



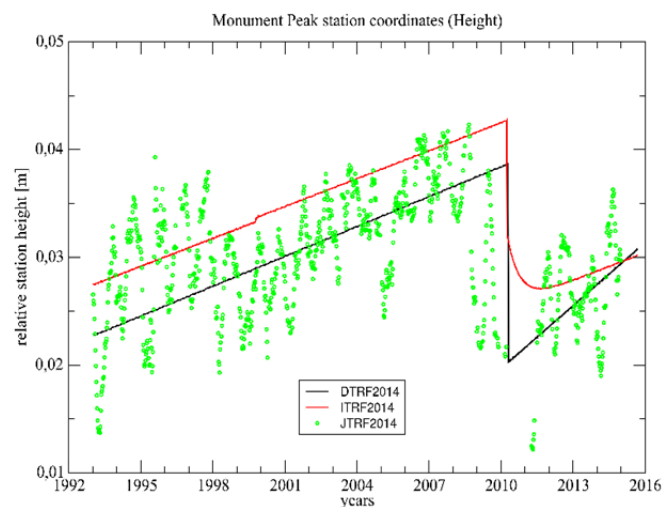
Current topic for a Master's Thesis

Evaluation of different ITRS realizations: How can scale differences between SLR and VLBI be explained?

In its role as one of the Combination Centres (CCs) of the International Earth Rotation and Reference Systems Service (IERS), DGFI-TUM is responsible for the realization of the International Terrestrial Reference System (ITRS). DGFI-TUM's most recent solution is named DGFI Terrestrial Reference Frame (**DTRF2014**) and includes observations of the four space geodetic techniques GNSS, VLBI, SLR and DORIS. Further ITRS realizations were computed by the IGN, France, (ITRF2014) and the JPL, USA, (JTRF2014).

A significant difference between the solutions is that the DTRF2014 and ITRF2014 contain only station coordinates and velocities at a reference epoch whereas the JTRF2014 comprises time series of weekly solutions (see figure).

In all three solutions the scale is realized as a weighted mean scale of VLBI and SLR. Up to now, the three ITRS CCs see differences between the scales of the VLBI and SLR single-technique solutions as well as between the combined solutions at different orders of magnitudes. It is unclear whether these scale differences are caused by technique-specific effects or by the different combination approaches used by the CCs.



Height time series for the SLR station Monument Peak (USA) computed from the three most recent ITRS realizations DTRF2014 (black), ITRF2014 (red), and JTRF2014 (green).

Main tasks:

- Discussion of the different combination approaches at the three ITRS CCs.
- Analysis and quantification of differences of station coordinates and Earth rotation parameters (systematics, statistics) between the three solutions.
- Evaluation of the test solutions based on (i) the precise orbit determination of SLR satellites and (ii) the estimation of geodetic parameters using VLBI observations.
- Investigation and comparison of the realized scales in the test solutions.

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