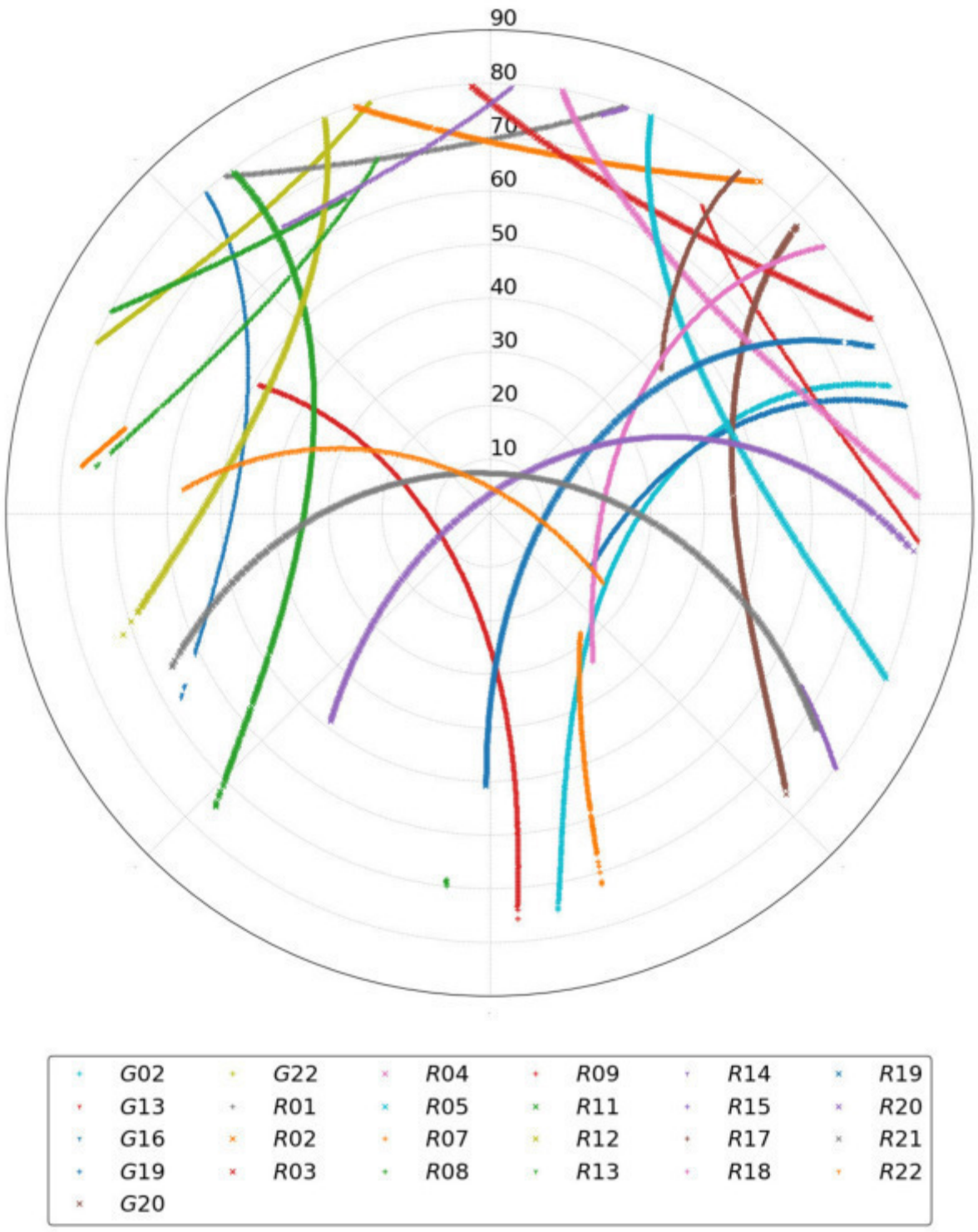


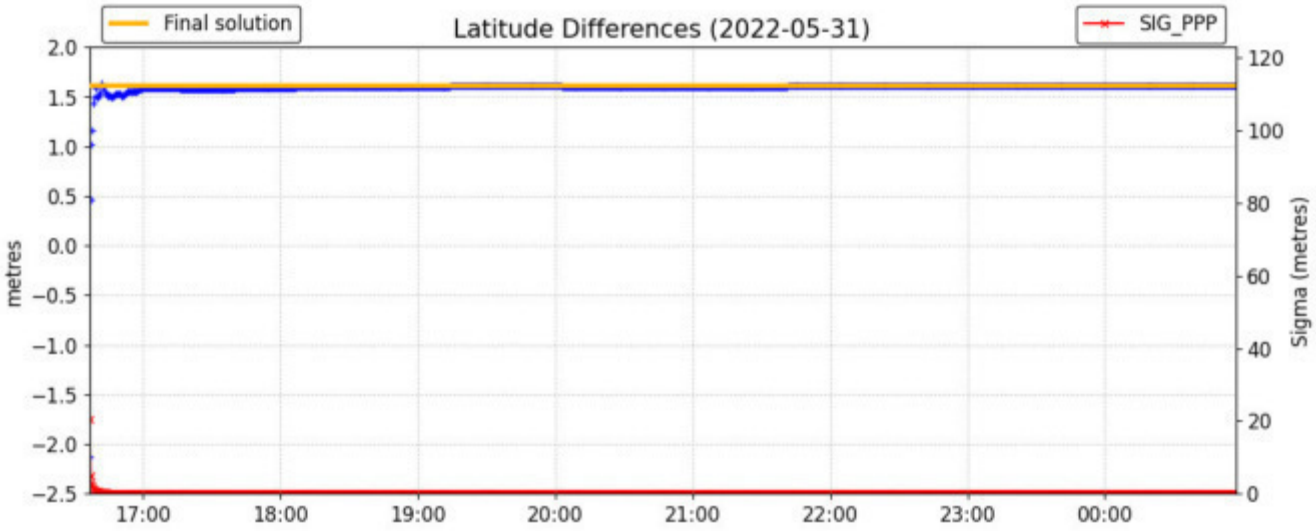
UTM (North)
Zone 8

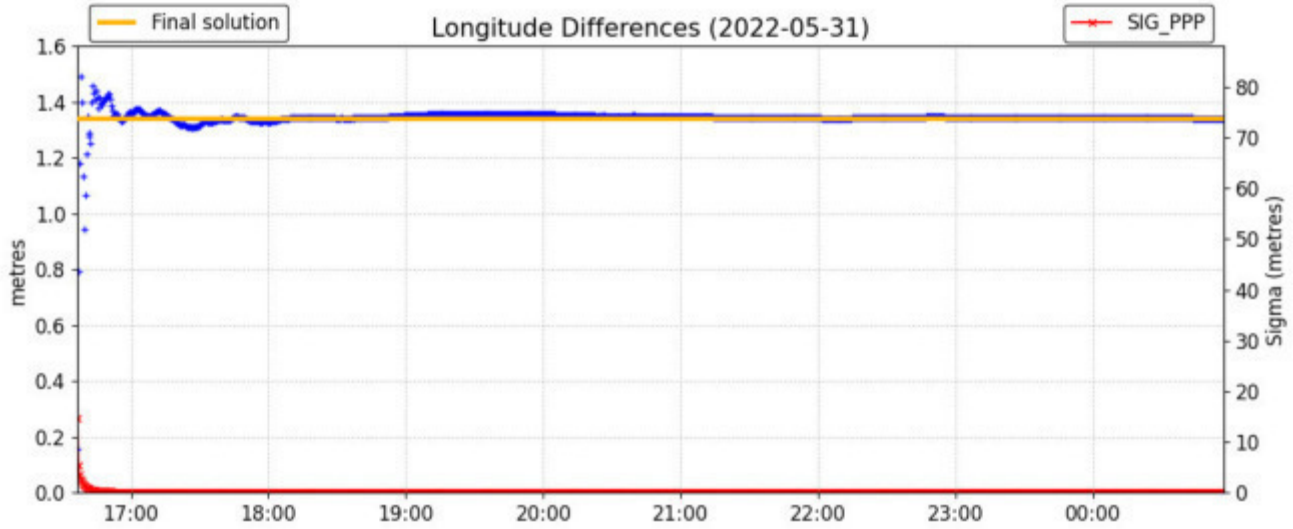
6670718.303 m (N)
628898.393 m (E)

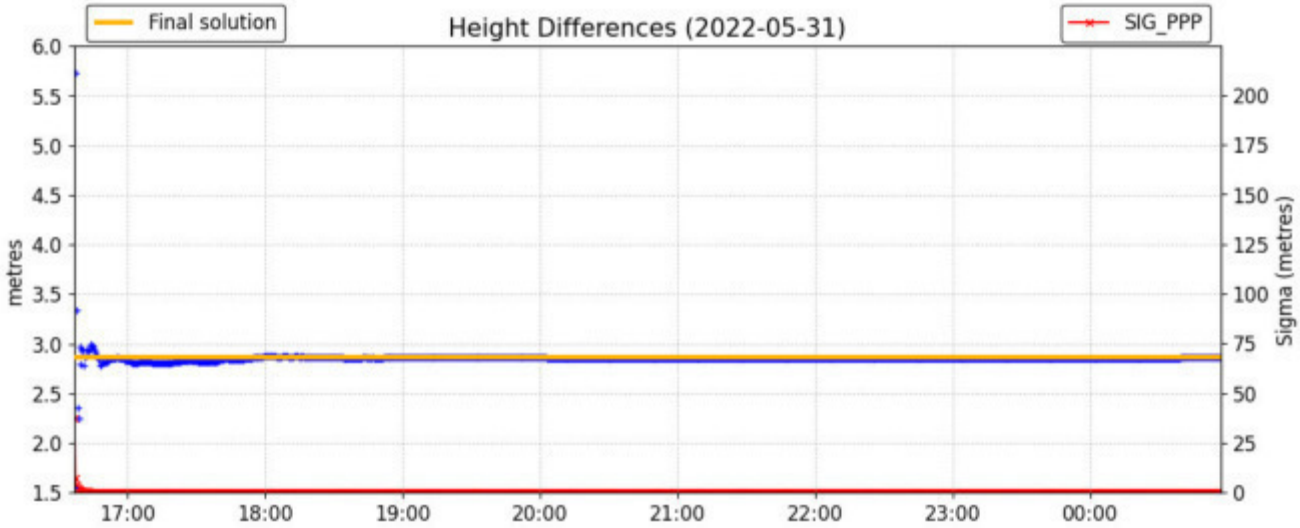
Scale Factors
0.99980361 (point)
0.99967954 (combined)

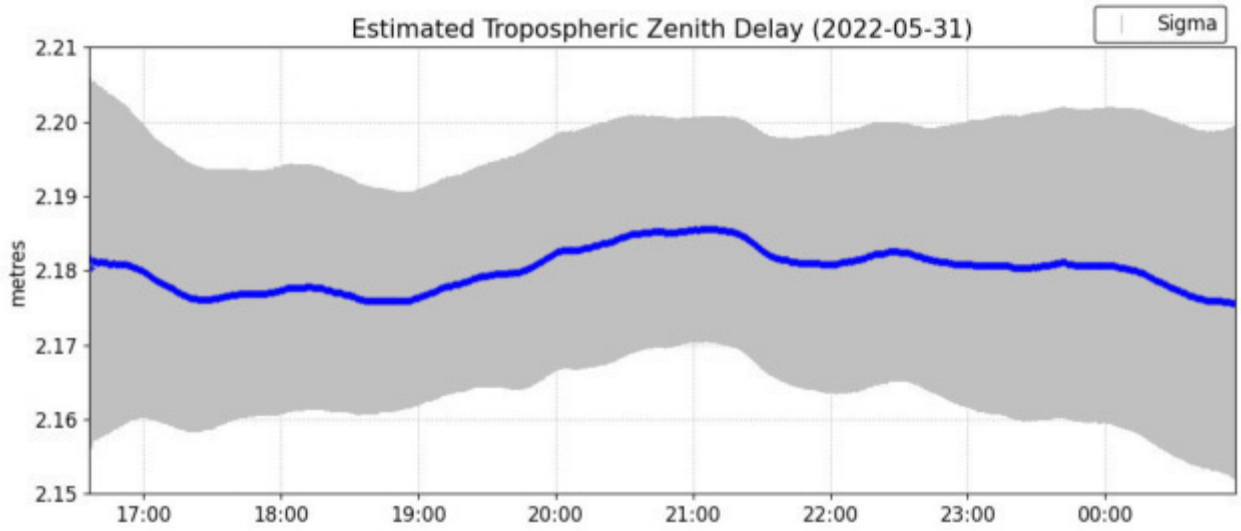
*(Coordinates from RINEX header used as a priori position)

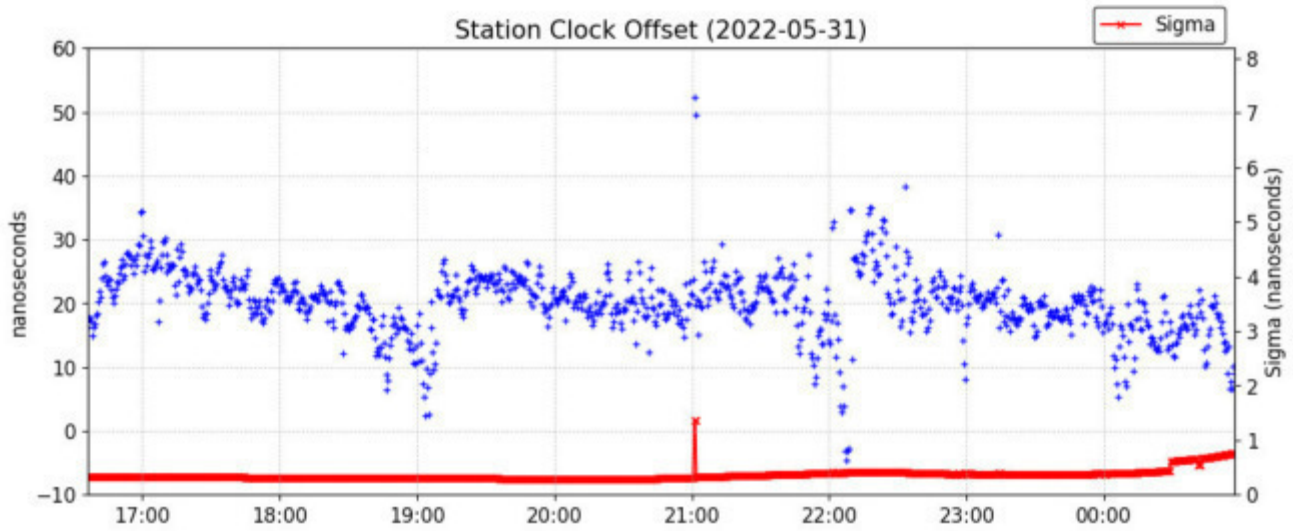

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22

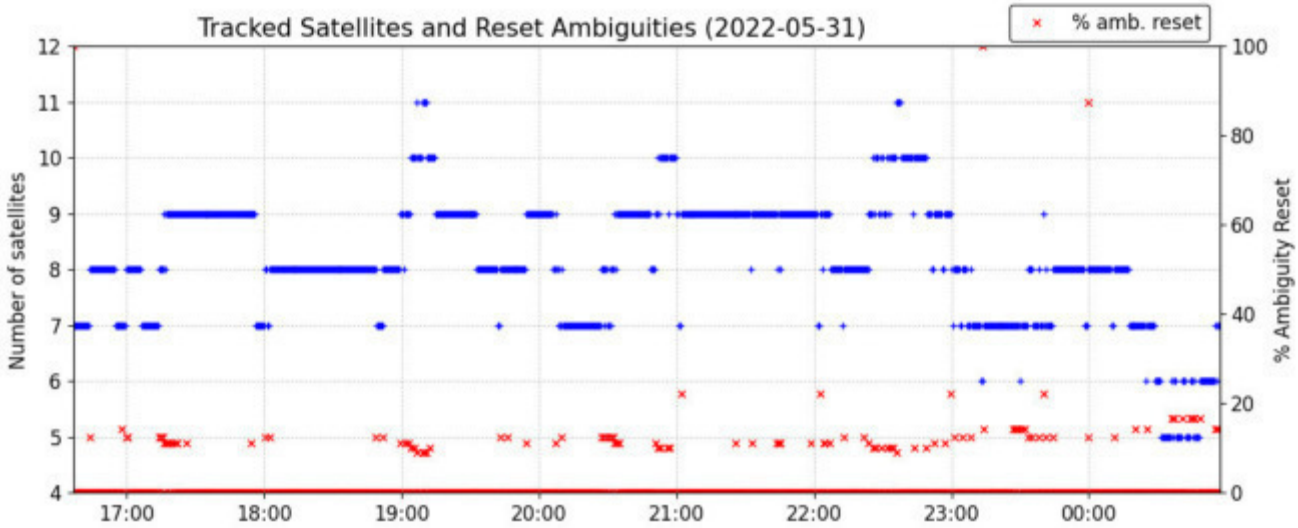

Final solution
Latitude Differences (2022-05-31)
SIG_PPP
metres
Sigma (metres)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
120
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

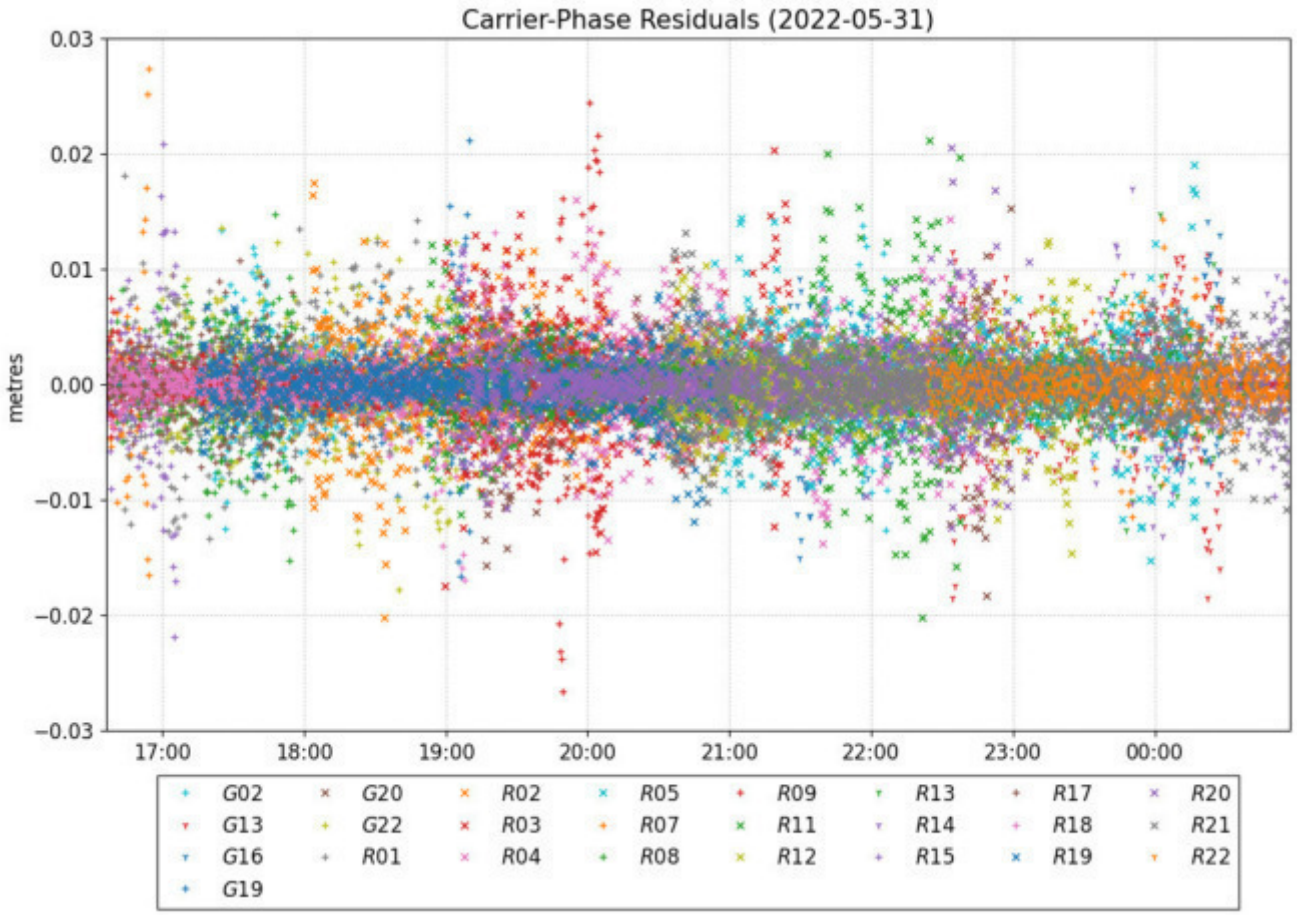

Final solution
Longitude Differences (2022-05-31)
SIG_PPP
metres
Sigma (metres)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
80
70
60
50
40
30
20
10
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

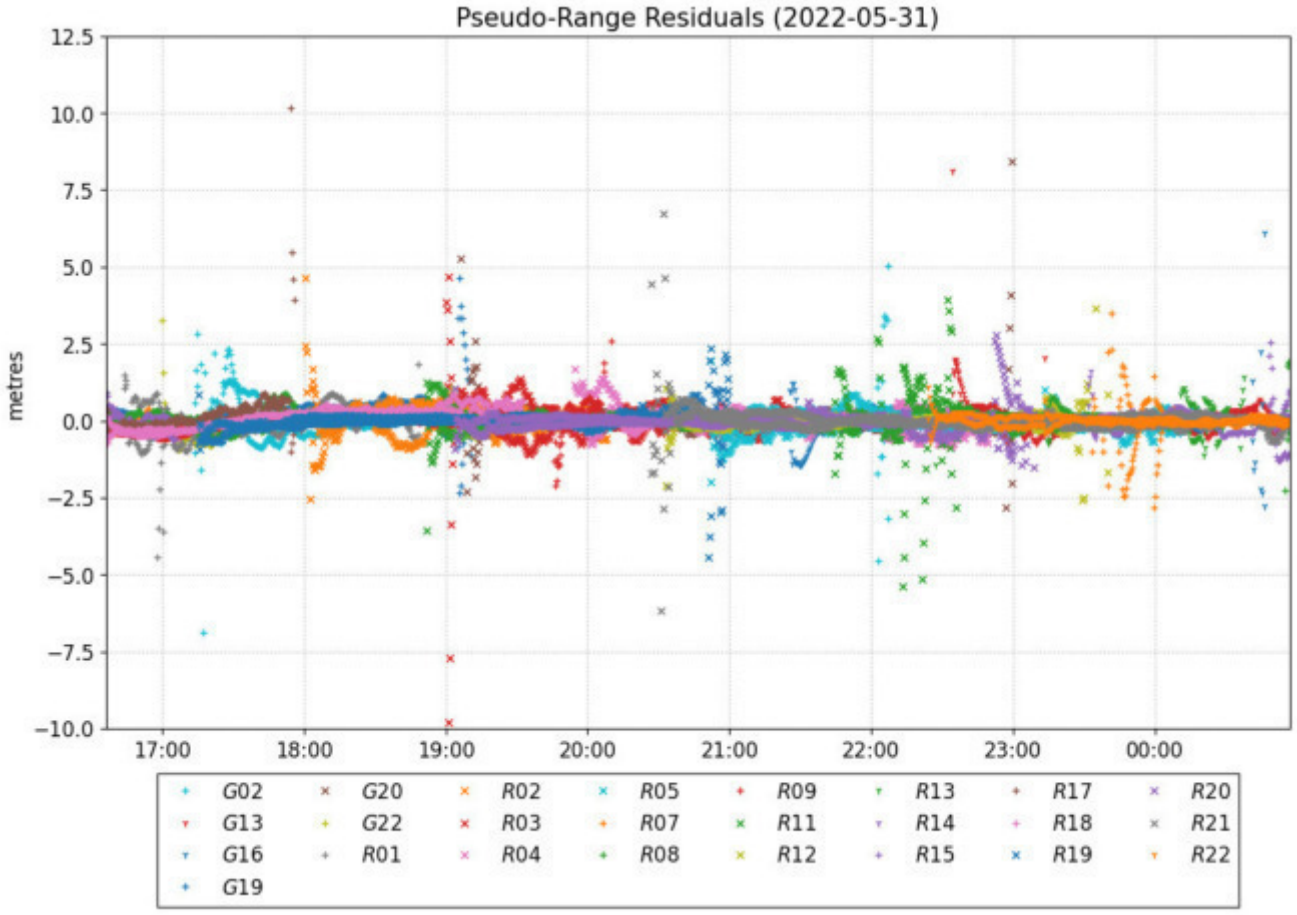

Final solution
Height Differences (2022-05-31)
SIG_PPP
metres
Sigma (metres)
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
200
175
150
125
100
75
50
25
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

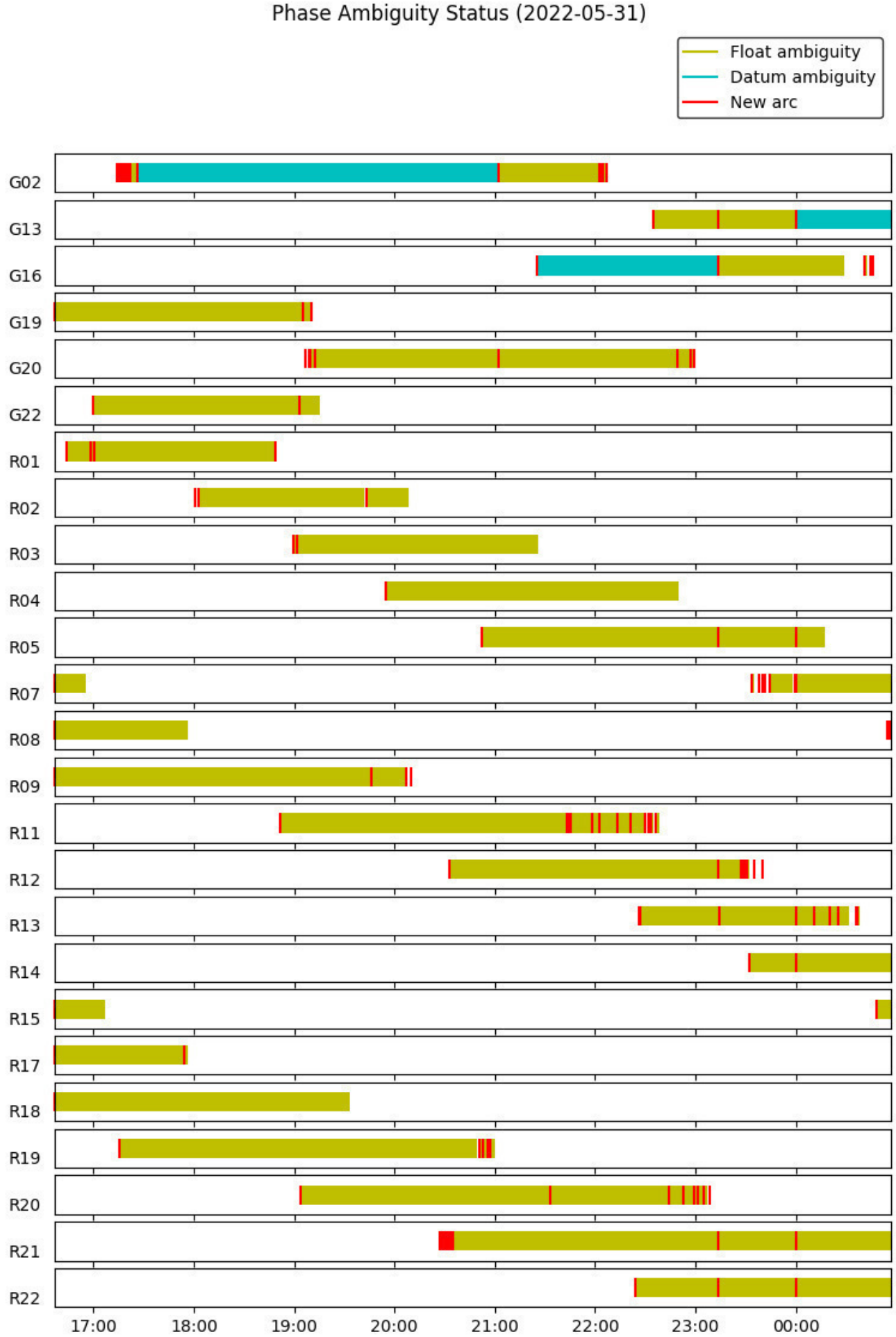

Estimated Tropospheric Zenith Delay (2022-05-31)
Sigma
metres
2.21
2.20
2.19
2.18
2.17
2.16
2.15
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Station Clock Offset (2022-05-31)
Sigma
nanoseconds
Sigma (nanoseconds)
60
50
40
30
20
10
0
−10
8
7
6
5
4
3
2
1
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Tracked Satellites and Reset Ambiguities (2022-05-31)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Carrier-Phase Residuals (2022-05-31)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G22 R03 R07 R11 R14 R18 R21
G16 R01 R04 R08 R12 R15 R19 R22
G19


Pseudo-Range Residuals (2022-05-31)
metres
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G22 R03 R07 R11 R14 R18 R21
G16 R01 R04 R08 R12 R15 R19 R22
G19


Phase Ambiguity Status (2022-05-31)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R22
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220725-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-07-25 16:13:30.00	2022-07-25 22:02:00.00	5:48:30
Processing Time		**Product Type**
23:07:51 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.29 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.223m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220725-GS15base.yyo

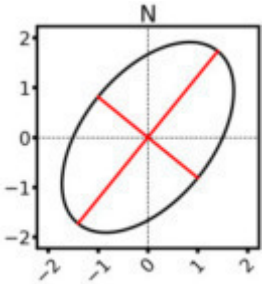
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32457"	-132° 43' 53.97721"	712.196 m
Sigmas(95%)	0.015 m	0.014 m	0.031 m
A priori*	60° 10' 26.29747"	-132° 43' 54.06467"	714.660 m
Estimated – A priori	0.839 m	1.349 m	-2.464 m

Orthometric Height CGVD28 (HTv2.0)†

708.420 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 2.2 cm
semi-minor: 1.3 cm
semi-major azimuth: 39° 2' 16.91"



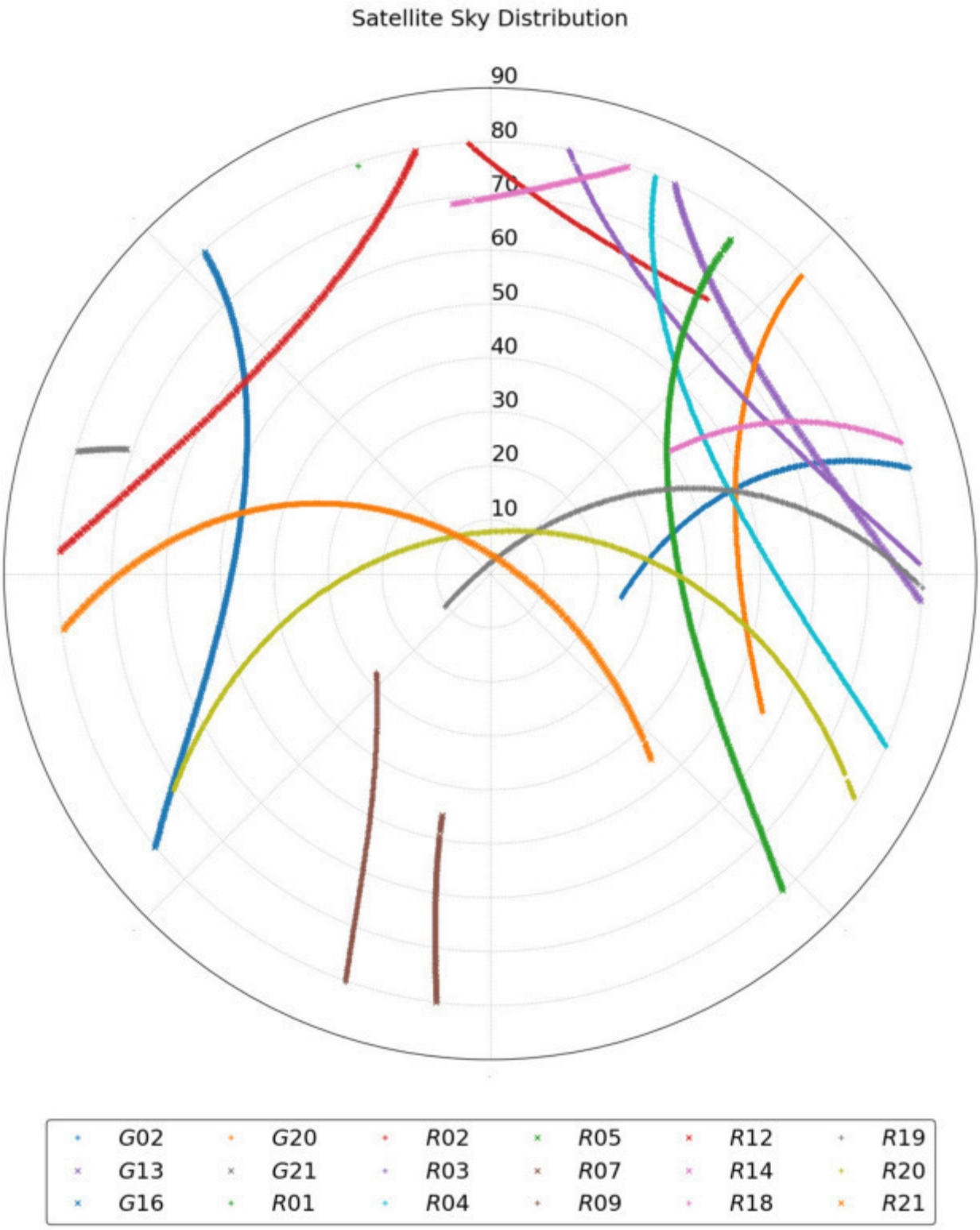
UTM (North) Zone 8

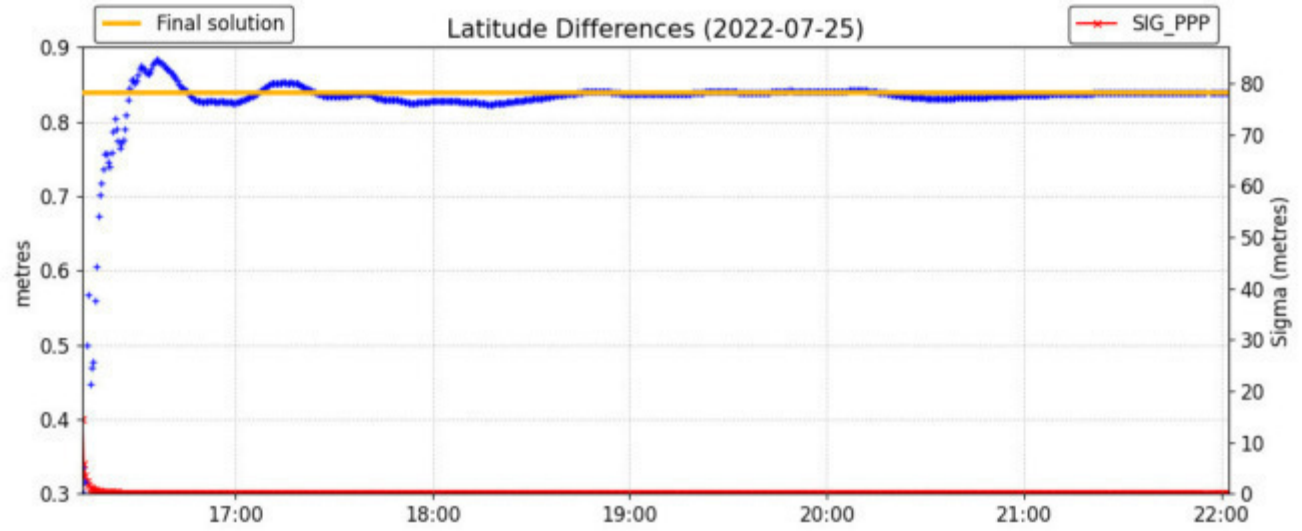
6672948.585 m (N)
625841.221 m (E)

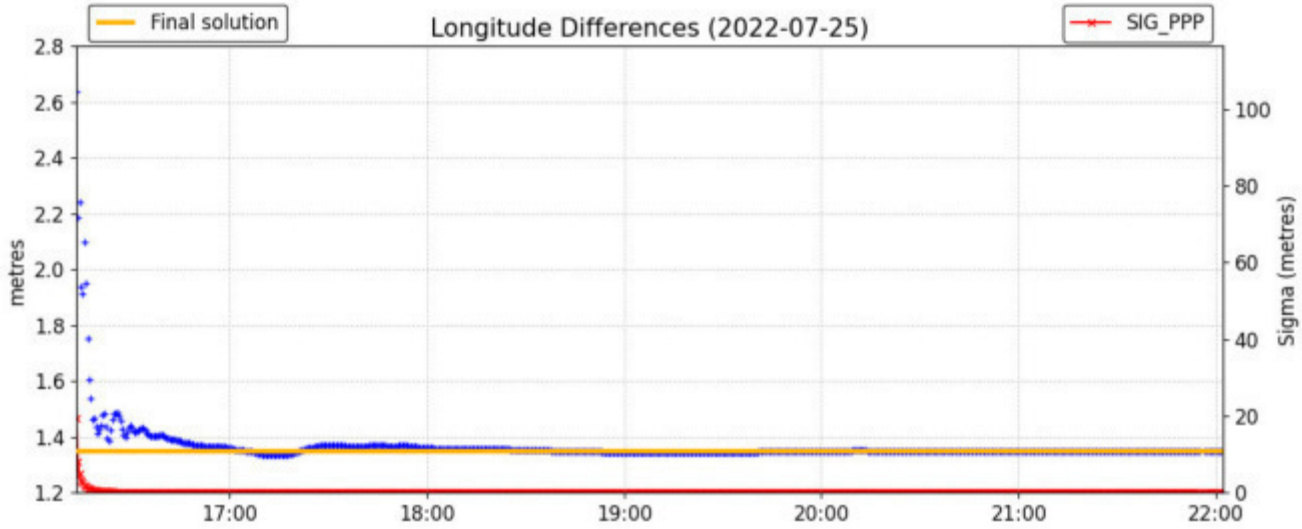
Scale Factors
0.99979406 (point)
0.99968263 (combined)

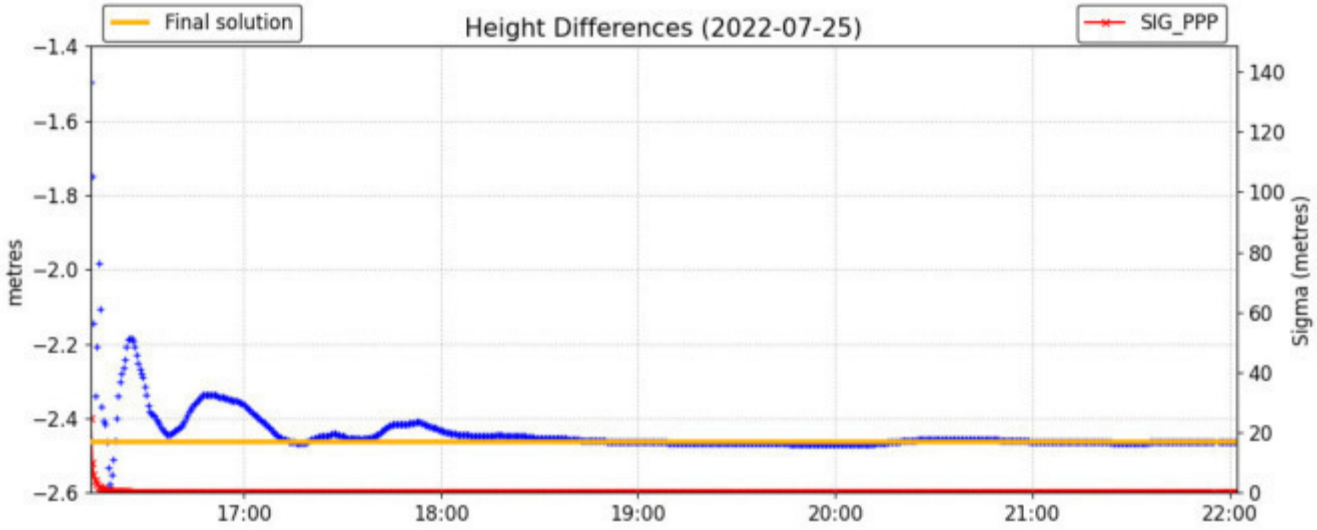
*(Coordinates from RINEX header used as a priori position)

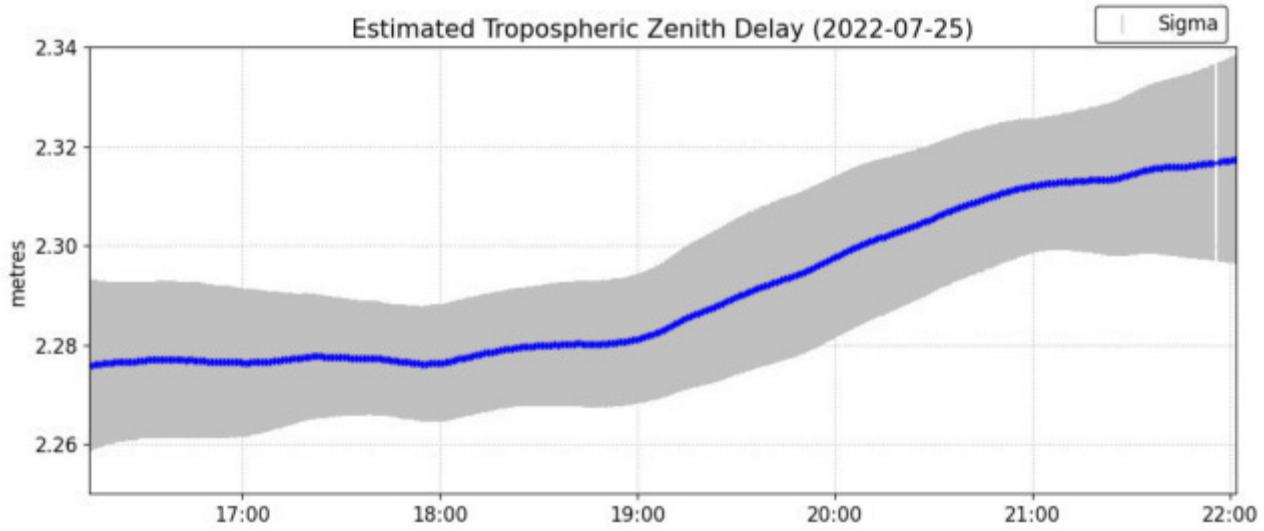
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

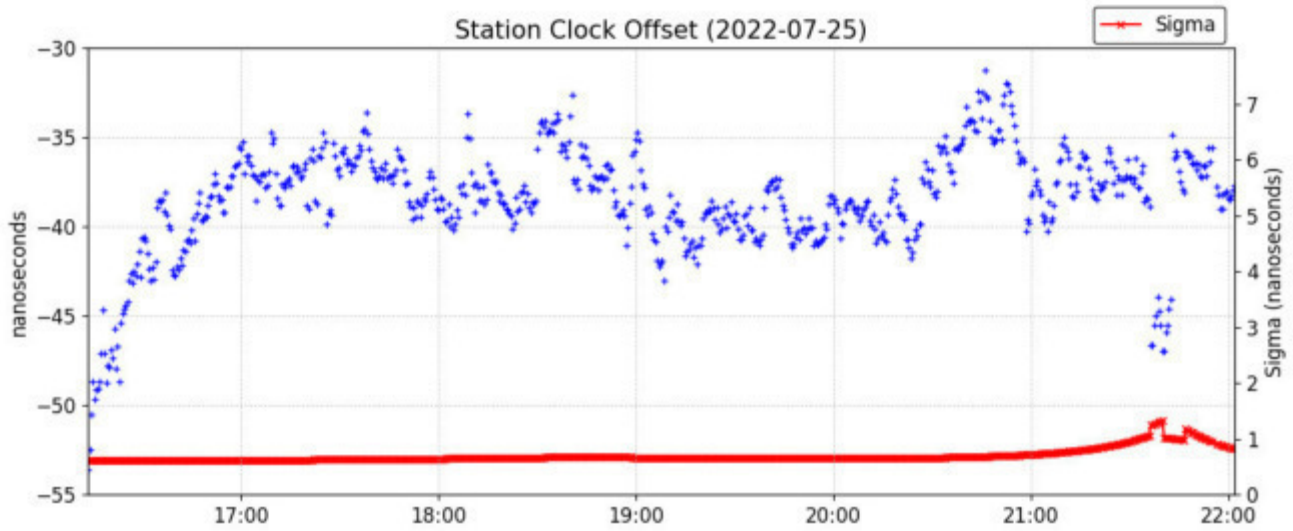

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G20
R02
R05
R12
R19
G13
G21
R03
R07
R14
R20
G16
R01
R04
R09
R18
R21

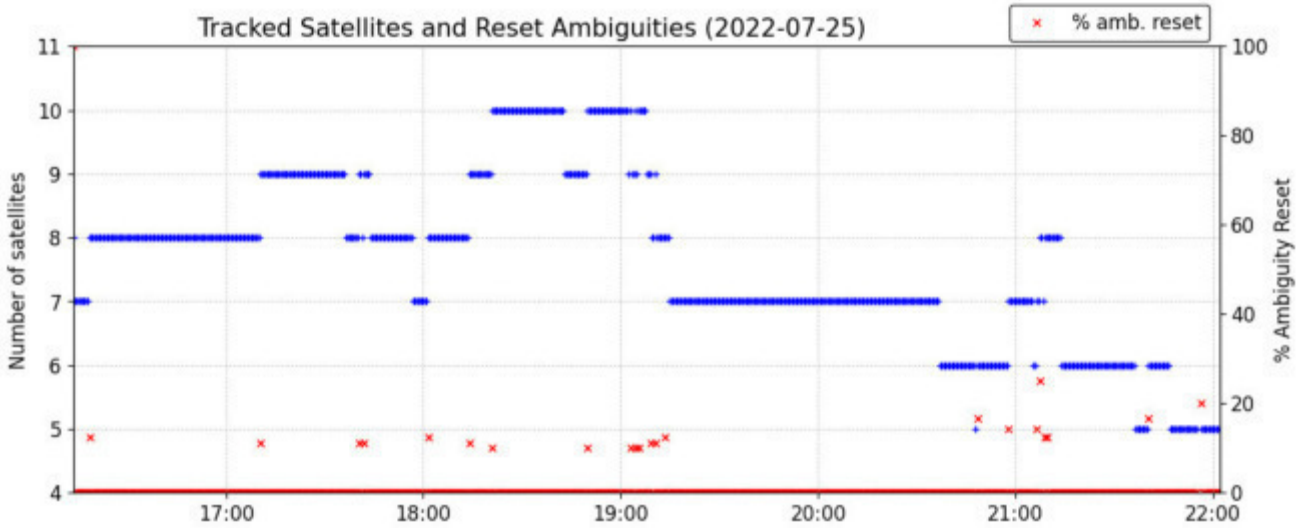

Final solution
Latitude Differences (2022-07-25)
SIG_PPP
metres
Sigma (metres)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
80
70
60
50
40
30
20
10
0
17:00
18:00
19:00
20:00
21:00
22:00

