



## **Characterization of GNSS site stability**

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In recent years, GNSS data have been and are still being collected that allow position determinations of relatively close sites. Some of these sites installed near GGOS reference sites are deployed to provide stability measurements to the nearby VLBI and/or SLR sites. Other deployments have been aimed assessing the stability of different monuments. One such experiment is being performed by UNAVCO as part of the Plate Boundary Observatory and seeks to compare drilled braced monuments with pillar type monuments. Tests have also been carried out radomes being removed and replaced. In this paper we examine these data and assess the magnitudes of the variations seen in the position estimates and thus provide a lower bound on the stability of monuments and the effects of some radomes. We will also apply different analysis methods to these data to assess the impacts of processing methods. For radomes, site multipath effects and antenna problems, comparing dual frequency analyses, the method always needed for site separations of more than 1 km, with single frequency solutions can yield bounds on the frequency dependent errors that can arise from multipath and possibly radomes. The best of the short baseline results have root-mean-square (RMS) scatters of 80 microns horizontally and 200 microns vertically over a 12-month period. Some monument types show much greater variations. Radome effects can be several millimeters and in some cases the largest effect of removing radomes can be horizontal.