DTRF2020: the ITRF 2020 realization of DGFI-TUM

Bloßfeld Mathis, Seitz Manuela, Glomsda Matthias, Angermann Detlef, Rudenko Sergei, Zeitlhoefler Julian DGFI-TUM, Munich, Germany

As one of three IERS ITRS combination centres (CC) worldwide, DGFI-TUM is in charge of the computation of an own ITRS 2020 realisation, the DTRF2020. The solution is carried out within the framework of the computation of the ITRF2020, the official ITRS realisation calculated and released by the Institut national de l'information géographique et forestière (IGN, Paris, France). A third realization, the JTRF2020, which represents a time series of terrestrial reference frames (TRF), is computed by the ITRS CC at NASA's Jet Propulsion Laboratory (JPL, Pasadena, USA). The DTRF2020 is based on the combination of constraint-free normal equation systems (NEQs) of the techniques and accounts for non-linear station motions due to all three components of the non-tidal loading signal (atmospheric, hydrological and oceanic component) as well as post-seismic deformation. Hence, it serves the validation and quality assurance of the official ITRF solution.

The input data for the ITRS realizations are long time series of weekly or session-wise solutions of the observation techniques VLBI, SLR, GNSS and DORIS, covering each entire observation history of the respective technique (e.g., more than 40 years in case of VLBI). By combining the techniques a precise and long-term stable TRF solution together with consistently estimated Earth Orientation Parameters is obtained, taking advantage of the individual strengths of each 5 technique. The DTRF2020 accounts for non-linear station motions due to, for the first time, the full non-tidal loading signal and post-seismic deformation. Both effects are reduced from the NEQs by applying corresponding model values.

The presentation shows the computation strategy of the DTRF2020 and its special features. Moreover, the datum stability and the quality of the TRF realization is presented. Finally, the presentation provides an overview of the DTRF2020 release dataset.