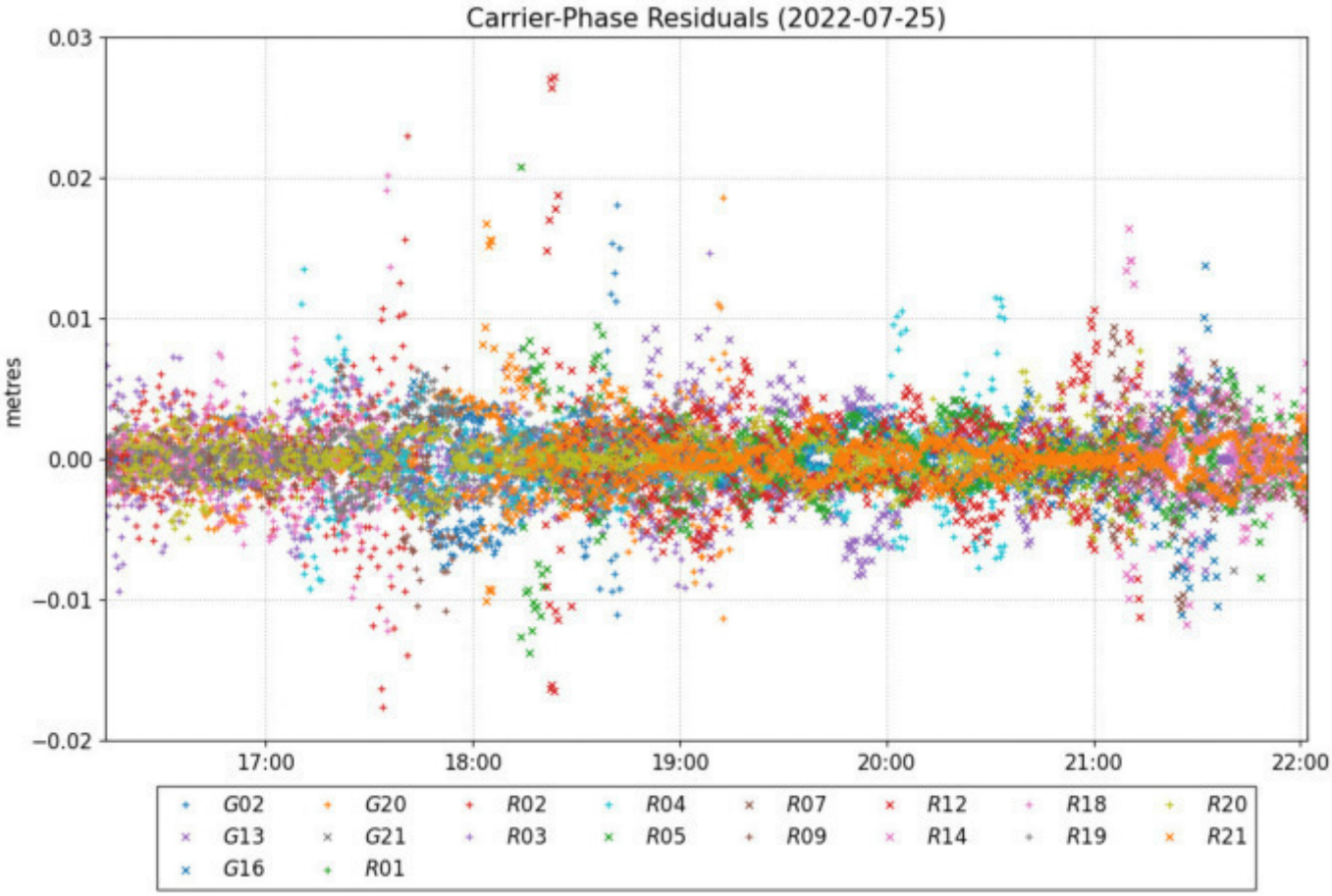

Final solution
Longitude Differences (2022-07-25)
SIG_PPP
metres
Sigma (metres)
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00

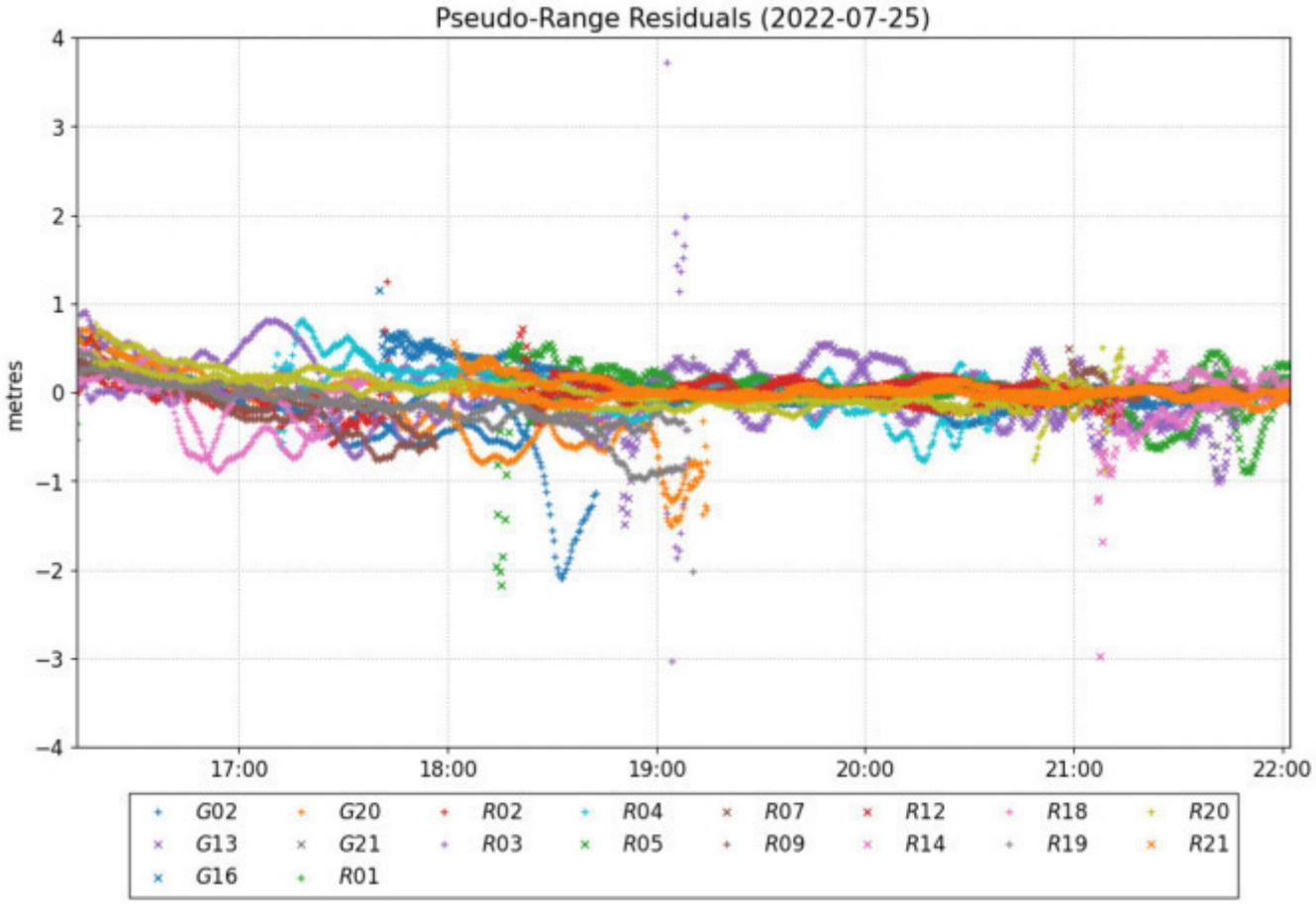

Final solution
Height Differences (2022-07-25)
SIG_PPP
metres
Sigma (metres)
−1.4
−1.6
−1.8
−2.0
−2.2
−2.4
−2.6
140
120
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00

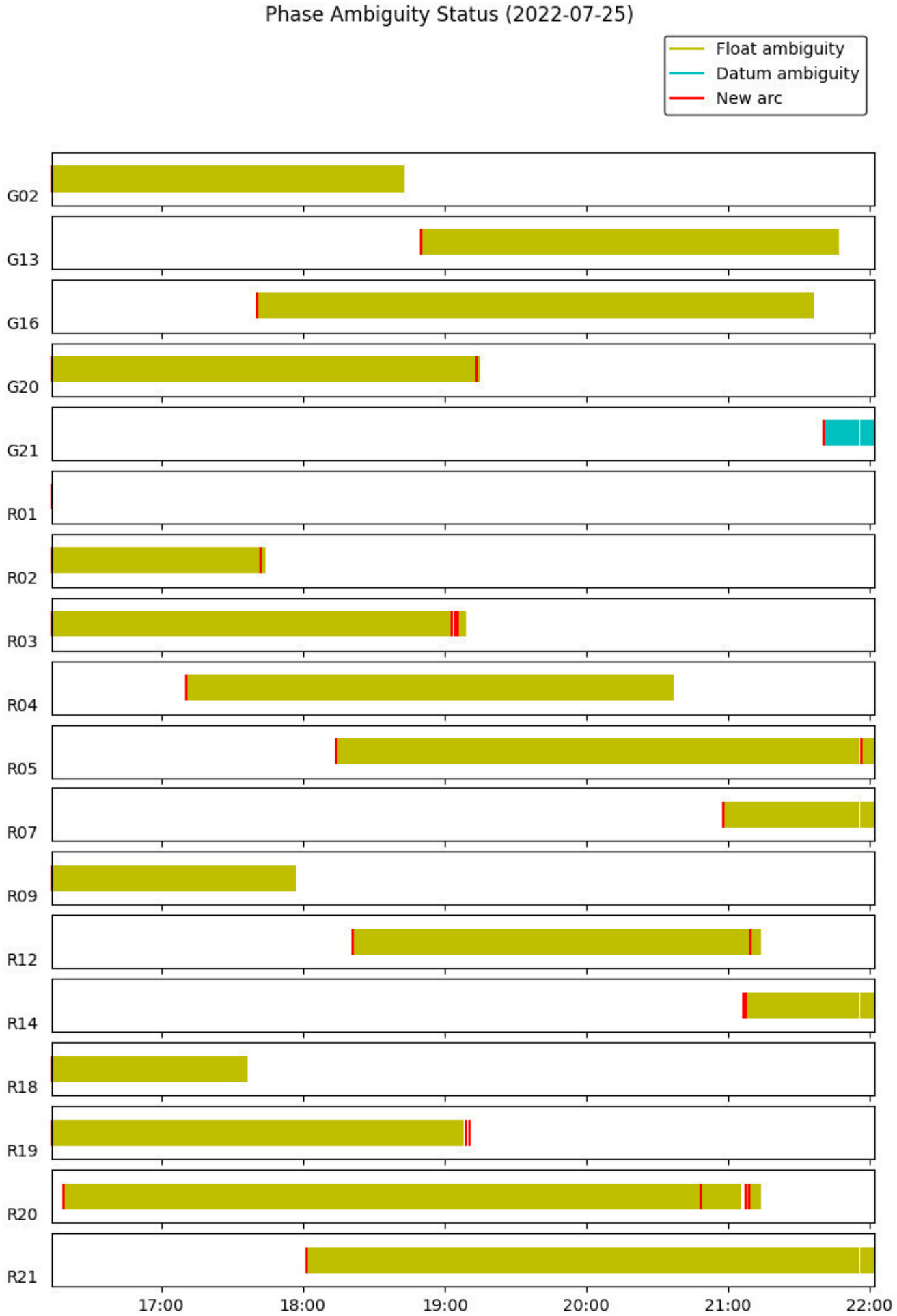

Estimated Tropospheric Zenith Delay (2022-07-25)
Sigma
metres
2.34
2.32
2.30
2.28
2.26
17:00
18:00
19:00
20:00
21:00
22:00


Station Clock Offset (2022-07-25)
Sigma
nanoseconds
Sigma (nanoseconds)
−30
−35
−40
−45
−50
−55
0
1
2
3
4
5
6
7
17:00
18:00
19:00
20:00
21:00
22:00


Tracked Satellites and Reset Ambiguities (2022-07-25)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00


Carrier-Phase Residuals (2022-07-25)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
17:00
18:00
19:00
20:00
21:00
22:00
G02 G20 R02 R04 R07 R12 R18 R20
G13 G21 R03 R05 R09 R14 R19 R21
G16 R01


Pseudo-Range Residuals (2022-07-25)
metres
4
3
2
1
0
−1
−2
−3
−4
17:00
18:00
19:00
20:00
21:00
22:00
G02 G20 R02 R04 R07 R12 R18 R20
G13 G21 R03 R05 R09 R14 R19 R21
G16 R01


Phase Ambiguity Status (2022-07-25)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G20
G21
R01
R02
R03
R04
R05
R07
R09
R12
R14
R18
R19
R20
R21
17:00
18:00
19:00
20:00
21:00
22:00

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220728-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-07-28 15:51:00.00	2022-07-29 03:11:30.00	11:20:30
Processing Time		**Product Type**
16:33:34 UTC 2022/10/08		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.223m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220728-GS15base.yyo

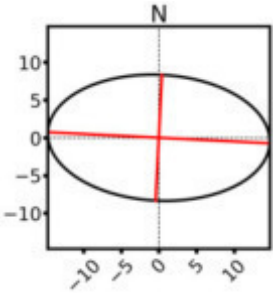
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32453"	-132° 43' 53.97693"	712.188 m
Sigmas(95%)	0.007 m	0.012 m	0.021 m
A priori*	60° 10' 26.31540"	-132° 43' 54.08934"	713.530 m
Estimated – A priori	0.283 m	1.733 m	-1.342 m

Orthometric Height CGVD28 (HTv2.0)†

708.412 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 15 mm
semi-minor: 8 mm
semi-major azimuth: -87° 51' 7.11"



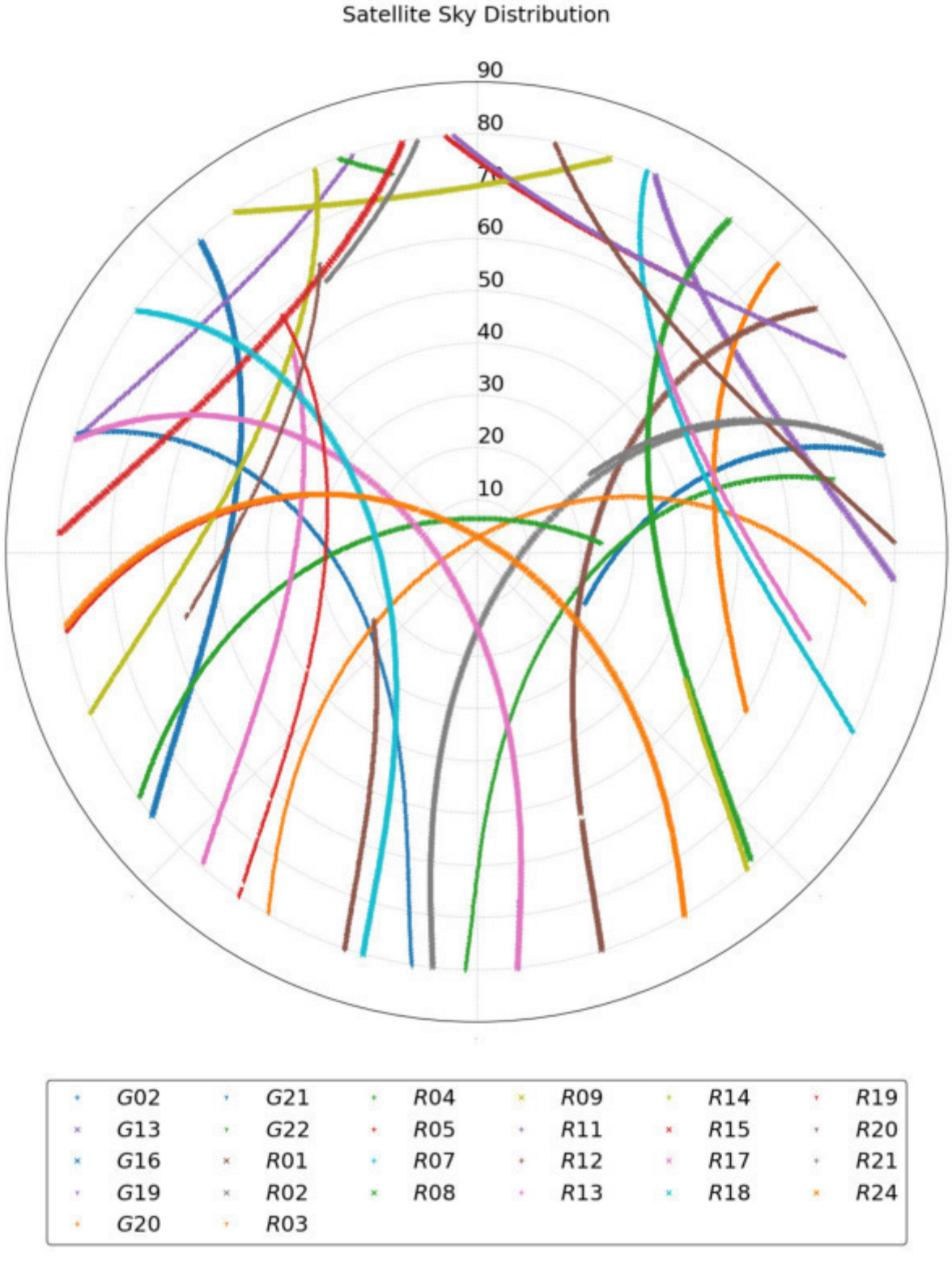
UTM (North) Zone 8

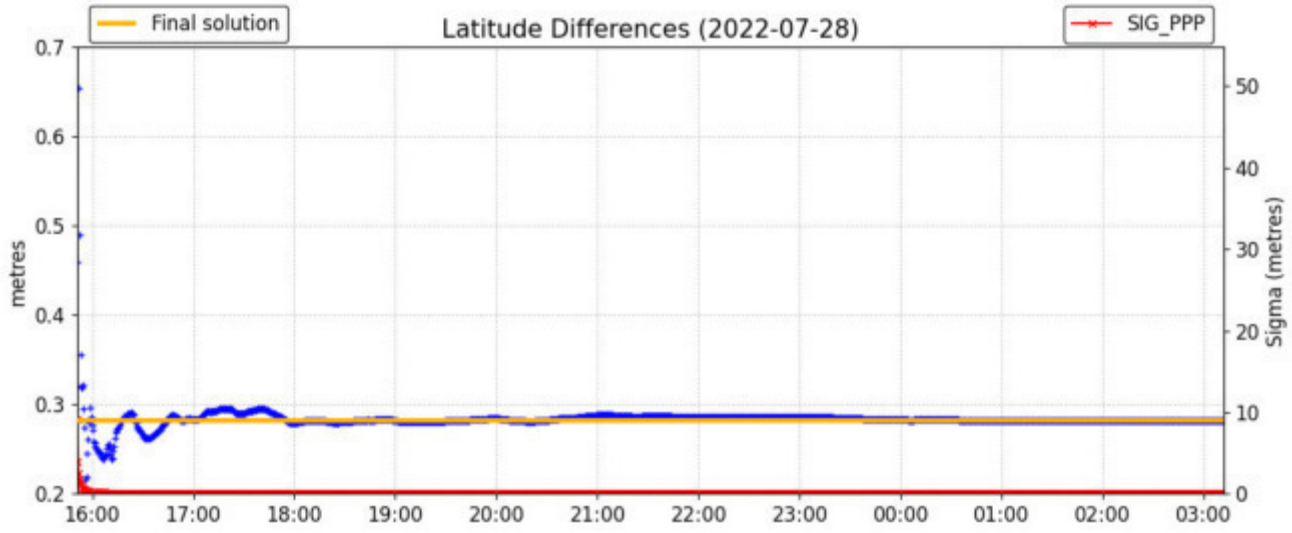
6672948.584 m (N)
625841.225 m (E)

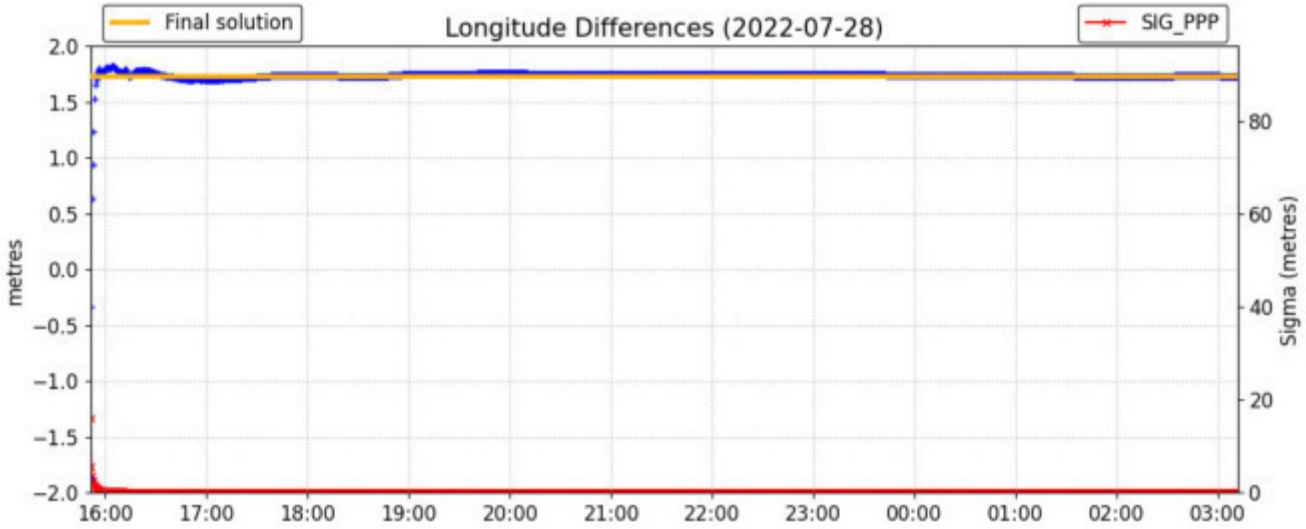
Scale Factors
0.99979406 (point)
0.99968263 (combined)

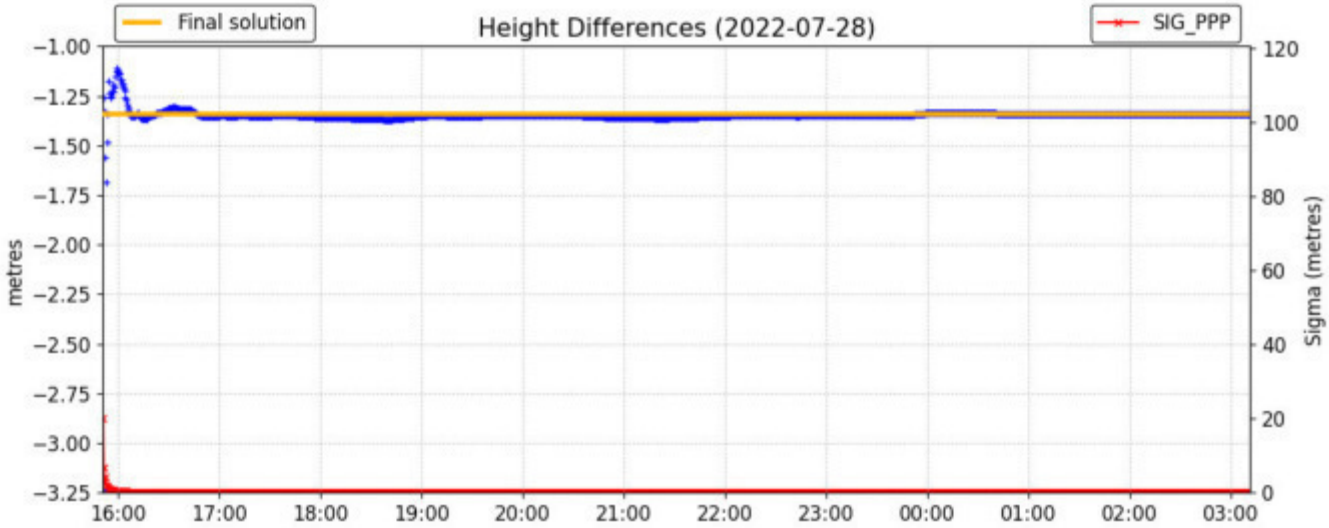
*(Coordinates from RINEX header used as a priori position)

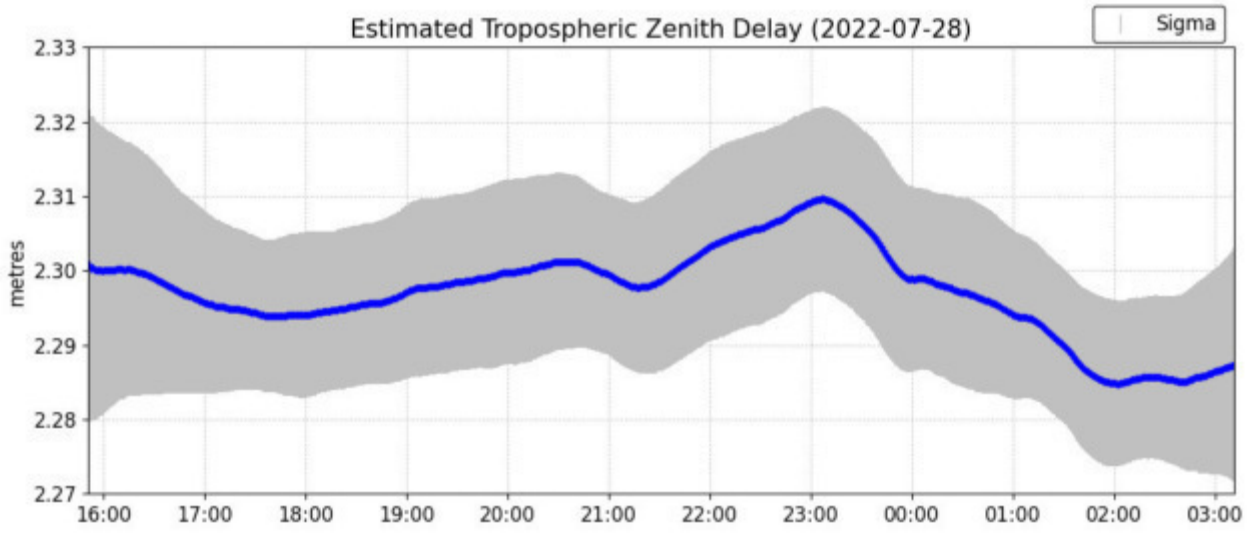
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

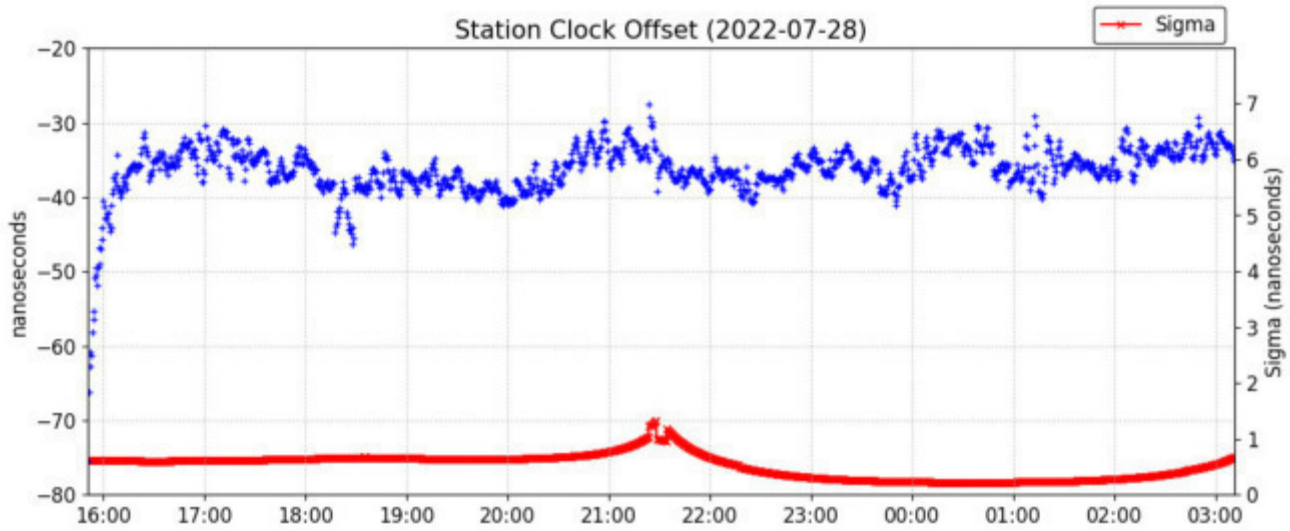

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24

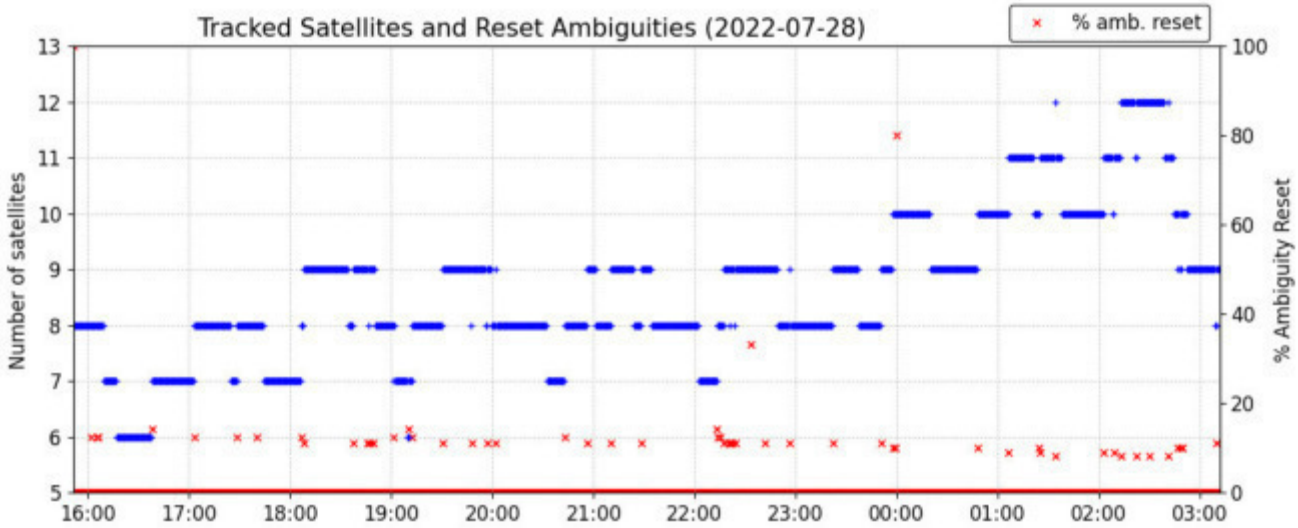

Final solution
Latitude Differences (2022-07-28)
SIG_PPP
metres
Sigma (metres)
0.7
0.6
0.5
0.4
0.3
0.2
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00

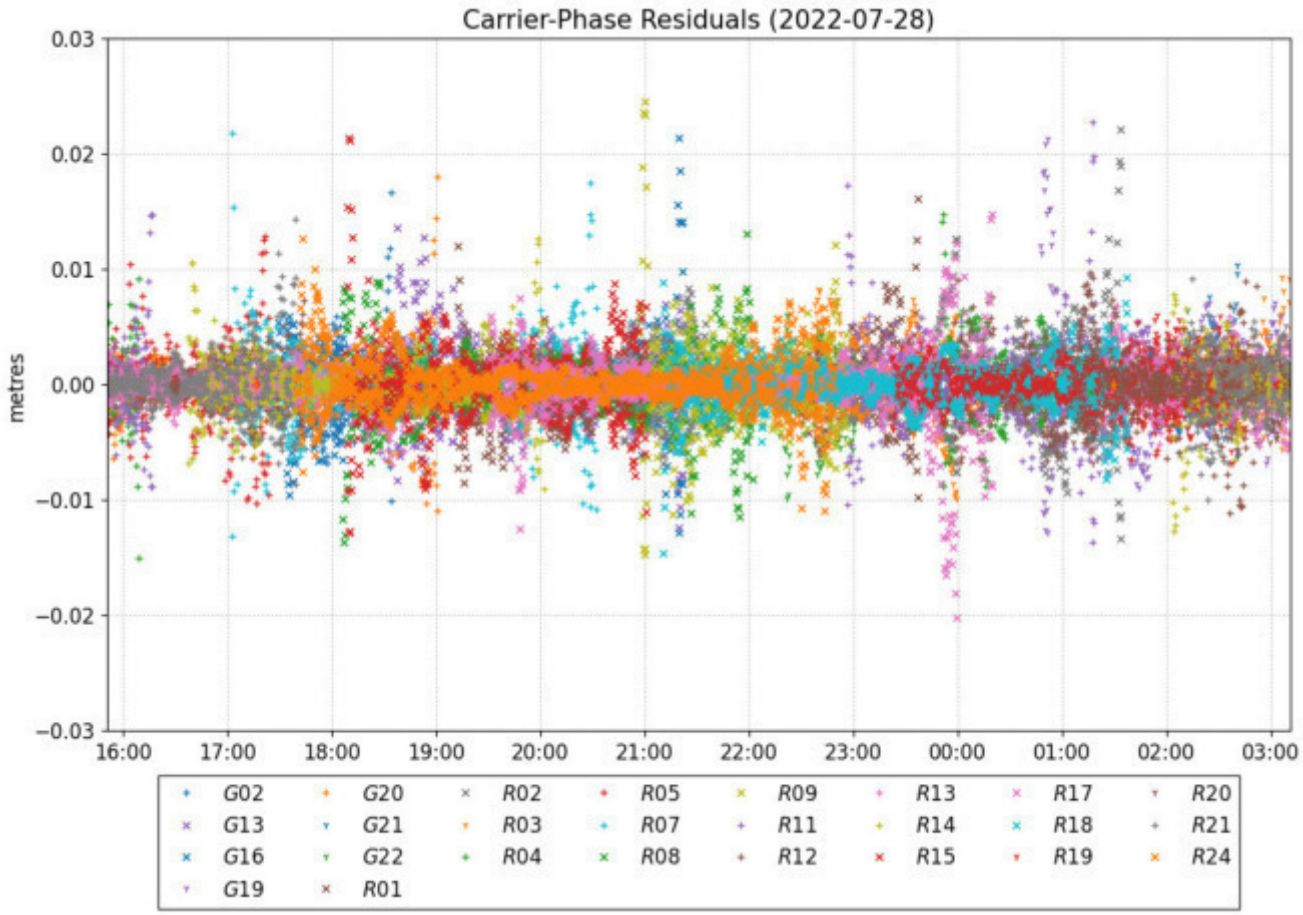

Final solution
Longitude Differences (2022-07-28)
SIG_PPP
metres
Sigma (metres)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00

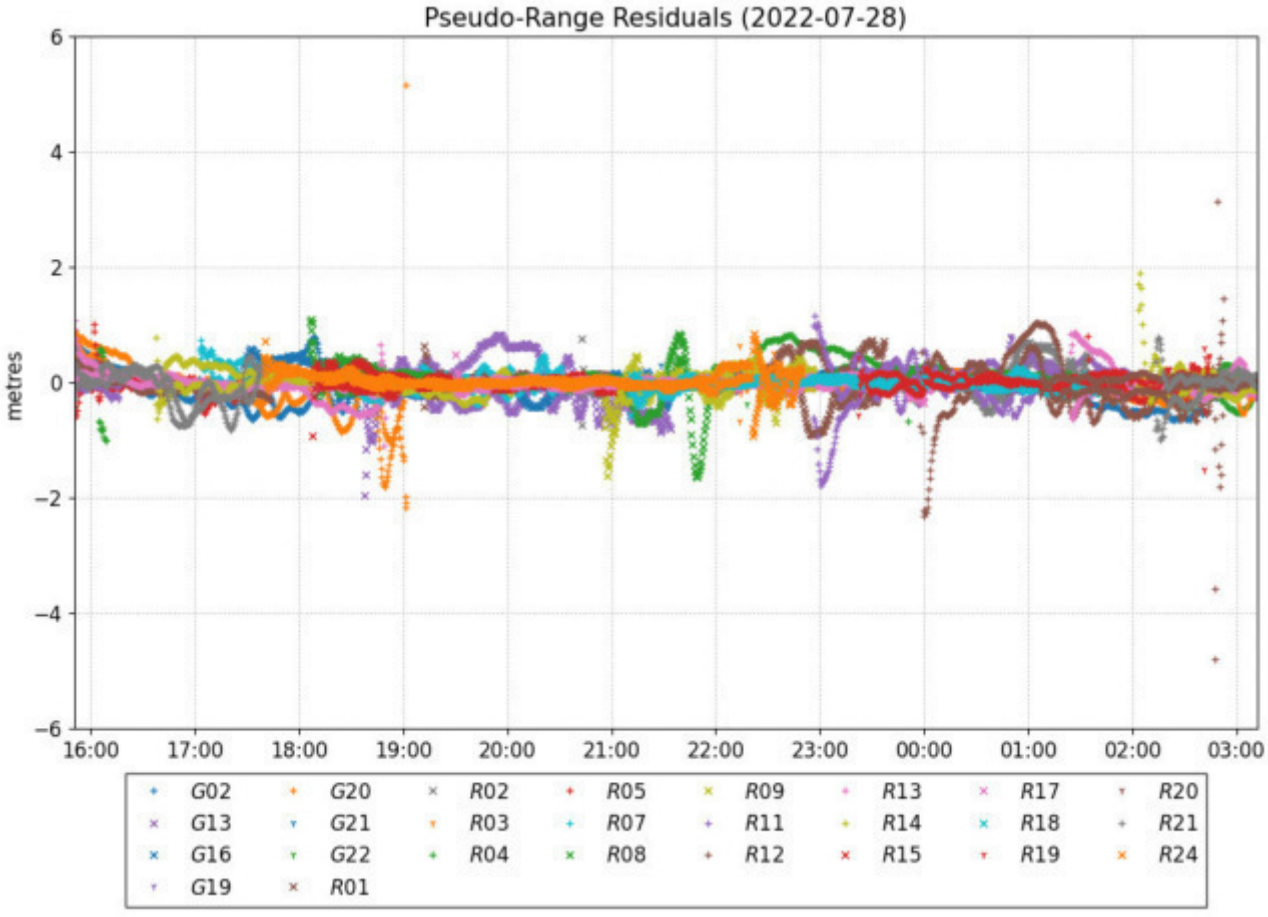

Final solution
Height Differences (2022-07-28)
SIG_PPP
metres
Sigma (metres)
−1.00
−1.25
−1.50
−1.75
−2.00
−2.25
−2.50
−2.75
−3.00
−3.25
120
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00

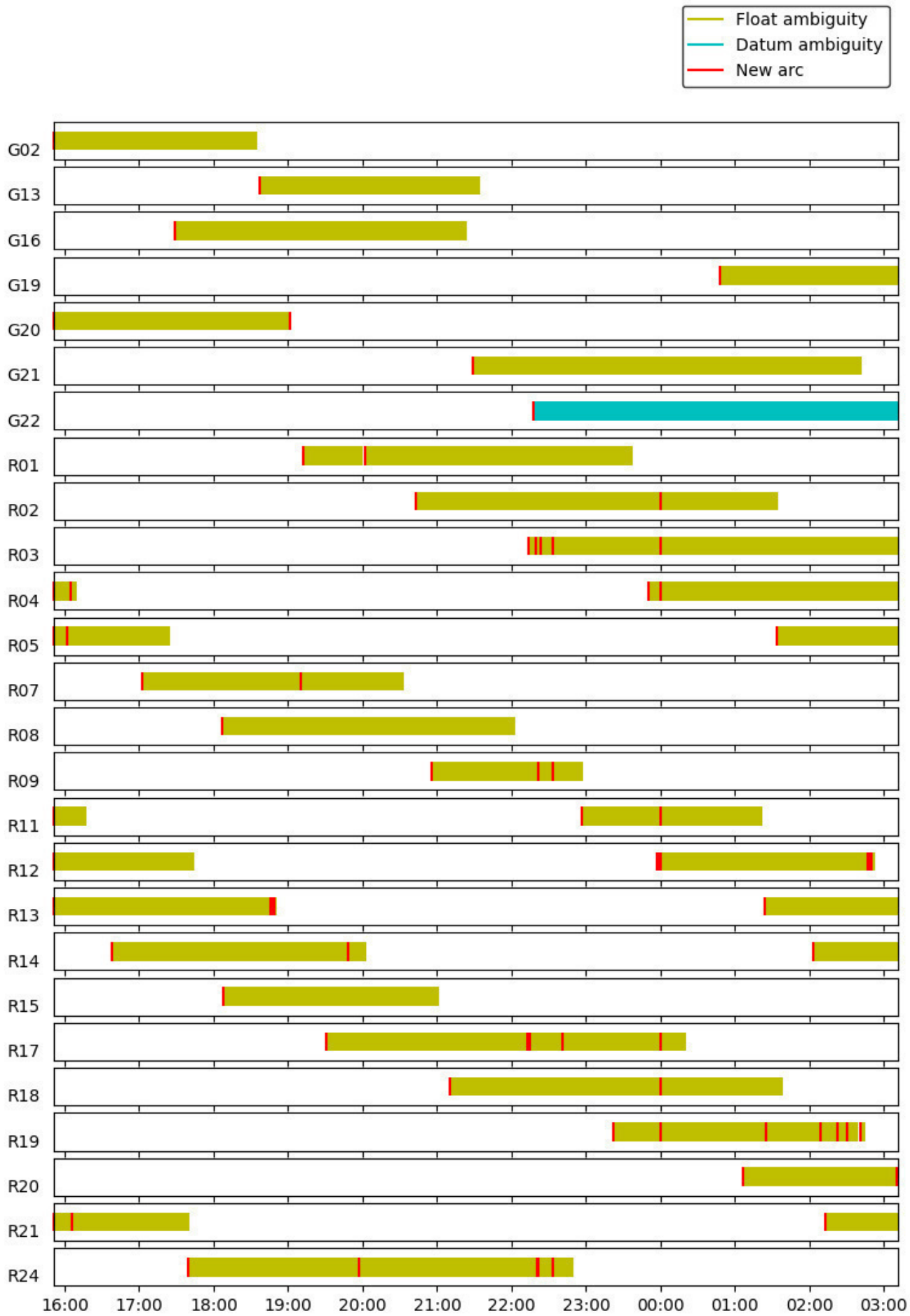

Estimated Tropospheric Zenith Delay (2022-07-28)
Sigma
metres
2.33
2.32
2.31
2.30
2.29
2.28
2.27
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00


Station Clock Offset (2022-07-28)
Sigma
nanoseconds
Sigma (nanoseconds)
−20
−30
−40
−50
−60
−70
−80
7
6
5
4
3
2
1
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00


Tracked Satellites and Reset Ambiguities (2022-07-28)
% amb. reset
Number of satellites
% Ambiguity Reset
13
12
11
10
9
8
7
6
5
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00


Carrier-Phase Residuals (2022-07-28)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Pseudo-Range Residuals (2022-07-28)
metres
6
4
2
0
−2
−4
−6
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Phase Ambiguity Status (2022-07-28)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220728-GS15base_test.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-07-29 15:39:00.00	2022-07-30 02:38:00.00	10:59:00
Processing Time		**Product Type**
22:40:00 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.223m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220728-GS15base_test.yyo

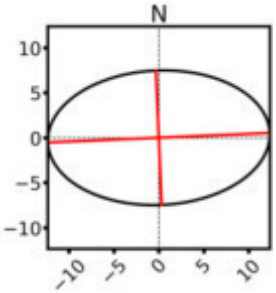
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32470"	-132° 43' 53.97692"	712.183 m
Sigmas(95%)	0.006 m	0.010 m	0.020 m
A priori*	60° 10' 26.32317"	-132° 43' 54.11091"	712.673 m
Estimated – A priori	0.047 m	2.066 m	-0.489 m

Orthometric Height CGVD28 (HTv2.0)†

708.408 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 12 mm
semi-minor: 7 mm
semi-major azimuth: 87° 32' 49.92"



UTM (North) Zone 8

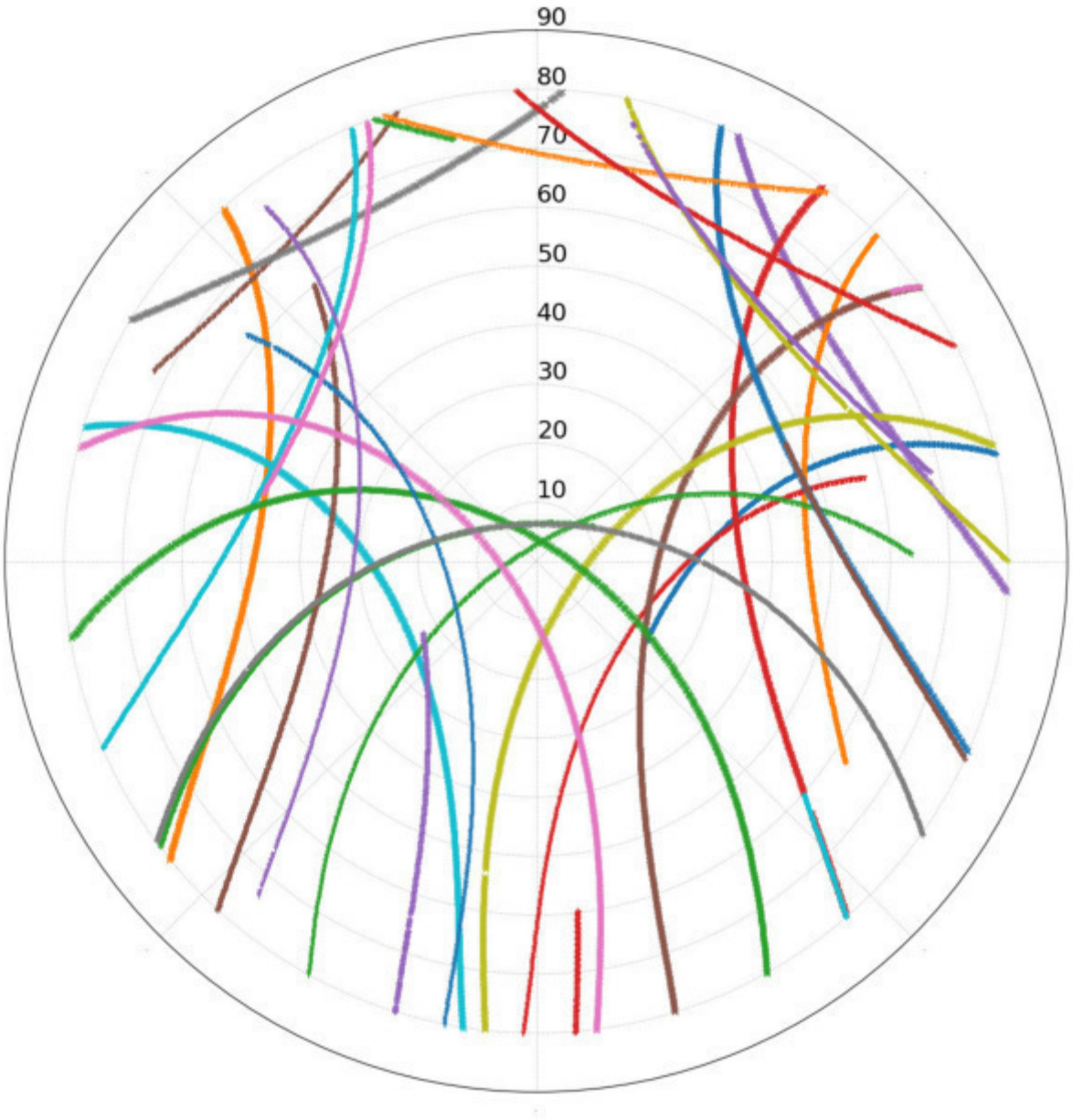
6672948.589 m (N)
625841.225 m (E)

Scale Factors
0.99979406 (point)
0.99968263 (combined)

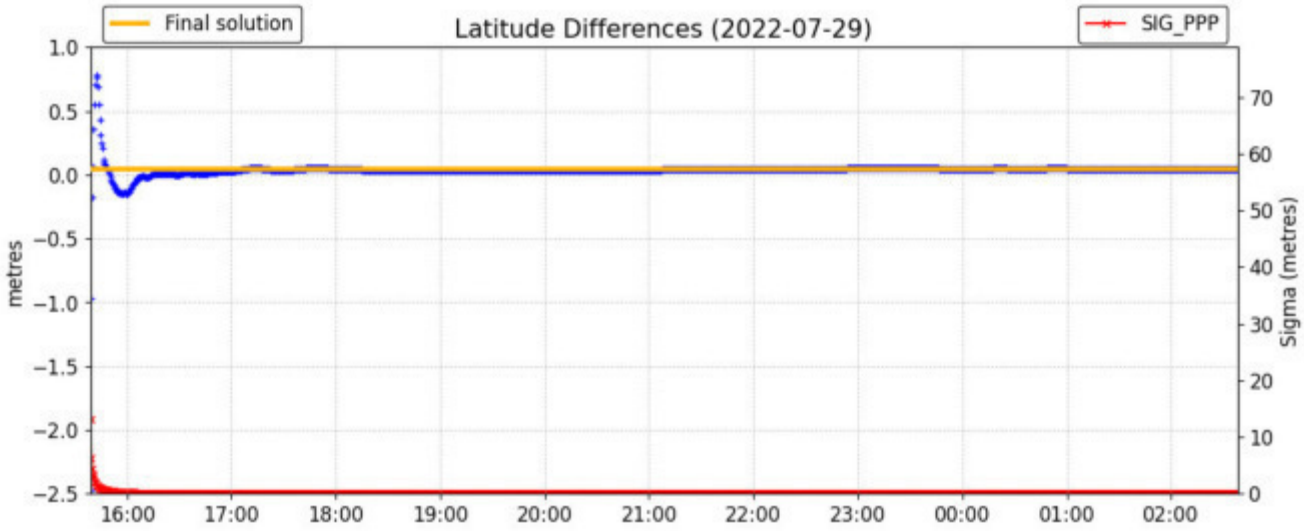
*(Coordinates from RINEX header used as a priori position)

