Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07995, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07995
EGU General Assembly 2008

Influence of Calibration of GPS antenna phase center variation in the deformation study

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Geodesy has worked well and proved that measurement and representation of geodynamic phenomena such as crustal motion, Earth rotation and generally Earth deformation are stated as one of its main goal.

In recent year, thanks to advent of space geodetic technique, such as GPS, positions containing both horizontal and vertical components.

Despite the ability of space geodesy to provide three-dimensional displacement field, the crustal deformation studies are still carried out in horizontal and vertical component separately. The main reason of the separation is claimed to be the non-sufficient accuracy of height component of point position due to unresolved modeling error such the antenna phase center variations. In this paper we will describe two procedures for Calibrating of GPS Antennas: Relative and Absolute calibration.

In Relative, we define a field method and in Absolute, we describe two methods: Anechoic chambers tests (moving test antenna within an anechoic chamber and use of artificial GPS signal) and Robot measurements (using a robot that rotates and tilts the antenna in all directions around a fixed point).

In addition, we will examine the different parameters that effect on phase center variation such as: multipath, tropospheric delay, use of Antenna domes and Time delay. For more information you can refer to this article.