Geophysical Research Abstracts
Vol. 14, EGU2012-11920, 2012
EGU General Assembly 2012


# Evaluation of the relative precision of space-geodetic techniques at ITRF co-located sites with the Three Corner Hat approach

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The International Terrestrial Reference Frame (ITRF) is a linear reference frame consisting of regularized positions and velocities for a set of global stations. It relies on the combination of
station positions, velocities and Earth orientation parameters (EOPs) acquired by GPS, VLBI, SLR and DORIS at co-located sites. To properly combine the individual reference frames and suitably scale the variance-covariance information from the 4 space-geodetic solutions, an a-priori knowledge of the relative precisions of the four techniques is mandatory.
In this study, focusing on the station position time series derived from GNSS, VLBI, SLR and DORIS at ITRF co-locations, we aim at assessing the relative uncertainty of the co-located space geodetic instruments contributing to ITRF. The investigation relies on the idea of pair-wise differencing station position time series of at least three co-located instruments in order to remove common geophysical signals. By computing the variances of the differenced time series, the relative precision of each time series can be recovered with the Three Corner Hat technique, under the assumption of absence of correlation between the noise processes of the different techniques. Results of the Three Corner Hat analysis of co-located station position time series will be presented.