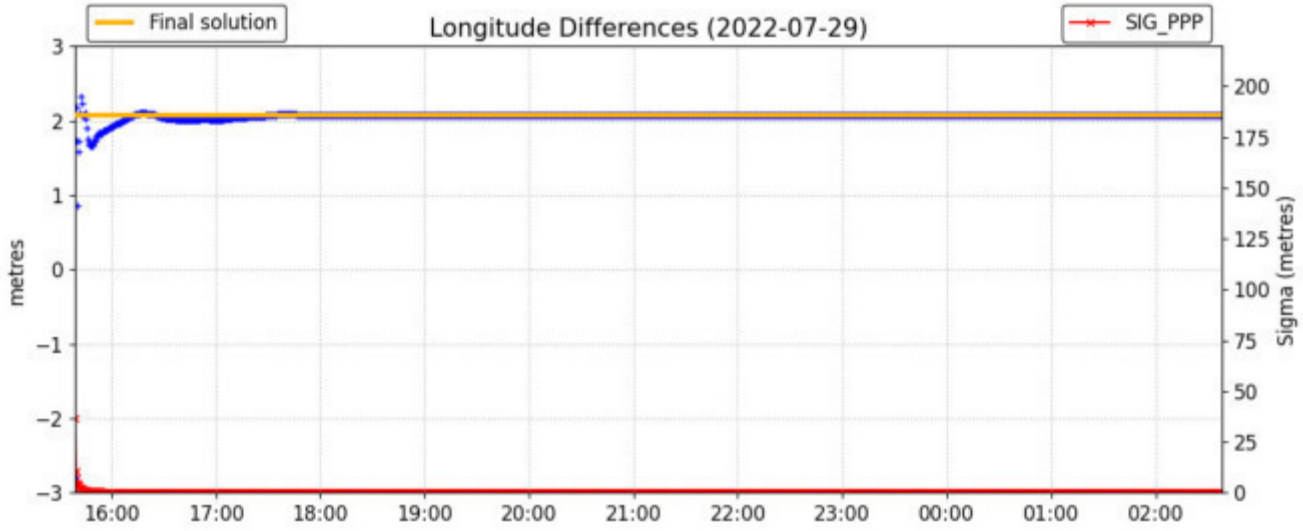
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

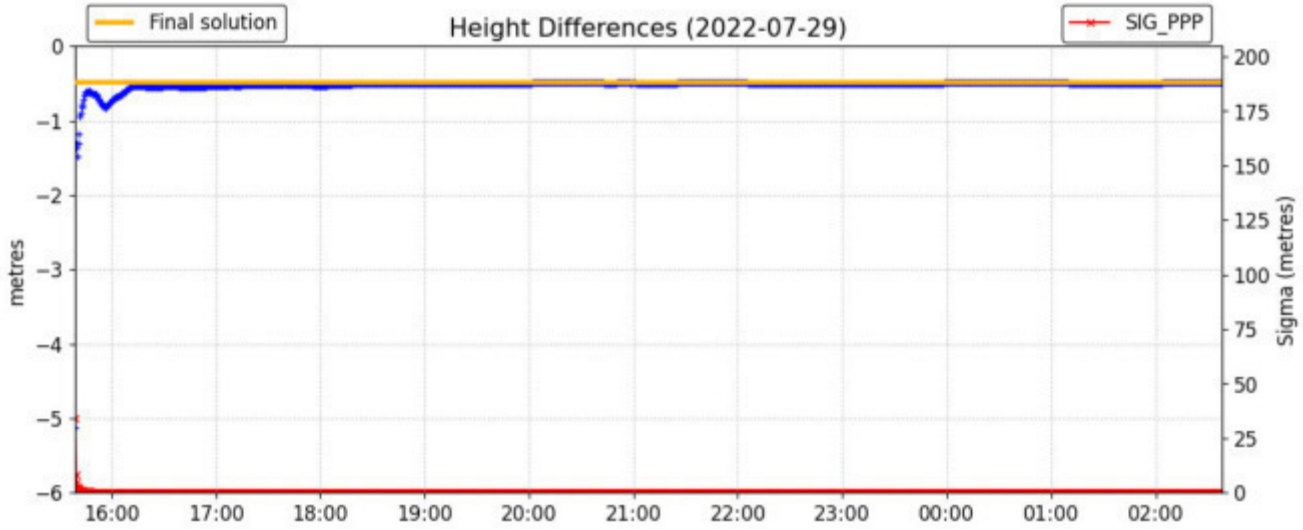
Satellite Sky Distribution

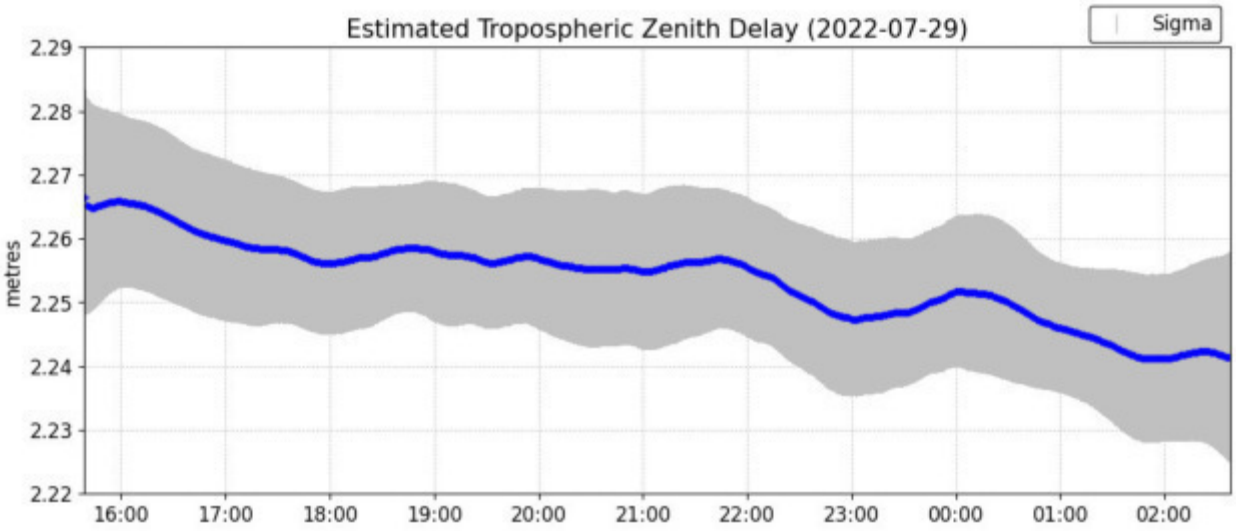


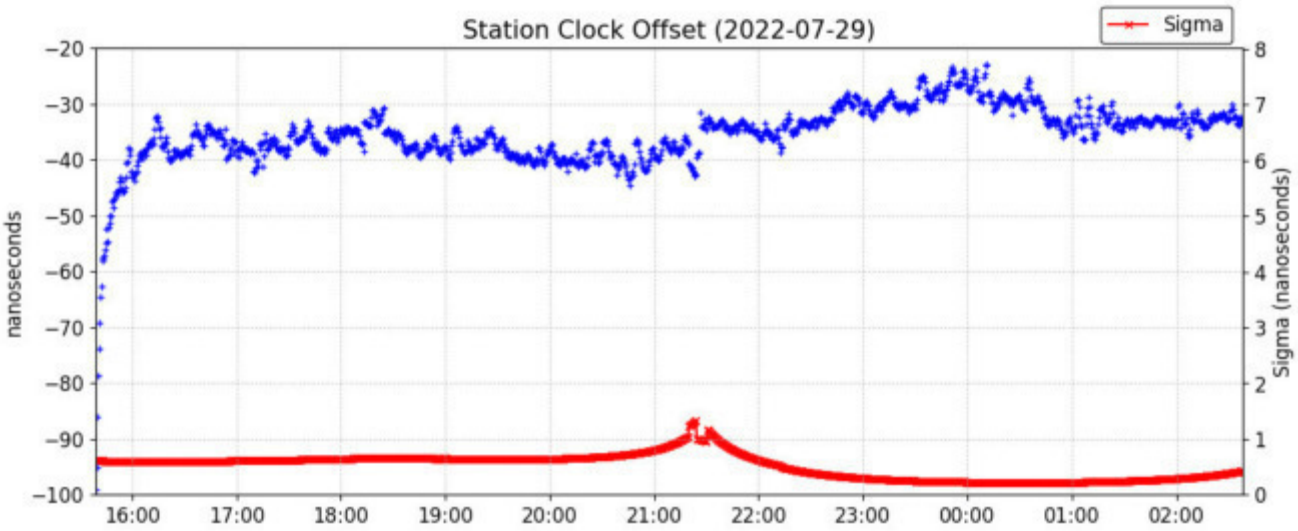
G02	G21	R04	R09	R14	R19
G13	G22	R05	R11	R15	R20
G16	R01	R07	R12	R17	R21
G19	R02	R08	R13	R18	R24
G20	R03				

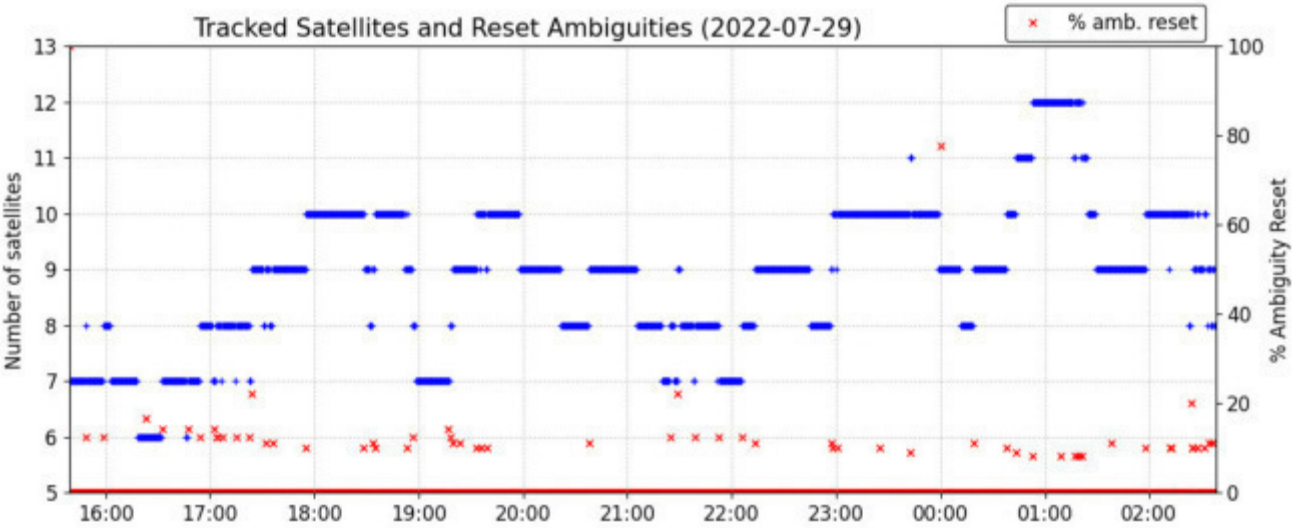

Final solution
Latitude Differences (2022-07-29)
SIG_PPP
metres
Sigma (metres)
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00

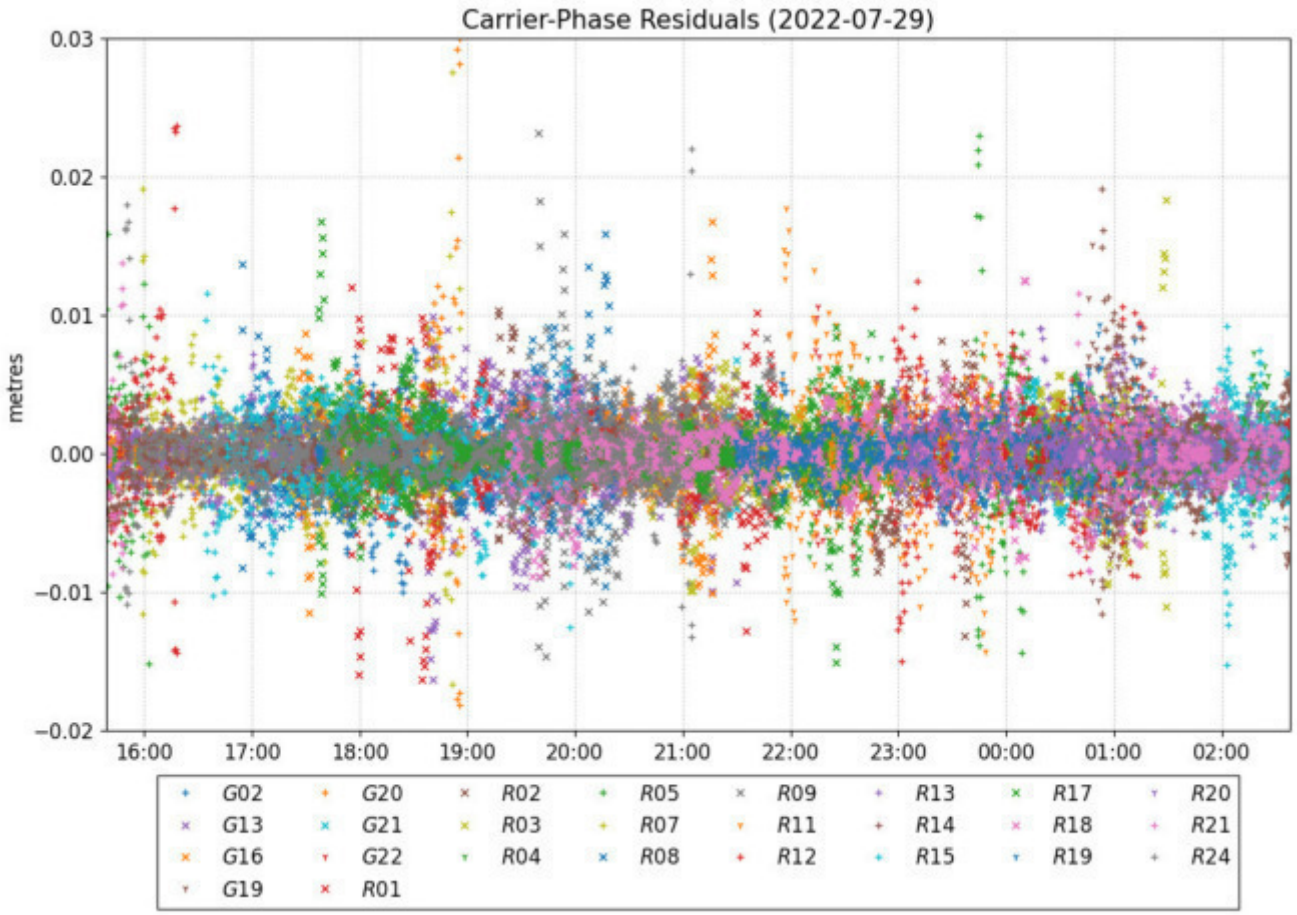

Final solution
Longitude Differences (2022-07-29)
SIG_PPP
metres
Sigma (metres)
3
2
1
0
−1
−2
−3
200
175
150
125
100
75
50
25
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00

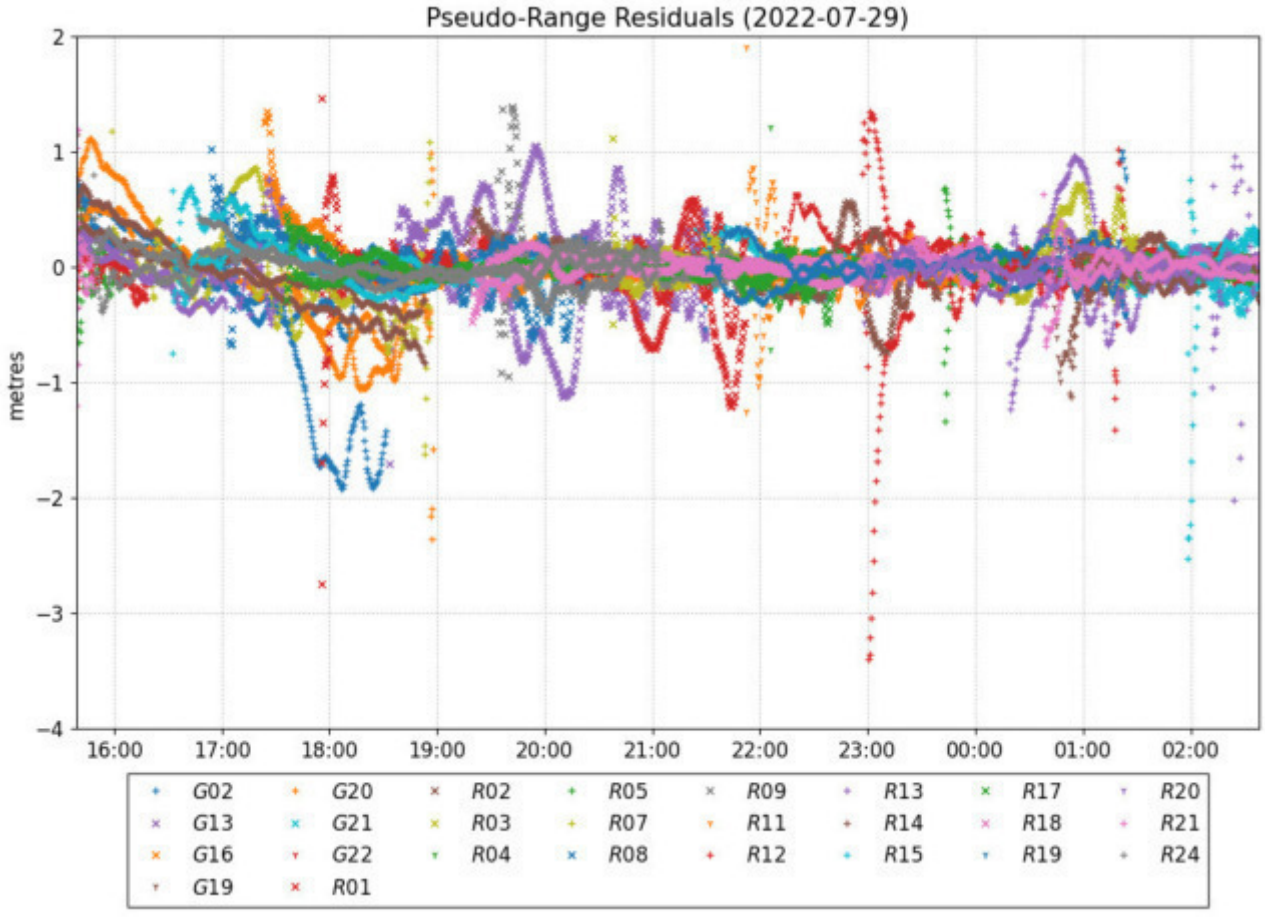

Final solution
Height Differences (2022-07-29)
SIG_PPP
metres
Sigma (metres)
0
−1
−2
−3
−4
−5
−6
200
175
150
125
100
75
50
25
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00

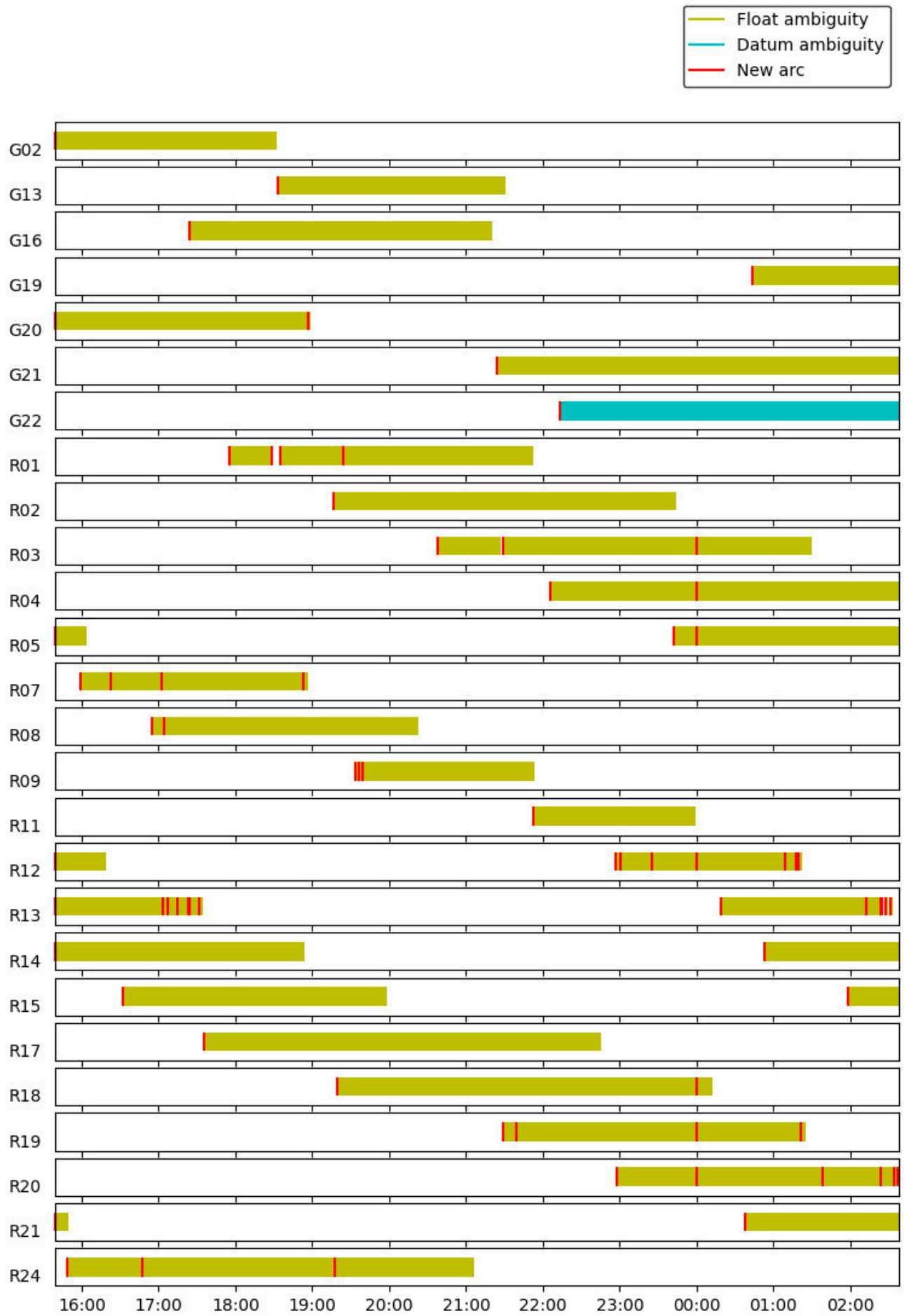

Estimated Tropospheric Zenith Delay (2022-07-29)
Sigma
metres
2.29
2.28
2.27
2.26
2.25
2.24
2.23
2.22
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Station Clock Offset (2022-07-29)
Sigma
nanoseconds
Sigma (nanoseconds)
−20
−30
−40
−50
−60
−70
−80
−90
−100
8
7
6
5
4
3
2
1
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Tracked Satellites and Reset Ambiguities (2022-07-29)
% amb. reset
Number of satellites
% Ambiguity Reset
13
12
11
10
9
8
7
6
5
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Carrier-Phase Residuals (2022-07-29)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Pseudo-Range Residuals (2022-07-29)
metres
2
1
0
−1
−2
−3
−4
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Phase Ambiguity Status (2022-07-29)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00

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Ottawa, Ontario K1A 0Y7
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Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

Natural Resources Canada | Ressources naturelles Canada

Canada

CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220730-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-07-30 16:10:00.00	2022-07-31 01:17:00.00	9:07:00
Processing Time		**Product Type**
22:21:13 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.221m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220730-GS15base.yyo

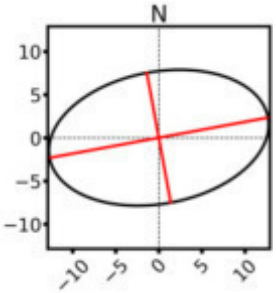
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32467"	-132° 43' 53.97685"	712.189 m
Sigmas(95%)	0.006 m	0.010 m	0.021 m
A priori*	60° 10' 26.32384"	-132° 43' 54.11246"	713.397 m
Estimated – A priori	0.026 m	2.091 m	-1.208 m

Orthometric Height CGVD28 (HTv2.0)†

708.414 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 13 mm
semi-minor: 8 mm
semi-major azimuth: 79° 34' 11.72"



UTM (North) Zone 8

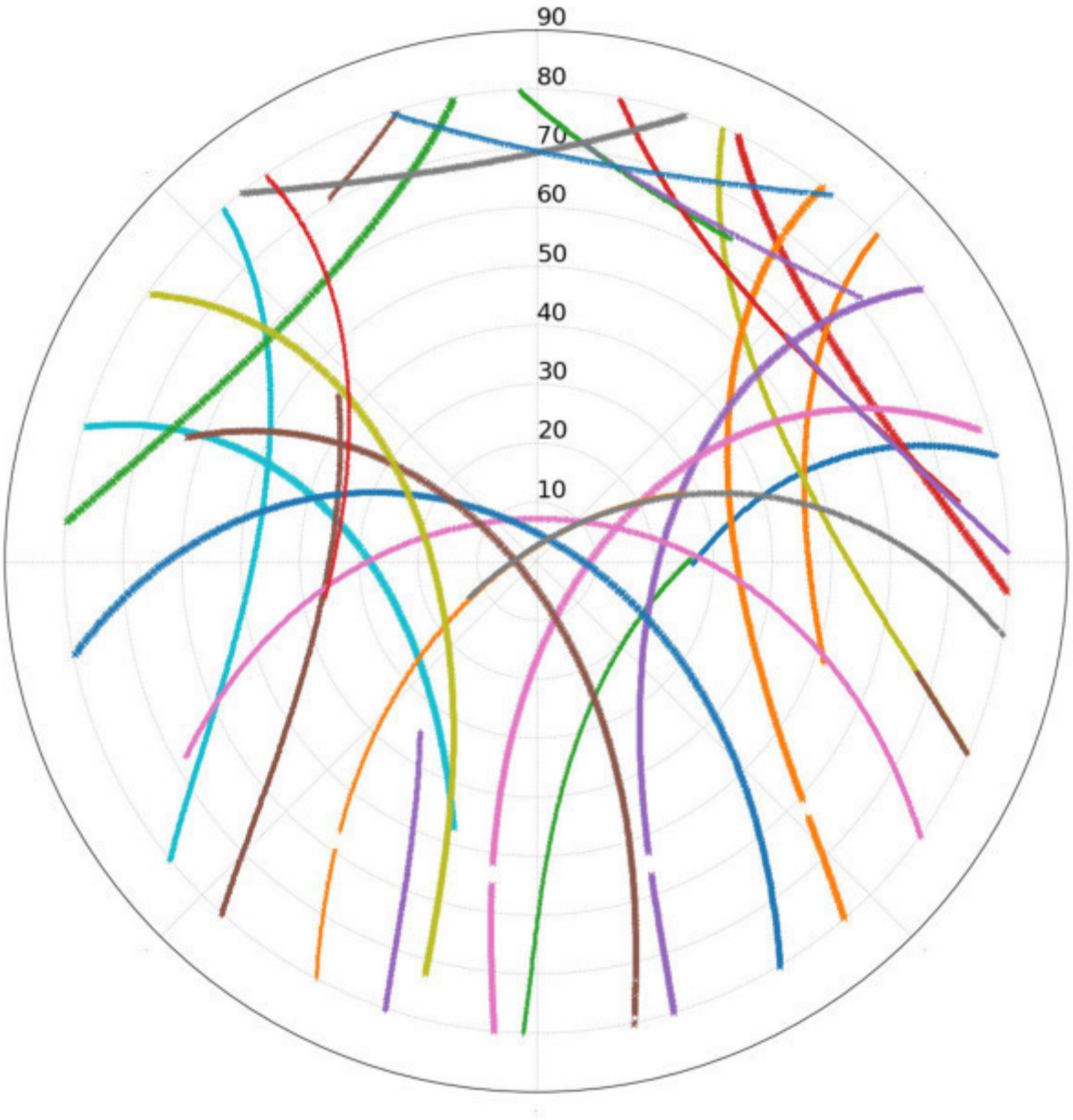
6672948.588 m (N)
625841.226 m (E)

Scale Factors
0.99979406 (point)
0.99968263 (combined)

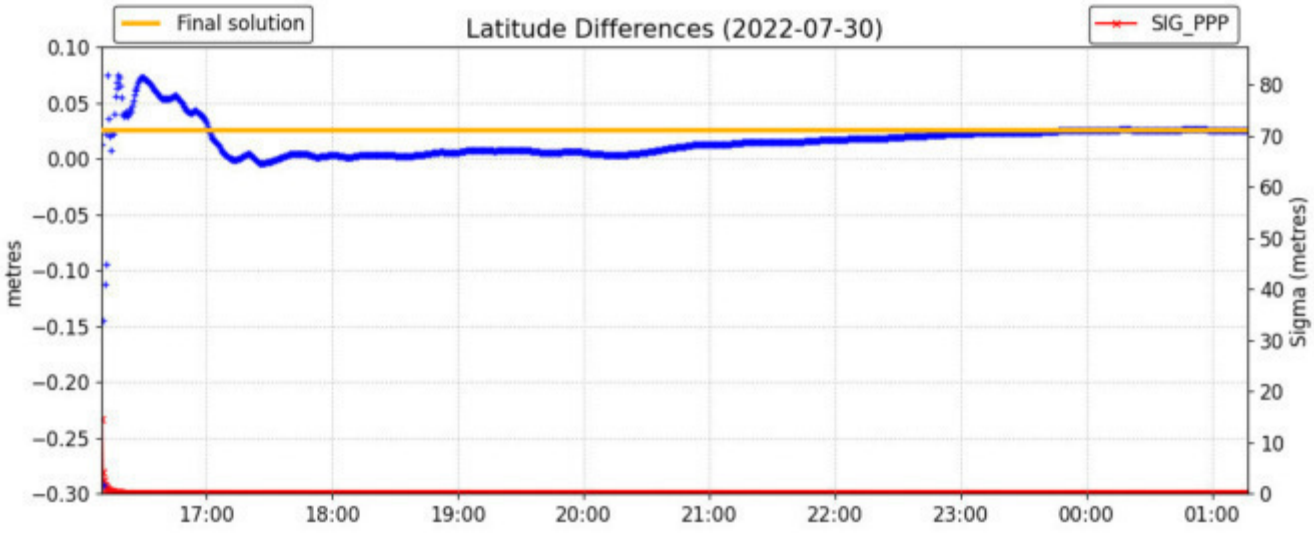
*(Coordinates from RINEX header used as a priori position)

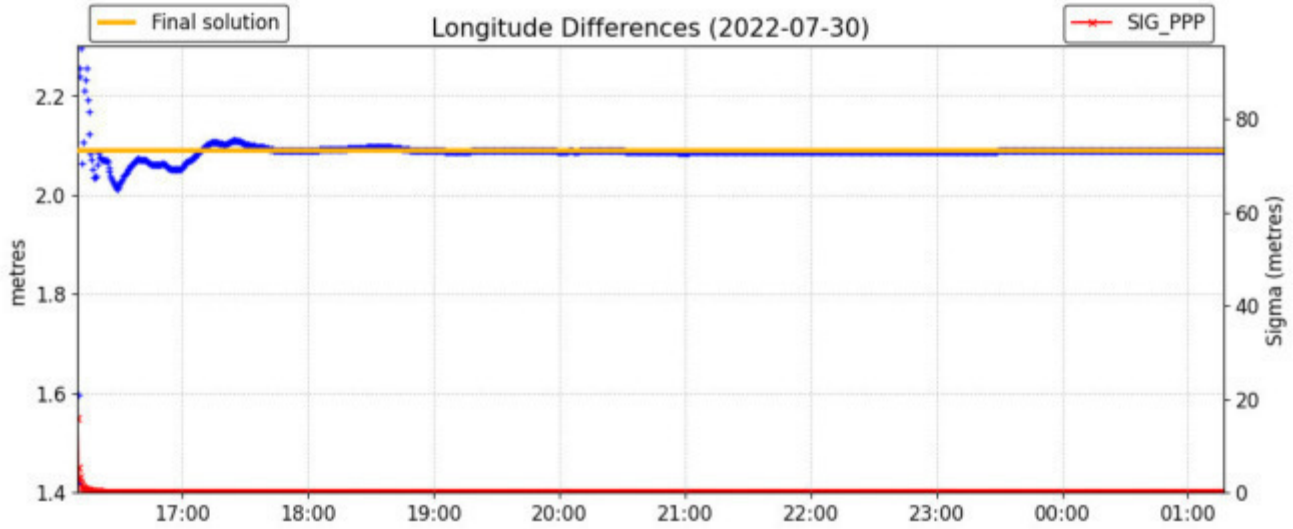
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

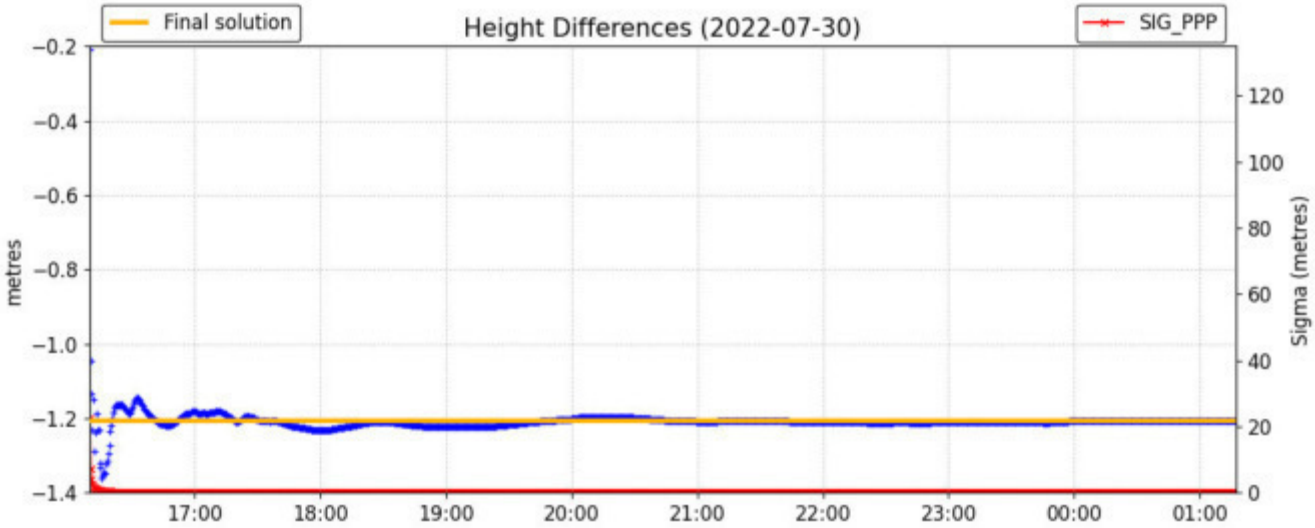
Satellite Sky Distribution

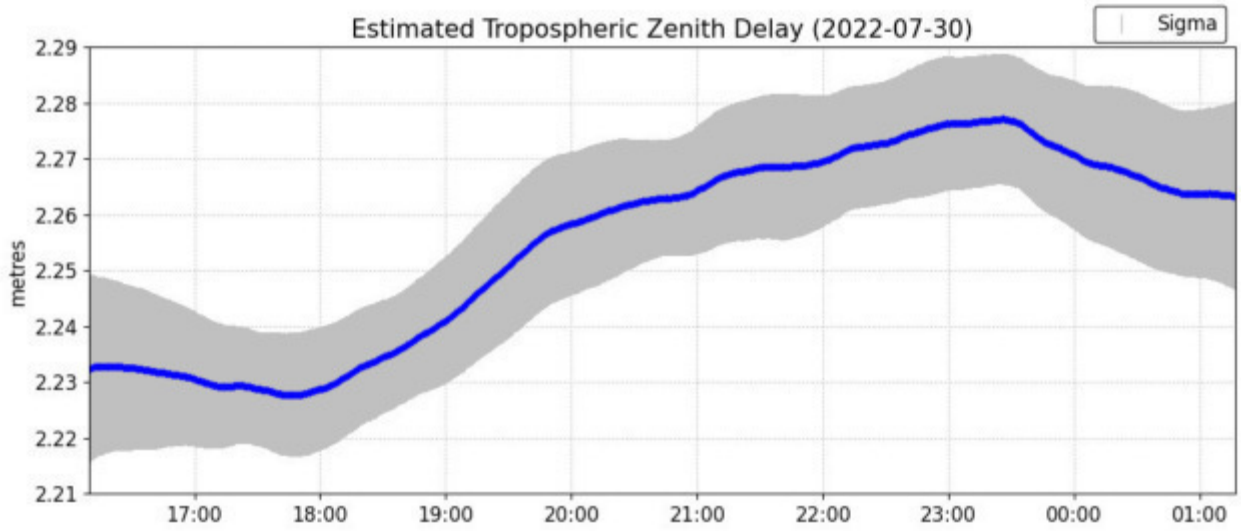


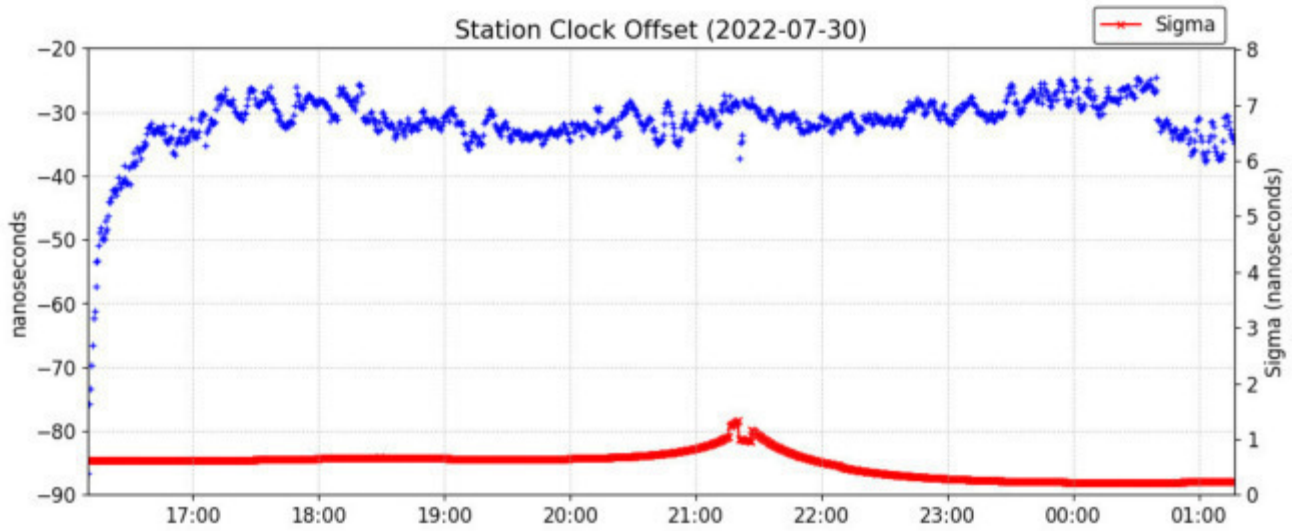
G02	G21	R04	R09	R14	R19
G13	G22	R05	R11	R15	R20
G16	R01	R07	R12	R17	R21
G19	R02	R08	R13	R18	R24
G20	R03				

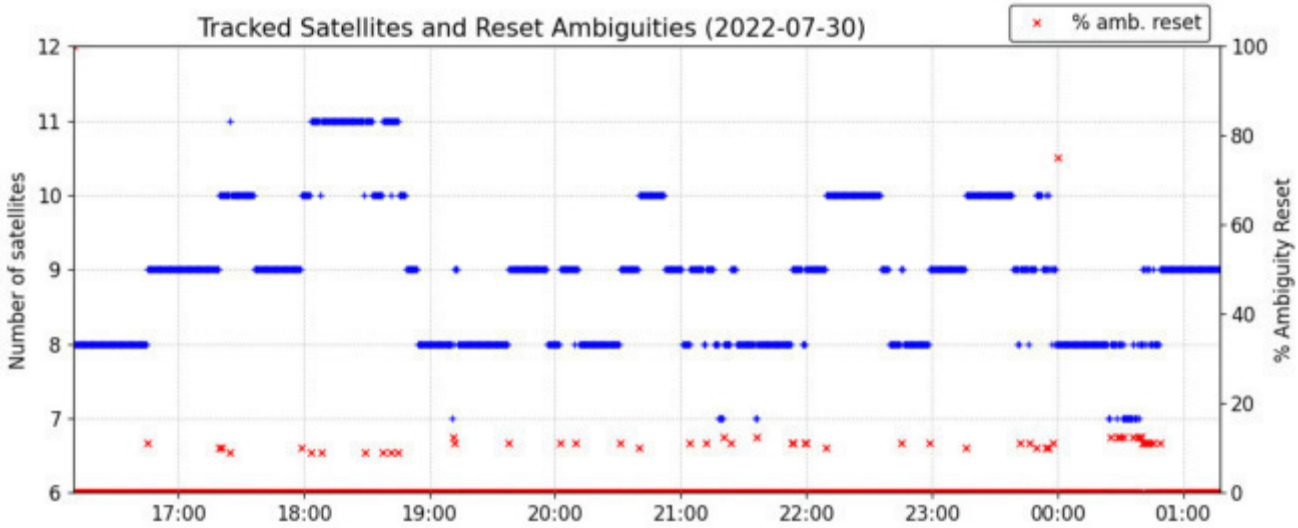

Final solution
Latitude Differences (2022-07-30)
SIG_PPP
metres
Sigma (metres)
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
−0.25
−0.30
80
70
60
50
40
30
20
10
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

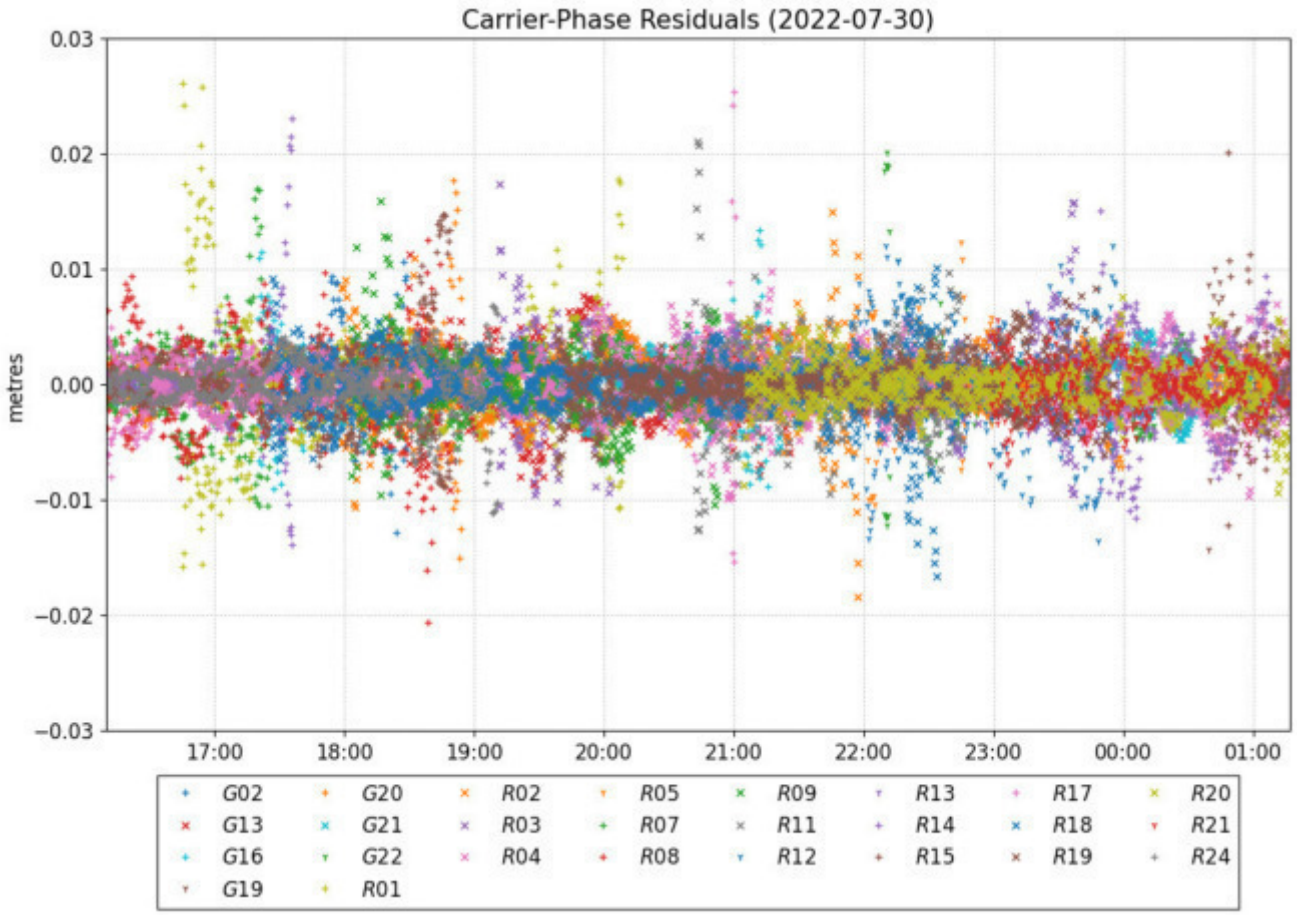

Final solution
Longitude Differences (2022-07-30)
SIG_PPP
metres
Sigma (metres)
2.2
2.0
1.8
1.6
1.4
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

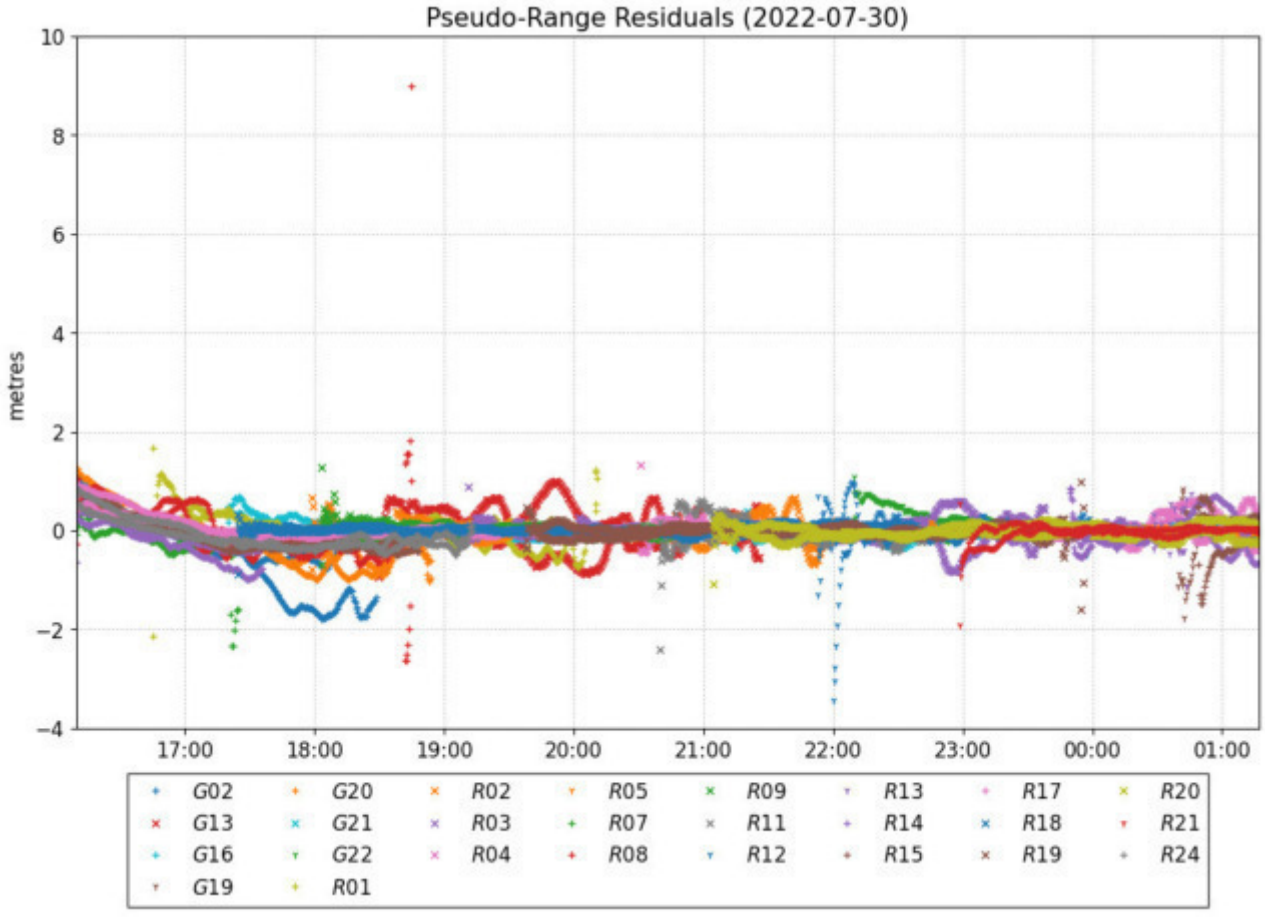

Final solution
Height Differences (2022-07-30)
SIG_PPP
metres
Sigma (metres)
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
−1.4
120
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

