



Results of Antenna Gain Calibration and Comparisons with Real GPS-Observations

M. Kirchner (1), P. Zeimet (2), M. Becker (3)

(1) Institute of Geodesy, University of the Bundeswehr Munich, Germany,
(+49-89-6004-3436, michael.kirchner@unibw-muenchen.de),

(2) Institute of Geodesy, University Bonn, Germany,

(3) Institute of Physical Geodesy, Darmstadt University of Technology, Germany

For precise GPS positioning down to the millimetre level all single error sources have to be treated individually, either by eliminating, modelling or estimating the influences. During the last decade significant improvements could be achieved in the field of GPS receiver antenna calibration. Traditionally, this is limited to the azimuth and elevation dependent phase center variation, which directly degrades the measurement. However, for a full description of antenna characteristics the direction dependent gain has to be measured and calibrated as well. This measurement is important to assess the degradation of signals from below the antenna horizon, which are usually caused by multipath reflections. Additionally, the variation in strength of the received GPS signal can be corrected for the antenna specific variation by use of the antenna gain from these calibrations. This is an improvement in relation to the current technique, which only accounts for an empirical elevation dependent variation determined from the observations. By this improvement the identification and evaluation of multipath influences is facilitated.

The gain of a test set of different antenna types has been calibrated by anechoic chamber measurements. The poster presents the results of the calibration. The calibrated antenna gain is compared with the typical elevation dependent signal-to-noise ratio of real GPS field observations.