

Current Accuracy of Vertical and Horizontal Station Displacements

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Space geodetic techniques like Global Navigation Satellite Systems (GNSS), Satellite Laser Ranging (SLR) and Very Long Baseline Interferometry (VLBI) provide valuable input for studies of Global Isostatic Adjustment (GIA). This contribution discusses the current precision and accuracy of vertical and horizontal station displacements. The precision of the space geodetic techniques will be evaluated by repeatabilities and solutions computed from different sub-intervals of the data available. However, due to systematic effects, the precision is often much better than the accuracy. The accuracy will be evaluated by comparisons of the space geodetic techniques amongst each other and comparisons with geophysical models, e.g., for atmospheric and hydrologic loading. Besides the analysis of time series, co-located GNSS, SLR, and VLBI sites allow for a comparison of velocities estimated in Terrestrial Reference Frame (TRF) solutions of the different techniques.

Inadequate modeling of technique-specific effects or systematic errors degrades the accuracy of the individual techniques. E.g., the height component of the radio-techniques GNSS and VLBI suffers from a mismodeling of the tropospheric refraction. The impact of different troposphere modeling on the estimated station heights and velocities will be shown. Technique-specific models like the antenna phase center model for GNSS or the modeling of thermal expansion for VLBI are studied by comparing solutions applying different models.