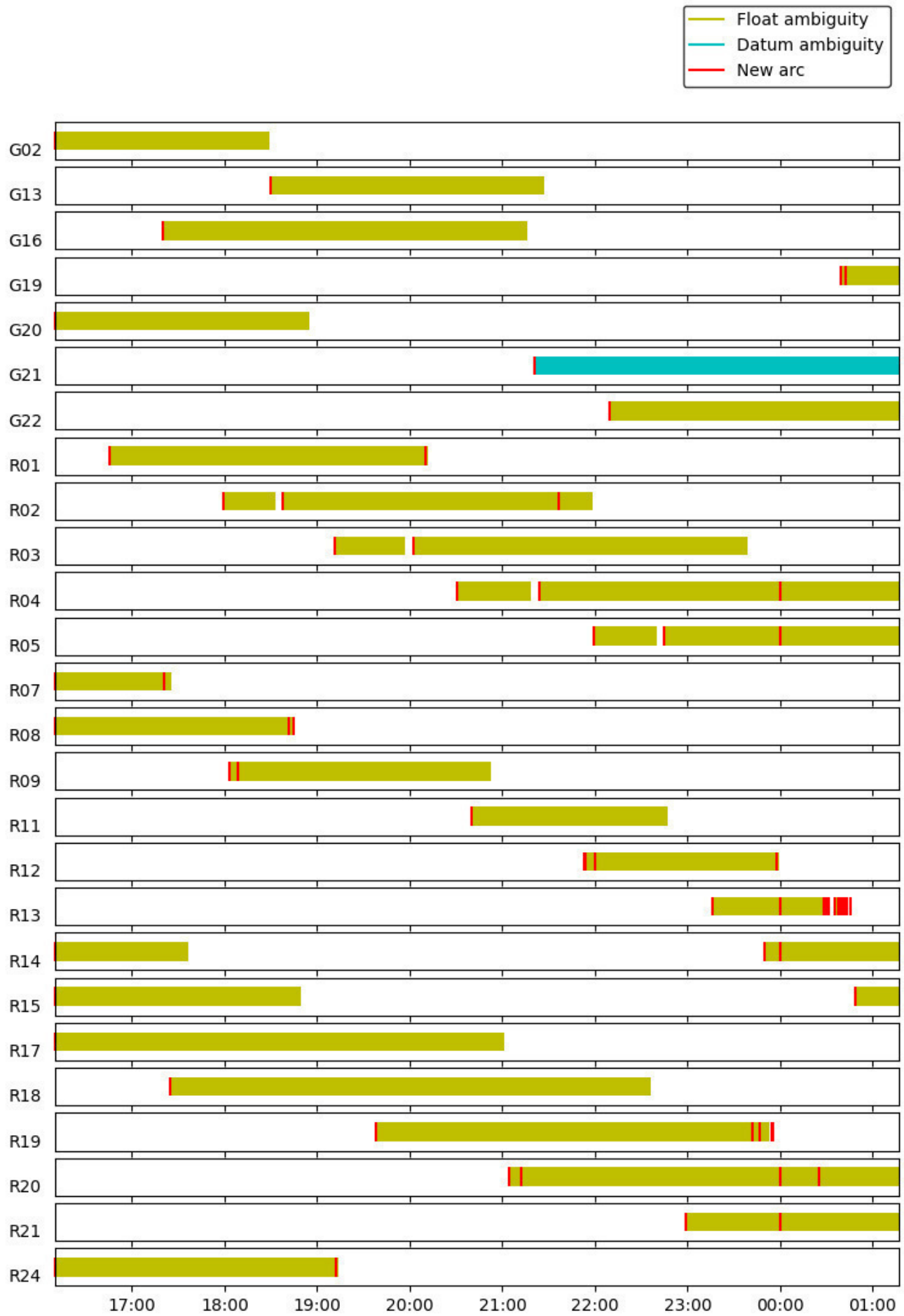

Estimated Tropospheric Zenith Delay (2022-07-30)
Sigma
metres
2.29
2.28
2.27
2.26
2.25
2.24
2.23
2.22
2.21
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-07-30)
Sigma
nanoseconds
Sigma (nanoseconds)
−20
−30
−40
−50
−60
−70
−80
−90
8
7
6
5
4
3
2
1
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-07-30)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-07-30)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Pseudo-Range Residuals (2022-07-30)
metres
10
8
6
4
2
0
−2
−4
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Phase Ambiguity Status (2022-07-30)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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If you have any questions, please feel free to contact:
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Surveyor General Branch
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Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220731-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-07-31 15:54:30.00	2022-08-01 04:55:00.00	13:00:30
Processing Time		**Product Type**
22:21:37 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.221m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220731-GS15base.yyo

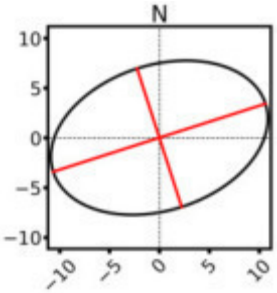
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32475"	-132° 43' 53.97699"	712.184 m
Sigmas(95%)	0.006 m	0.009 m	0.019 m
A priori*	60° 10' 26.32686"	-132° 43' 54.14121"	713.955 m
Estimated – A priori	-0.065 m	2.532 m	-1.770 m

Orthometric Height CGVD28 (HTv2.0)†

708.409 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 11 mm
semi-minor: 7 mm
semi-major azimuth: 72° 11' 41.07"



UTM (North) Zone 8

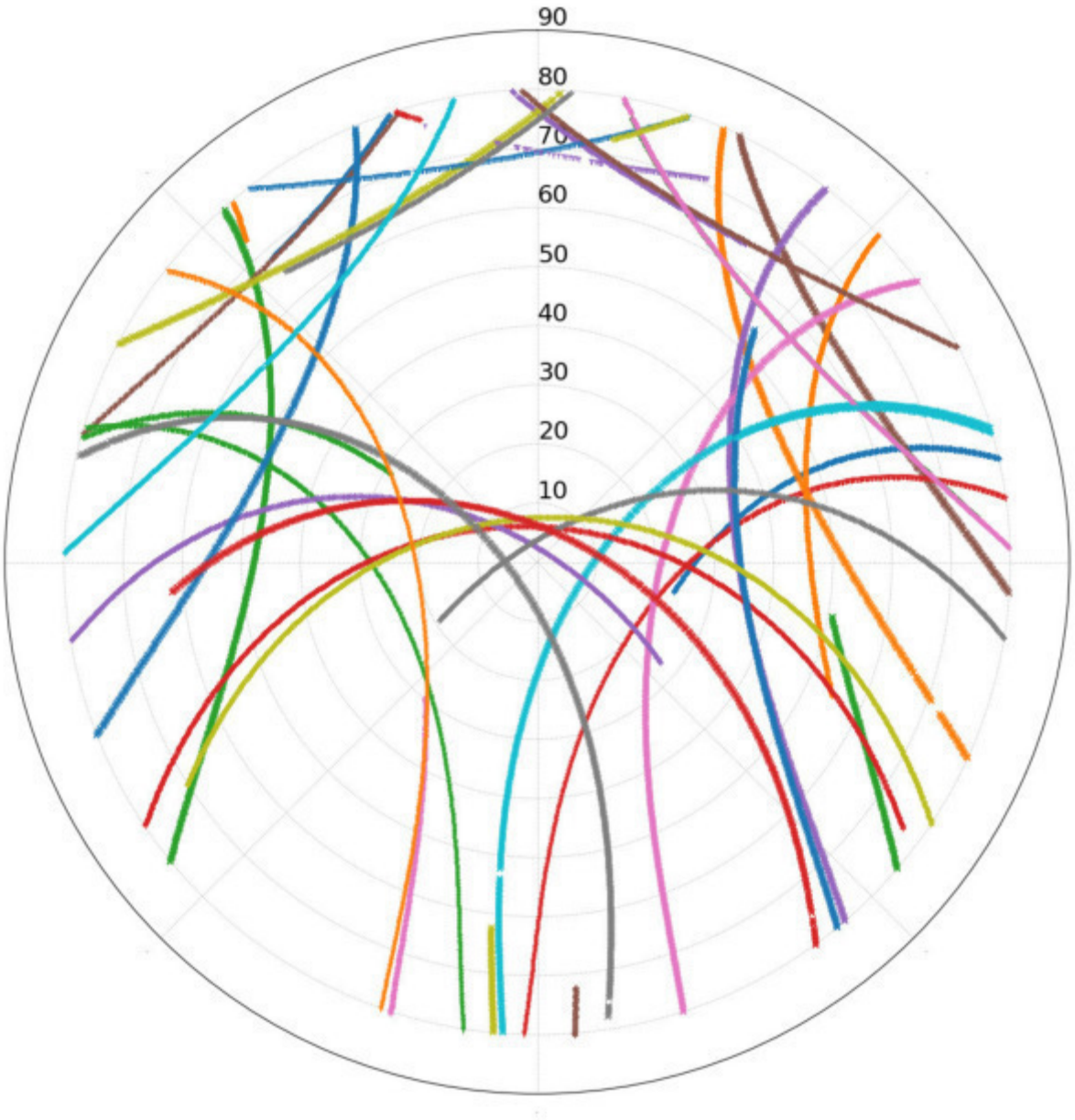
6672948.590 m (N)
625841.224 m (E)

Scale Factors
0.99979406 (point)
0.99968263 (combined)

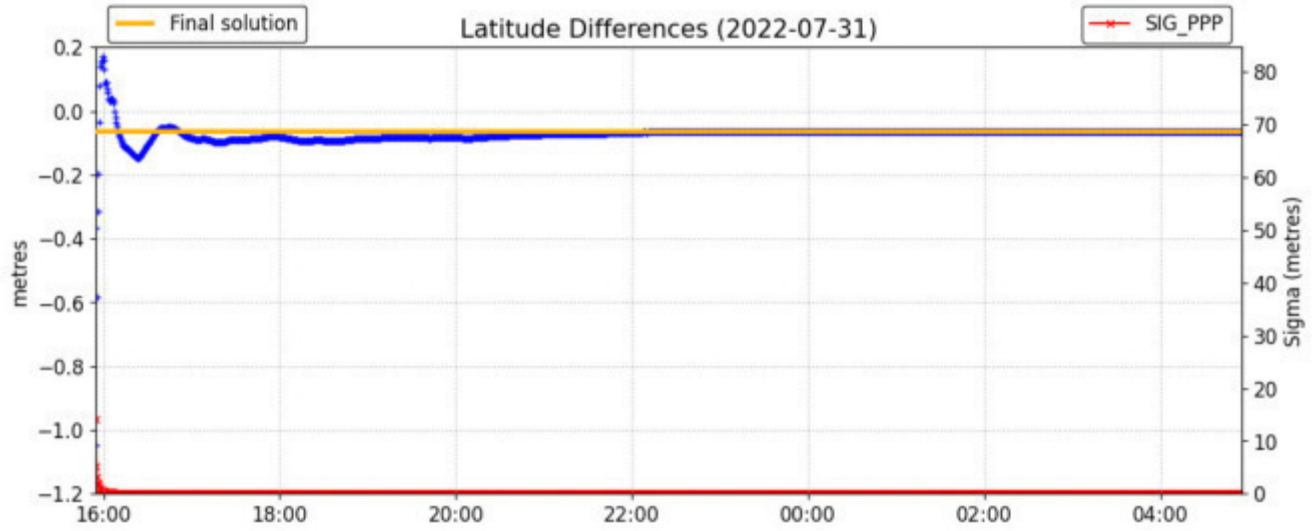
*(Coordinates from RINEX header used as a priori position)

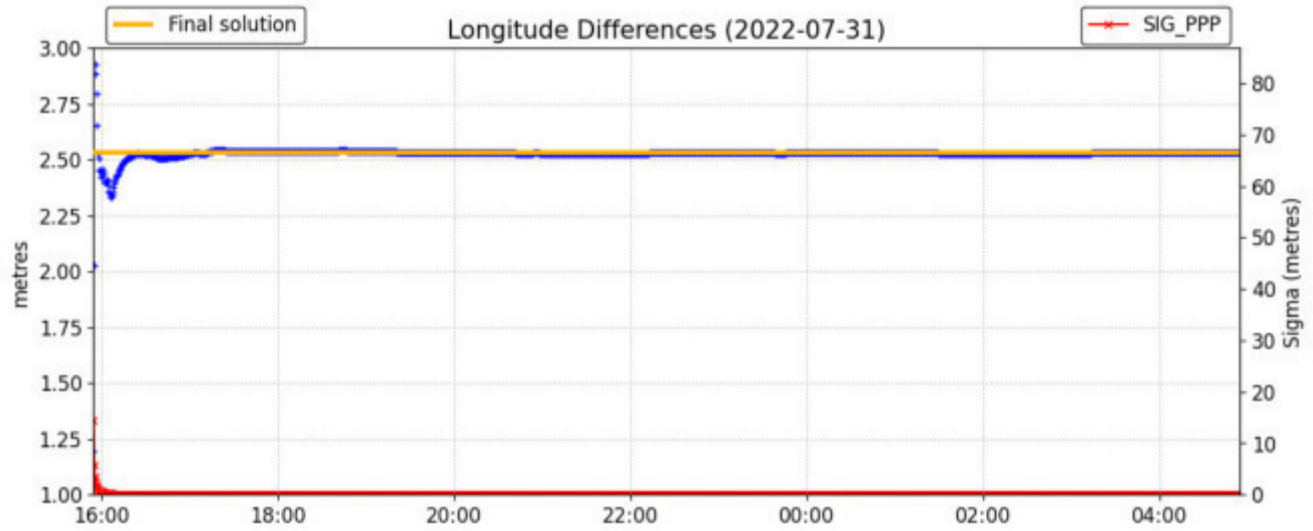
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

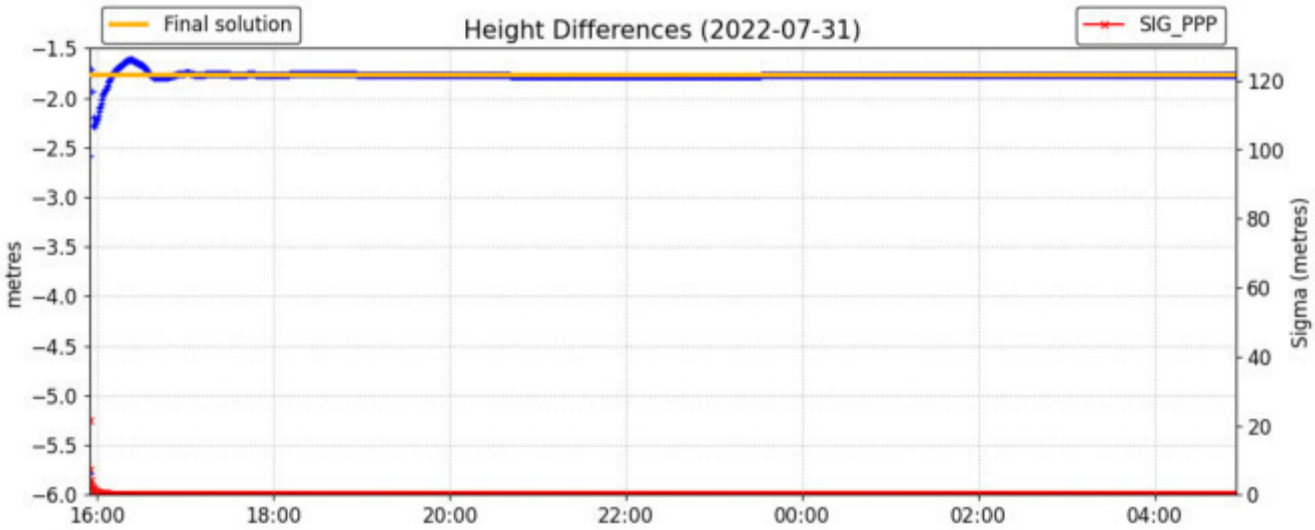
Satellite Sky Distribution

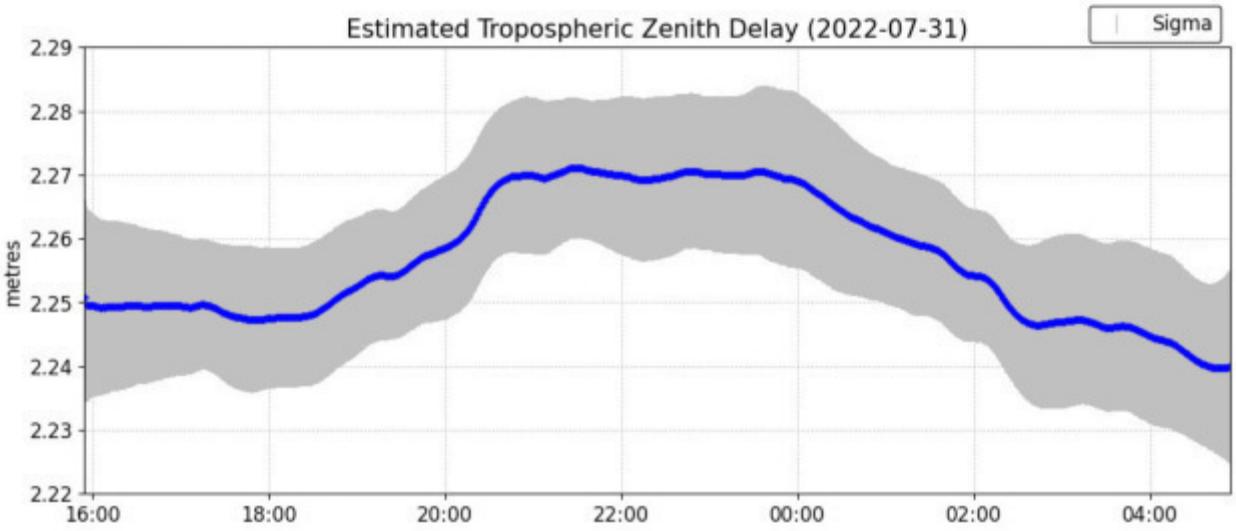


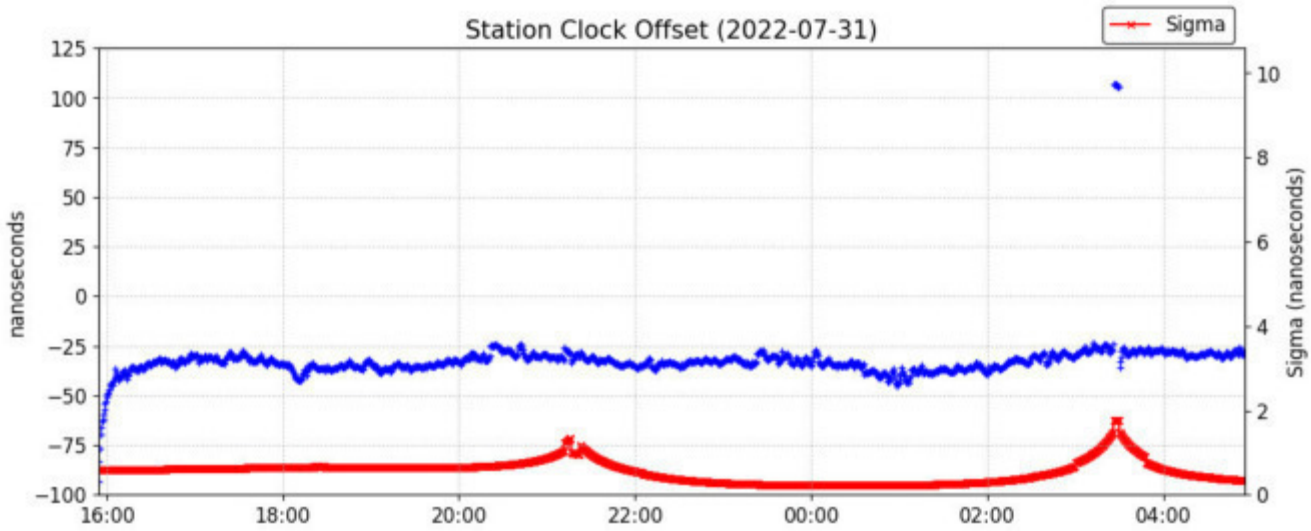
G02	G21	R04	R09	R14	R19
G13	G22	R05	R11	R15	R20
G16	R01	R07	R12	R17	R21
G19	R02	R08	R13	R18	R24
G20	R03				

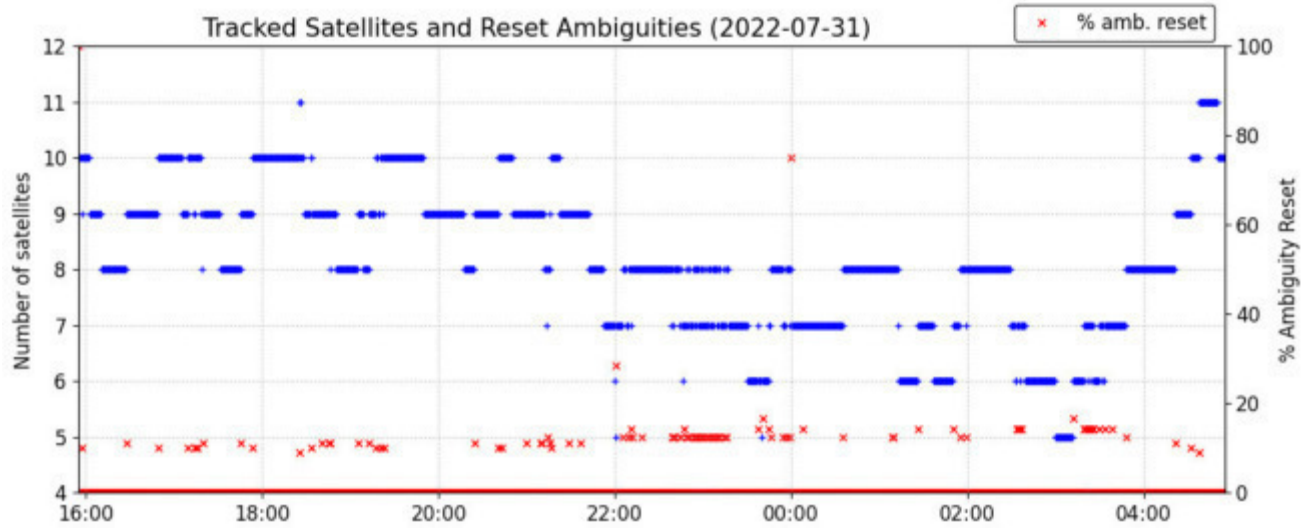

Final solution
Latitude Differences (2022-07-31)
SIG_PPP
metres
Sigma (metres)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
80
70
60
50
40
30
20
10
0
16:00
18:00
20:00
22:00
00:00
02:00
04:00

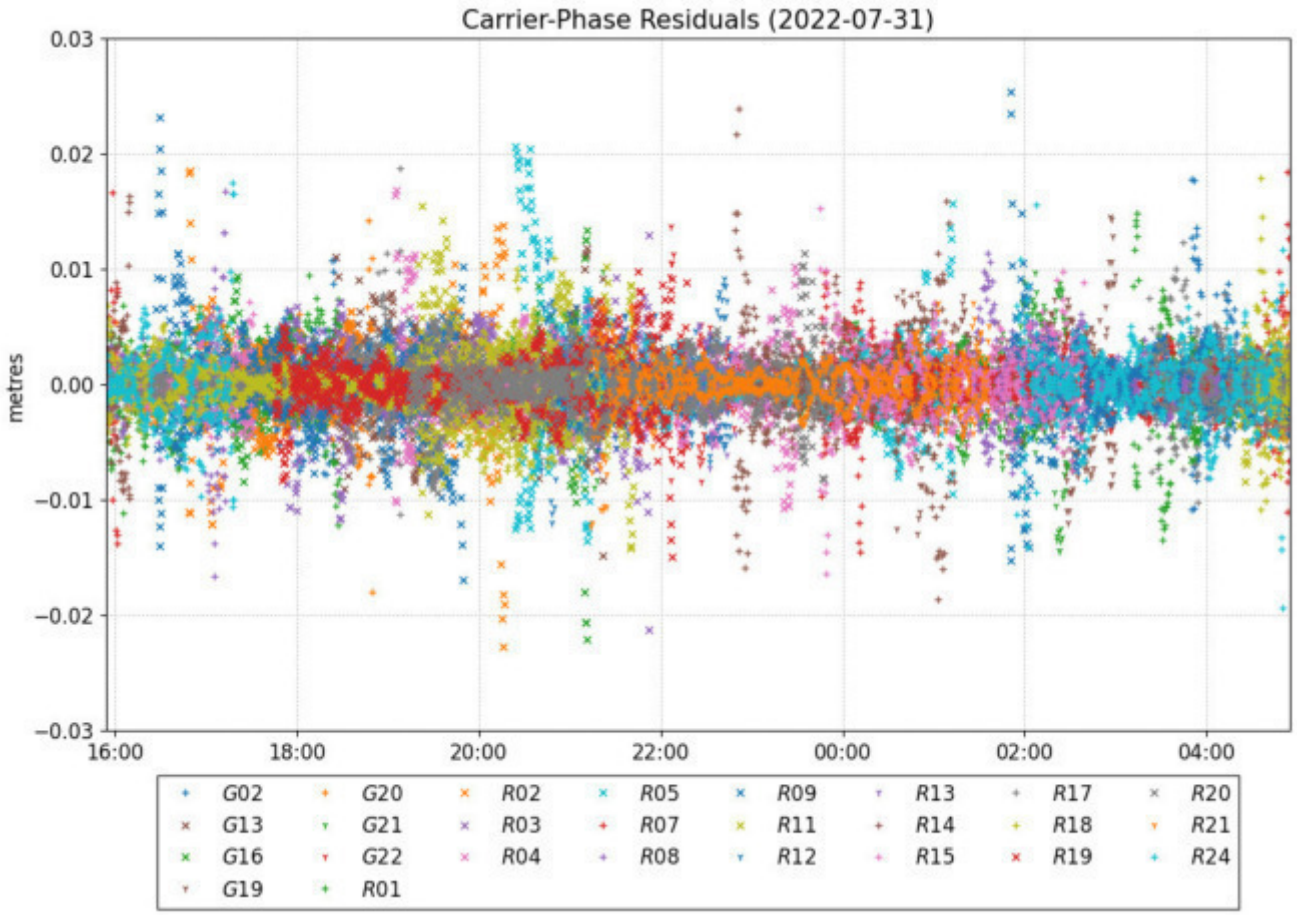

Final solution
Longitude Differences (2022-07-31)
SIG_PPP
metres
Sigma (metres)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
80
70
60
50
40
30
20
10
0
16:00
18:00
20:00
22:00
00:00
02:00
04:00

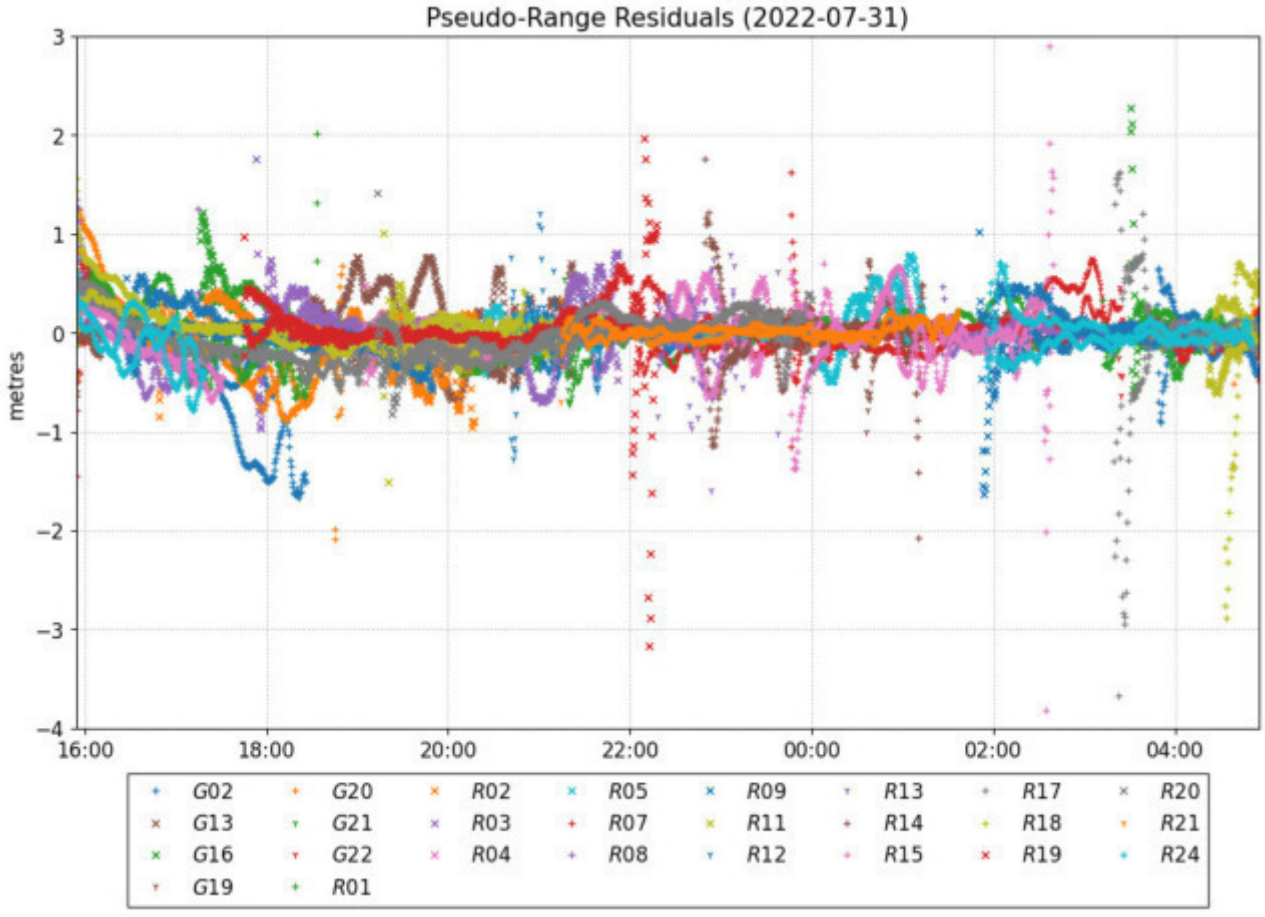

Final solution
Height Differences (2022-07-31)
SIG_PPP
metres
Sigma (metres)
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
−5.0
−5.5
−6.0
120
100
80
60
40
20
0
16:00
18:00
20:00
22:00
00:00
02:00
04:00

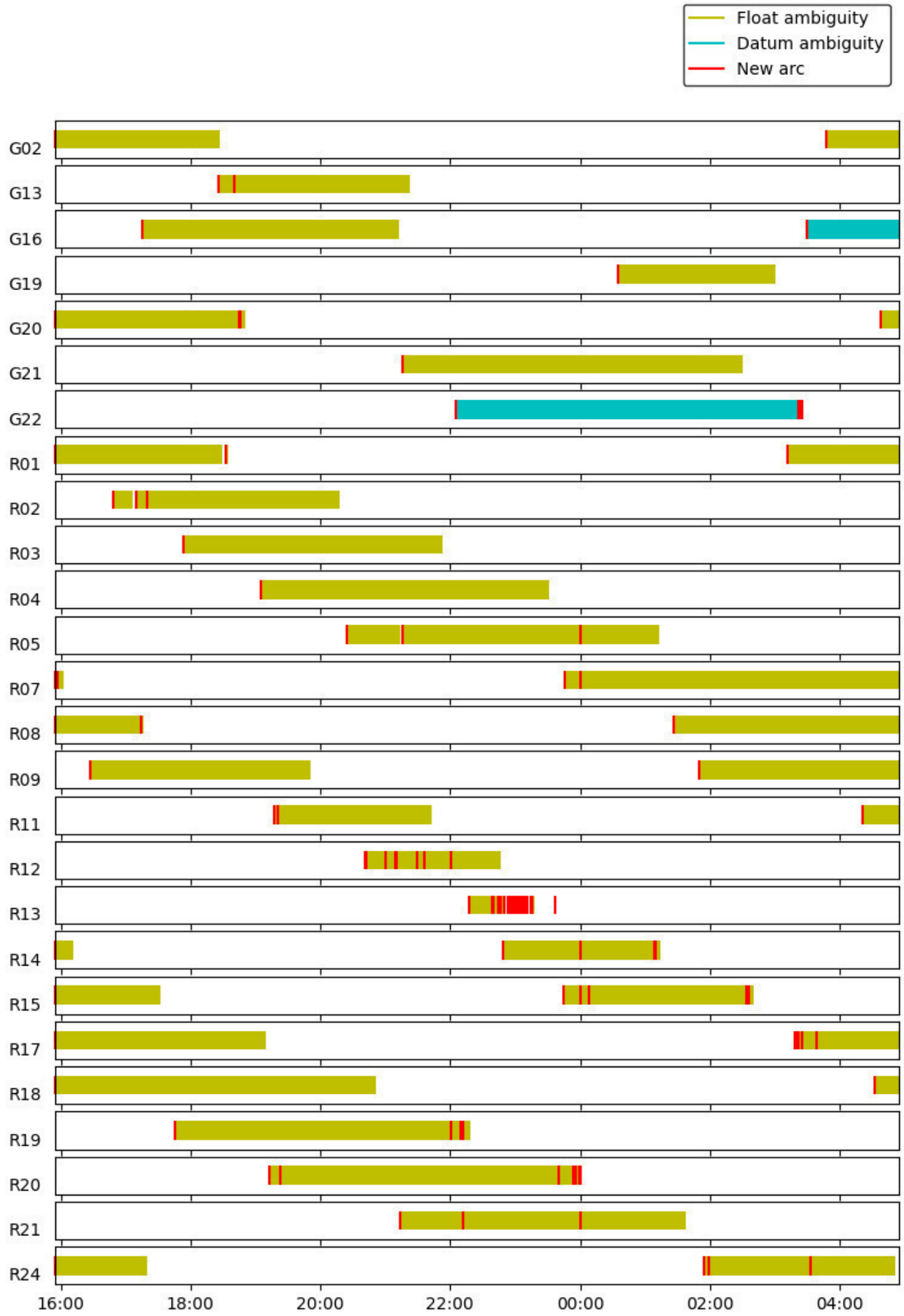

Estimated Tropospheric Zenith Delay (2022-07-31)
Sigma
metres
2.29
2.28
2.27
2.26
2.25
2.24
2.23
2.22
16:00
18:00
20:00
22:00
00:00
02:00
04:00


Station Clock Offset (2022-07-31)
Sigma
nanoseconds
Sigma (nanoseconds)
125
100
75
50
25
0
−25
−50
−75
−100
10
8
6
4
2
0
16:00
18:00
20:00
22:00
00:00
02:00
04:00


Tracked Satellites and Reset Ambiguities (2022-07-31)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
16:00
18:00
20:00
22:00
00:00
02:00
04:00


Carrier-Phase Residuals (2022-07-31)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
16:00
18:00
20:00
22:00
00:00
02:00
04:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Pseudo-Range Residuals (2022-07-31)
metres
3
2
1
0
−1
−2
−3
−4
16:00
18:00
20:00
22:00
00:00
02:00
04:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Phase Ambiguity Status (2022-07-31)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
16:00
18:00
20:00
22:00
00:00
02:00
04:00

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Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220801-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-01 16:19:30.00	2022-08-01 22:21:30.00	6:02:00
Processing Time		**Product Type**
22:22:07 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.41 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.221m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220801-GS15base.yyo

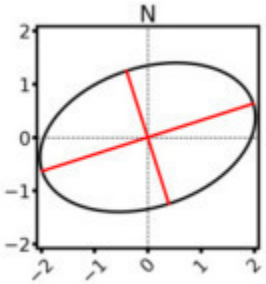
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32449"	-132° 43' 53.97722"	712.171 m
Sigmas(95%)	0.011 m	0.016 m	0.032 m
A priori*	60° 10' 26.34913"	-132° 43' 54.10006"	712.270 m
Estimated – A priori	-0.763 m	1.894 m	-0.099 m

Orthometric Height CGVD28 (HTv2.0)†

708.395 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 2.1 cm
semi-minor: 1.3 cm
semi-major azimuth: 72° 18' 0.06"



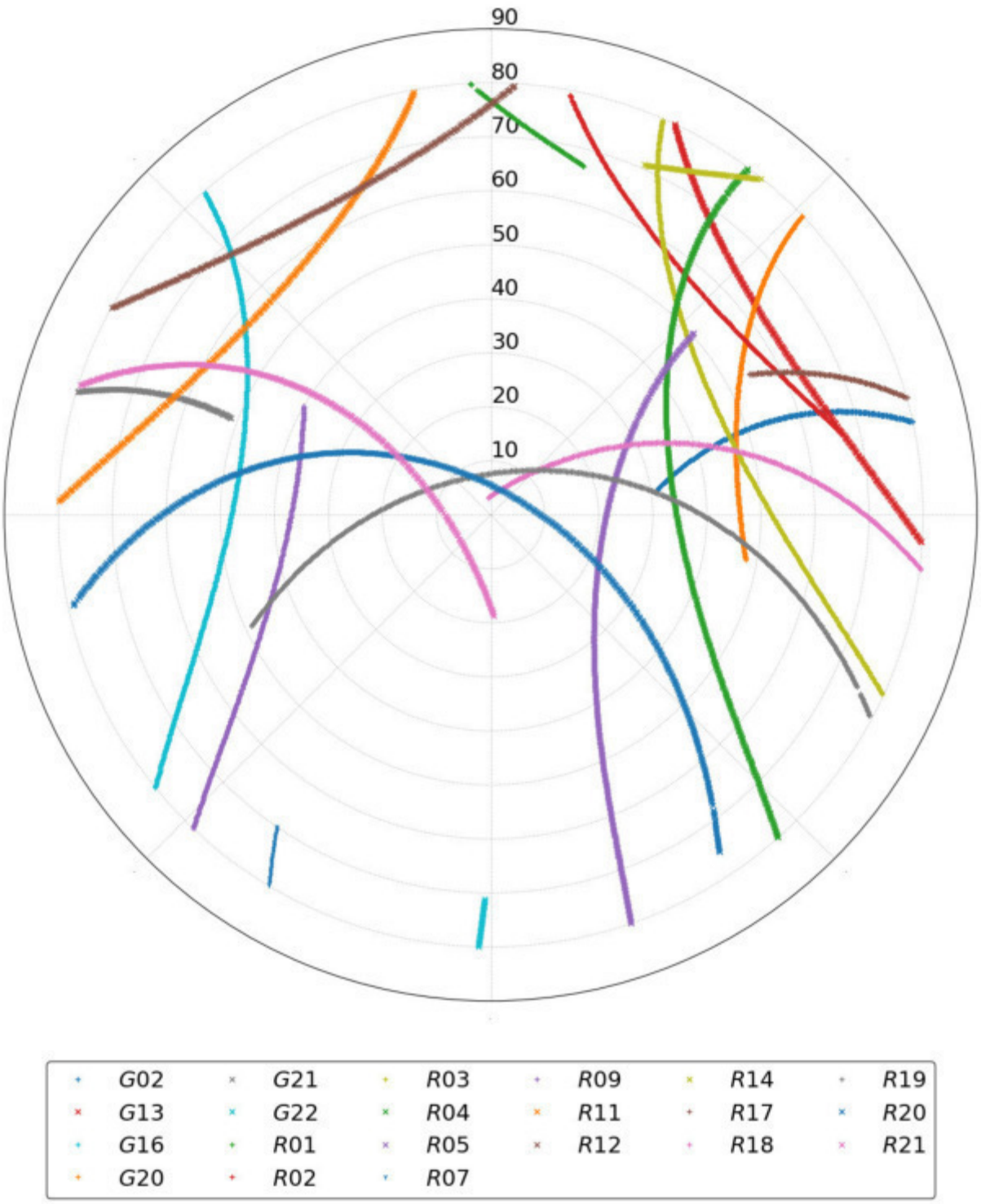
UTM (North) Zone 8

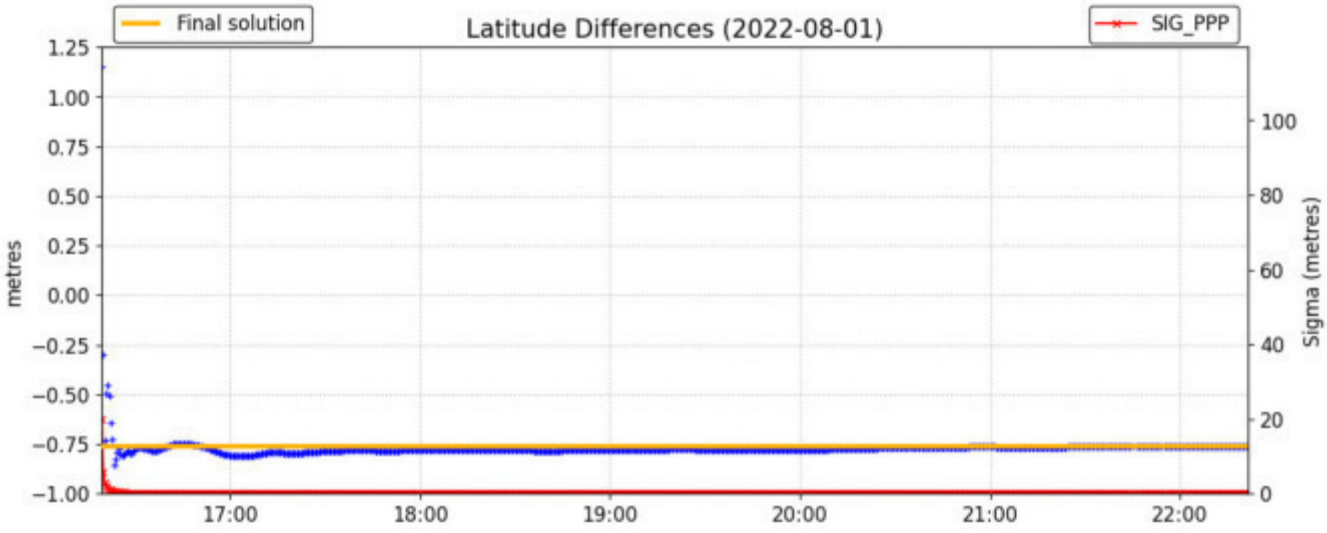
6672948.582 m (N)
625841.221 m (E)

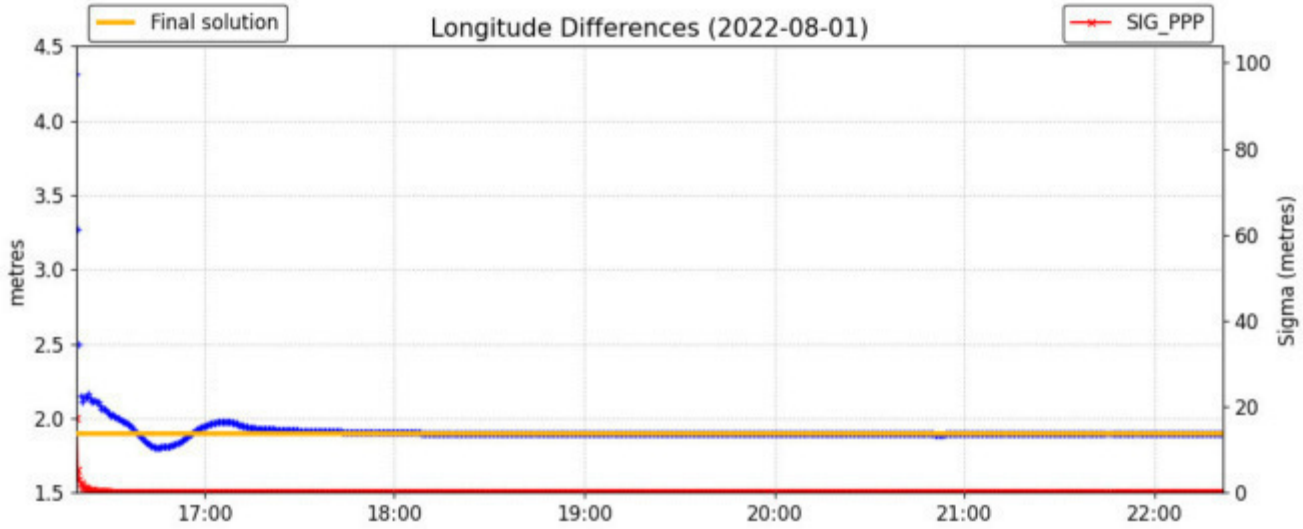
Scale Factors
0.99979406 (point)
0.99968263 (combined)

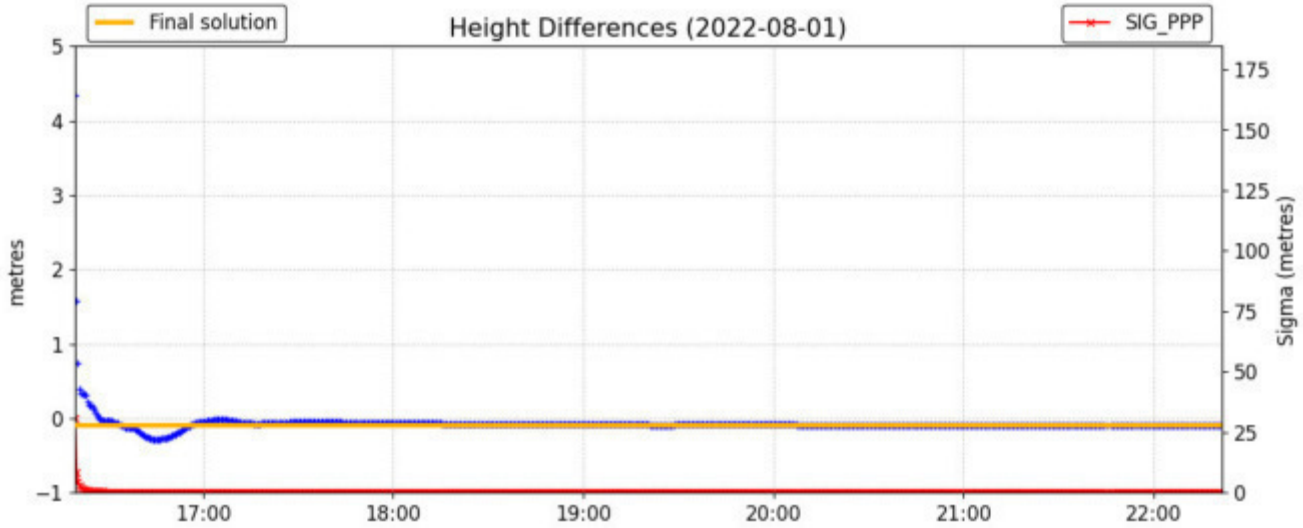
*(Coordinates from RINEX header used as a priori position)

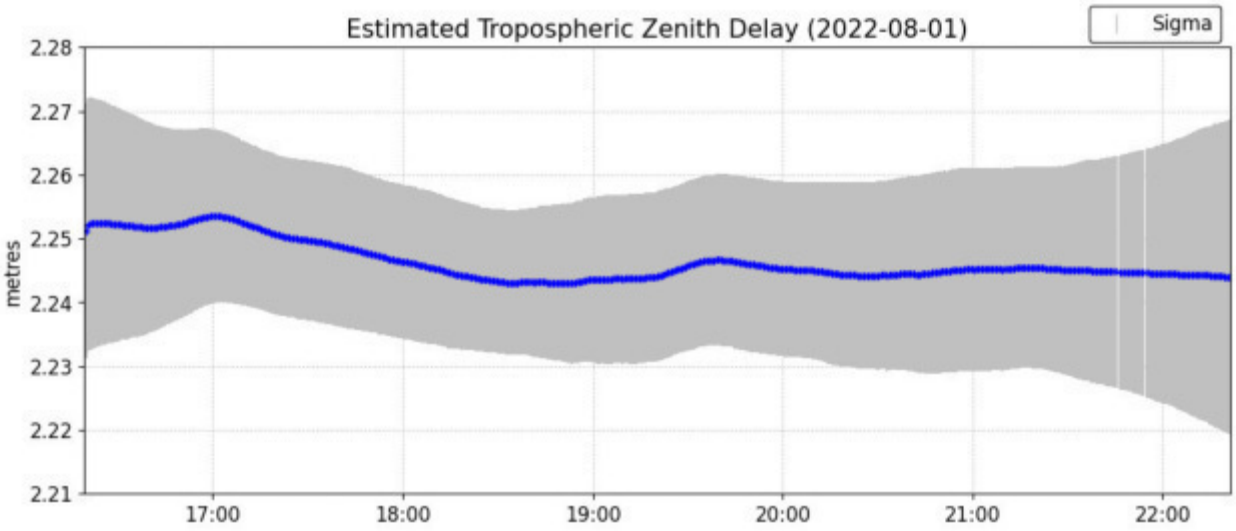
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

