Geophysical Research Abstracts
Vol. 15, EGU2013-5773-1, 2013
EGU General Assembly 2013

GNSS site characterization

Thomas A Herring
MIT, EAPS Room 54-820A, Milton MA, United States (tah@mit.edu, 001 617 2587401)

We examine the character of phase residuals from global GNSS sites that are used to form the basis of the International Terrestrial Reference Frame and are critical in connecting the different space geodetic components of the Global Geodetic Observing System (GGOS). Many of the longest running GNSS systems have very systematic, low frequency (in terms of sky coverage) phase residuals. These systematic variations directly impact the quality of the survey tie comparisons at the sites since part of systematic error is likely absorbed into the position estimates. They could also lead to temporal changes in the estimates of site position as changes in the GNSS constellation add or remove measurements in specific directions and thus alter the projection of the systematic errors into the position estimates; or as changes in receiver sensitivity or antenna type again effect the magnitude of the errors and their projection into position estimates. In some cases, the systematic phase errors are time dependent most likely due to changes in the area around the GNSS antenna, for example, from viable moisture content in soils and vegetation or by snow accumulations near the antenna. (Snow on antennas can have large effects on position estimates and in extreme cases can be detected in signal-to-noise (SNR) values and code multipath errors). In this talk, we look a variety of GNSS sites, concentrating on those near other geodetic systems, and characterize the nature of the systematic phase residuals at the sites and their time dependence, if any. We also assess the likely impact of these errors on survey ties and the potential temporal variations in position estimates due system evolution.