

PCV ESTIMATION OF RECEIVER ANTENNAE REVISITED

Tobias Kersten and Steffen Schön
Institut für Erdmessung (IfE)
Leibniz Universität Hannover
Schneiderberg 50, D-30167 Hannover, Germany
phone: +49 511 762 5711, fax: +49 511 762 4006
mail: kersten@ife.uni-hannover.de

Abstract

In future, multi frequency and multi GNSS equipment will be used by a broader community. Consequently antenna phase center variations (PCV) for these frequencies and systems have to be provided and parameterized in an adequate way. In the current procedure of the Hannover concept of absolute field calibration with a robot, the PCV are estimated from time differenced single differences. These observations contain the PVC structure, the differential receiver clock and residual error terms like multipath and various hardware delays. To bring up new investigations and to refine the existing PCV models based on spherical harmonics, a fundamental analysis of the methodology of the parameterizations and estimation of the PCV is necessary and currently realized at IfE.

In this contribution the focus is kept on the estimability of and the correlations between the differential receiver clock error and the parameters used to model the PCV. Different parameterizations of the differential receiver clock error and the PCV are considered and their impact on the parameter correlation is discussed. This includes PCV representations by spherical harmonics or polynomials as well as a study of the impact of the maximum degree and order of the spherical harmonic expansion.

For multi-frequency multi-GNSS equipment, the PCV can be determined separately for each system and frequency or in a combined adjustment. In a last step we will investigate the correlations and dependencies that occur between parameters representing the PCV of different frequencies and GNSS systems that were estimated in a combined adjustment.

Tobias Kersten
November 11, 2011