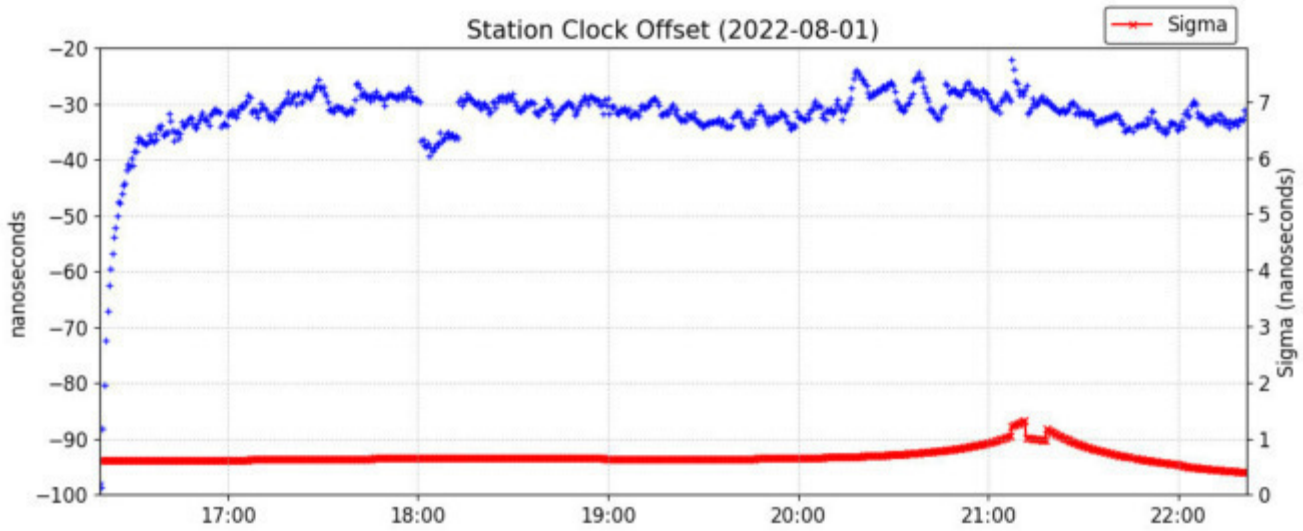

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G20
G21
G22
R01
R02
R03
R04
R05
R07
R09
R11
R12
R14
R17
R18
R19
R20
R21

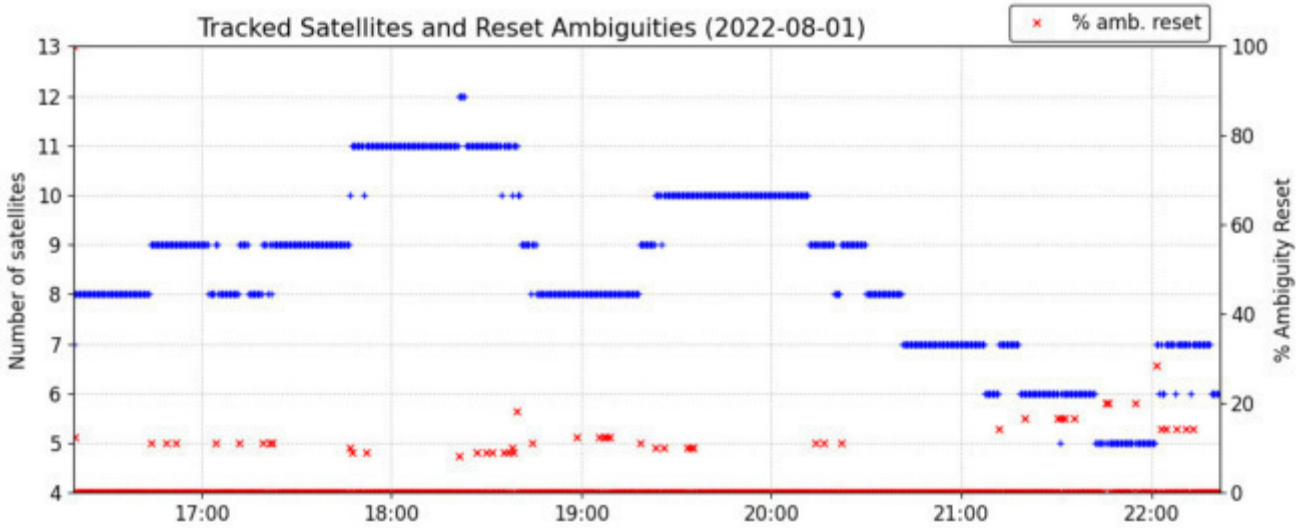

Final solution
Latitude Differences (2022-08-01)
SIG_PPP
metres
Sigma (metres)
1.25
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00

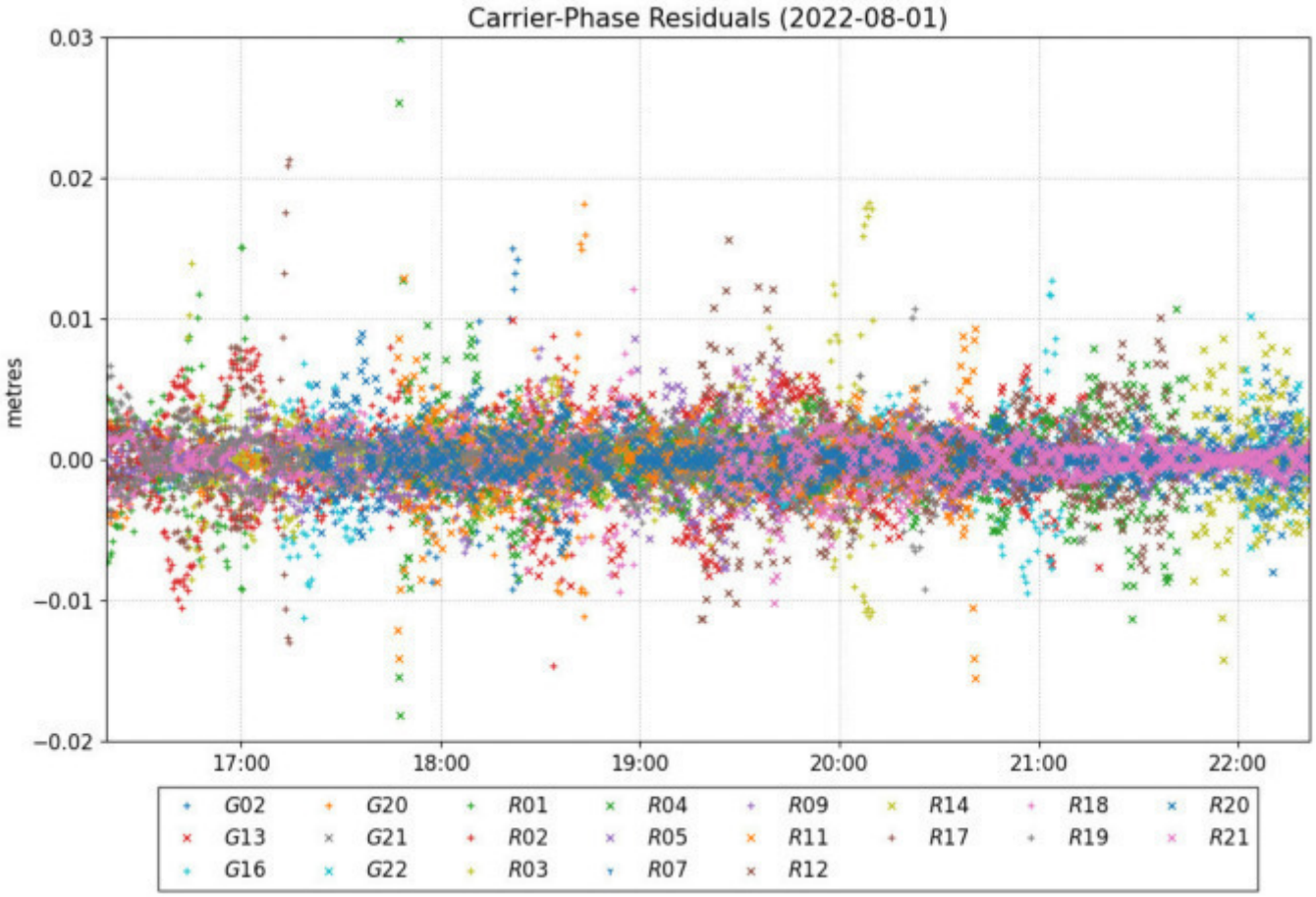

Final solution
Longitude Differences (2022-08-01)
SIG_PPP
metres
Sigma (metres)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00

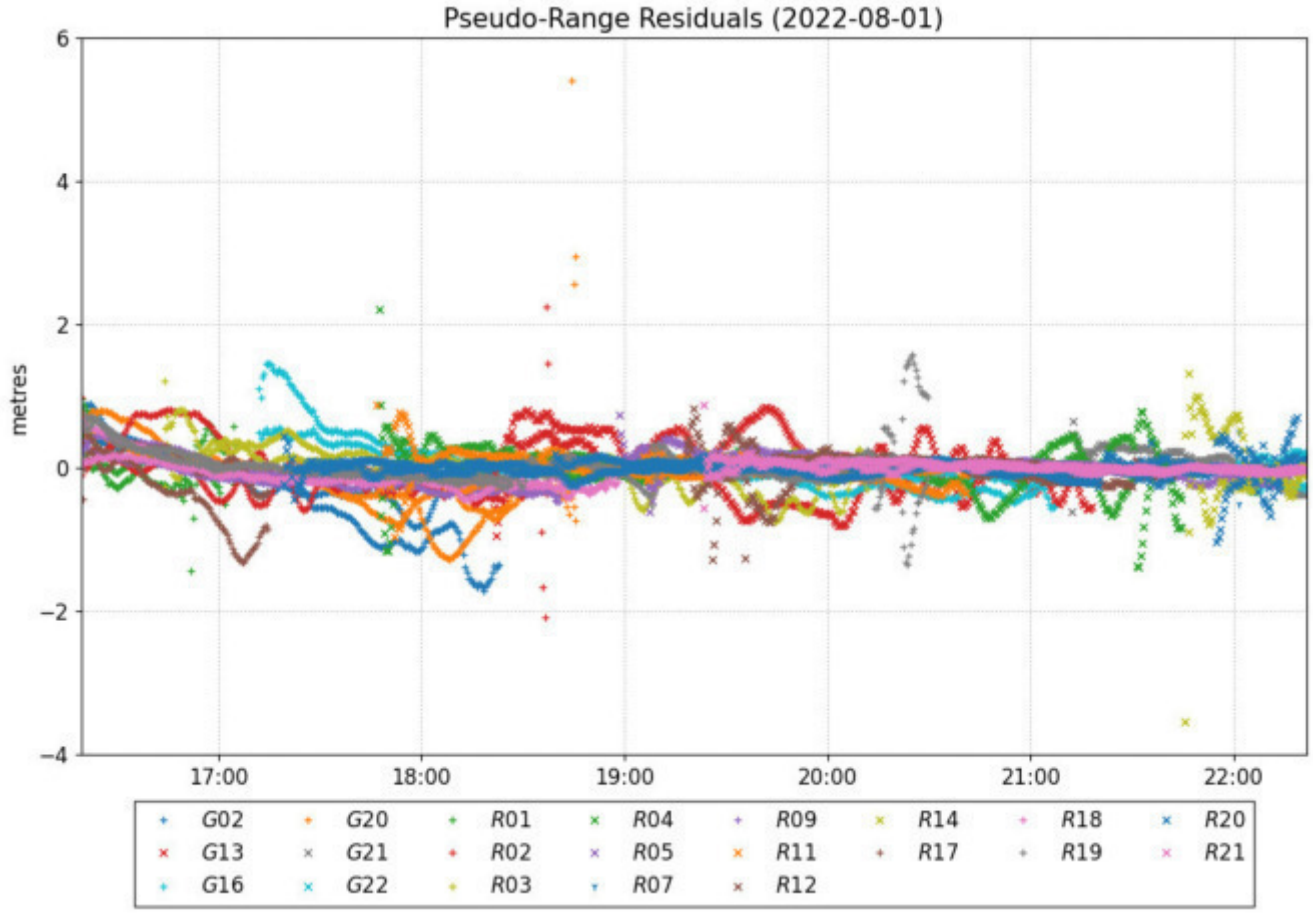

Final solution
Height Differences (2022-08-01)
SIG_PPP
metres
Sigma (metres)
5
4
3
2
1
0
−1
175
150
125
100
75
50
25
0
17:00
18:00
19:00
20:00
21:00
22:00

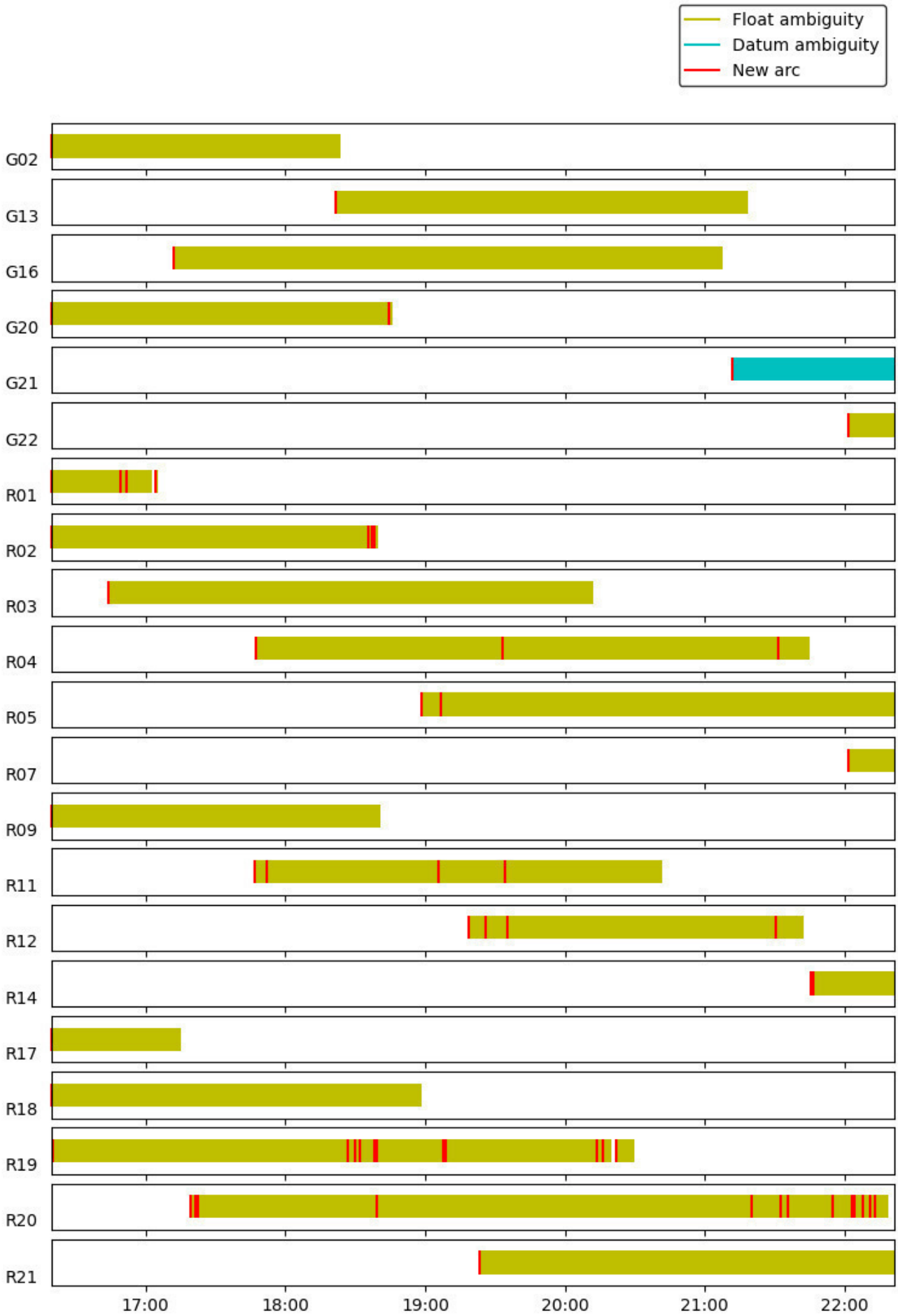

Estimated Tropospheric Zenith Delay (2022-08-01)
Sigma
metres
2.28
2.27
2.26
2.25
2.24
2.23
2.22
2.21
17:00
18:00
19:00
20:00
21:00
22:00


Station Clock Offset (2022-08-01)
Sigma
nanoseconds
Sigma (nanoseconds)
−20
−30
−40
−50
−60
−70
−80
−90
−100
7
6
5
4
3
2
1
0
17:00
18:00
19:00
20:00
21:00
22:00


Tracked Satellites and Reset Ambiguities (2022-08-01)
% amb. reset
Number of satellites
% Ambiguity Reset
13
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
17:00
18:00
19:00
20:00
21:00
22:00


Carrier-Phase Residuals (2022-08-01)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
17:00
18:00
19:00
20:00
21:00
22:00
G02 G20 R01 R04 R09 R14 R18 R20
G13 G21 R02 R05 R11 R17 R19 R21
G16 G22 R03 R07 R12


Pseudo-Range Residuals (2022-08-01)
metres
6
4
2
0
−2
−4
17:00
18:00
19:00
20:00
21:00
22:00
G02 G20 R01 R04 R09 R14 R18 R20
G13 G21 R02 R05 R11 R17 R19 R21
G16 G22 R03 R07 R12


Phase Ambiguity Status (2022-08-01)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G20
G21
G22
R01
R02
R03
R04
R05
R07
R09
R11
R12
R14
R17
R18
R19
R20
R21
17:00
18:00
19:00
20:00
21:00
22:00

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Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220802-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-02 19:41:30.00	2022-08-03 02:37:00.00	6:55:30
Processing Time		**Product Type**
22:22:17 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.84 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.203m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220802-GS15base.yyo

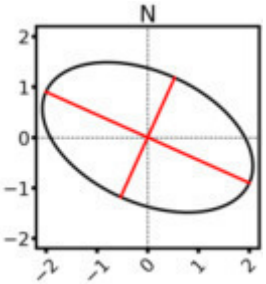
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32426"	-132° 43' 53.97722"	712.197 m
Sigmas(95%)	0.012 m	0.017 m	0.031 m
A priori*	60° 10' 26.30177"	-132° 43' 54.13182"	714.845 m
Estimated – A priori	0.696 m	2.384 m	-2.648 m

Orthometric Height CGVD28 (HTv2.0)†

708.421 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 2.2 cm
semi-minor: 1.3 cm
semi-major azimuth: -65° 12' 43.44"



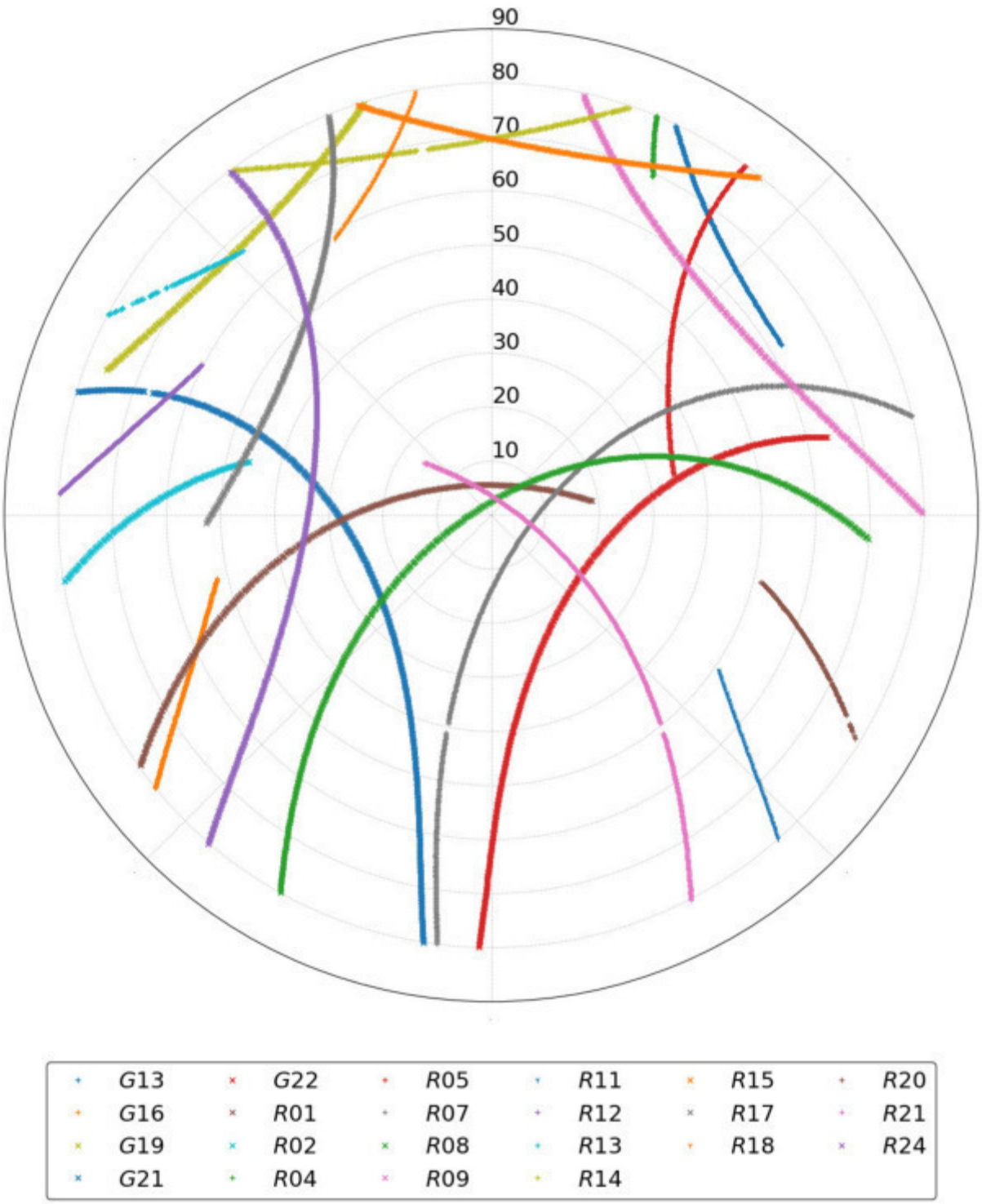
UTM (North) Zone 8

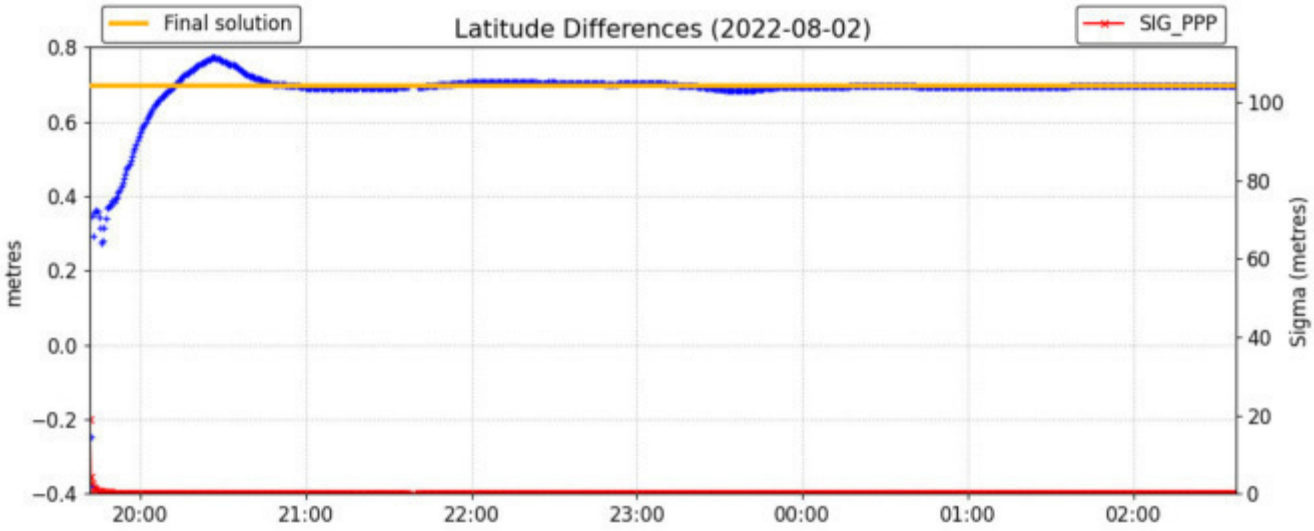
6672948.575 m (N)
625841.221 m (E)

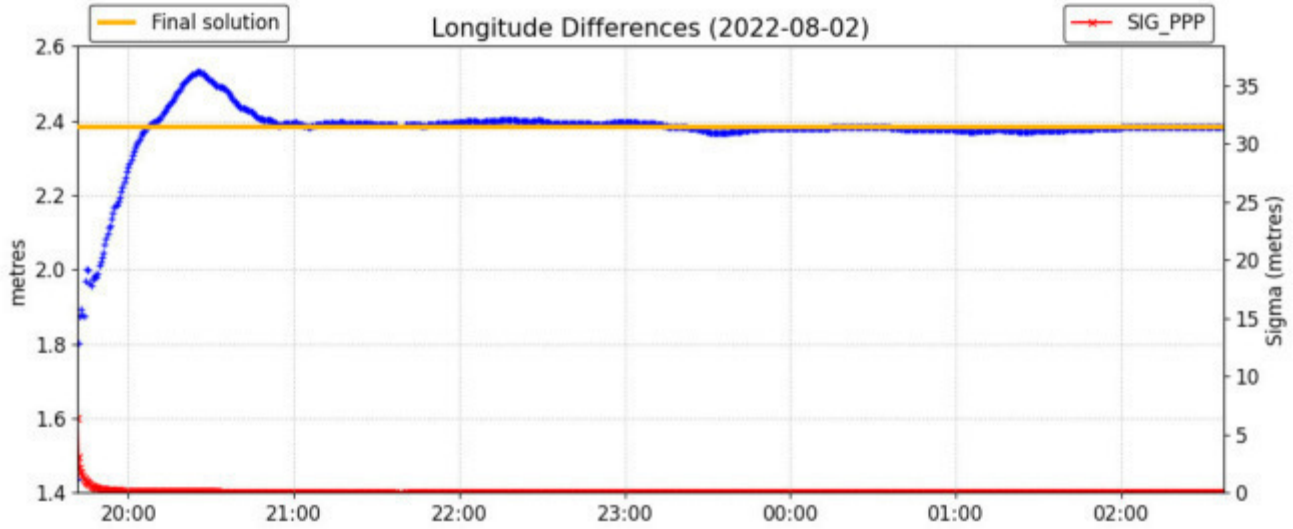
Scale Factors
0.99979406 (point)
0.99968263 (combined)

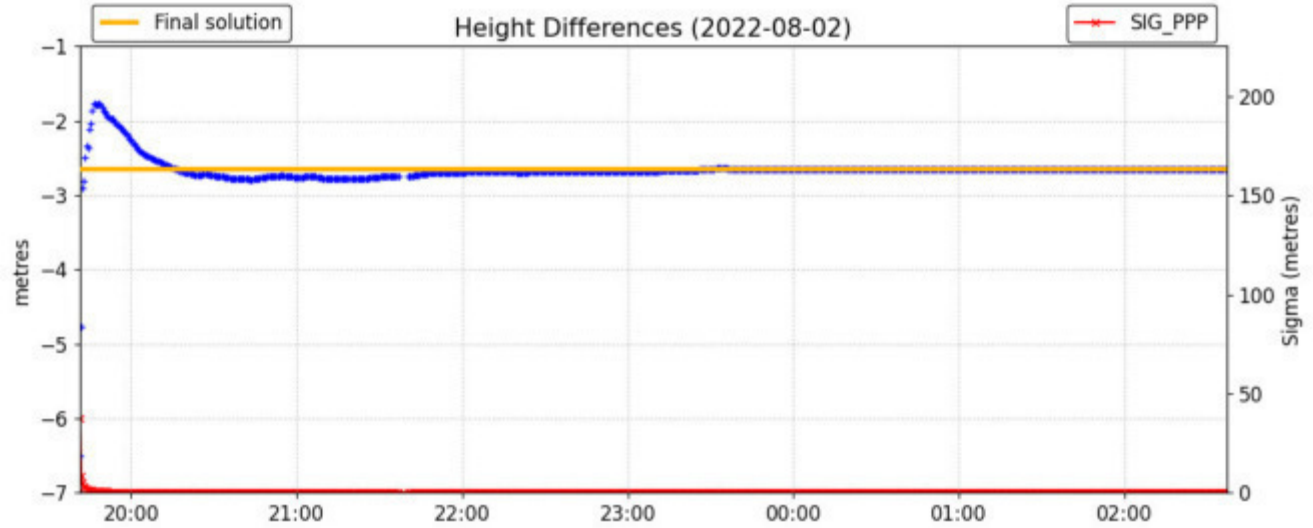
*(Coordinates from RINEX header used as a priori position)

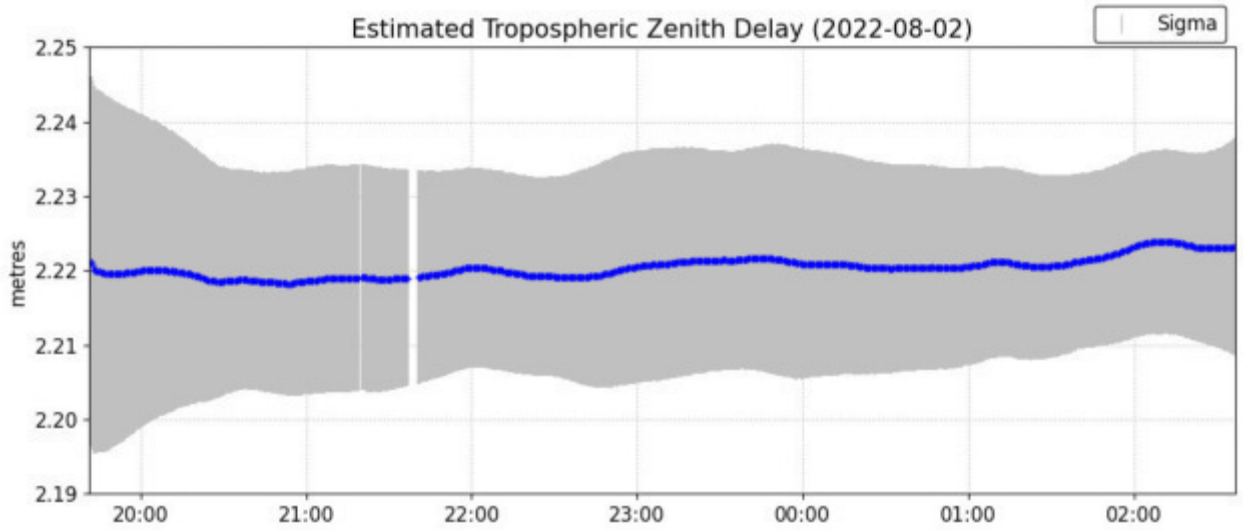
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

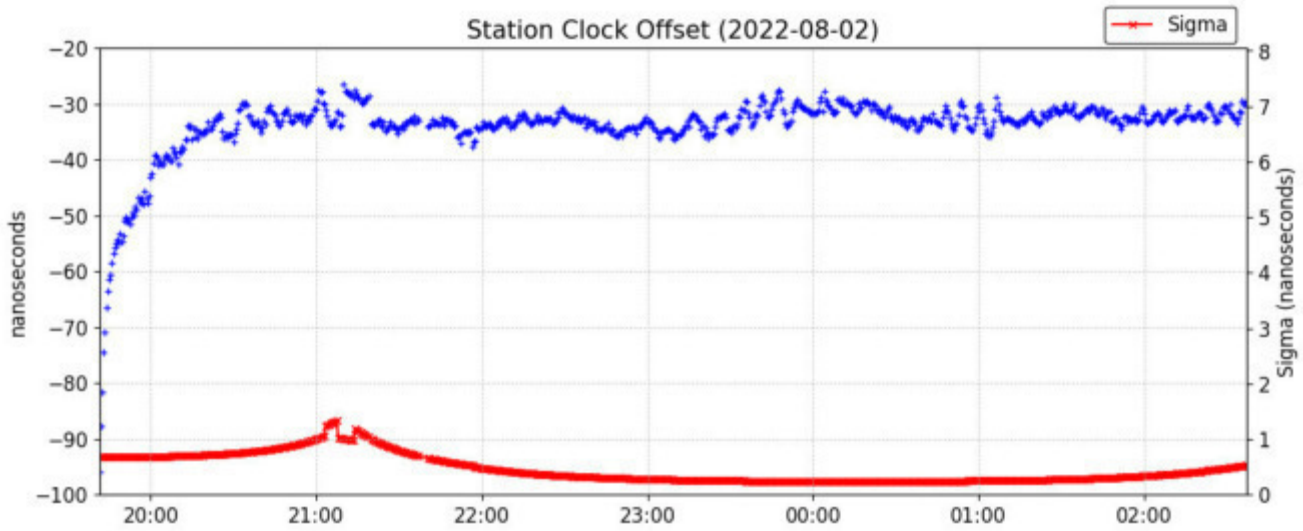

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G13
G16
G19
G21
G22
R01
R02
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R20
R21
R24

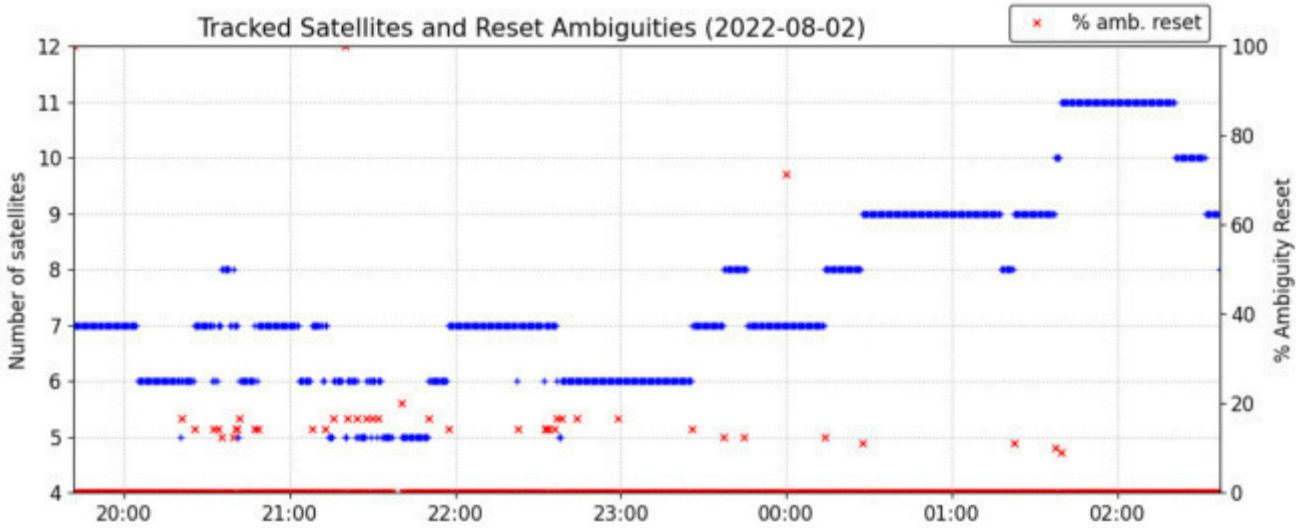

Final solution
Latitude Differences (2022-08-02)
SIG_PPP
metres
Sigma (metres)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
100
80
60
40
20
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

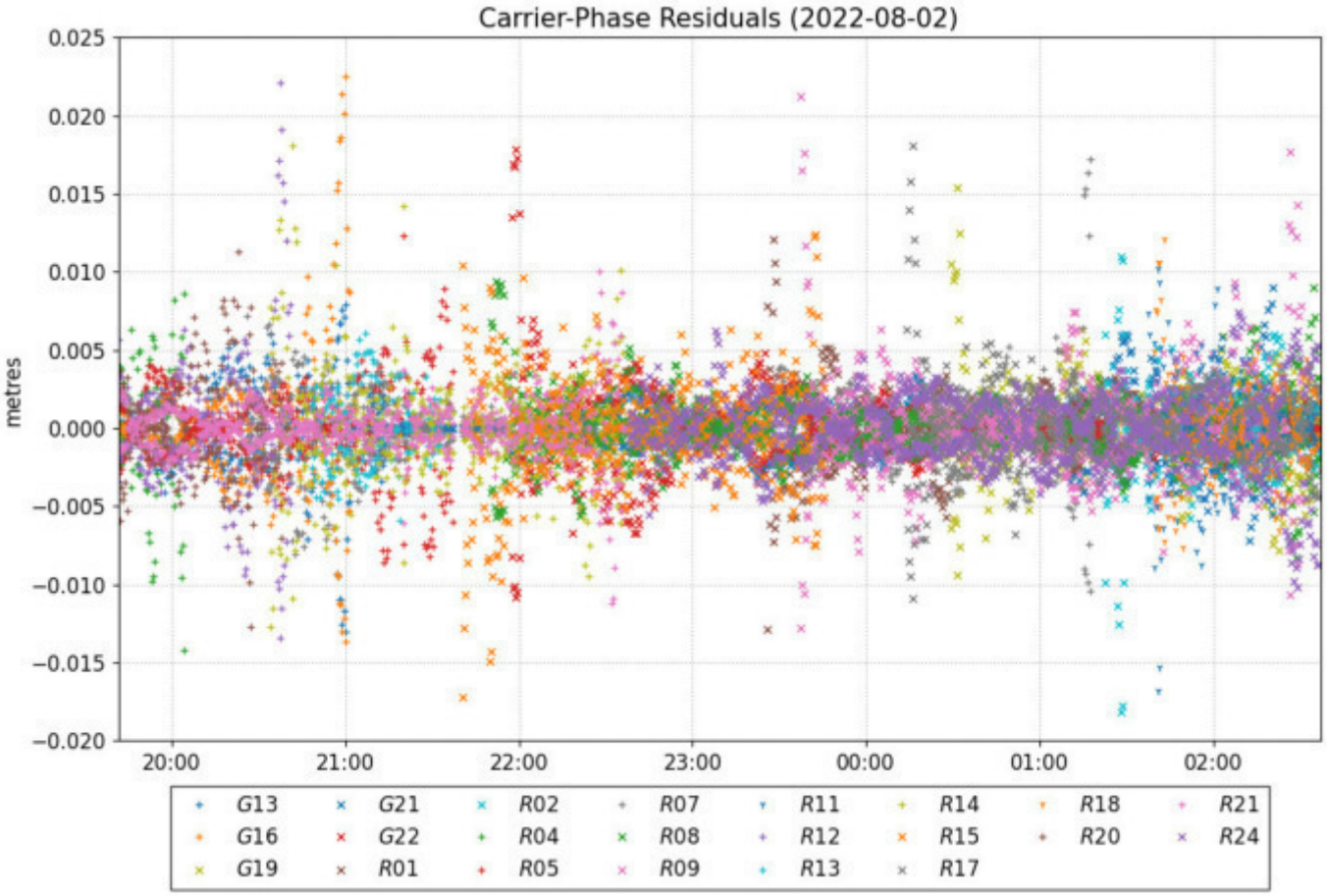

Final solution
Longitude Differences (2022-08-02)
SIG_PPP
metres
Sigma (metres)
2.6
2.4
2.2
2.0
1.8
1.6
1.4
35
30
25
20
15
10
5
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

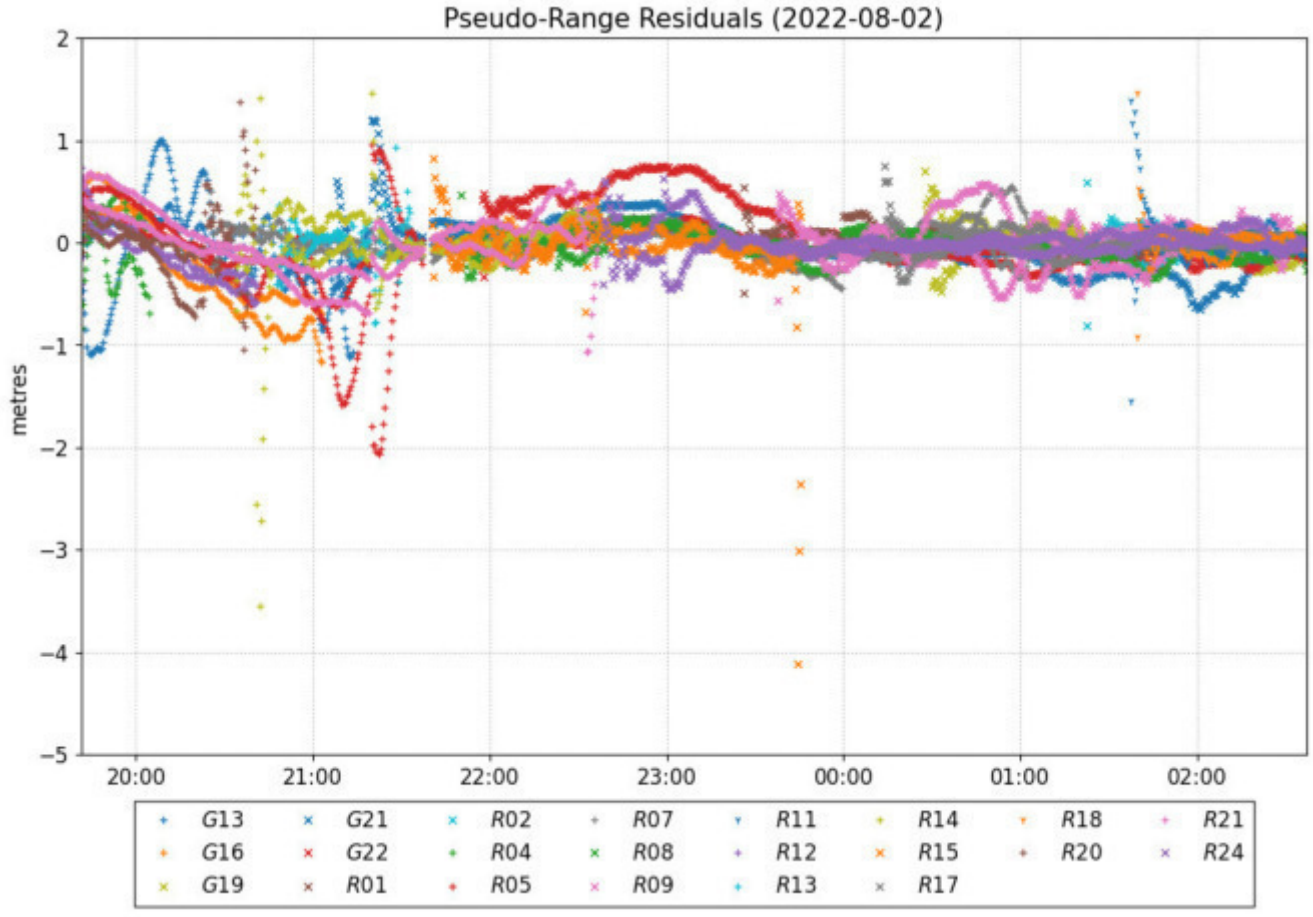

Final solution
Height Differences (2022-08-02)
SIG_PPP
metres
Sigma (metres)
−1
−2
−3
−4
−5
−6
−7
200
150
100
50
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

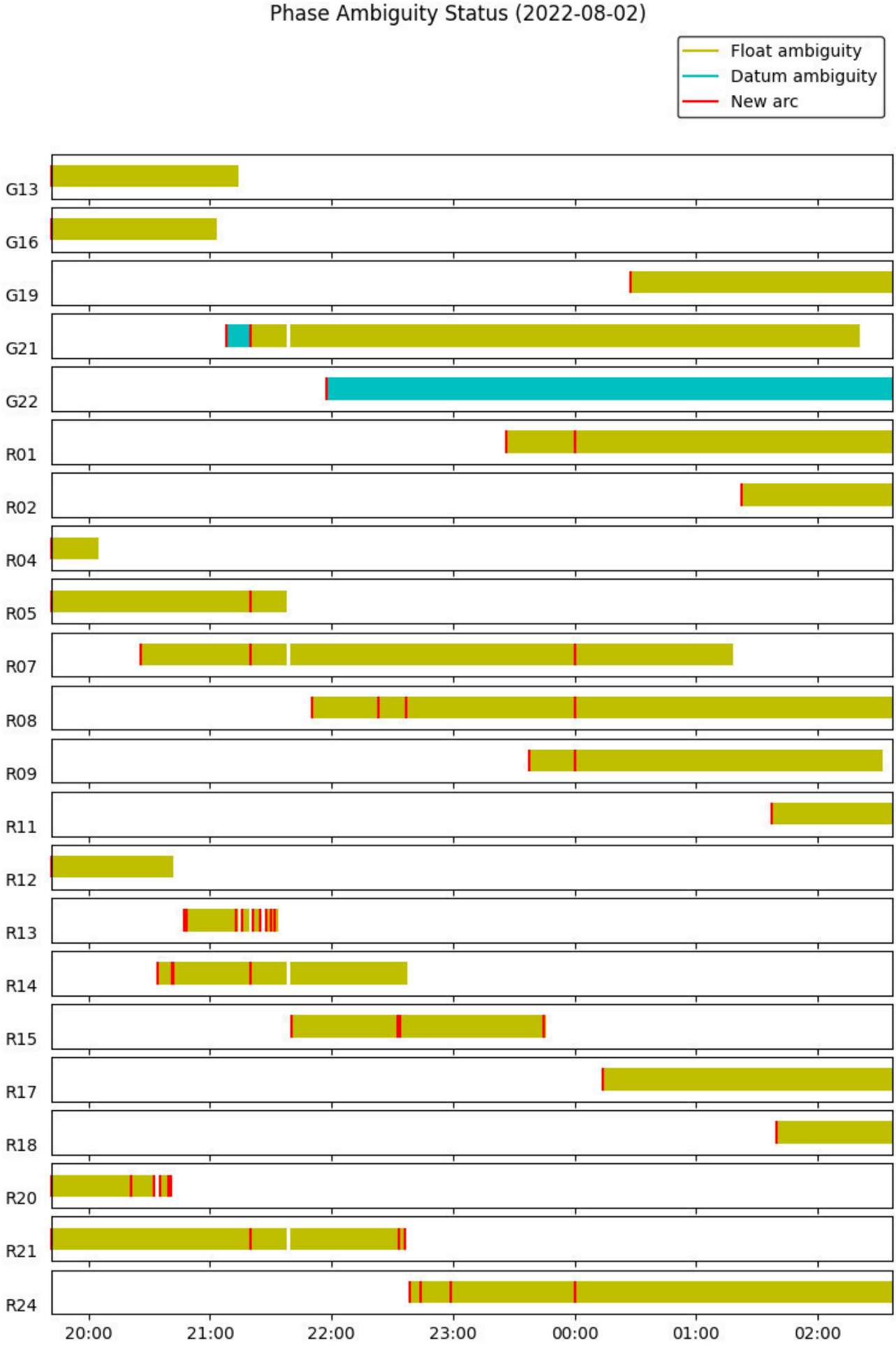

Estimated Tropospheric Zenith Delay (2022-08-02)
Sigma
metres
2.25
2.24
2.23
2.22
2.21
2.20
2.19
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Station Clock Offset (2022-08-02)
Sigma
nanoseconds
Sigma (nanoseconds)
−20
−30
−40
−50
−60
−70
−80
−90
−100
8
7
6
5
4
3
2
1
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Tracked Satellites and Reset Ambiguities (2022-08-02)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Carrier-Phase Residuals (2022-08-02)
metres
0.025
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
−0.020
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G13 G21 R02 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R20 R24
G19 R01 R05 R09 R13 R17


Pseudo-Range Residuals (2022-08-02)
metres
2
1
0
−1
−2
−3
−4
−5
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G13 G21 R02 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R20 R24
G19 R01 R05 R09 R13 R17


Phase Ambiguity Status (2022-08-02)
Float ambiguity
Datum ambiguity
New arc
G13
G16
G19
G21
G22
R01
R02
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R20
R21
R24
20:00
21:00
22:00
23:00
00:00
01:00
02:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220803-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-03 15:39:00.00	2022-08-04 01:12:30.00	9:33:30
Processing Time		**Product Type**
22:22:18 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.35 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.202m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220803-GS15base.yyo

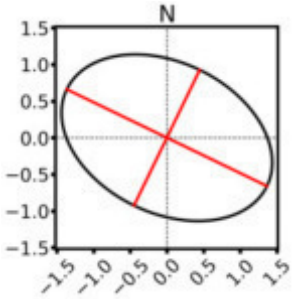
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32430"	-132° 43' 53.97764"	712.180 m
Sigmas(95%)	0.009 m	0.011 m	0.025 m
A priori*	60° 10' 26.33922"	-132° 43' 54.09730"	713.672 m
Estimated – A priori	-0.462 m	1.845 m	-1.492 m

Orthometric Height CGVD28 (HTv2.0)†

708.404 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 1.5 cm
semi-minor: 1.0 cm
semi-major azimuth: -64° 48' 45.39"



