Federal Agency for Cartography and Geodesy

GNSS-related Activities of the EUREF Governing Board

Wolfgang Söhne

EUREF GNSS: Network

- Several new stations for the EPN in the last months
- Some replacements (e.g. BAUT for DRES)
- Addition of long-time existing (IGS) stations (e.g. WTZx)
- Why adding stations with neighboring stations already in the EPN?
- One reason to add the stations: some stations (silently) became IGS stations via merging the IGLOS network
- Also interesting for reprocessing

EUREF GNSS: Network

- Goal: all IGS stations in the area of EUREF should be EPN stations
- Keep the requirements (stability, Multi-GNSS etc.)
- Too much EPN stations? – Approx 1/10 w.r.t. densification stations
- Not easy to find enough ACs willing to process the data
- What about ITRF GNSS stations not part of IGS (and EPN)?

EUREF GNSS: Data Centres

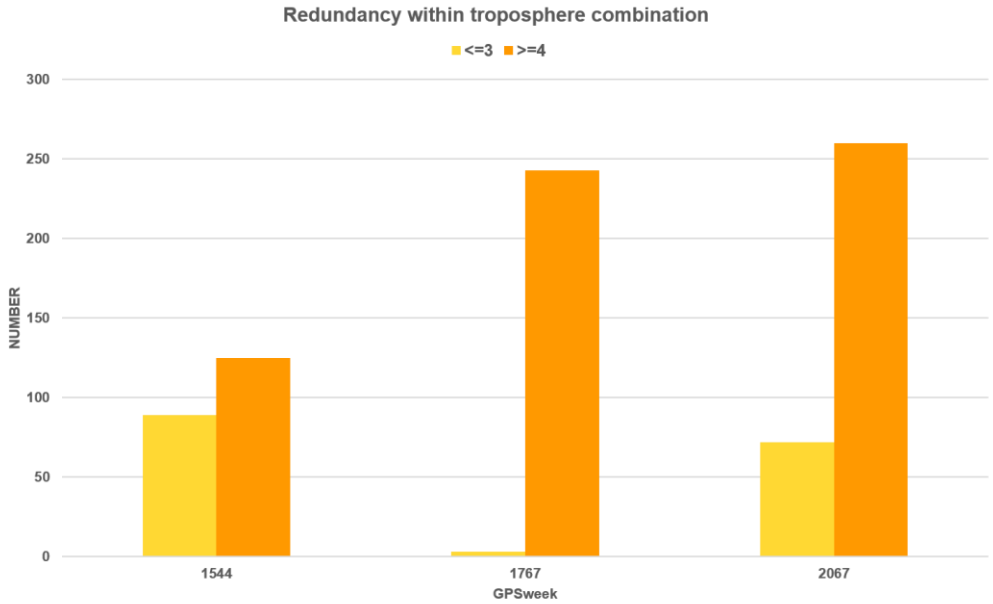
- Two regional data centres (BKG, BEV), one historical data centre (ROB), several local data centres
- Three regional broadcasters (ASI, BKG, ROB), several local broadcasters
- BKG is going to follow the IGS approach (CDDIS, GA) to be visible for the outside world as one data centre for daily, hourly and secondly data
- Distributed approach: not all data stored in each DC but available from each DC (through meta data)
- Meta data: review of handling them, store the information in a database, optionally derive site logs as output

EUREF GNSS: Analysis

- Is it possible and / or wishful to widen the software packages used in the EPN for processing (likewise the IGS)?
- EUREF focus is on reference frame, not on orbits, clocks etc.
- Number of ACs: too many, too few, exactly right?
- Large diversity of network size
- Got loose of the goal to process each station by four ACs

EUREF GNSS: Analysis

- Is it possible and / or wishful to widen the software packages used in the EPN for processing (likewise the IGS)?
- EUREF focus is on reference frame, not on orbits, clocks etc.
- Number of ACs: too many, too few, exactly right?
- Large div
- Got loose ‘our ACs



EUREF GNSS: Reference Frame

- New accumulated solution every 15 weeks – arbitrary number but reduction too time-consuming
- RF coordinator presented a new approach for station classification overcoming class A and class B classification
- ITRF ↔ ETRF:
- 1 mm per year in the vertical component of ETRF
- Reference frame realization for Europe still timely?
- Kinematic or dynamic reference frame?
- More than one reference frame realization?

EUREF GNSS: Densification

- Working Group on EPN Densification
  - Since 2015
  - > 3300 stations
  - 24 ACs
  - Some global solutions?
- Working Group on Dense Velocities
  - Since 2017
  - > 53000 solutions, > 6000 combinations
  - 29 contributions
  - Global map = global solution?

EUREF GNSS: Densification

- E-GVAP
  - Since 2005
  - > 1500 stations
  - ~ 20 ACs
  - Several global solutions
- EPOS
  - Since 2010
  - Thematic Core Service GNSS
- (Less common stations as i expected)
- Do all the different projects need a consolidated action w.r.t., e.g., standards, accessibility, visibility?

EUREF GNSS: EPN going global

- Discussion since … a decade?
- How to proceed?
- Communication of the advantages?
- One AC with global solution? Or more than one?
- All ACs with global solutions?
- 50 – 70 global stations plus a bulk of 350 regional stations?
- How about the weighting? The antenna corrections applied?
- Why establishing a competitor to long-term established global solutions?

EUREF GNSS: Reprocessing

- EUREF WG since 2009
- IGS is going to start the third reprocessing (repro3)
- Agreement on the models, PCVs etc. – scale?!
- Tight schedule with regard to the combination and input for the next ITRS realization
- Third reprocessing of the EPN?
- Similar to repro1 (almost all ACs, sub-networks)?
- Similar to repro2 (some ACs, full network, different softwares, and sub-networks)? – global?
- Necessary to describe and communicate the benefit of a reprocessing for the European geodetic community

EUREF GNSS: Multi-GNSS

- EUREF WG since 2012
- Adding Galileo to the processing since 2019
- Lack in correct PCVs (GPS L2 → Galileo E5)
- Approx. 40-50 stations with chamber-calibrated values
- Robot-calibrated results now available for the IGS
- Type-mean PCVs – are the individual calibrations available?
- What using within EUREF in the future – type-mean, individual (chamber+robot), robot only?
- How to stick with 4th constellation BeiDou and with regional systems (QZSS, NaviC)?

EUREF GNSS: Real-time

- Update of guidelines for EPN stations & OCs
- Long mount-point names for data streams and for product streams
  - WARN0 => WARN00DEU0
  - CLK90 => SSRC00GRG0
  - CLK91 => SSRA00GRG0
  - CLK92 => SSRC01GRG0
  - CLK93 => SSRA01GRG0
- Lack of applications for the denser regional network
- Lack of dedicated EUREF ACs

Thank you for your kind attention!

Contact:

Federal Agency for Cartography and Geodesy
Section G2
Richard-Strauss-Allee 11
60598 Frankfurt, Germany

contact person
Wolfgang Söhne
wolfgang.soehne@bkg.bund.de
www.bkg.bund.de
Tel. +49 (0) 69 6333-263