Toward ITRF2020: Enhancing the Modelling of Nonlinear Station Motions

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Abstract

In preparation for the ITRF2020, a number of combination software developments and updates were undertaken in order to enhance and improve the modelling of nonlinear station motions. While the adjustment of post-seismic deformation (PSD) parametric models for stations subject to major earthquakes will be rigorously determined on a station-by-station basis, significant periodic signals embedded in the station coordinates time series will be jointly determined during the ITRF2020 combination process. In addition to the classical annual and semi-annual frequencies, satellite draconitic periods will also be adjusted and their impact on the ITRF2020 results will be assessed. The ITRF2020 is expected to be provided in the form of an augmented reference frame so that in addition to station positions and velocities, parametric models for both PSD and seasonal signals (expressed in the CM frame of satellite laser ranging) will also be delivered to the users. After some introductory remarks, the presentation recalls the main features of data analysis and shows major preliminary results, focusing on the frame origin and scale parameters, horizontal and vertical velocity fields, the level of technique consistencies of nonlinear station motions (PSD functions and seasonal signals) at colocation sites, as well as some performance indicators of the ITRF2020.

Keywords: ITRF, ITRF2020, Nonlinear Station Motions