UTM (North) Zone 8

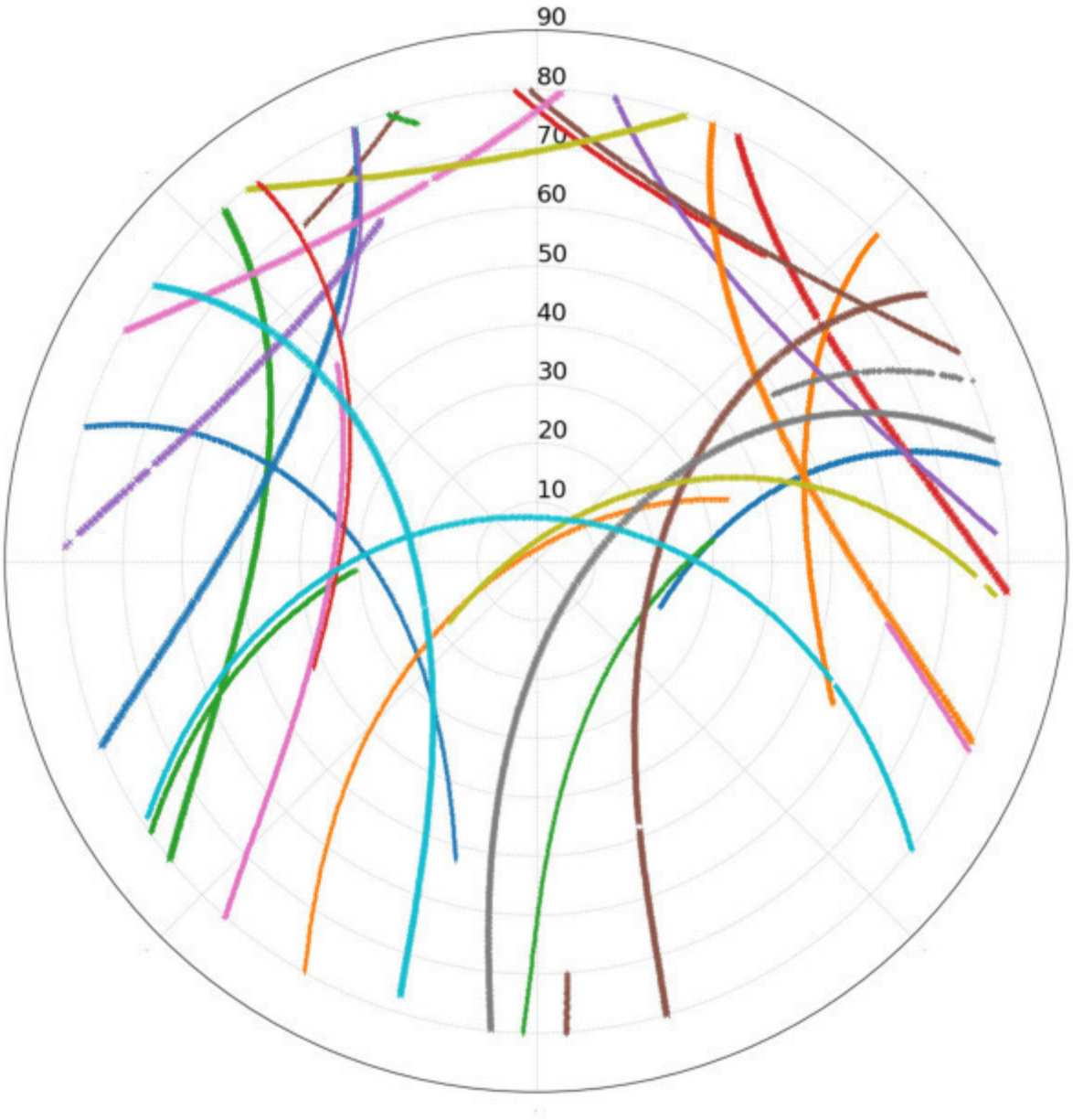
6672948.576 m (N)
625841.214 m (E)

Scale Factors
0.99979406 (point)
0.99968263 (combined)

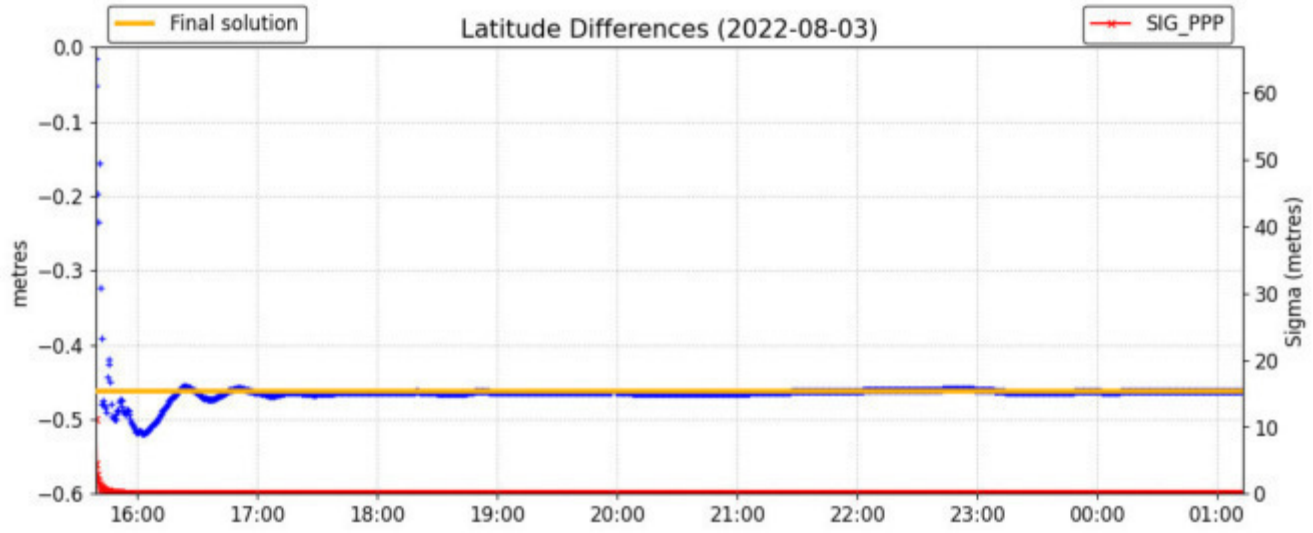
*(Coordinates from RINEX header used as a priori position)

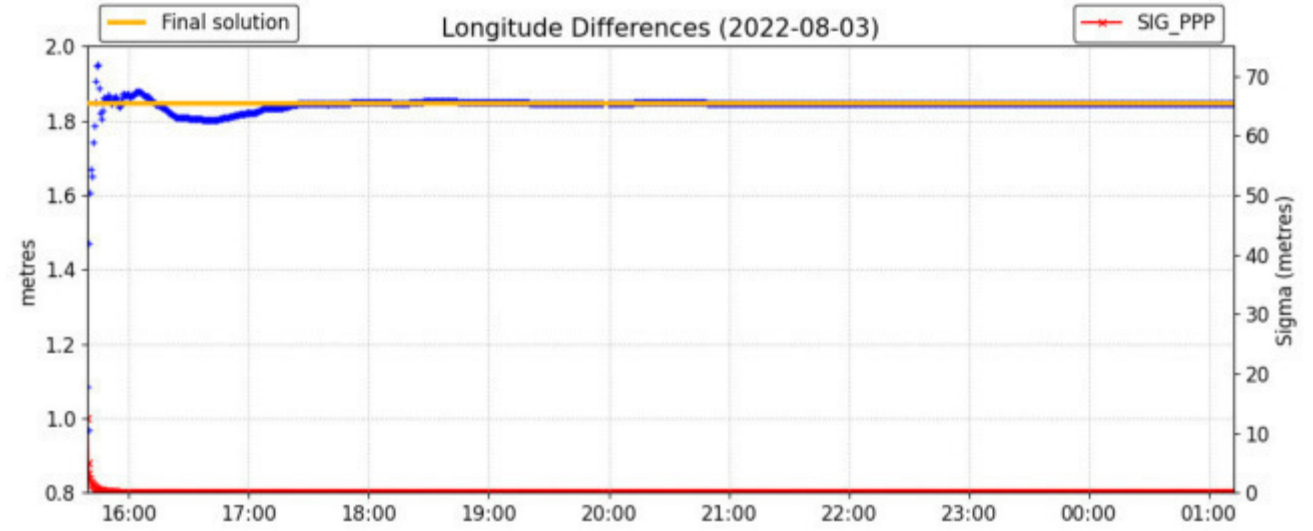
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

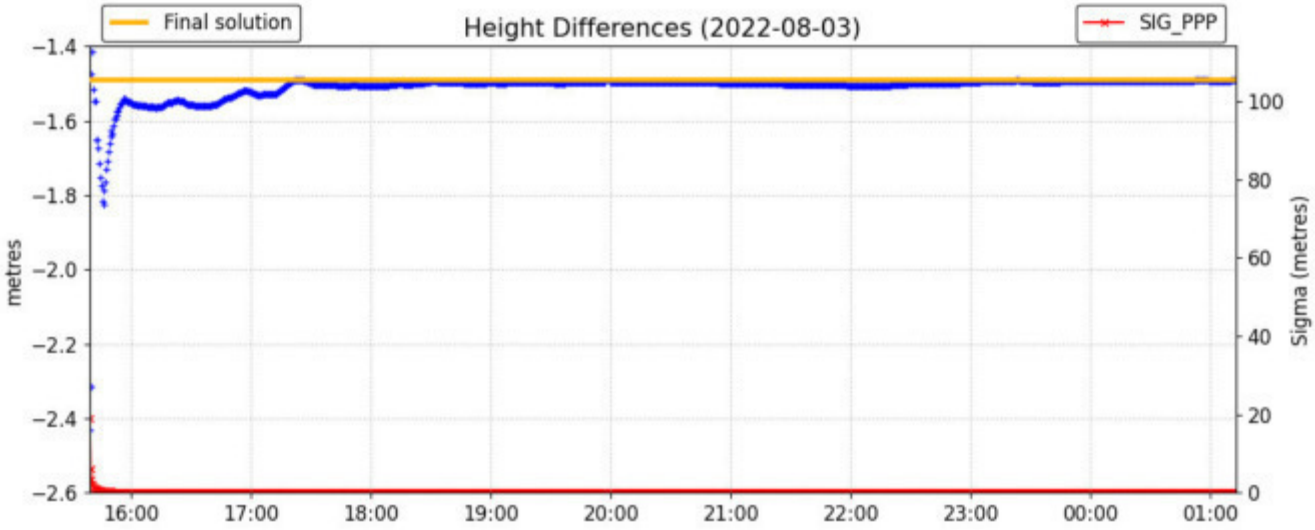
Satellite Sky Distribution

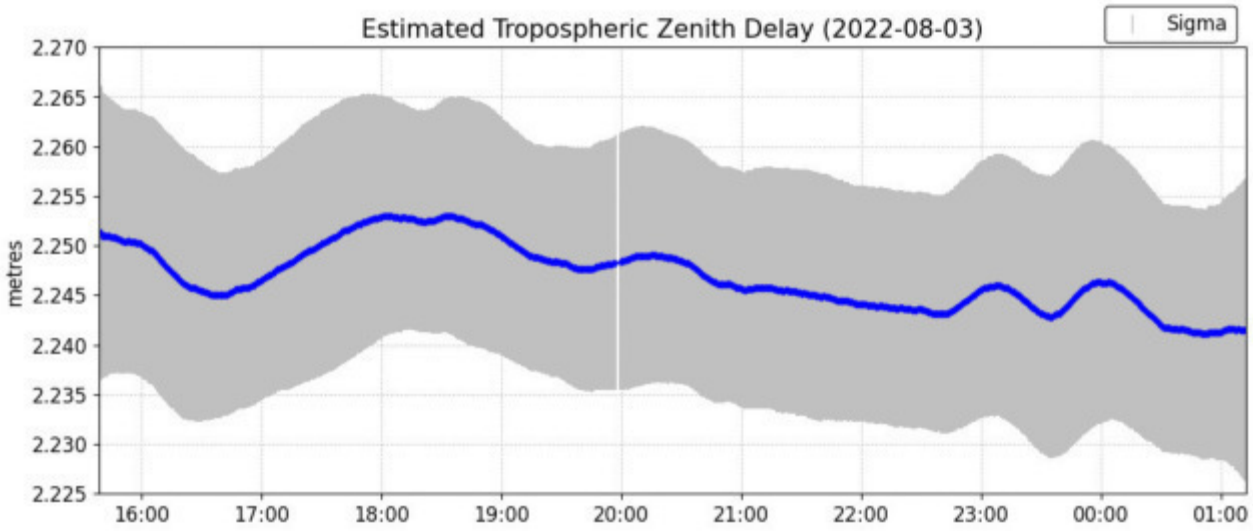


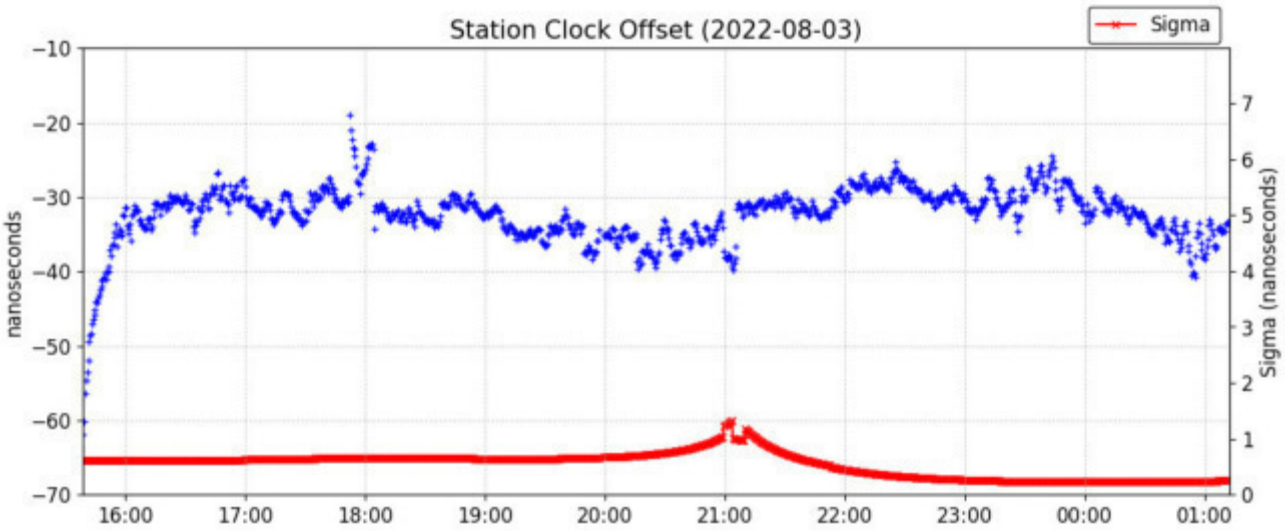
G02	G21	R04	R09	R14	R19
G13	G22	R05	R11	R15	R20
G16	R01	R07	R12	R17	R21
G19	R02	R08	R13	R18	R24
G20	R03				

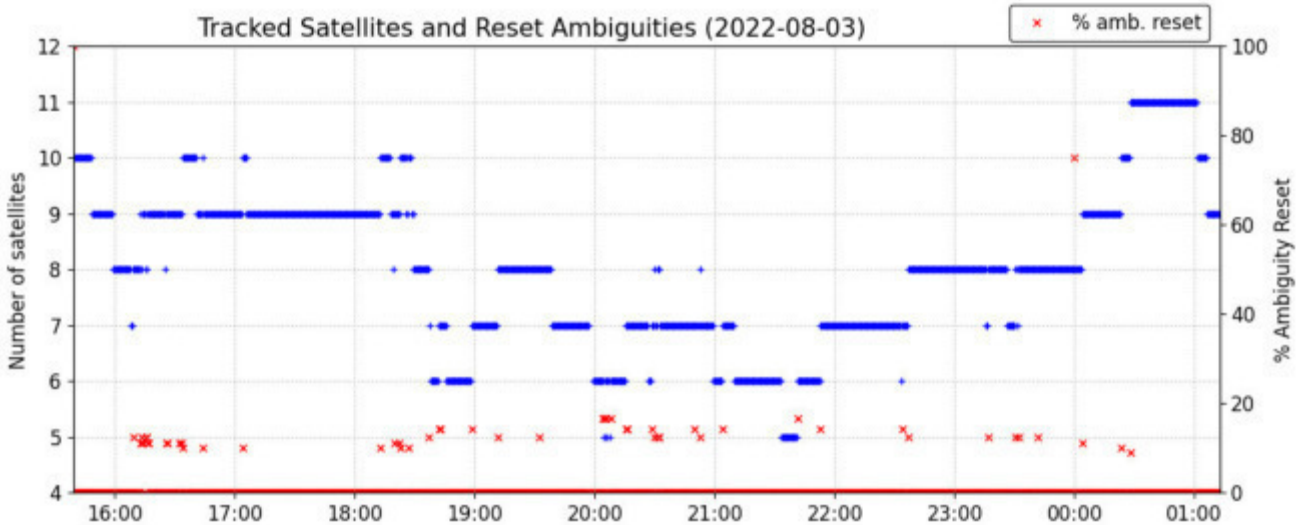

Final solution
Latitude Differences (2022-08-03)
SIG_PPP
metres
Sigma (metres)
0.0
−0.1
−0.2
−0.3
−0.4
−0.5
−0.6
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

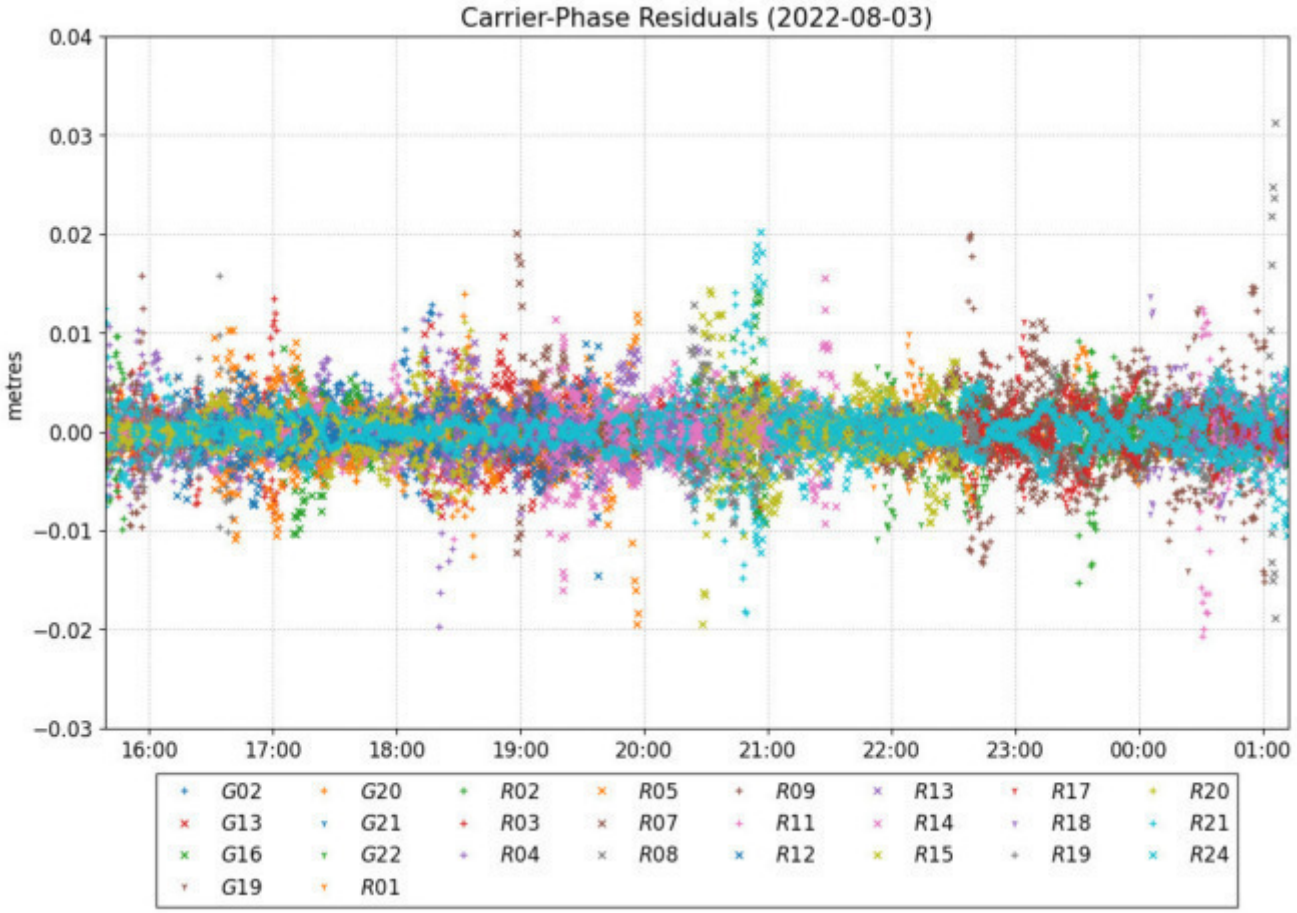

Final solution
Longitude Differences (2022-08-03)
SIG_PPP
metres
Sigma (metres)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
70
60
50
40
30
20
10
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

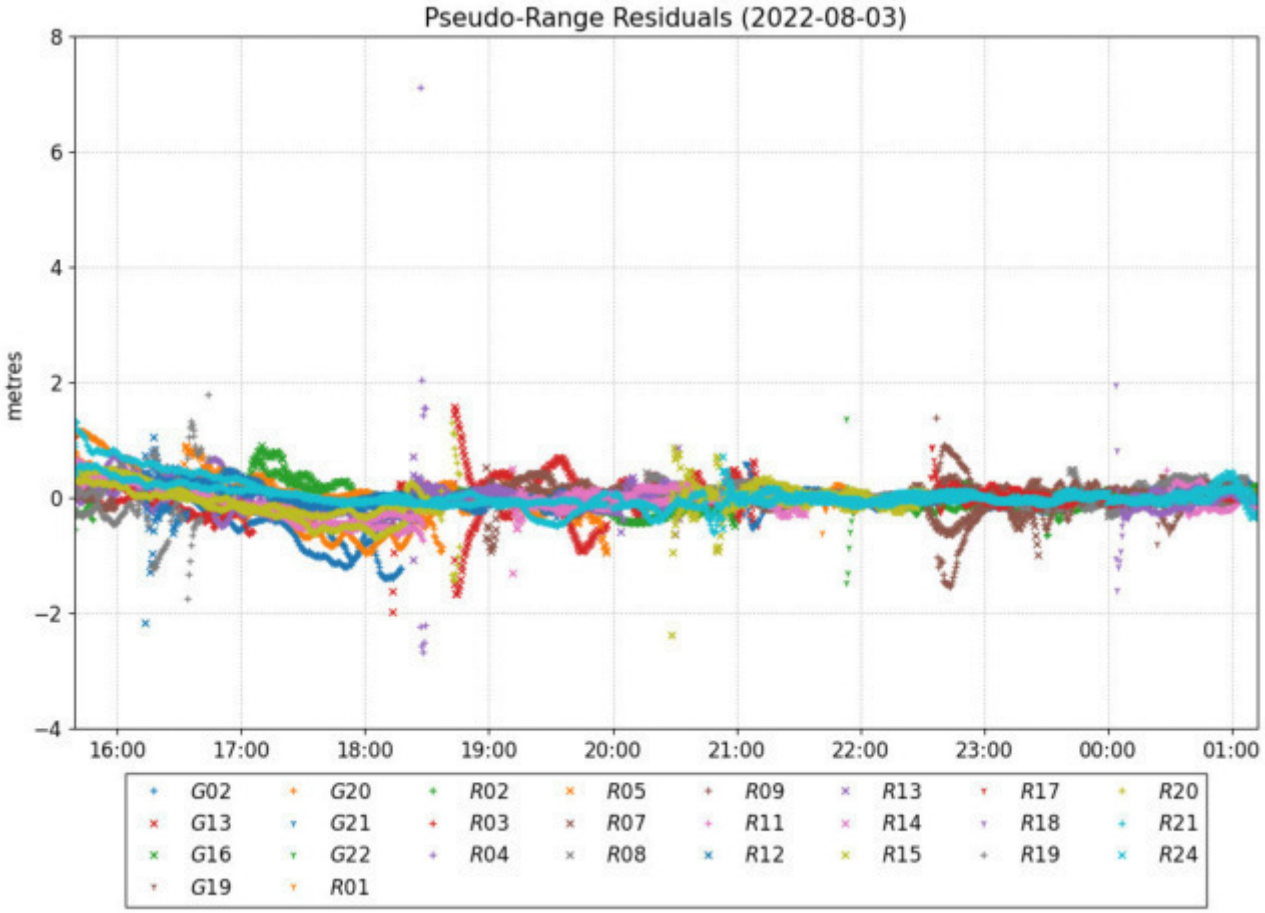

Final solution
Height Differences (2022-08-03)
SIG_PPP
metres
Sigma (metres)
−1.4
−1.6
−1.8
−2.0
−2.2
−2.4
−2.6
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

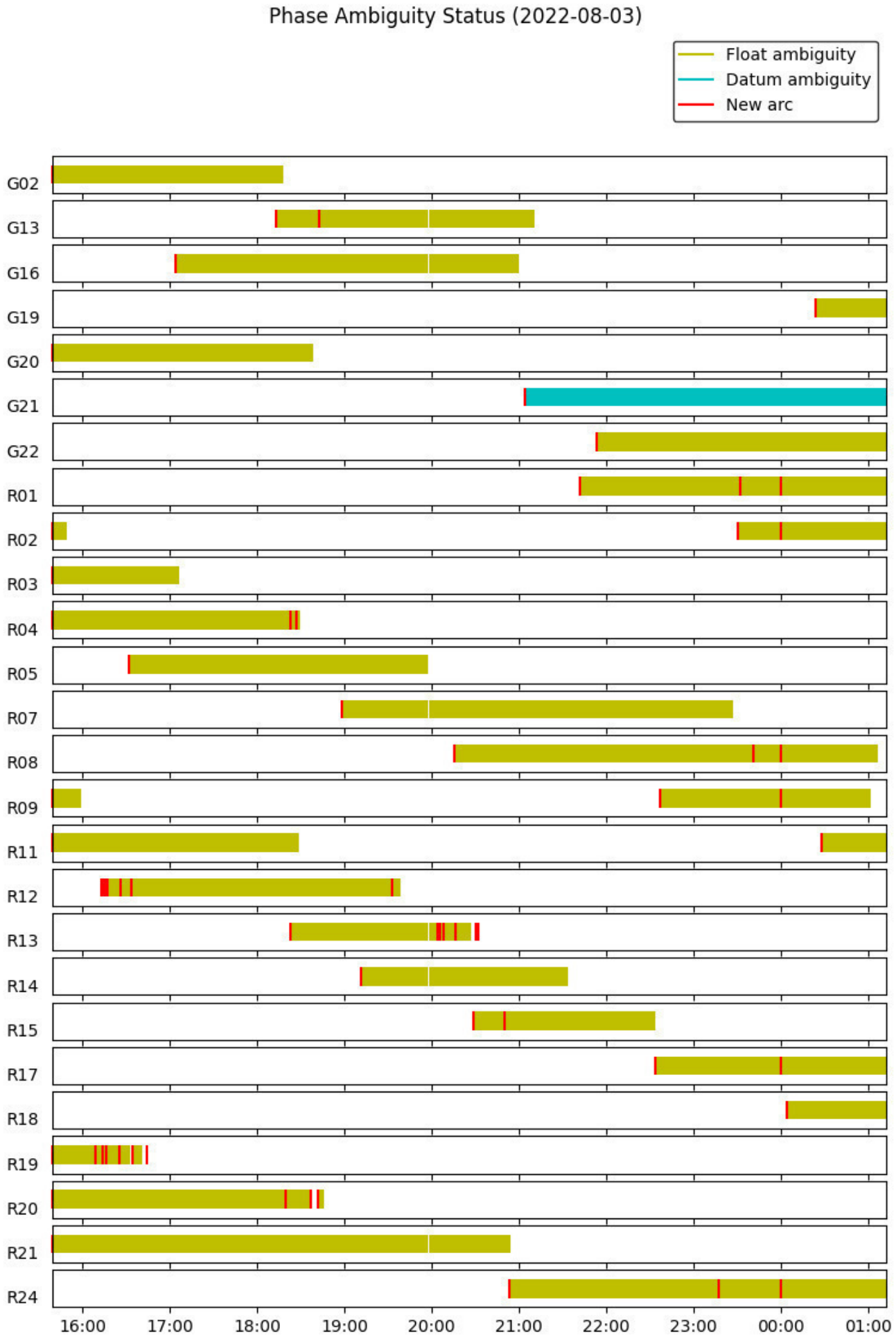

Estimated Tropospheric Zenith Delay (2022-08-03)
Sigma
metres
2.270
2.265
2.260
2.255
2.250
2.245
2.240
2.235
2.230
2.225
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Station Clock Offset (2022-08-03)
Sigma
nanoseconds
Sigma (nanoseconds)
−10
−20
−30
−40
−50
−60
−70
7
6
5
4
3
2
1
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Tracked Satellites and Reset Ambiguities (2022-08-03)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
4
100
80
60
40
20
0
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00


Carrier-Phase Residuals (2022-08-03)
metres
0.04
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Pseudo-Range Residuals (2022-08-03)
metres
8
6
4
2
0
−2
−4
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
G02 G20 R02 R05 R09 R13 R17 R20
G13 G21 R03 R07 R11 R14 R18 R21
G16 G22 R04 R08 R12 R15 R19 R24
G19 R01


Phase Ambiguity Status (2022-08-03)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G19
G20
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00

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Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220804-GS15base_2.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-05 19:27:00.00	2022-08-06 02:45:00.00	7:18:00
Processing Time		**Product Type**
23:00:22 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGPPNULLANTENNA	Unknown	H:1.266m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220804-GS15base_2.yyo

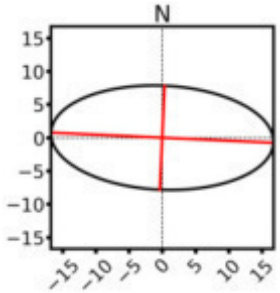
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32414"	-132° 43' 53.97711"	712.182 m
Sigmas(95%)	0.006 m	0.013 m	0.022 m
A priori*	60° 10' 26.28710"	-132° 43' 54.12901"	714.003 m
Estimated – A priori	1.146 m	2.342 m	-1.821 m

Orthometric Height CGVD28 (HTv2.0)†

708.407 m

(click for height reference information)

95% Error Ellipse (mm)
semi-major: 17 mm
semi-minor: 8 mm
semi-major azimuth: -87° 36' 50.39"



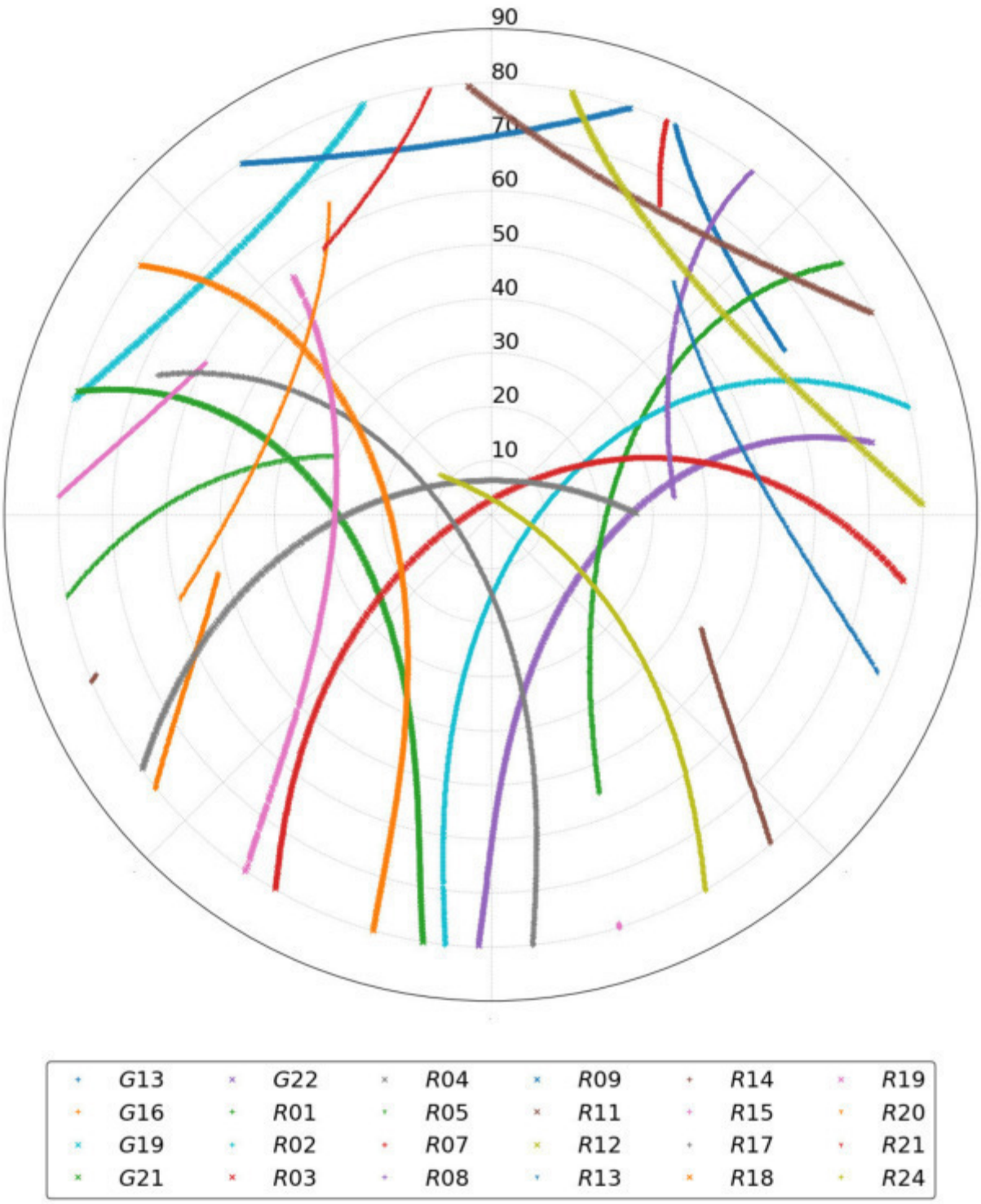
UTM (North) Zone 8

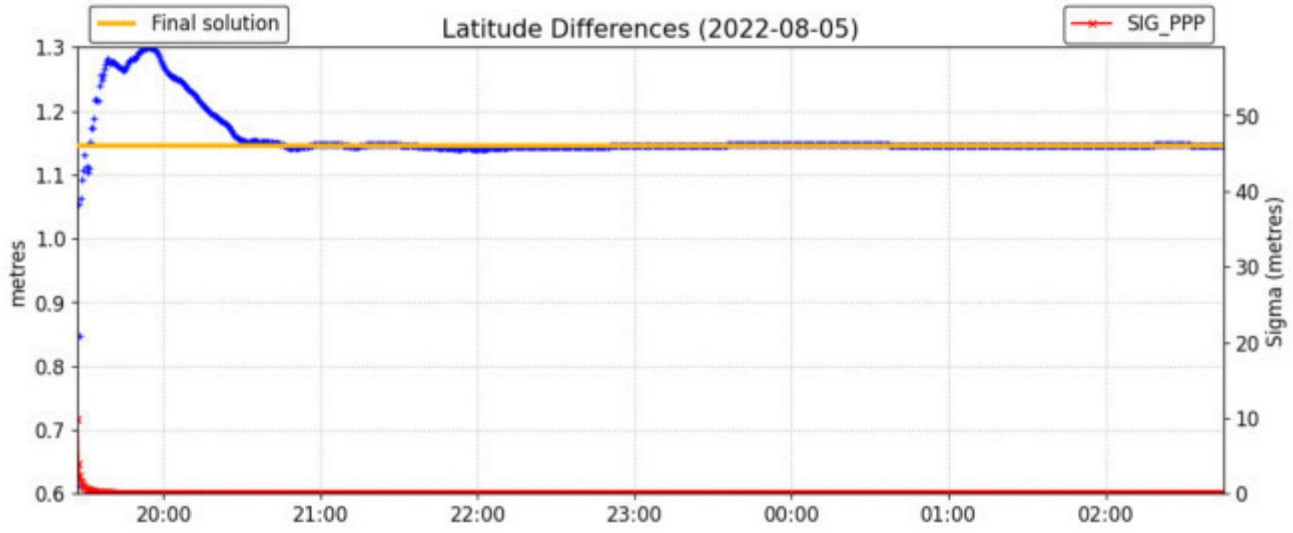
6672948.571 m (N)
625841.223 m (E)

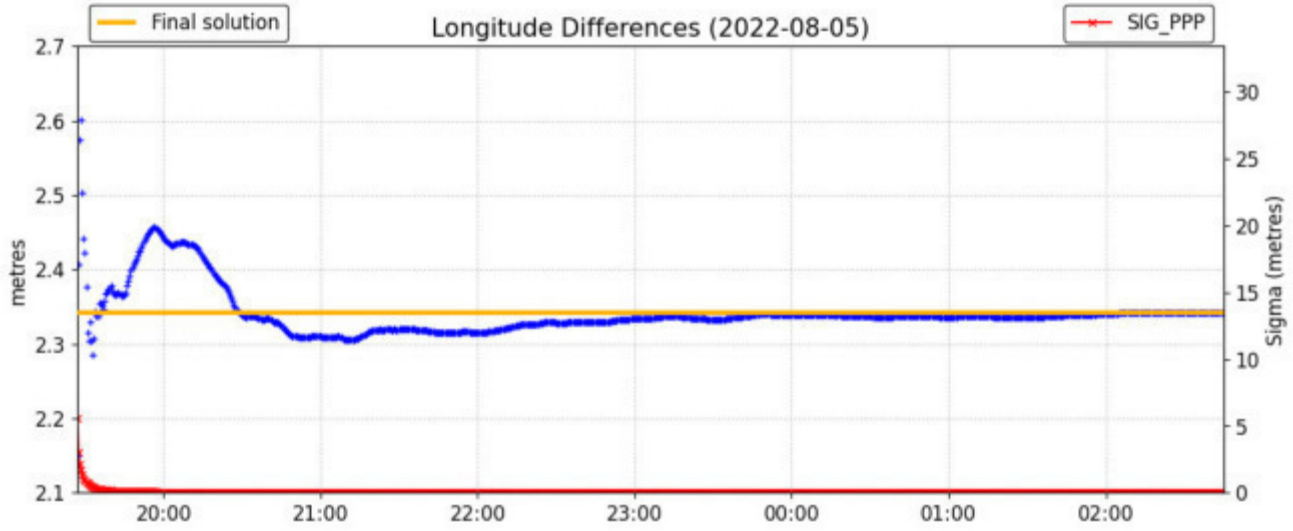
Scale Factors
0.99979406 (point)
0.99968263 (combined)

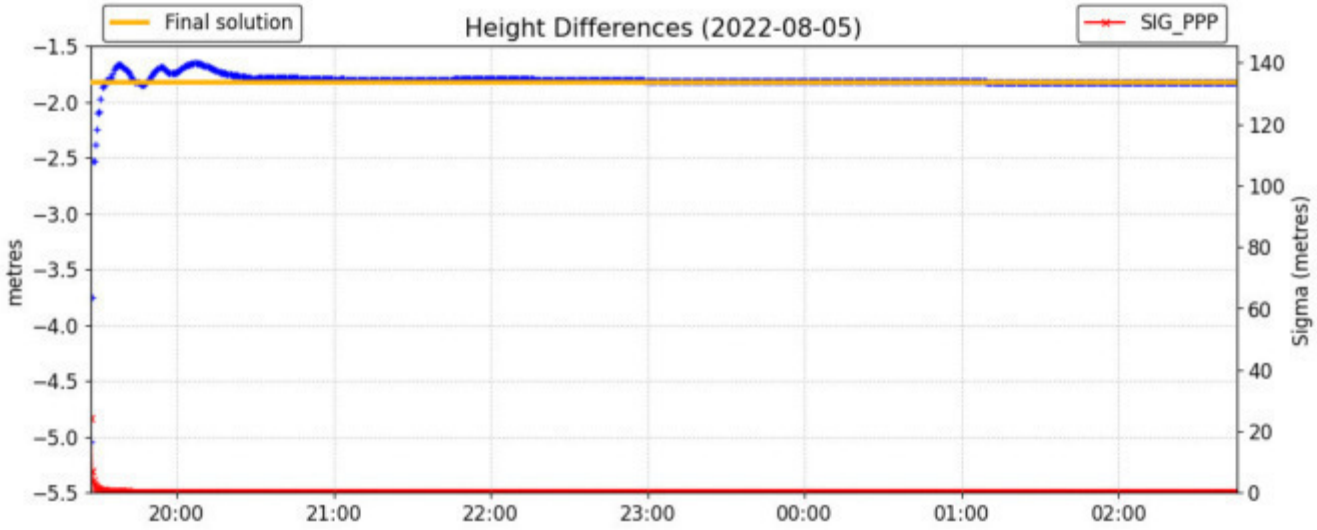
*(Coordinates from RINEX header used as a priori position)

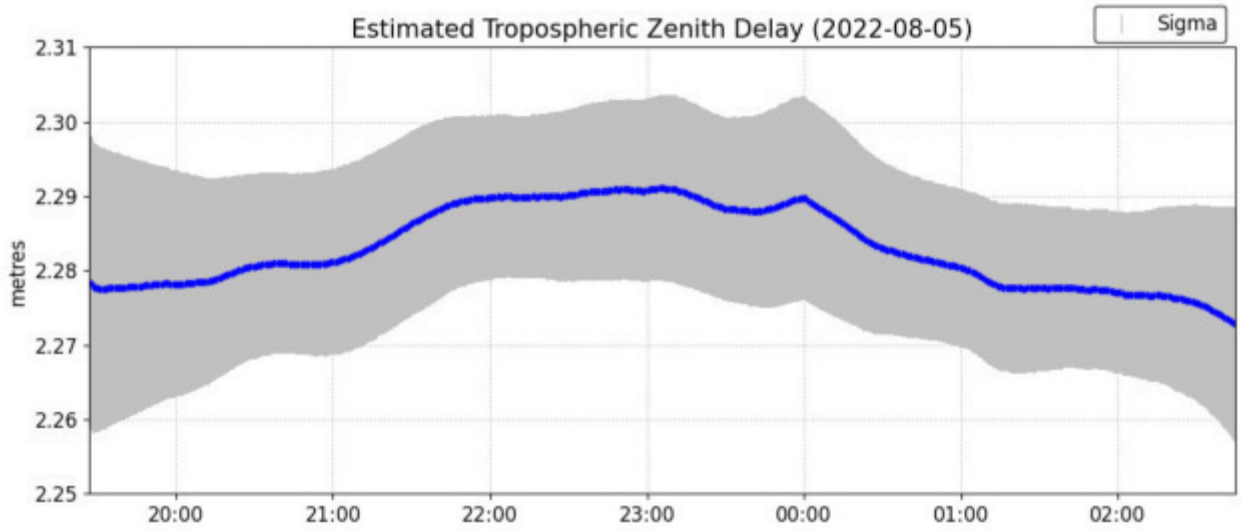
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

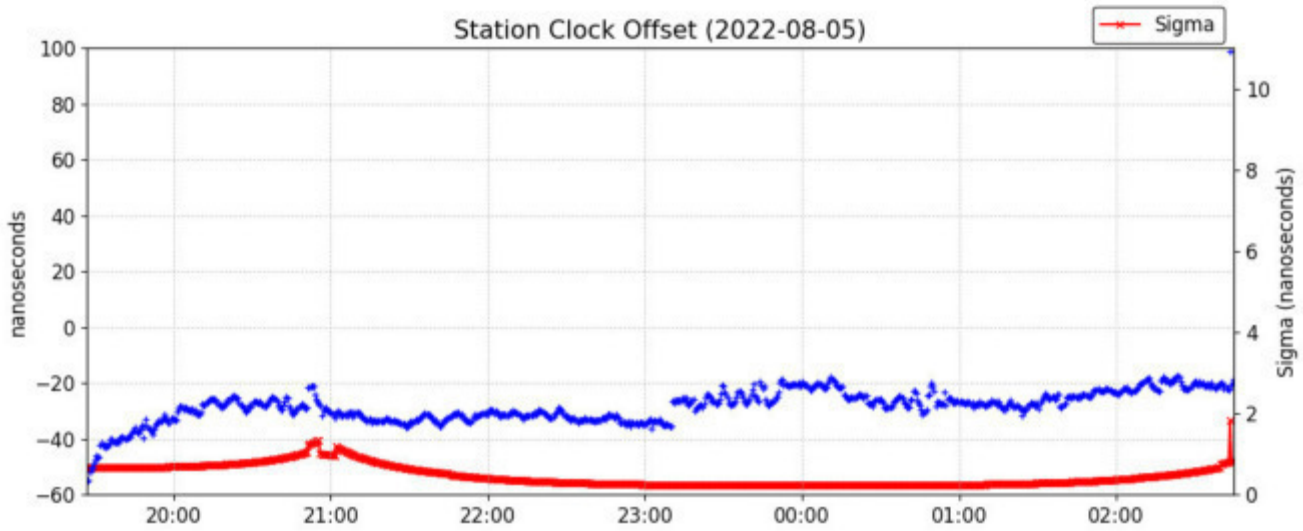

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G13
G16
G19
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24

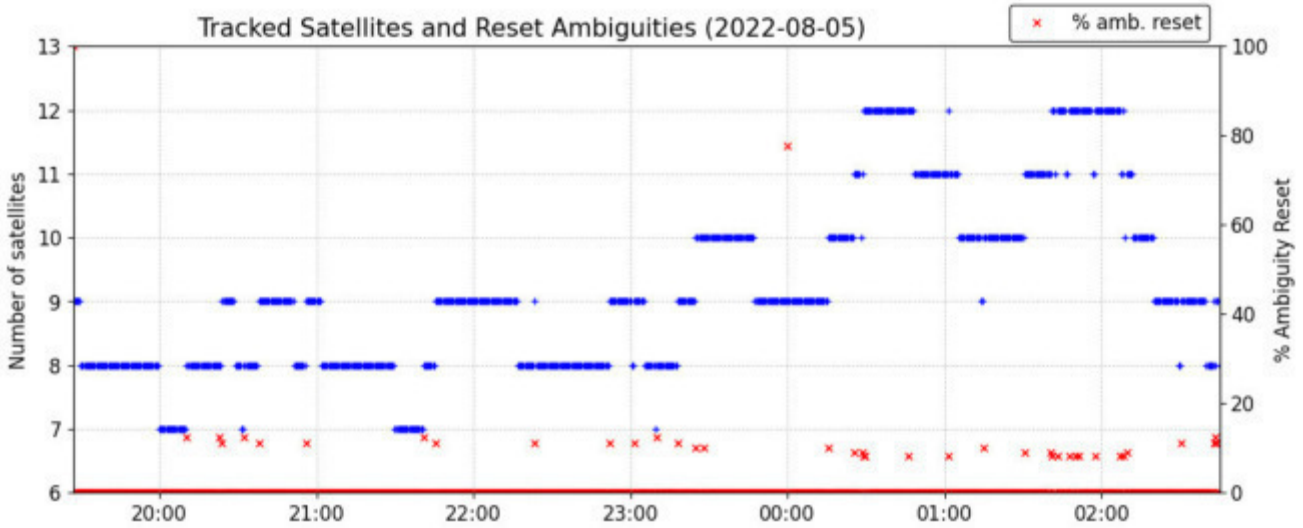

Final solution
Latitude Differences (2022-08-05)
SIG_PPP
metres
Sigma (metres)
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
50
40
30
20
10
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

