



GNSS RTK-networks: The significance and issues to realize a recent reference coordinate system

Elke Umnig, Gregor Möller, and Robert Weber

Department of Geodesy and Geoinformation, Research Group Advanced Geodesy, Vienna University of Technology, Austria
(elke.umnig@tuwien.ac.at)

The upcoming release of the new global reference frame ITRF2013 will provide high accurate reference station positions and station velocities at the mm- and mm/year level, respectively. ITRF users benefit from this development in various ways. For example, this new frame allows for embedding high accurate GNSS baseline observations to an underlying reference of at least the same accuracy. Another advantage is that the IGS products are fully consistent with this frame and therefore all GNSS based zero-difference positioning results (Precise Point Positioning (PPP)) will be aligned to the ITRF2013.

Unfortunately the transition to a new frame (or just to a new epoch) implies also issues in particular for providers and users of real time positioning services. Thus providers have to perform arrangements, such as the readjustment of the reference station coordinates and the update of the transformation parameters from the homogeneous GNSS coordinate frame into the national datum. Finally providers have to inform their clients appropriately about these changes and significant adjustments.

Furthermore the aspect of the continental reference frame has to be considered: In Europe the use of the continental reference system/reference frame ETRS89/ETRF2000 is, due to cross-national guidelines, recommended by most national mapping authorities. Subsequently GNSS post-processing applications are degraded by the concurrent use of the reference systems and reference frames, to which terrestrial site coordinates and satellite coordinates are aligned.

In this presentation we highlight all significant steps and hurdles which have to be jumped over when introducing a new reference frame from point of view of a typical regional RTK-reference station network provider. This network is located in Austria and parts of the neighbouring countries and consists of about 40 reference stations. Moreover, we discuss the significance of permanently monitoring the stability of the reference network sites and the determination of station velocities/rates for geodynamical investigations.