GNSS4SWEC Real-time PPP Demonstration Campaign

(Design & Instructions)

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Submitting tropospheric products

The Analysis Centres should submit files containing troposphere parameters estimated in real time from all selected sites (see the List of stations) to the ftp-server at the Geodetic Observatory Pecny (GOP).

The product files should be converted to the latest **COST-716 format** (optimally v2.2, (http://egvap.dmi.dk/support/formats/egvap_cost_v22.pdf)). Headers of each COST-716 file should be generated using the actual RINEX skeleton files (see Station metadata). File names should follow the COST-716 conventions using the **"demo"** product status.

If individual analysis centre provides more product lines each should be uploaded using a separate COST-716 file and using a specific analysis centre acronym (i.e. consisting of unique analysis centre ID and a product line ID).

Update rate, parameter resolution

Parameters must be estimated with a **5-minute** resolution (**parameter sampling rate**). If the higher sampling rate is used in the processing delivered product files should be reduced to 5 minutes. Product files should be uploaded to the FTP server at GOP every **60 minutes** (**product update rate**) with following username and password.

FTP server: ftp://ftp.pecny.cz (no more subdir since USER is linked to it directly)

for the access (user and password) contact jan.dousa@pecny.cz

Note: time epochs in UTC. Files should be submitted on every hour of UTC (i.e. HH:00:00 UTC).

Monitoring and evaluating results

Tropospheric parameters estimated by individual analysis centres will be initially visualized at the http://www.pecny.cz/COST/RT-TROPO/ providing time-series for past two months with a possible selection and combination of individual products. The results will be evaluated using the GOP-TropDB compared to the EUREF and IGS final tropospheric products.

Parameters to be estimated

ZTD: mandatory (sampling at least 5 minutes – for delivery)
GRD: optional
CRD: estimated as static parameters

Processing strategy and applied models

The strategy for tropospheric estimation is generally free and should be as much as optimized with respect to individual software capability and the state-of-the-art knowledge. The same deals with the precise models, such as IERS conventions,

antenna phase offsets and variations, a priori tropospheric model, and mapping functions, and others. However, the each submitted product (i.e. product of single analysis centre and single production line) should be documented - template will be prepared and available from the GOP monitoring web page. Optimally, the strategy modifications could be briefly introduced in the COST_716 file header.

List of stations

A common mandatory list of sites is based on E-GVAP supersites, EPN and IGS sites.

Note: more stations can be included optionally, but for the demonstration campaign, please, don't not use more than 50 in total.

E-GVAP super-sites (5):
BRST, GOPE, ONSA, YEBE, ZIM2

EPN sites (10):
CASC, HERT, HOFN, MALL, MATE, NICO, PDEL, POTS, REYK, WTZR

IGS sites (17):
ADIS, ALBH, ALGO, ALIC, AUCK, DUBO, LHAZ, NKLG, NRMD, OHI3, POVE, THTI, ULAB, UNSA, WIND, YAR3, YELL

Station metadata

The RINEX skeleton files for EUREF and E-GVAP sites should be used from the EPN Central Bureau at
http://www.epncb.oma.be/stations/log/skl

while for IGS sites from the IGS Central Bureau at
http://igscb.jpl.nasa.gov/igscb/station/general/skel

Use of GNSS

GPS: mandatory
GPS+GLO: mandatory (if supported with software and real-time data streams)
Other: optional

Notes: Used constellation must be specified in the header of the COST-716 file using the PCD flag.

The GPS and GPS+GLONASS solutions should be stored in different files with different names. The solution type has to be specified by the fourth character in the processing centre name. The character 'G' will be used for GPS-only results, and the character 'R' will be used for GPS+GLONASS.

Use of real-time orbit and clocks

IGS03: mandatory
Others: optional

In order to guarantee a consistency of GPS+GLONASS products and comparable results from all analysis centres, participants agreed in using **IGS03 stream** that contains both GPS and GLONASS real-time orbits and clocks.