



Stability of velocity estimations and quality assessment of the EPN stations

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The primary purpose of the EPN (EUREF Permanent GNSS Network) multi-year coordinate & velocity solution is to provide access to the European Terrestrial Reference System 89 (ETRS89) which is the standard precise GNSS coordinate system throughout Europe. The EPN multi-year solution is an IGS14 realization of the ITRS in Europe. Starting with the release of IGS14 (January 2017), it is based on daily solutions (instead of weekly solutions) and on EPN-repro2 completed by operational solutions. The solution is updated each 15 weeks using CATREF software (Altamimi et al., 2007) and is expressed in IGS14 as well as in two realisations of the ETRS89, the ETRF2000 and the ETRF2014.

When using the EPN multi-year position and velocity solution as reference solution, the user has to select a set of reference stations in order to tie its network to the reference frame. When selecting the stations, the user aims at choosing the best stations of the reference network. In order to help the user to choose his set of reference stations, EUREF is providing a station classification (A and B). Class A stations represent stations whose multi-year positions and velocities are reliable enough to be used as reference station for densification projects.

However, this classification is lacking granularity. In order to improve the station classification within the EPN, more criteria have been investigated such as the sensitivity of the velocity and its error estimation with respect to time correlated noise, used software, and tracking performance of the station.

This study allows assessing the quality of the stations, but it also provides more general results on the stability of the velocity estimation for a network such as the EPN.