



On the impact of GNSS receiver settings on the estimation of codephase center corrections

Yannick Breva and Steffen Schön

Leibniz Universität Hannover, Institut für Erdmessung, Hannover, Germany (breva@ife.uni-hannover.de)

The role of codephase center corrections (CPC), also known as group delay variations (GDV), become more important nowadays, e.g. in navigation applications or ambiguity resolution. The CPC are antenna dependent delays of the received codephase, which are varying with azimuth and elevation of the incoming GNSS signal. These corrections can be estimated with a robot in the field with a similar approach as used for phase center corrections (PCC) for carrierphase measurements. The Institut für Erdmessung (IfE) has been established an absolute calibration approach to estimate CPC and PCC for multi GNSS signals. The antenna under test (AUT) is precisely tilted and rotated around a fixed point in space by using a robot. With a reference station nearby and an external frequency standard a short-baseline common-clock setup can be achieved, which allows to calculate time-differenced single differences (dSD). The dSD can be used to estimate absolute CPC and PCC with spherical harmonics of degree and order 8. Due to highly dynamic stress, caused by the fast robot motion, a perfect tracking of the GNSS signals is challenging. This can lead to a worse repeatability of the estimated antenna pattern.

In this contribution, we are analysing different receiver settings, e.g. tracking loops, during a calibration process and their impact on the input observations (dSD) for the antenna pattern estimation, as well as their impact on the estimated CPC. Therefore, the Sx3 GNSS software receiver from the IFEN company is used, which allows to change settings in post processing using the same digitalized data stream. We show, that an optimal receiver setting can increase the repeatability of the CPC estimation.