Martin Schmitz, Gerhard Wübbena
Geo++®, Gesellschaft für satellitengestützte geodätische und navigatorische Technologien mbH
D−30827 Garbsen, Germany

April 2001

Some Selected Examples on Effects of Radomes on PCV

The phase center variation (PCV) of the some GPS antennas have been calibrated with the Automated Absolute Field Calibration of GPS Antennas in a Real−Time procedure at Geo++®. Please refer to the references for detailed information on the absolute field calibration approach.

The Automated Absolute Field Calibration characteristics are:

- absolute three−dimensional offsets
- absolute PCV
- PCV from 0° to 90° elevation and azimuth dependent PCV
- free of multipath effects

The following three graphics show the effect of radomes on the PCV characteristic. As examples, the following differences are depicted

- LEIAT504 / LEIAT504 LEIS
- LEIAT303 / LEIAT303 LEIC
- TRM29659.00 / TRM29659.00 TCWD

Each PCV difference are computed from absolute PCV results for the identical antenna without and with radome. The PCV differences are given in the following figures for the ionospheric free linear combination L0.

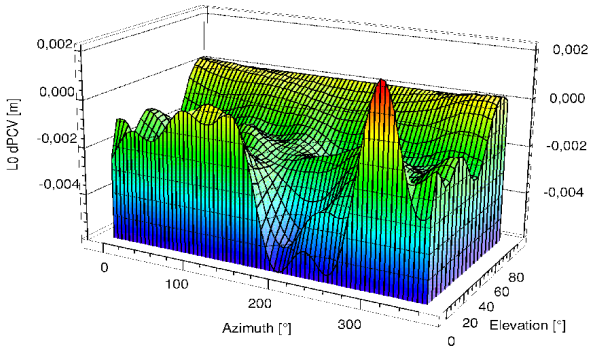

Fig. 1: Difference absolute L0 PCV LEIAT504 without and with LEIS

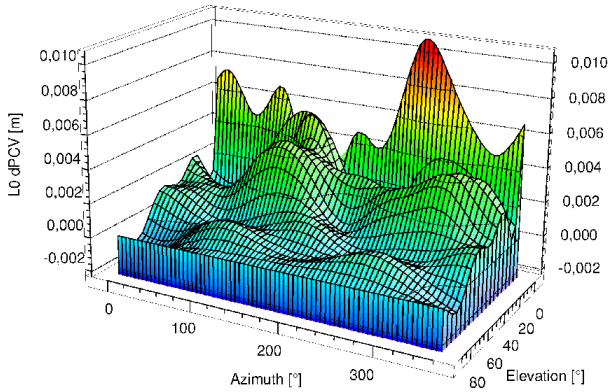

Fig. 2: Difference absolute L0 PCV LEIAT303 without and with Dome LEIC (from 90° to 0° elevation)

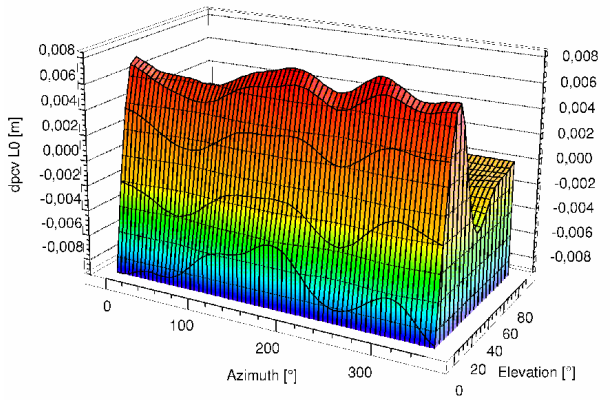

Fig. 3: Difference absolute L0 PCV TRM29659.00 without and with TCWD

The above graphics are extracted from Schmitz, M. (2001).

References

Most of the references are available for download at http://www.geopp.de.

IfE, Geo++® (2000): *AOAD/M_T Choke Ring Antenna Absolute Phase Center Variations, Results of Absolute PCV Field Calibrations at IfE and Geo++®*. Internet Publication compiled by F. Menge and M. Schmitz, world wide web (WWW): http://www.ife.uni−hannover.de/~web/AOA_DM_T.

Menge, F., G. Seeber, C. Völksen, G. Wübbena, M. Schmitz (1998): *Results of Absolute Field Calibration of GPS Antenna PCV*. Proceedings of the 11th International Technical Meeting of the Satellite Division of the Institute of Navigation, ION GPS−98, Nashville, Tennessee, USA, September 15−18, 1998.

Schmitz, M. (2001). Spezielle Untersuchungen und Ergebnisse zum PCV von GPS−Antennen. Wissenschaftliche Arbeiten Fachrichtung Vermessungswesen an der Universität Hannover, Festschrift Prof. G. Seeber zum 60. Geburtstag, Nr. 239, Hannover, 101−112.

Seeber, G., F. Menge, C. Völksen, G. Wübbena, M. Schmitz (1998). *Precise GPS Positioning Improvements by Reducing Antenna and Site Dependent Effects*. In: Brunner (Ed.). Advances in Positioning and Reference Frames, IAG Symposia, Vol. 118, Rio de Janeiro, Brasil, September 3−9, 1997, Springer Verlag.

Wübbena, G., F. Menge, M. Schmitz, G. Seeber, C. Völksen (1996). A New Approach for Field Calibration of Absolute Antenna Phase Center Variations. Proceedings *International Technical Meeting, ION GPS−96*, Kansas City, Missouri, 1205−1214.

Wübbena, G., M. Schmitz, F. Menge, G. Seeber, C. Völksen (1997). *A New Approach for Field Calibration of Absolute GPS Antenna Phase Center Variations.* NAVIGATION: Journal of The Institut of Navigation, Vol. 44, No. 2, Summer 1997, USA.

Wübbena, G., M. Schmitz, F. Menge, V. Böder, G. Seeber (2000). Automated Absolute Field Calibration of GPS Antennas in Real−Time. Proceedings *International Technical Meeting*, *ION GPS−00*, Salt Lake City, Utah.

Acknowledgments

The actual project is funded by the German Ministry of Education, Science, Research and Technology (Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie, BMBF) and Germany's National Aerospace Research Center/National Space Agency (Deutsches Zentrum für Luft− und Raumfahrt, DLR) under the grant 50NA9809.