

On the Future High-Precision European GNSS CORS Infrastructure

Carine Bruyninx (1), Eric Pottiaux (1,2), Rosa Pacione (3), Andras Fabian (1,2), and Juliette Legrand (1)

(1) Royal Observatory of Belgium, Reference Systems and Planetology, Brussels, Belgium (C.Bruyninx@oma.be), (2) Solar-Terrestrial Center of Excellence, Brussels, Belgium, (3) e-GEOS S.p.A, ASI/CGS, Italy

Thousands of continuously operating GNSS reference stations (CORS) cover Europe. Their data are used for high-precision applications ranging from reference frame maintenance, monitoring of tectonic deformations, monitoring of sea-level variations, long-term climate monitoring, numerical weather prediction, space weather applications...

The EUREF Permanent Network (EPN), created in 1996, was the first pan-European effort to coordinate the exchange of data and metadata of GNSS CORS and focussed primarily on reference frame applications. Today, this network contains more than 300 participating stations that comply with EUREF guidelines, and whose observation data and metadata are provided to EUREF for further validation, dissemination and generation of dedicated products. In 2010, EUREF took the initiative to coordinate also the data analysis of an EPN densification network consisting of more than 1800 GNSS stations for which also metadata are collected and validated. The goal of the EPN densification is to determine a dense European velocity field.

In addition to the EUREF networks, the EUMETNET EIG GNSS water VApour Program (E-GVAP, 2005-now) coordinates the collection and distribution of GNSS tropospheric delays and water vapour data obtained from the near real-time data analysis of more than 3500 GNSS stations, from which about 3000 are located in Europe. E-GVAP itself does not distribute GNSS station metadata nor data.

Finally, Europe is today constructing the European Plate Observing System (EPOS), which contains also a European GNSS network, but now aiming to support Solid Earth science. EPOS will collect and validate GNSS station metadata and data, and also organise their operational analysis. In January 2019, almost 800 GNSS stations were proposed to EPOS.

The goal of this presentation is to give a comparative overview of the pan-European GNSS networks mentioned above in order to highlight their overlaps and differences, and map their weaknesses and strong points. Then, we will investigate which steps are necessary to homogenise their activities and provide users with a comprehensive overview of all available GNSS CORS data, metadata, and operational products suitable for high-precision applications in Europe.