



## **Modeling and Observation of Loading Contribution to Time-Variable GPS Sites Positions**

**P. Gegout** (1), J.-P. Boy (1), J. Hinderer (1) and G. Ferhat (1,2)

(1) EOST/IPGS UMR7516 CNRS-ULP, 5 rue René Descartes, 67084 STRASBOURG, France

(2) INSA de Strasbourg, 24 blvd de la Victoire, 67084 STRASBOURG, France

Our aim is to investigate loading consequences on the time-variable GPS site positions of hundred stations around the world during the period 2003-2007. We model the three dimensional site displacements using a Love number formalism to describe the elastic deformation of a spherical Earth's model submitted to atmospheric, oceanic and hydrological loadings. We produce site positions time series using the GPS analysis software GAMIT/GLOBK with/without inserting a combination of loading models and study their impact on 3D site positions. We first of all compare the variability of modeled and observed sites positions (without loading in the GAMIT Software). We secondly study the variance reduction in the GPS sites positions provided by the loading process. We conclude that the seasonal variability of sites displacements is quite well explained by our model at several locations, mainly located at mid-latitudes in the northern hemisphere, while it is much less understood near coastal areas.