An Improved GPS Geodetic Antenna (1996)

175 Beth Bartel March 24, 2010 GNSS Antenna and Dome Test Reports, Testing and Specifications 2682

An Improved GPS Geodetic Antenna

F. Solheim, C. Alber, M. Exner, C. Rocken, C. Meertens, J. Johnson
UNAVCO, POB 3000, Boulder, CO 80307

Signal reflected from the antenna environment mixes with the direct sky signal to induce error in GPS positioning, especially in the vertical dimension. This multipath effect can be reduced by carefully selecting the antenna site and by reducing the gain of the antenna below the desired horizon. UNAVCO has experimented with a number of methods to diminish this gain, including microwave absorbing foam and absorbing ground planes. We find large choke rings to be most effective, and have utilized them in geodesy experiments wherein we obtained better than 1mm repeatability on all three axes on a 45 km baseline. These experiments also included water vapor radiometer (WVR) tropospheric corrections along the propagation path to each of the satellites in view.

A 1 meter choke ring was added to a Turbo Rogue antenna and the gain and phase center were mapped in the Ball Aerospace anechoic antenna test range.

[See attached .pdf file for more.]