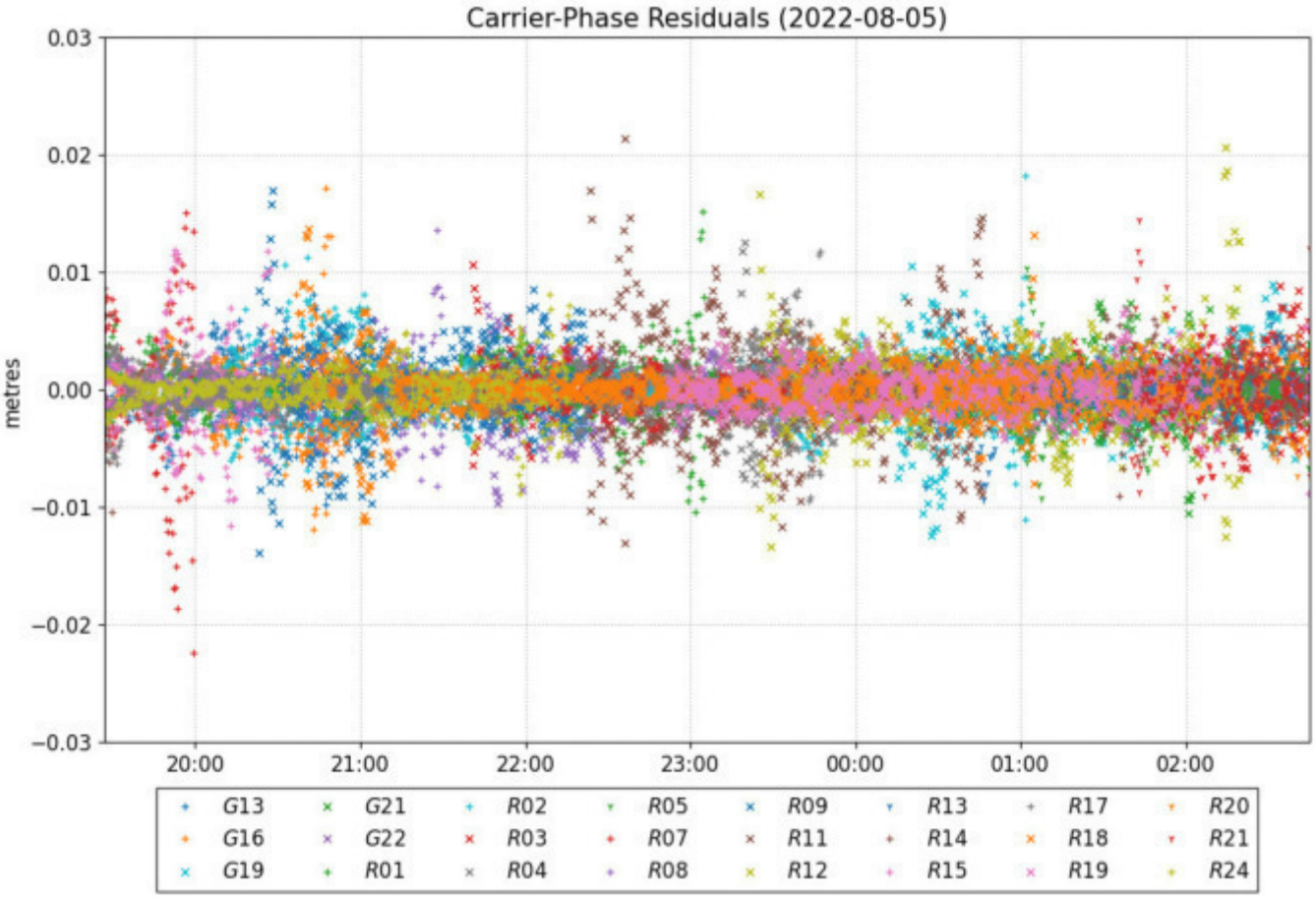

Final solution
Longitude Differences (2022-08-05)
SIG_PPP
metres
Sigma (metres)
2.7
2.6
2.5
2.4
2.3
2.2
2.1
30
25
20
15
10
5
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

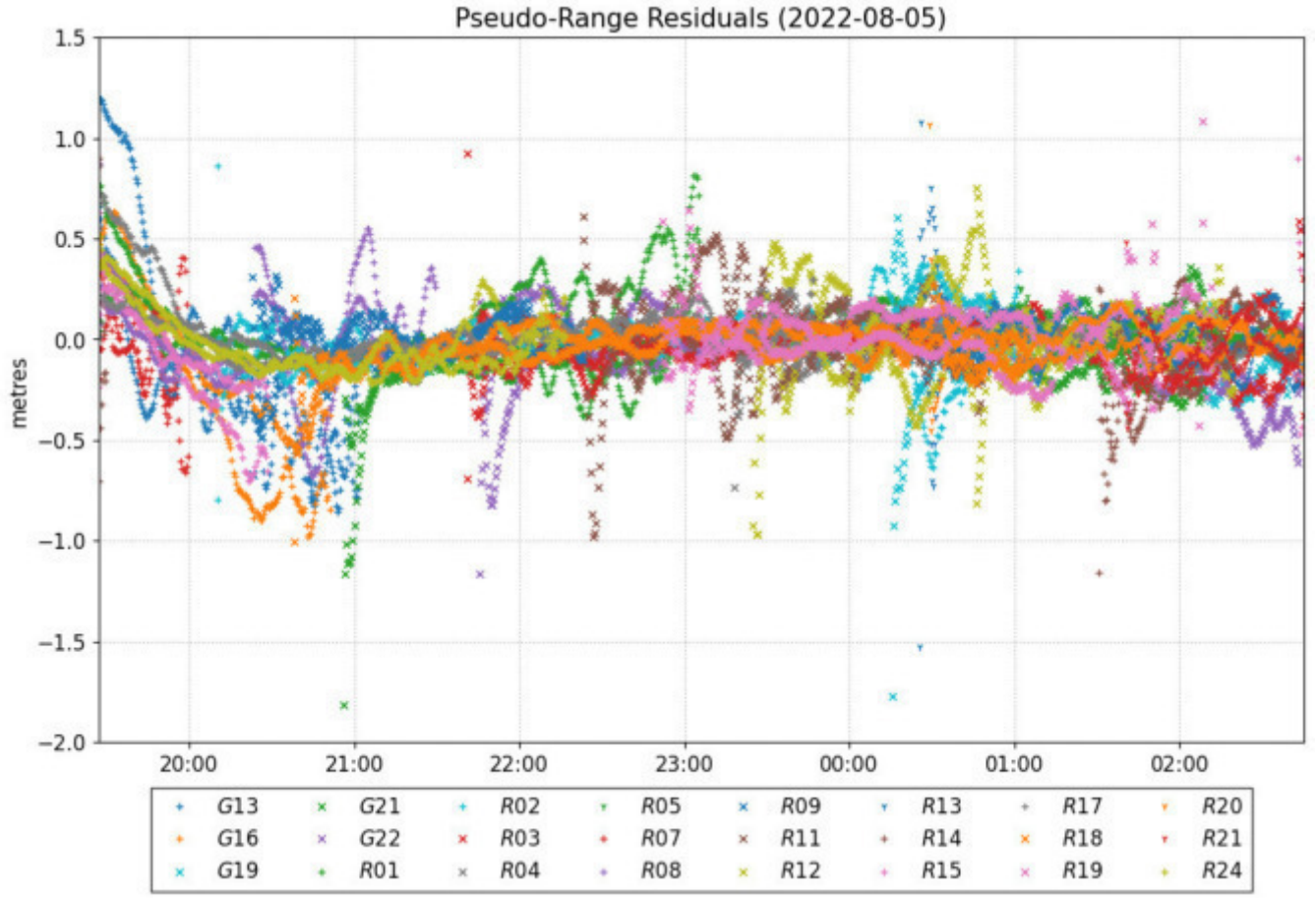

Final solution
Height Differences (2022-08-05)
SIG_PPP
metres
Sigma (metres)
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
−5.0
−5.5
140
120
100
80
60
40
20
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00

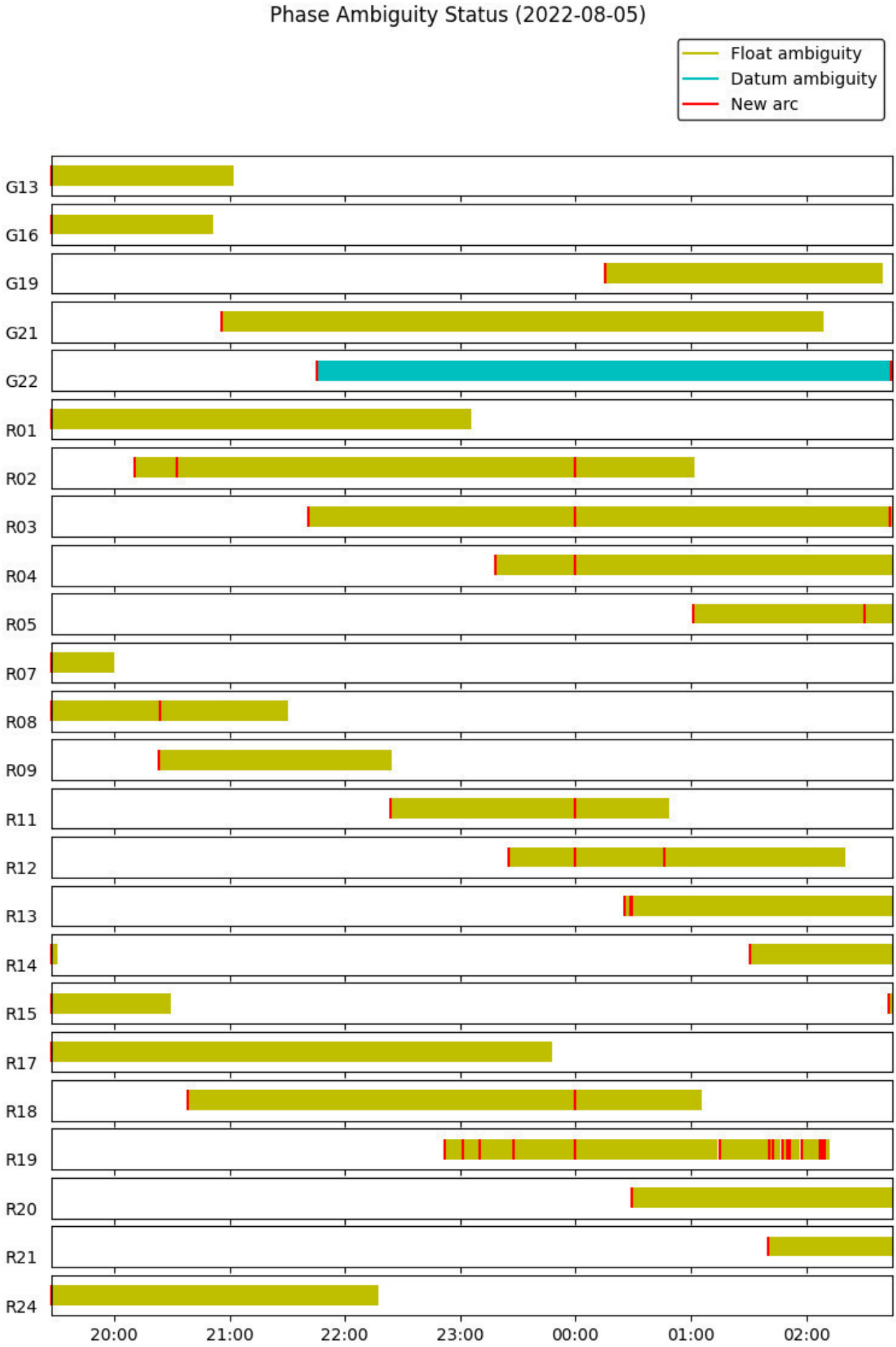

Estimated Tropospheric Zenith Delay (2022-08-05)
Sigma
metres
2.31
2.30
2.29
2.28
2.27
2.26
2.25
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Station Clock Offset (2022-08-05)
Sigma
nanoseconds
Sigma (nanoseconds)
100
80
60
40
20
0
−20
−40
−60
10
8
6
4
2
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Tracked Satellites and Reset Ambiguities (2022-08-05)
% amb. reset
Number of satellites
% Ambiguity Reset
13
12
11
10
9
8
7
6
100
80
60
40
20
0
20:00
21:00
22:00
23:00
00:00
01:00
02:00


Carrier-Phase Residuals (2022-08-05)
metres
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G13 G21 R02 R05 R09 R13 R17 R20
G16 G22 R03 R07 R11 R14 R18 R21
G19 R01 R04 R08 R12 R15 R19 R24


Pseudo-Range Residuals (2022-08-05)
metres
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
20:00
21:00
22:00
23:00
00:00
01:00
02:00
G13 G21 R02 R05 R09 R13 R17 R20
G16 G22 R03 R07 R11 R14 R18 R21
G19 R01 R04 R08 R12 R15 R19 R24


Phase Ambiguity Status (2022-08-05)
Float ambiguity
Datum ambiguity
New arc
G13
G16
G19
G21
G22
R01
R02
R03
R04
R05
R07
R08
R09
R11
R12
R13
R14
R15
R17
R18
R19
R20
R21
R24
20:00
21:00
22:00
23:00
00:00
01:00
02:00

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220811-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-12 01:58:00.00	2022-08-12 04:17:00.00	2:19:00
Processing Time		**Product Type**
22:39:50 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	5.11 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.195m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220811-GS15base.yyo

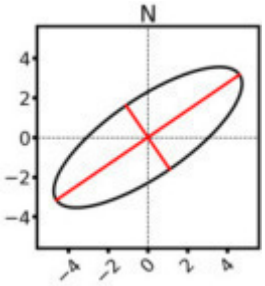
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32509"	-132° 43' 53.97771"	712.018 m
Sigmas(95%)	0.028 m	0.038 m	0.054 m
A priori*	60° 10' 26.26477"	-132° 43' 54.14274"	710.216 m
Estimated – A priori	1.867 m	2.545 m	1.802 m

Orthometric Height CGVD28 (HTv2.0)†

708.242 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 5.6 cm
semi-minor: 1.9 cm
semi-major azimuth: 55° 35' 46.57"



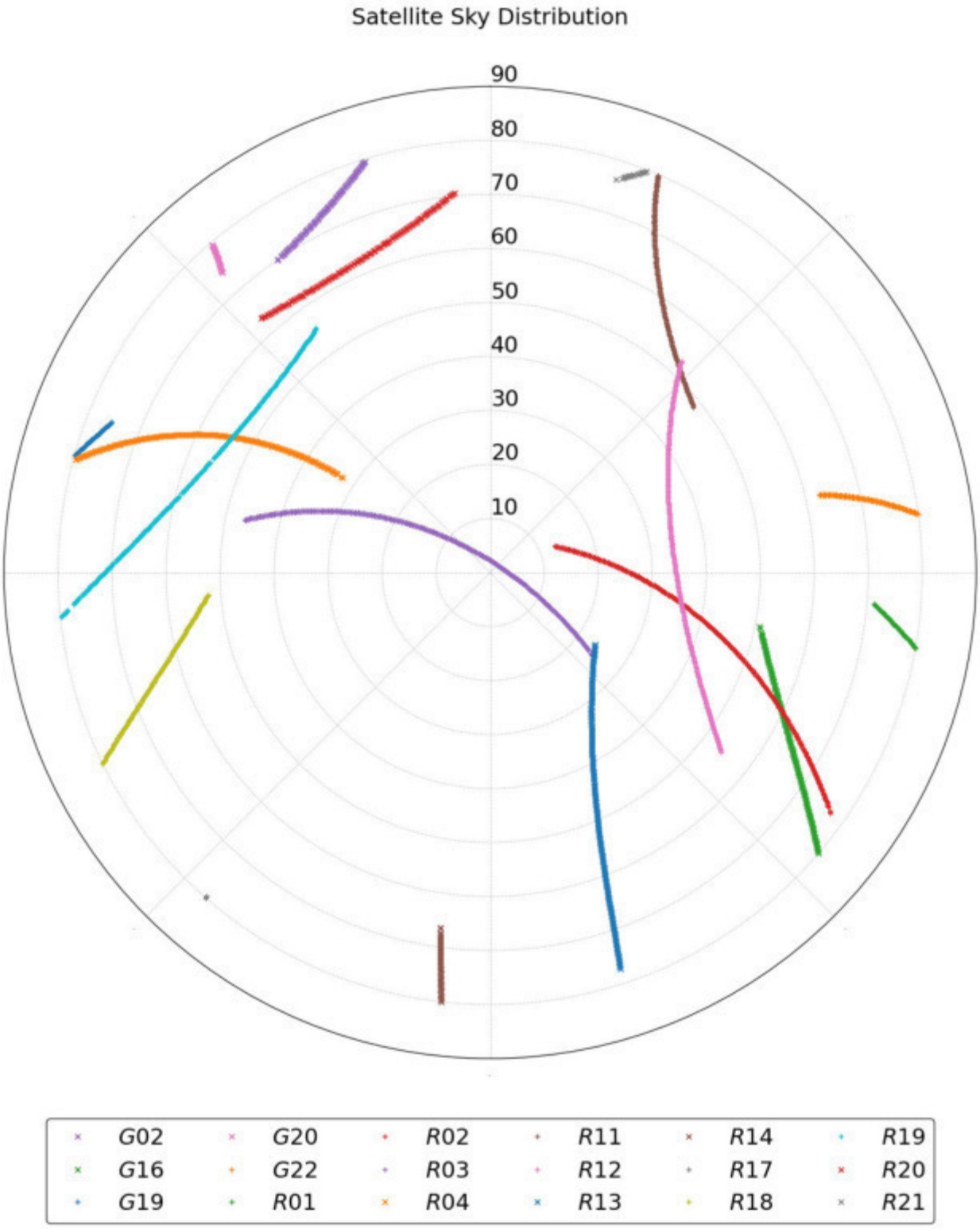
UTM (North) Zone 8

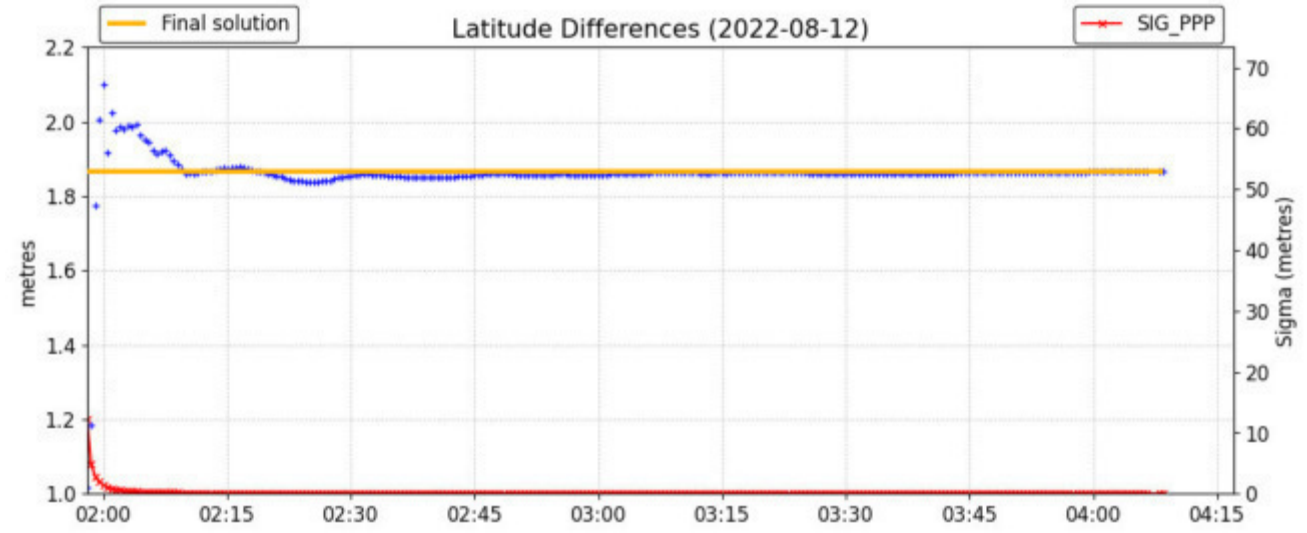
6672948.600 m (N)
625841.212 m (E)

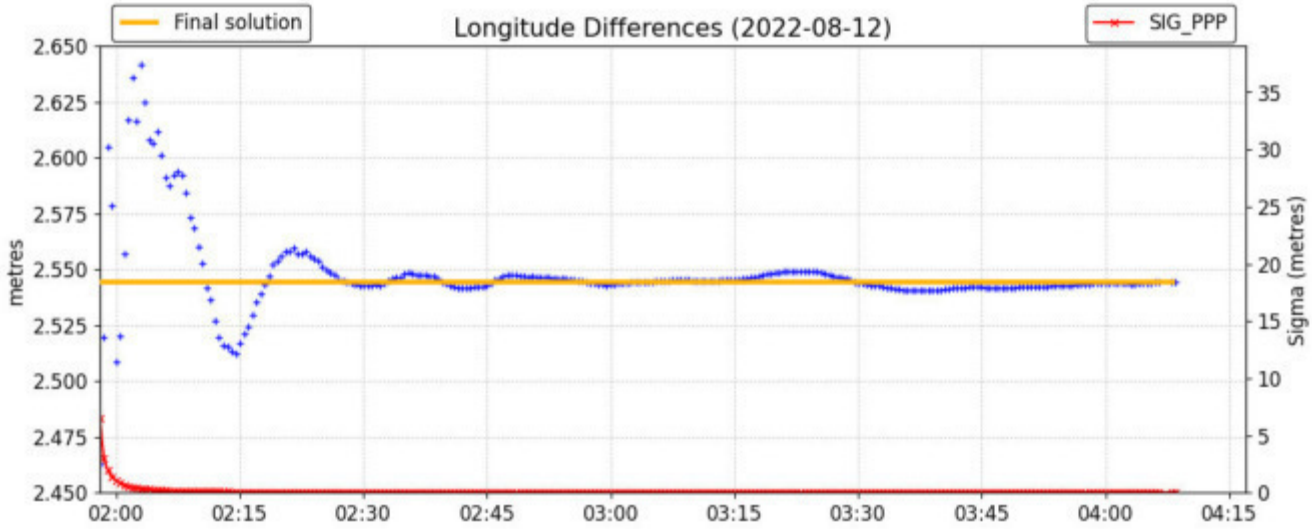
Scale Factors
0.99979406 (point)
0.99968265 (combined)

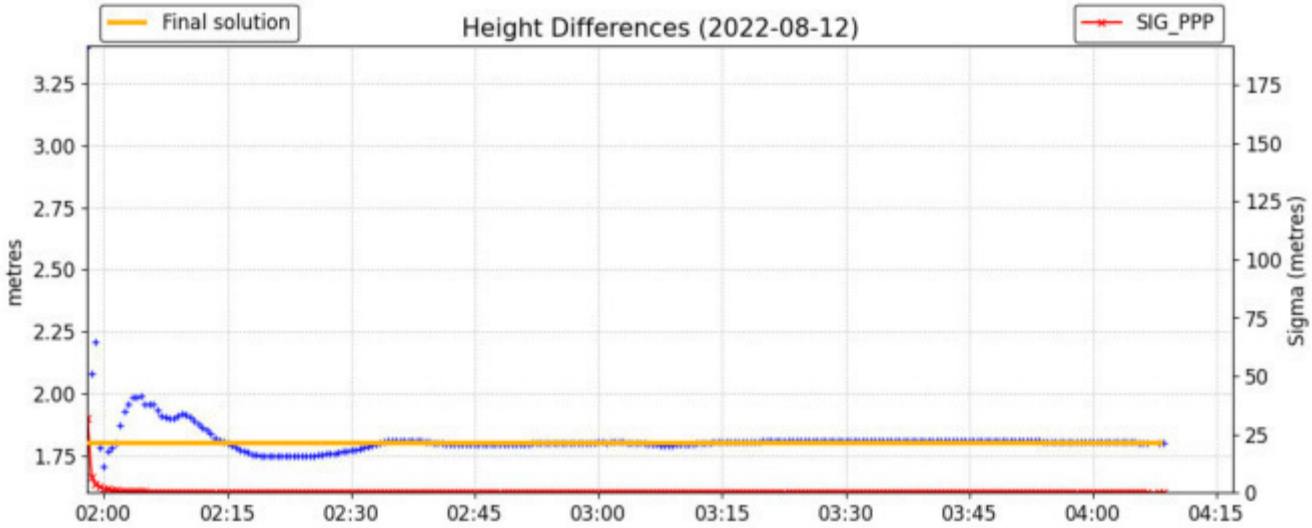
*(Coordinates from RINEX header used as a priori position)

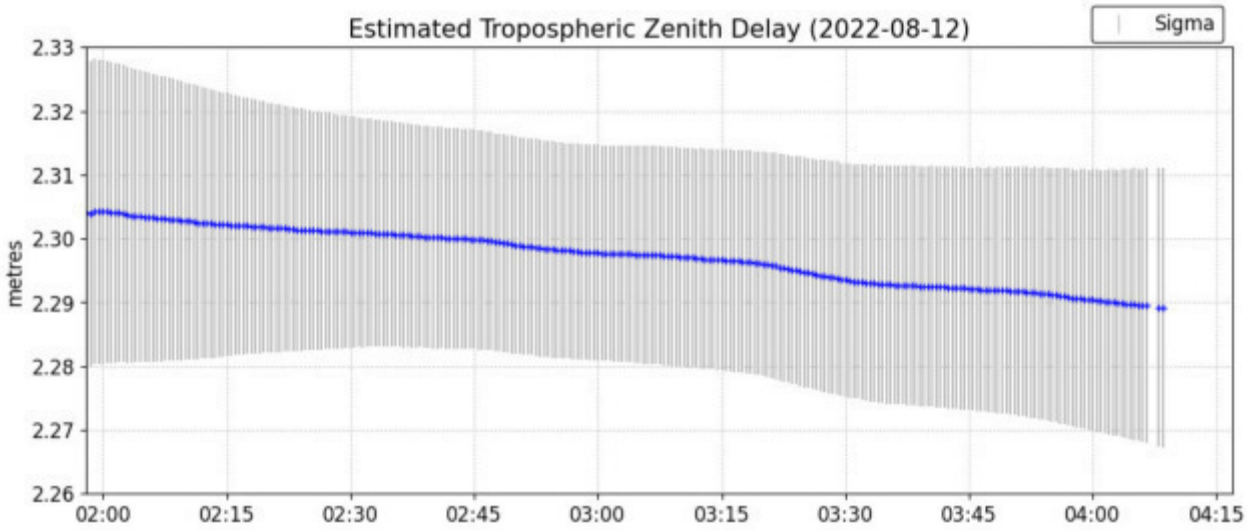
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

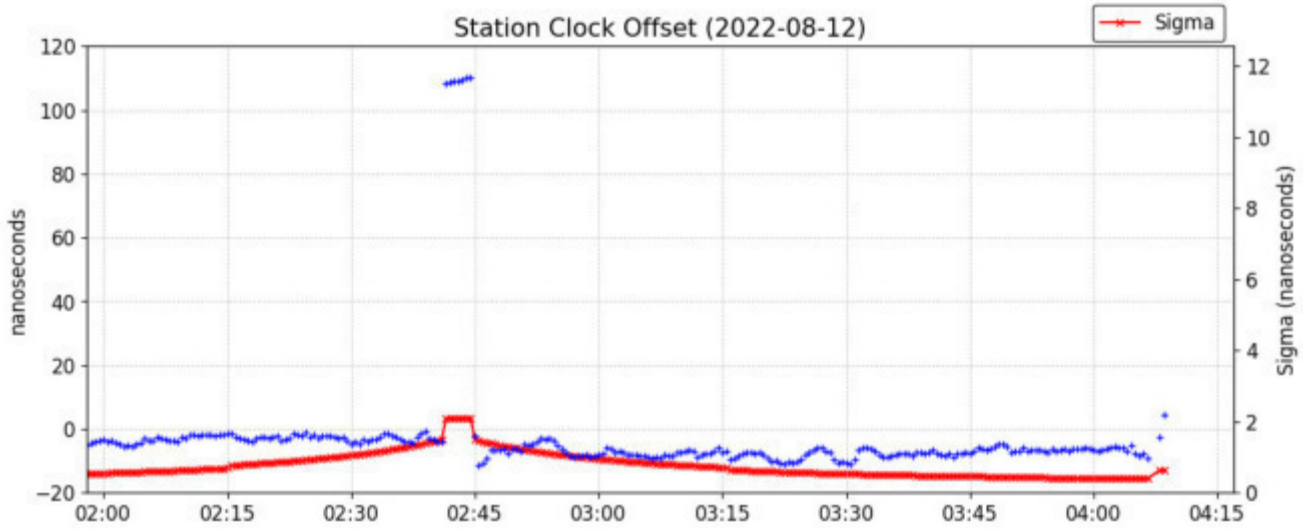

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G20
R02
R11
R14
R19
G16
G22
R03
R12
R17
R20
G19
R01
R04
R13
R18
R21

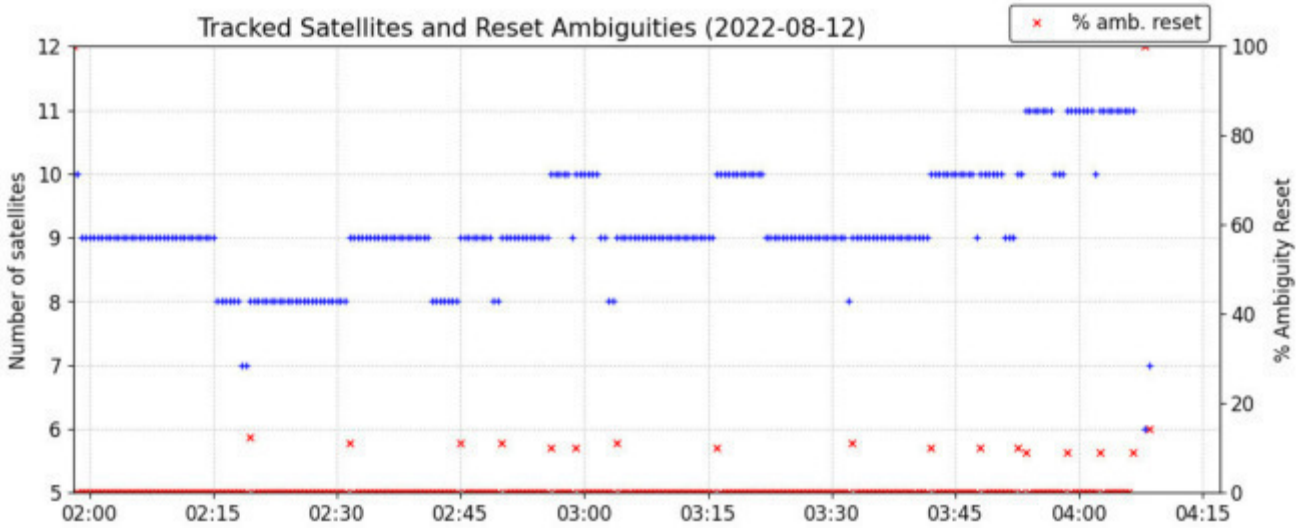

Final solution
Latitude Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
2.2
2.0
1.8
1.6
1.4
1.2
1.0
70
60
50
40
30
20
10
0
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15

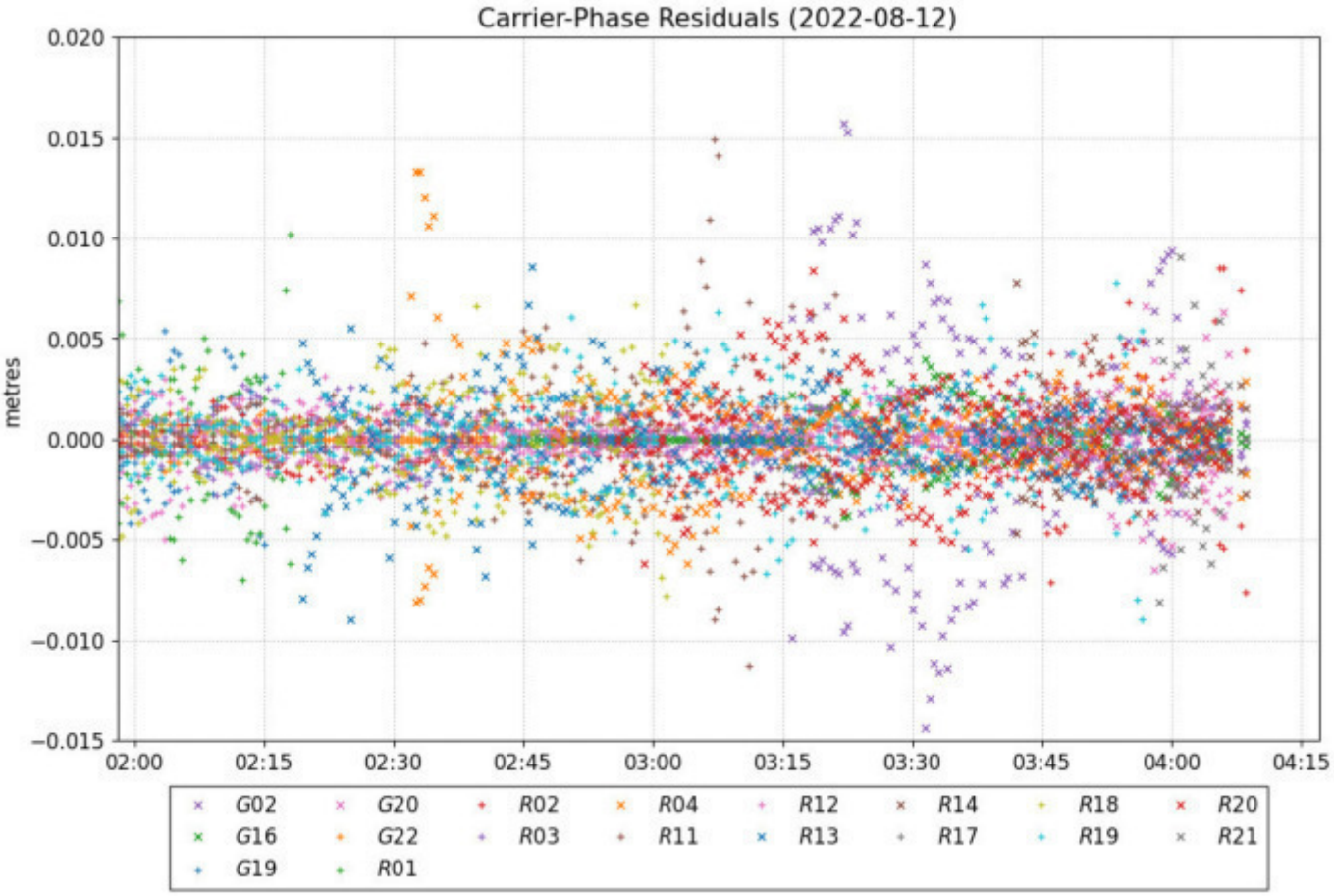

Final solution
Longitude Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
2.650
2.625
2.600
2.575
2.550
2.525
2.500
2.475
2.450
35
30
25
20
15
10
5
0
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15

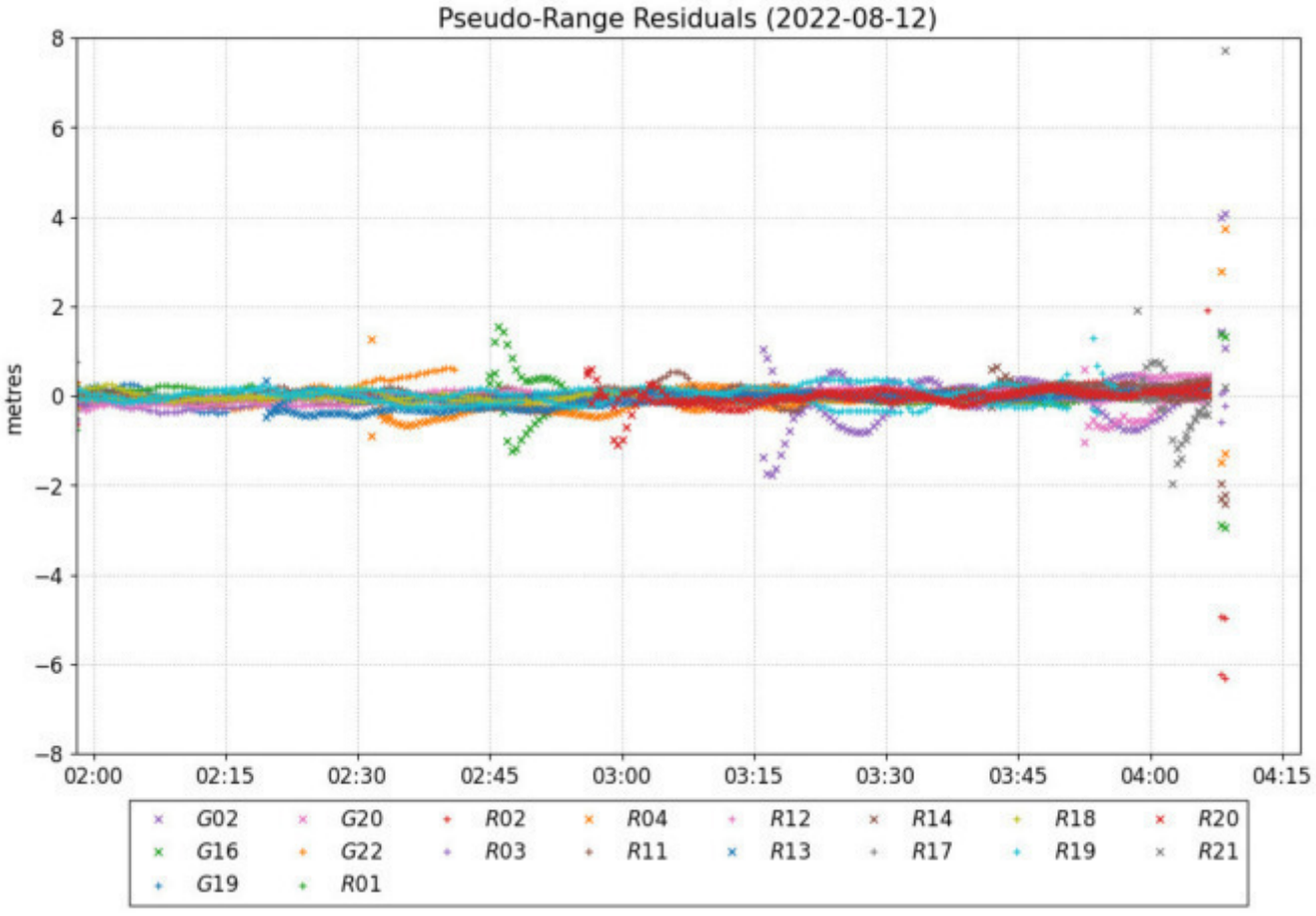

Final solution
Height Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
3.25
3.00
2.75
2.50
2.25
2.00
1.75
175
150
125
100
75
50
25
0
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15

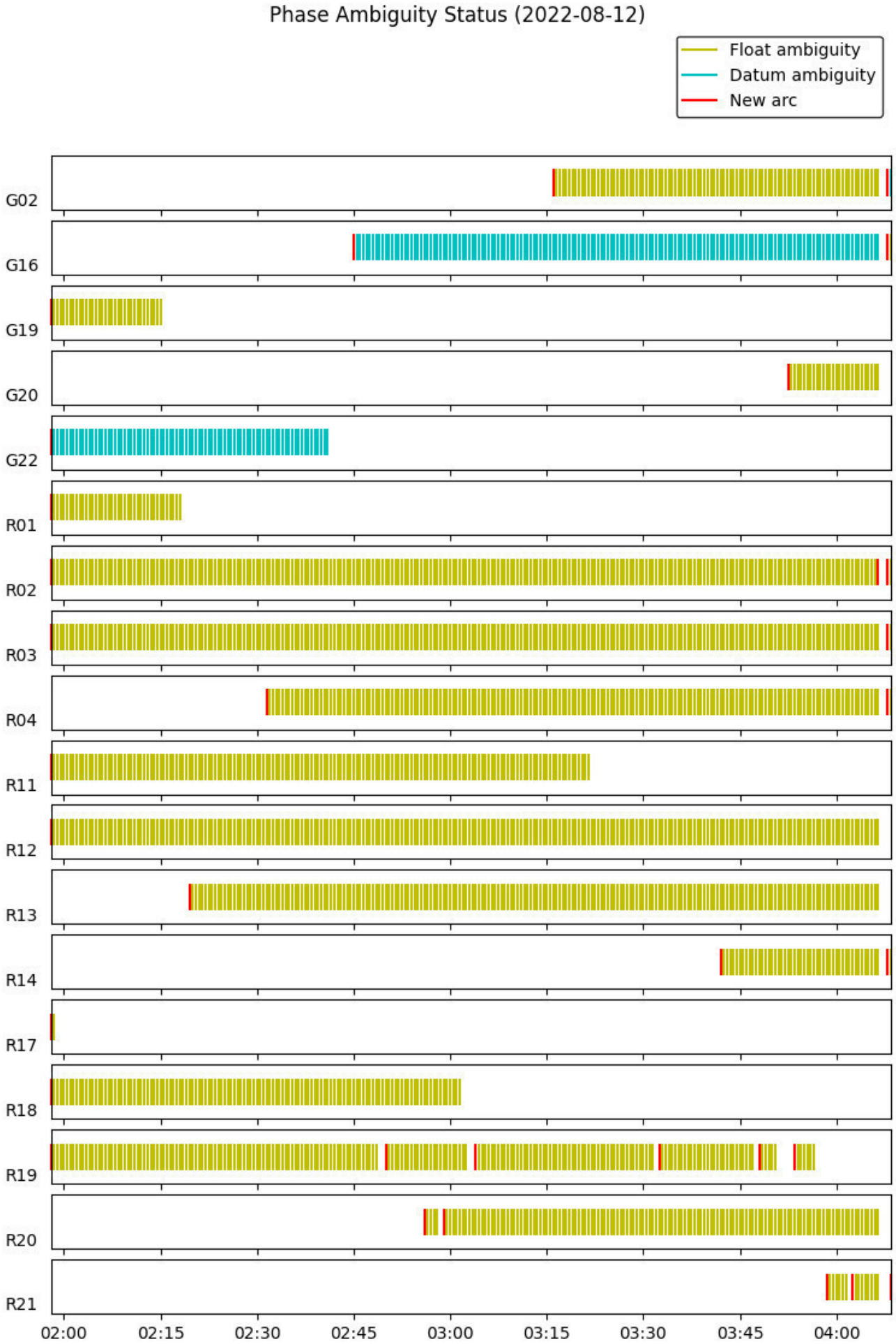

Estimated Tropospheric Zenith Delay (2022-08-12)
Sigma
metres
2.33
2.32
2.31
2.30
2.29
2.28
2.27
2.26
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15


Station Clock Offset (2022-08-12)
Sigma
nanoseconds
Sigma (nanoseconds)
120
100
80
60
40
20
0
−20
12
10
8
6
4
2
0
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15


Tracked Satellites and Reset Ambiguities (2022-08-12)
% amb. reset
Number of satellites
% Ambiguity Reset
12
11
10
9
8
7
6
5
100
80
60
40
20
0
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15


Carrier-Phase Residuals (2022-08-12)
metres
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15
G02 G20 R02 R04 R12 R14 R18 R20
G16 G22 R03 R11 R13 R17 R19 R21
G19 R01


Pseudo-Range Residuals (2022-08-12)
metres
8
6
4
2
0
−2
−4
−6
−8
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00
04:15
G02 G20 R02 R04 R12 R14 R18 R20
G16 G22 R03 R11 R13 R17 R19 R21
G19 R01


Phase Ambiguity Status (2022-08-12)
Float ambiguity
Datum ambiguity
New arc
G02
G16
G19
G20
G22
R01
R02
R03
R04
R11
R12
R13
R14
R17
R18
R19
R20
R21
02:00
02:15
02:30
02:45
03:00
03:15
03:30
03:45
04:00

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CSRS-PPP 3.50.3 (2022-03-04)

YGS-20220812-GS15base.yyo
-Unknown-

Data Start	Data End	Duration of Observations
2022-08-12 16:48:00.00	2022-08-12 21:40:30.00	4:52:30
Processing Time		**Product Type**
22:39:57 UTC 2022/10/11		NRCan/IGS Final
Observations	**Frequency**	**Mode**
Phase and Code	Double	Static

Elevation Cut-Off	Rejected Epochs	Fixed Ambiguities	Estimation Steps
7.5 degrees	0.00 %	0.00 %	30.00 sec

Antenna Model	APC to ARP	ARP to Marker
LEIGS15 NONE	L1 = 0.202 m L2 = 0.201 m	H:1.197m / E:0.000m / N:0.000m

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

Estimated Position for YGS-20220812-GS15base.yyo

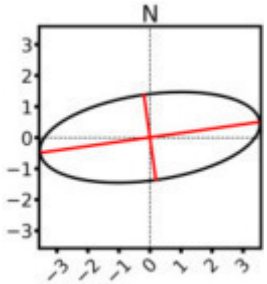
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2022.6)	60° 10' 26.32484"	-132° 43' 53.97713"	711.988 m
Sigmas(95%)	0.012 m	0.028 m	0.043 m
A priori*	60° 10' 26.28448"	-132° 43' 54.07590"	710.411 m
Estimated – A priori	1.249 m	1.523 m	1.577 m

Orthometric Height CGVD28 (HTv2.0)†

708.212 m

(click for height reference information)

95% Error Ellipse (cm)
semi-major: 3.6 cm
semi-minor: 1.4 cm
semi-major azimuth: 82° 0' 4.75"



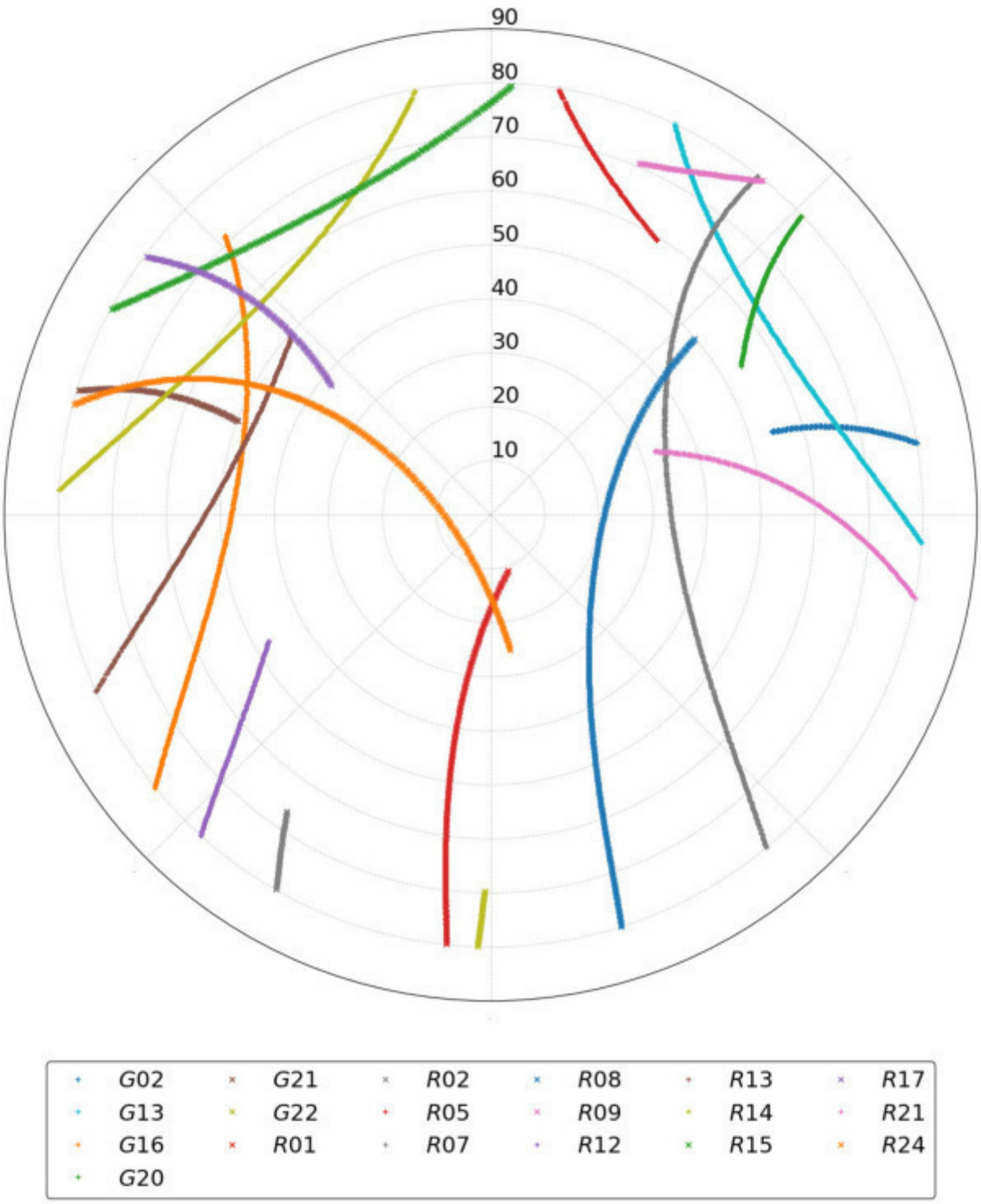
UTM (North) Zone 8

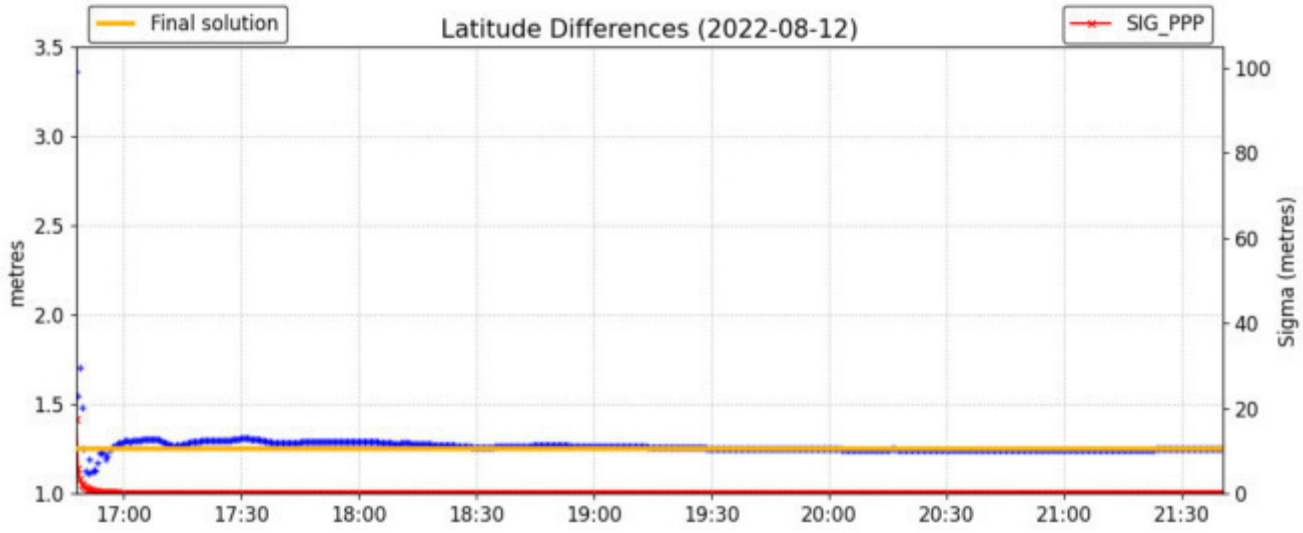
6672948.593 m (N)
625841.222 m (E)

