

## **Status of the International Terrestrial Reference Frame: ITRF2014 and future developments**

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We review the progress and continuous improvements being made since more than 30 years in the determination and development of the International Terrestrial Reference Frame (ITRF). We evaluate the precision and accuracy of the main geodetic and geophysical products of the latest ITRF release, namely the ITRF2014, using some key performance indicators. These indicators include the evaluation of the performance of the annual and semi-annual signals and Post-Seismic Deformation (PSD) models: the two main innovations introduced in the ITRF2014 elaboration. We address some scientific questions of space geodesy contribution, via ITRF2014 results, to understanding geophysical processes that affect the Earth system, such as earthquake displacement, tectonic motion, glacial isostatic adjustment, geocenter motion and loading effects. We evaluate in particular the performance of estimating periodic signals versus applying a non-tidal atmospheric loading model, as well as the extrapolation of the PSD models beyond the ITRF2014 time-span for sites that are subjects to major earthquakes. A particular emphasis will be devoted to the level of agreement between techniques in terms of frame physical parameters (origin and scale), Earth Orientation Parameters, and consistency with terrestrial local ties at co-location sites. Main conclusions will be drawn to guide and improve our analysis and combination strategy for future ITRF developments.