Results of the GNSS Reprocessing Effort at GOP

Jan Dousa and Pavel Vaclavovic

Research Institute of Geodesy,, Geodetic observatory Pecny, Zdiby, Czech Republic (JAN.DOUSA@PECNY.CZ, +420 2 323649235)

Significant improvements in GNSS data modelling have been achieved since the first permanent networks were established in the early 90th and since the GNSS observations were used for defining and maintaining geodetic reference frames. The products from GNSS permanent networks are thus not consistent over the time because affected by both new observations as well as new models.

During recent years, the availability of a powerful processing hardware has supported a complete reprocessing of all observed data. Up-to-date models enable to achieve the most precise products and continuous parameter time-series. For that reason the IGS initiated its first global reanalysis effort in 2005 (called Repro1). This effort was finished by providing combined reprocessed GPS orbit and clock products in April 2010, which are available for the period of 1994-2007 and these finally support the reanalysis on a regional level.

The reprocessing activity within the EUREF permanent network was initiated already at the LAC workshop in Frankfurt (Oct 2008). The EUREF special project was established in February 2009 planning for a coordinated reprocessing of the entire EUREF permanent network data from the period of 1996-2009. The Geodetic Observatory Pecny (GOP) EUREF analysis center started the reprocessing campaign in August 2010, when the IGS repro1 products were already available. Using the processing strategy slightly revised from the GOP standard EUREF analysis and the network of approximately 80 stations in total, the processing system has been setup and an initial run completed. After fixing a few problems identified in the first run, the second one went smoothly before the end of 2010. Since 2008, we have applied the IGS final orbits instead of the IGS repro1 orbits and we have continued the reanalysis until the end of 2010. Daily and weekly coordinates and daily zenith tropospheric parameters were uploaded to the regional EUREF data center at BKG in January 2011.

The GOP processing system is described and the results of the GPS reprocessing from period 1997-2010 are presented. In order to assess the product improvements, we also analysed the time-series of the estimated coordinate and zenith total delay parameters.