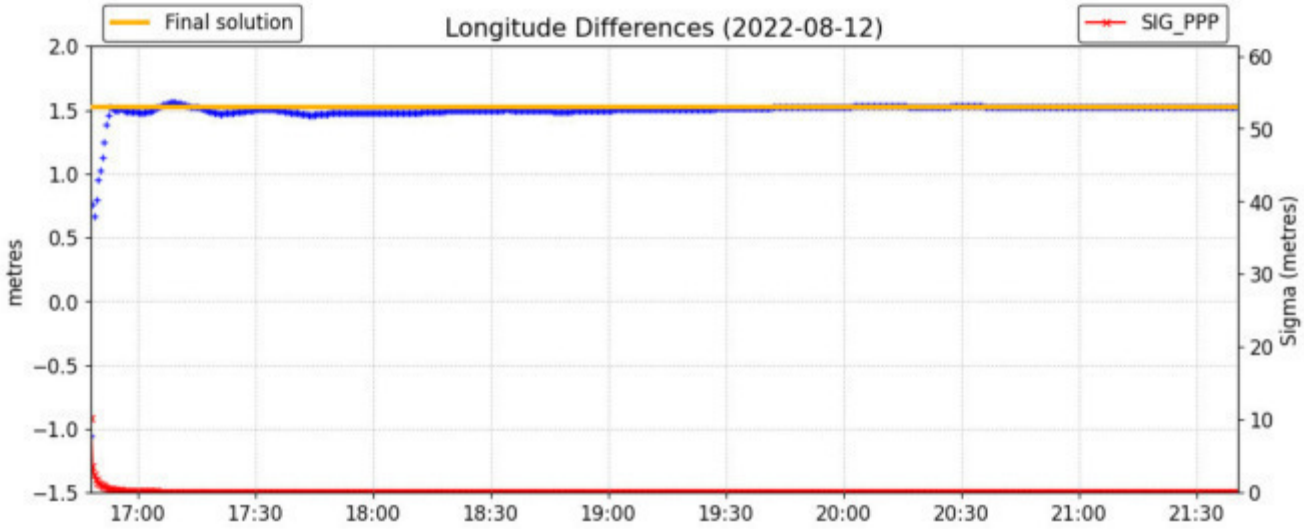
Scale Factors
0.99979406 (point)
0.99968266 (combined)

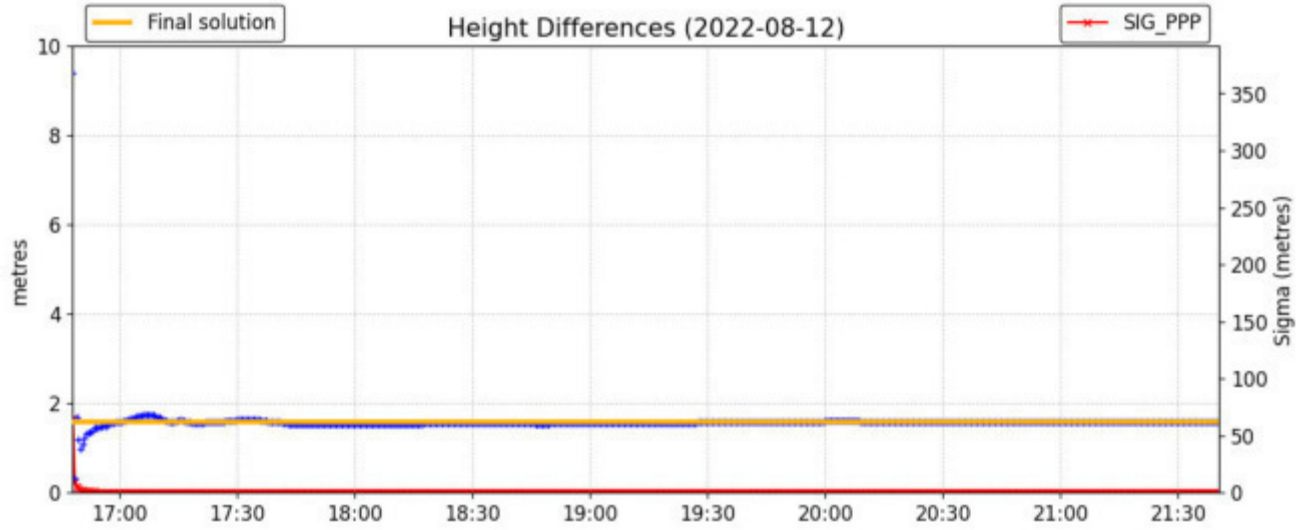
*(Coordinates from RINEX header used as a priori position)

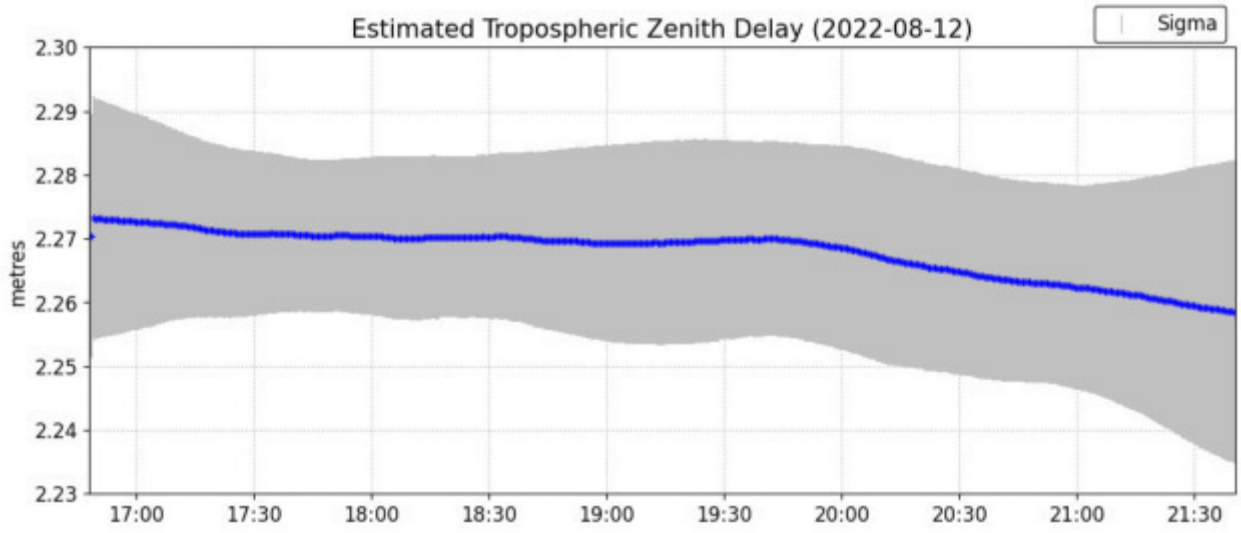
†(Epoch transformation using velocity grid NAD83v70VG (click for documentation))

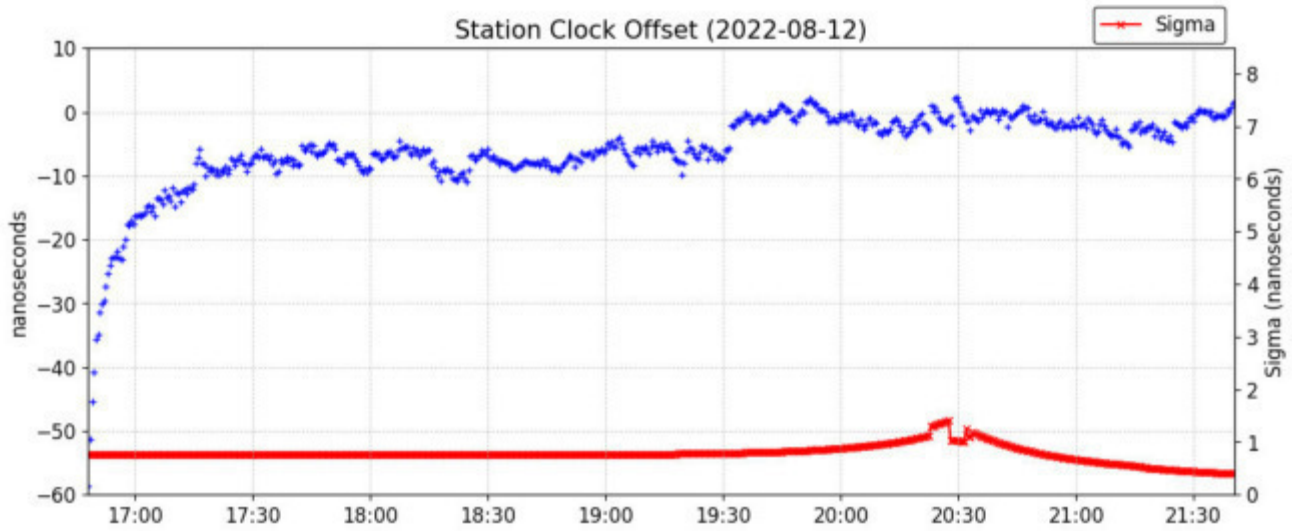

Satellite Sky Distribution
90
80
70
60
50
40
30
20
10
G02
G13
G16
G20
G21
G22
R01
R02
R05
R07
R08
R09
R12
R13
R14
R15
R17
R21
R24

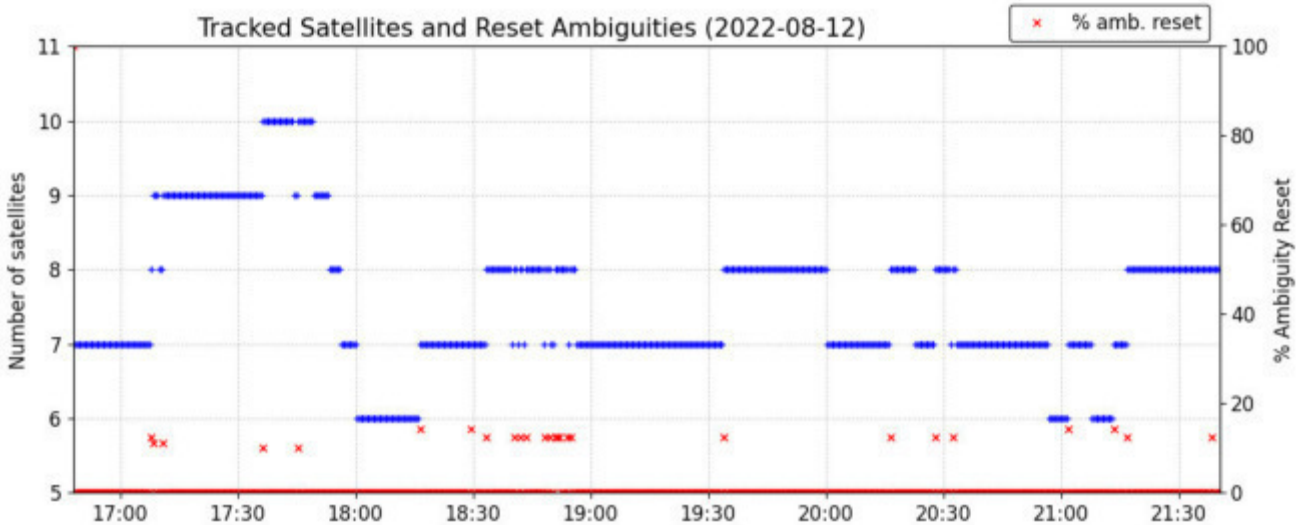

Final solution
Latitude Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
3.5
3.0
2.5
2.0
1.5
1.0
100
80
60
40
20
0
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30

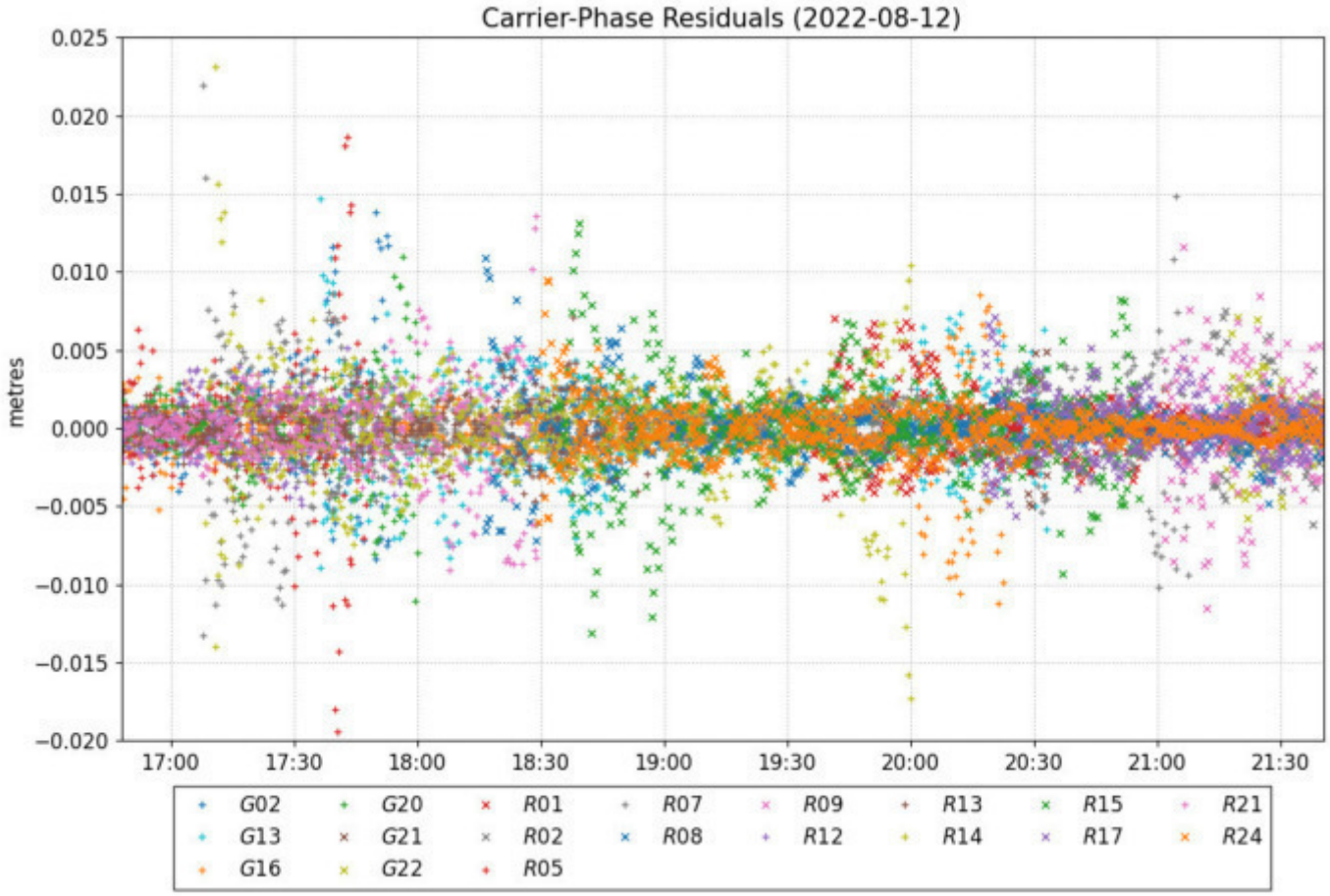

Final solution
Longitude Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
60
50
40
30
20
10
0
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30

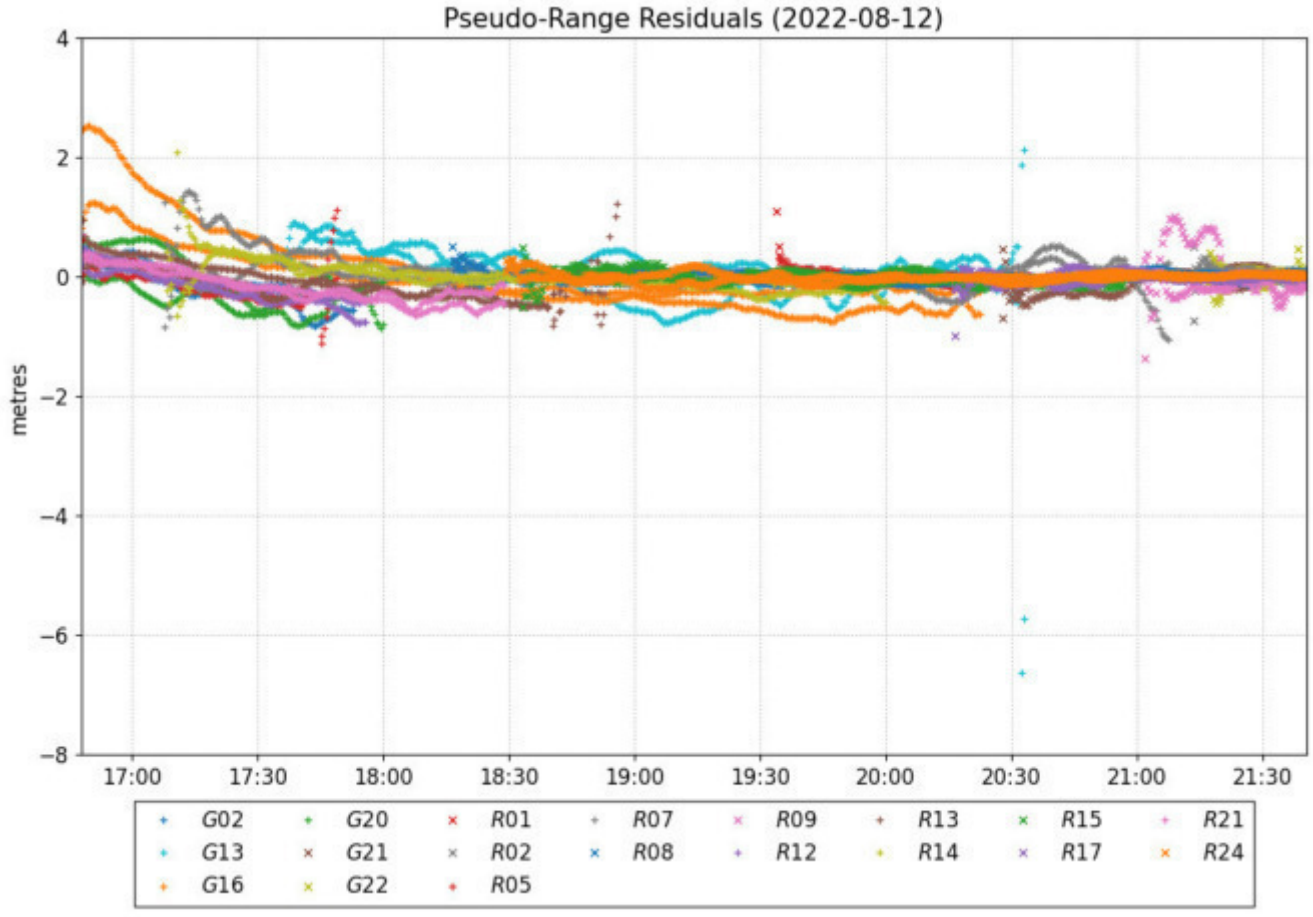

Final solution
Height Differences (2022-08-12)
SIG_PPP
metres
Sigma (metres)
10
8
6
4
2
0
350
300
250
200
150
100
50
0
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30

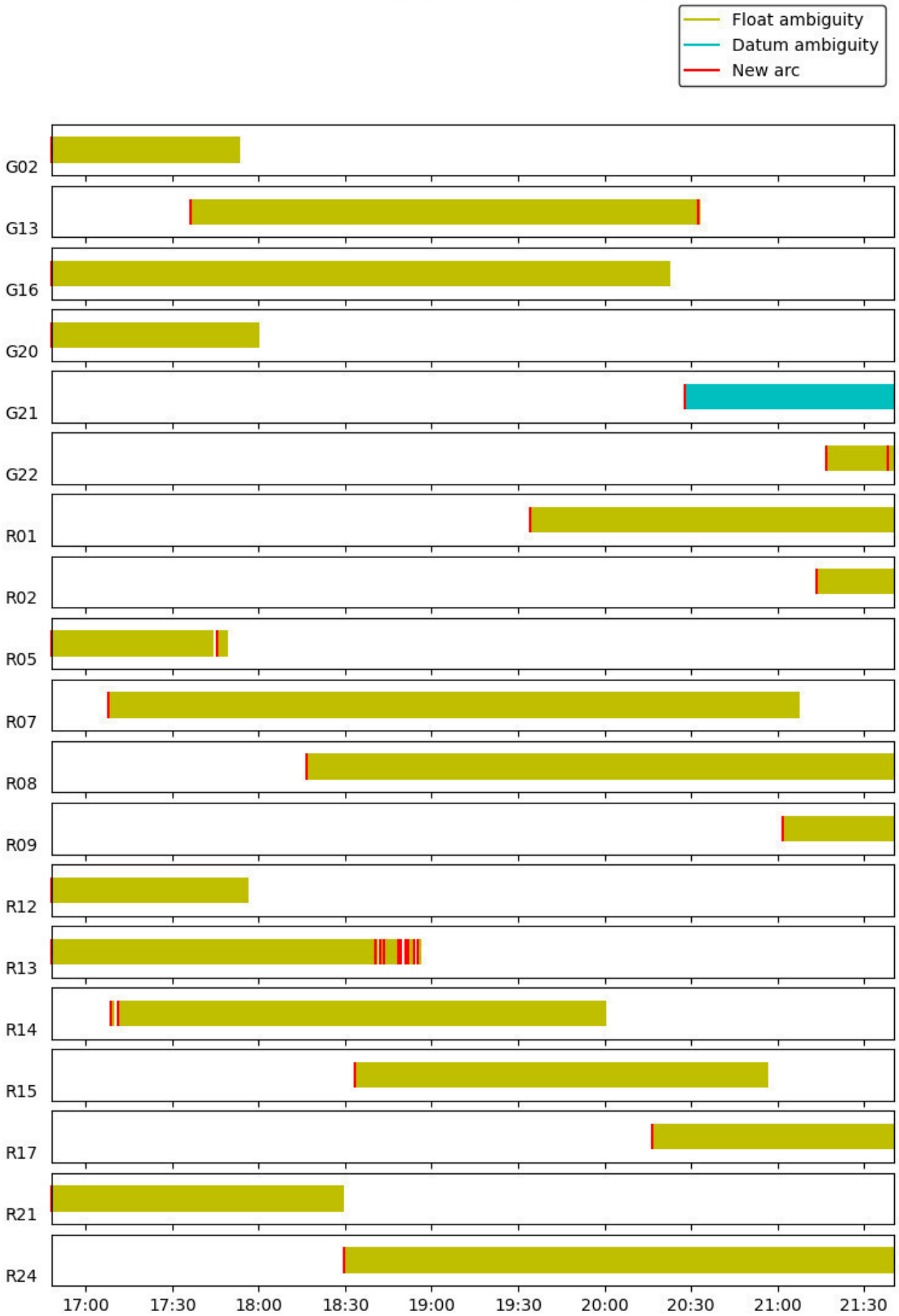

Estimated Tropospheric Zenith Delay (2022-08-12)
Sigma
metres
2.30
2.29
2.28
2.27
2.26
2.25
2.24
2.23
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30


Station Clock Offset (2022-08-12)
Sigma
nanoseconds
Sigma (nanoseconds)
10
0
−10
−20
−30
−40
−50
−60
8
7
6
5
4
3
2
1
0
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30


Tracked Satellites and Reset Ambiguities (2022-08-12)
% amb. reset
Number of satellites
% Ambiguity Reset
11
10
9
8
7
6
5
100
80
60
40
20
0
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30


Carrier-Phase Residuals (2022-08-12)
metres
0.025
0.020
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
−0.020
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
G02
G13
G16
G20
G21
G22
R01
R02
R05
R07
R08
R09
R12
R13
R14
R15
R17
R21
R24


Pseudo-Range Residuals (2022-08-12)
metres
4
2
0
−2
−4
−6
−8
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
G02
G13
G16
G20
G21
G22
R01
R02
R05
R07
R08
R09
R12
R13
R14
R15
R17
R21
R24


Phase Ambiguity Status (2022-08-12)
Float ambiguity
Datum ambiguity
New arc
G02
G13
G16
G20
G21
G22
R01
R02
R05
R07
R08
R09
R12
R13
R14
R15
R17
R21
R24
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30

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Canadian Geodetic Survey
Surveyor General Branch
Natural Resources Canada
Government of Canada
588 Booth Street, Room 334
Ottawa, Ontario K1A 0Y7
Phone: 343-292-6617
Email: geodeticinformation-informationgeodesique@nrcan-rncan.gc.ca

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Canada

Gravity (CGSN) - 9340-1978

Station 1 of 1

Site Identification

Name	Province	Unique Number	Classification	Status	Last Inspection
TESLIN LAKE	YT	9340-1978	Special project	Active	08/1978

Station Coordinates (Scaled)

Latitude	Longitude	Elevation	Description
N60° 13' 7" ± 20.0 m	W132° 52' 16" ± 20.0 m	729.00 ± .30 m	KM1305 AL HWY VMSTSL

Gravimetric Information

Adjustment Number	Gravity	Instrument Height	Gradient	Velocity	Epoch
1991603	981705.9439 ± .0150 mGal	0.15 m	0.308 mGal/m		

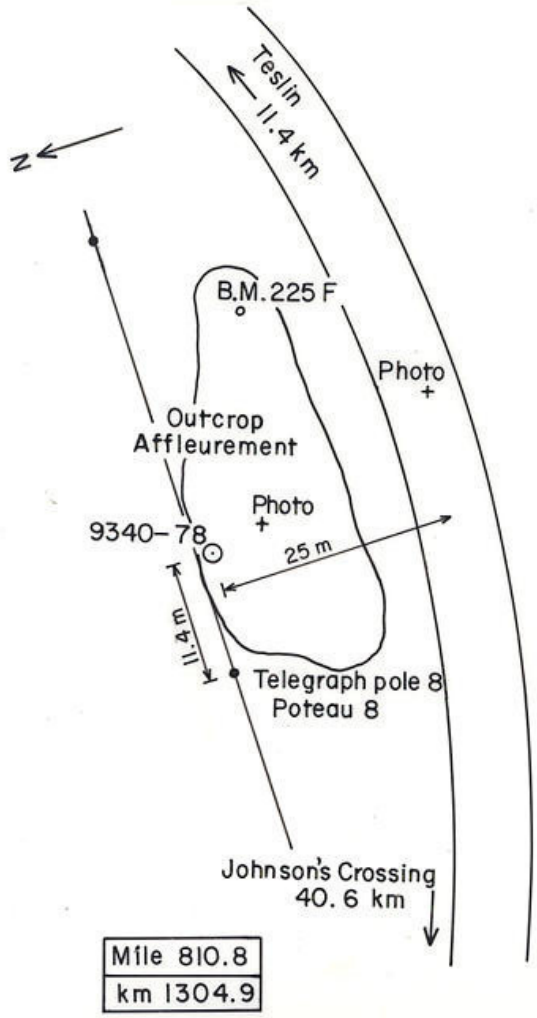
Station Description

The site is located on the highest point of a large rock outcrop on the N side of the Alaska Hwy at km 1304.9. The position is marked by an aluminum disc 4m above road level.

Stations with same name

No other stations with the same name

Sketch



Distant View

Close View

Appendix II Crew Log

Report Date	01-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Lots of recent snow, highway driving was not relaxing.				
Camp Comments	Mobilize from Whitehorse. Locate spot for base, do initial job safety work.				
Production Comments	None				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	2
Total:	2	2

Report Date	02-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	-25C, not too windy				
Camp Comments	No comments				
Production Comments	All lake stations, a lot of snow on the lake and quite a few sections of overflow.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	4
Total:	2	4

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	26	26
Total:	26	26

Report Date	03-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	-20 to -25C, 15-20 km/hr wind				
Camp Comments	No comments				
Production Comments	More wind today, required longer readings				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	6
Total:	2	6

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	49	23
Total:	49	23

Report Date	04-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	-15C. Heavy snow during the night and carrying on through the day				
Camp Comments	No comments				
Production Comments	Got very stuck in overflow. Spent all day getting both machines back to hotel.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	8
Total:	2	8

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	49	0
Total:	49	0

Report Date	05-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	-5, light winds				
Camp Comments	Late night - Vince walked back while Dave cleaned up all gear. Snowmachine acting up				
Production Comments	Land stations. Overflow very bad, got one sled stuck at end of day in dying light, Vince walked back to town, didn't want to risk doubling with gravity and getting both machines stuck.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	10
Total:	2	10

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	55	6
Total:	55	6

Report Date	06-Feb-22	Prepared on	30-May-22	Prepared By	Dave Hildes

Weather: Around zero.

Camp Comments: Warming trend and bad conditions on lake lead to decision to demobilize back to Whitehorse and wait for better conditions.

Got help from locals Steve and Tristan to extract sled from overflow.

Production Comments: Extracting sled, packing up and driving back to Whitehorse.

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	12
Total:	2	12

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	55	
Total:	55	

Report Date	05-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sunny, between 0 and 5 C, wind 20-25 km/hr				
Camp Comments	Mobilize from Whitehorse. Go check out lake and conditions are good, get some readings done late in the afternoon.				
Production Comments	Windy, lots of repeats on the lake. And warm, tripod melting into the ice.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	14
Total:	2	14

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	61	6
Total:	61	6

Report Date	06-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Partly cloudy, 0 to 5 deg, light winds				
Camp Comments	No comments				
Production Comments	All lake stations. Good day				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	16
Total:	2	16

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin Main	98	37
Total:	98	37

Report Date	07-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sun and clound with gusting wind. +3c				
Camp Comments	No comments				
Production Comments	Half lake stations, moved to the 100m grid around the beginning of the afternoon.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	18
Total:	2	18

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	27	27
Teslin Main	111	13
Total:	138	40

Report Date	08-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Clear and sunny all day. +5c				
Camp Comments	No comments				
Production Comments	Spent all day at the teslin airport. Got 49 points.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	20
Total:	2	20

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	76	49
Teslin Main	111	
Total:	187	49

Report Date	09-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Clear and sunny with wind in the afternoon. +3C				
Camp Comments	Trained Braeden on rtk, Dave demobed back to whitehorse leaving Vince as crew chief for remainder of job.				
Production Comments	Finished teslin airport except for a couple points near road. Got 35 points.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	23
Total:	3	23

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	111	35
Teslin Main	111	
Total:	222	35

Report Date	10-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sun and cloud with wind blowing all day. 0C				
Camp Comments	Had to pause survey mid day to drive up alaska highway and swap grey truck out with black truck.				
Production Comments	Resurveyed 3 points near airport and got orphan point. Swept down toward lower teslin residential area. 31 new points				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	25
Total:	2	25

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	142	31
Teslin Main	111	
Total:	253	31

Report Date	11-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sun and cloud with wind all day. 0C				
Camp Comments	No comments				
Production Comments	Finished peninsula except for one point, started forest section. 50 points aquired.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	27
Total:	2	27

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	192	50
Teslin Main	111	
Total:	303	50

Report Date	12-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sunny and clear, light wind, -4C				
Camp Comments	No comments				
Production Comments	Completed forest section, only 5 orphan points remaining. 48 points aquired.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	29
Total:	2	29

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	240	48
Teslin Main	111	
Total:	351	48

Report Date	13-Apr-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Clear and sunny, -6C				
Camp Comments	Demobilize back to Whitehorse				
Production Comments	Aquired final 5 orphan points, was able to get to the predetermined points of 3, the other 2 had to be moved to the closest spot on public land.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	31
Total:	2	31

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	5
Teslin Main	111	
Total:	356	5

Report Date	28-May-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sunny, 15C-20C.				
Camp Comments	Mobilize from Whitehorse.				
Production Comments	Re-establish GPS base. Located GSC monument west of Teslin. Went out for a few points late in the afternoon, radio problems with GPS.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	33
Total:	2	33

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	115	4
Total:	360	4

Report Date	29-May-22	Prepared on	30-May-22	Prepared By	Dave Hildes
Weather	Sunny, 10C-20C				
Camp Comments	No comments				
Production Comments	Resolved GPS radio issue, although still had problems with topography and distance on a few stations. Explored ATV tracks at end of day.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	35
Total:	2	35

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	125	10
Total:	370	10

Report Date	30-May-22	Prepared on	31-May-22	Prepared By	Dave Hildes
Weather	Sunny, 20C in afternoon. A storm brewing but didn't hit where crew was working.				
Camp Comments	No comments				
Production Comments	Bad bush on stations 10000 between lines 500 and 4000 = tired crew.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	37
Total:	2	37

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	140	15
Total:	385	15

Report Date	31-May-22	Prepared on	31-May-22	Prepared By	Dave Hildes
Weather	Sunny, high of over 20C				
Camp Comments	No comments				
Production Comments	Good day except for GPS radio at a few stations.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	39
Total:	2	39

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	157	17
Total:	402	17

Report Date	01-Jun-22	Prepared on	01-Jun-22	Prepared By	Dave Hildes
Weather	Sunny, high of 23C.				
Camp Comments	No comments				
Production Comments	Completed the southeast corner between Teslin Lake and Nisutlan Bay & started on the area north of Nisutlan Bay. Forest was more walkable but struggled to find holes in the trees sufficient for the GPS and had to have several long occupation times.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	41
Total:	2	41

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	170	13
Total:	415	13

Report Date	02-Jun-22	Prepared on	02-Jun-22	Prepared By	Dave Hildes
Weather	Sunny, high of 23C				
Camp Comments	No comments				
Production Comments	Spent first half of day exploring ATV access trails, then surveyed on eastern edge of grid north of Teslin Lake.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	43
Total:	2	43

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	178	8
Total:	423	8

Report Date	03-Jun-22	Prepared on	04-Jun-22	Prepared By	Dave Hildes
Weather	Sunny with later afternoon thunder, high 23C.				
Camp Comments	Crew swap. Robert in and Vince out. Replaced the ATV with the rough idle.				
Production Comments	Surveyed northeast edge of grid. No good openings in forest. Struggled all day with GPS, took a long time and had to dead walk back > 2.5 km at end of day.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	46
Total:	3	46

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	186	8
Total:	431	8

Report Date	04-Jun-22	Prepared on	05-Jun-22	Prepared By	Dave Hildes
Weather	Sunny in morning and early afternoon, high of 20C. Cooled down in late afternoon.				
Camp Comments	No comments				
Production Comments	Northeast part of grid. No canopy opening and poor GPS radio meant long readings and low production. Re-aquired L10000,9500 that didn't get phase fixed post processing solution.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	48
Total:	2	48

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	195	9
Total:	440	9

Report Date	05-Jun-22	Prepared on	06-Jun-22	Prepared By	Dave Hildes
Weather	Mostly sunny, high of 23C				
Camp Comments	No comment				
Production Comments	GNSS continued to be an issue through the first part of the day, including re-occupying the three problem points. Forest got better and better radio topography at the end of the day.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	50
Total:	2	50

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	205	10
Total:	450	10

Report Date	06-Jun-22	Prepared on	07-Jun-22	Prepared By	Dave Hildes
Weather	Cooler and rain the afternoon.				
Camp Comments	No comments				
Production Comments	Getting into better radio reception from GNSS base but still some challenging stations to find opening in canopy.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	52
Total:	2	52

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	219	14
Total:	464	14

Report Date	07-Jun-22	Prepared on	07-Jun-22	Prepared By	Dave Hildes
Weather	Cooler, high of 15C				
Camp Comments	No commetns				
Production Comments	Took a break from the long hikes to the northern edge of grid and moved between a few smaller areas.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	54
Total:	2	54

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	231	12
Total:	476	12

Report Date	08-Jun-22	Prepared on	08-Jun-22	Prepared By	Dave Hildes
Weather	Sun and cloud, high of 20C				
Camp Comments	No comments				
Production Comments	A good day to the northern edge of the grid. Easy to find a sufficent hole in the canopy, probably because radio geometry was good.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	56
Total:	2	56

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	
Teslin Main	244	13
Total:	489	13

Report Date	09-Jun-22	Prepared on	23-Jul-22	Prepared By	Dave Hildes
Weather	No comments				
Camp Comments	Demobilize to Whitehorse				
Production Comments	Did GNSS checks and repeats in town and explored western part of grid.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	1	45
Total:	1	45

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
Teslin 100m	245	0
Teslin Main	244	
Total:	489	0

Report Date	24-Jul-22	Prepared on	24-Jul-22	Prepared By	Robert Chee
Weather	Rainy and 15C				
Camp Comments	Mobe to Teslin				
Production Comments	Absolute grav check in bookened by hotel grav check in				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	148
Total:	2	148

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	244	
Total:	489	

Report Date	25-Jul-22	Prepared on	25-Jul-22	Prepared By	Robert Chee
Weather	Overcast morning, sunny and clear afternoon 25C				
Camp Comments	No comment				
Production Comments	Very wet, 2 sections of trail not passable, got quad stuck twice				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	150
Total:	2	150

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	254	10
Total:	499	10

Report Date	26-Jul-22	Prepared on	26-Jul-22	Prepared By	Robert Chee
Weather	Sunny 26C				
Camp Comments	Charles mob from Whitehorse for bathy survey				
Production Comments	Problems with a ATV caused delayed start. Wet ground, thick bush and steep slopes severly slowed survey.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	152
Total:	2	152

Geophysics Production

Grid Name	Total Production	Todays Production
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	261	7
Total:	506	7

Report Date	27-Jul-22	Prepared on	27-Jul-22	Prepared By	Robert Chee
Weather	23C sunny to overcast and light showers in evening				
Camp Comments	No comments				
Production Comments	Many issues with bathy including non functional tablet and connectivity issues with replacement laptop. Forest very good for gravity.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	154
Total:	2	154

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin 100m	0	0
Total:	0	0
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	268	7
Total:	513	7

Report Date	28-Jul-22	Prepared on	28-Jul-22	Prepared By	Robert Chee
Weather	17C Raining, wet and overcast				
Camp Comments	No comments				
Production Comments	Bathy issues continued and caused minor delay. Bad bush and poor RTK connection				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	156
Total:	2	156

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	46.5	29
Total:	46.5	29
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	275	7
Total:	520	7

Report Date	29-Jul-22	Prepared on	29-Jul-22	Prepared By	Robert Chee
Weather	Overcast wet morning, patial sun into afternoon 18C				
Camp Comments	No comments				
Production Comments	Decent day for gravity, despite sporatic issues with GNSS connection. Bathy tests continue with alternative sonar device.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	162
Total:	3	162

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	46.5	
Teslin Bathy Longitudi	29	29
Total:	75.5	29
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	288	13
Total:	533	13

Report Date	30-Jul-22	Prepared on	30-Jul-22	Prepared By	Robert Chee
Weather	Partial clouds to full sun in evening. High of 25C				
Camp Comments	No comments				
Production Comments	Bathy continued with new sonar system. Good day of gravity despite initial issues with repeater.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	165
Total:	3	165

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	28
Teslin Bathy Longitudi	29	
Teslin Bathy West	30	30
Total:	133.5	58
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	300	12
Total:	545	12

Report Date	31-Jul-22	Prepared on	31-Jul-22	Prepared By	Robert Chee
Weather	Sunny morning, thunderstorms in the afternoon high of 18C				
Camp Comments	No comments				
Production Comments	Good day of bathy. Good day of gravity through tough bush with a GNSS connection problem spots.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	168
Total:	3	168

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	46	17
Teslin Bathy West	66	36
Total:	186.5	53
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	312	12
Total:	557	12

Report Date	01-Aug-22	Prepared on	01-Aug-22	Prepared By	Robert Chee
Weather	Sunny to overcast and rain in evening. 22C				
Camp Comments	Charles returned to Whitehorse				
Production Comments	Bathy completed. Good day of gravity focused on straggler points near town.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	171
Total:	3	171

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	36.5
Teslin Bathy West	66	
Total:	223	36.5
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	324	12
Total:	569	12

Report Date	02-Aug-22	Prepared on	02-Aug-22	Prepared By	Robert Chee
Weather	Partial clouds to sunny 21C				
Camp Comments	No comments				
Production Comments	Acess road to mountain top blocked due to construction. Scouted alternative ways up mountain. Repeater and ATV issues, now believed to be fully resolved.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	3	174
Total:	3	174

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	328	4
Total:	573	4

Report Date	03-Aug-22	Prepared on	03-Aug-22	Prepared By	Robert Chee
Weather	Mostly sunny 25C				
Camp Comments	No comments				
Production Comments	Confirmed access to mountain top with site manager and took absolute gravity point. Decent gravity with a few areas of spotty GNSS connection				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	175
Total:	2	175

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	338	10
Total:	583	10

Report Date	04-Aug-22	Prepared on	04-Aug-22	Prepared By	Robert Chee
Weather	Mostly sunny high of 23C				
Camp Comments	No comments				
Production Comments	Decent day, lots of very steep slopes and occasional GNSS connection issues.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	177
Total:	2	177

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	348	10
Total:	593	10

Report Date	05-Aug-22	Prepared on	05-Aug-22	Prepared By	Robert Chee
Weather	Cloudy and rain into evening. High of 14C				
Camp Comments	No comments				
Production Comments	Equipment maintenance delayed start. Worked on eastern section of the grid, few GNSS issues.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	179
Total:	2	179

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	357	9
Total:	602	9

Report Date	06-Aug-22	Prepared on	06-Aug-22	Prepared By	Robert Chee
Weather	Mostly cloudy, rain into evening. High of 18C				
Camp Comments	No comments				
Production Comments	Very good day, completed longest line along northern edge of the grid. Long dead walk at the end of day.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	181
Total:	2	181

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	370	13
Total:	615	13

Report Date	07-Aug-22	Prepared on	07-Aug-22	Prepared By	Robert Chee
Weather	Rainy high of 14C.				
Camp Comments	No comments				
Production Comments	Good day, collected points near roads.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	183
Total:	2	183

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	384	14
Total:	629	14

Report Date	08-Aug-22	Prepared on	09-Aug-22	Prepared By	Robert Chee
Weather	20C Sunny				
Camp Comments	GPS controller issues, commuted part way to Whitehorse to trade GPS controllers				
Production Comments	GPS controller water damaged yesteday. The controller was replaced and many radio connectivity issues occured and were eventually resolved.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	185
Total:	2	185

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	384	
Total:	629	

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Report Date	09-Aug-22	Prepared on	09-Aug-22	Prepared By	Robert Chee
Weather	Mostly sunny high of 19C				
Camp Comments	No comments				
Production Comments	Good day, continued on north west section with a long dead walk.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	187
Total:	2	187

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	397	13
Total:	642	13

Report Date	10-Aug-22	Prepared on	08-Oct-22	Prepared By	Robert Chee
Weather	Patially cloudy high of 17C				
Camp Comments	No comments				
Production Comments	Decent day, final day of long deadwalks. Collected some straggler points near paths.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	189
Total:	2	189

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	409	12
Total:	654	12

Report Date	11-Aug-22	Prepared on	11-Aug-22	Prepared By	Robert Chee
Weather	Partially cloudy high of 18C				
Camp Comments	No comments				
Production Comments	Finished points on mountain leaving only town points. Re-took 2 points lost due to water damaged GPS controller.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	191
Total:	2	191

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	422	13
Total:	667	13

Report Date	12-Aug-22	Prepared on	08-Oct-22	Prepared By	Robert Chee
Weather	18C sunny				
Camp Comments	Demob to Whitehorse				
Production Comments	Completed main grid and recollected town points to tie in data.				

Personnel

Type of Personnel	Qty in Camp Today	Total Person Days
Geophysics Personnel	2	193
Total:	2	193

Geophysics Production

Grid Name	Total Production	Todays Production
Bathymetry	Line km	Line km
Teslin Bathy East	74.5	
Teslin Bathy Longitudi	82.5	
Teslin Bathy West	66	
Total:	223	
Gravity Survey	Stations	Stations
	0	
Teslin 100m	245	
Teslin Main	427	5
Total:	672	5

Appendix III Instrument Specifications

CG-6 SPECIFICATIONS

SENSOR TYPE	Fused quartz using electrostatic nulling
READING RESOLUTION	0.1 microGal
STANDARD DEVIATION	< 5 microGal
OPERATING RANGE	World-wide (8,000 mGal without resetting)
RESIDUAL DRIFT	< 20 microGal/day
UNCOMPENSATED DRIFT	< 200 microGal/day
RANGE OF AUTOMATIC TILT COMPENSATION	±200 arcseconds
TARES	Typically < 5 microGal for shocks up to 20 g
AUTOMATED CORRECTIONS	Tide, instrument tilt, temperature, noisy sample filter, seismic noise filter, drift
DATA OUTPUT RATE	User selectable up to 10 Hz
GPS ACCURACY	Standard < 3 m
TOUCH-FREE OPERATION	Handheld Tablet with Bluetooth
BATTERY CAPACITY	2 X 6.8 Ah (10.8 V) rechargeable lithium smart batteries. Full day operation at 25 °C (77 °F)
POWER CONSUMPTION	5.2 Watts at 25 °C (77 °F)
OPERATING TEMPERATURE	-40 °C to + 45 °C (-40 °F to 113 °F); Optional high temperature version to +55 °C (131 °F)
DIGITAL DATA OUTPUT	USB and Bluetooth
DIMENSIONS	21.5 cm(H) x21 cm x 24 cm (8.5 in x 8.2 in x 9.4 in)
WEIGHT	5.2 kg (11.5 lbs) including batteries
STANDARD SYSTEM CONTAINS	• CG-6 Autograv™ Gravity Meter • CG-6 Tripod • 2 Rechargeable Smart Batteries • Battery Charger • Tablet Computer w/GPS + accessories • Lynx LG Land Gravity Software • Power Supply and USB Cable • Transit Case • Shoulder Strap • User Manual • Spare Parts Kit • Carry Bag
AVAILABLE OPTIONS AND ACCESSORIES	• High-Temperature (HT) Meter Option • Cold Weather Survey Accessories • Surveyor's Backpack • Spare Meter Batteries • Spare Tablet Batteries • Trident Gradient Tripod • Spare Battery Caps

* Tablet and CG-6 specifications are subject to change without notice.

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Setting the Standards

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700-370-001 REV B

SCINTREX CG-5 AUTOGRAV SPECIFICATIONS

Sensor Type:	Fused quartz using electrostatic nulling
Reading Resolution:	0.001 milligal
Minimum Operating Range:	8000 milligals, without resetting
Residual Long-term Drift:	Less than 0.02 milligal/day
Standard Deviation:	less than 0.005 mGal
Range of Automatic Tilt Correction:	±200 arc sec.
Automated Corrections:	Tide, instrument tilt, temperature, noisy sample, seismic noise filter
Tares:	Typically less than 0.005 mgals
Dimensions:	30cm (H) x 21cm x 22cmm
Weight:	8 kg, including standard battery
Battery Capacity:	2 x 6Ah (10.8V) rechargeable lithium smart batteries
Power Consumption:	4.5W at +25°C
Operating Temperature Range:	-40°C to +45°C.
Standard Memory:	1 MByte.
Noise Rejection:	Samples of more than 4 standard deviations from the average are rejected, if this feature is selected upon initialization of the instrument.
Displayed & Recorded Data:	Corrected Gravity, Standard Deviation, Tilt about the X-axis, Tilt about the Y-axis, Gravity Sensor Temperature, Tidal Correction, Duration of Measurement, Time at start of measurement and Header information (including date and initialization constants).
Digital Display:	1/4 VGA 320X240
Keypad Input:	27 key alpha/numeric for entering all commands, co-ordinates, header and ancillary information
Real Time Clock:	Day, month, year, hour, minute and second. Continuous lithium battery backup.
Digital Data Output:	RS-232 C and USB interface
Digital Data Formats:	Scintrex, text, CG-3, xyz