

Vienna IGG Special Analysis Center Annual Report 2000

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Abstract

A short overview about the Institute of Geodesy and Geophysics (IGG) at the Vienna University of Technology is given and its activities as IVS Special Analysis Center are described. Topics currently worked on and future plans are described.

1. Introduction

The Institute of Geodesy and Geophysics (IGG) at the University of Technology in Vienna, Austria, was officially appointed as an IVS Special Analysis Center on December 4, 2000. Already since 1999 the VLBI group at IGG has worked on the modification of the VLBI software package OCCAM and on investigations concerning the modeling of tropospheric path delays.

2. Staff at IGG associated with the IVS Special Analysis Center

Personnel at IGG associated with the IVS Special Analysis Center in Vienna are Harald Schuh (Head of the Department of Advanced Geodesy) and the research assistants Johannes Böhm (allocation 100%) and Thomas Hobiger (50%).

3. Special Analyses at IGG

- **Modification of the VLBI software package OCCAM**
Together with Oleg Titov (Astronomical Institute of St. Petersburg University) and Volker Tesmer (Deutsches Geodätisches Forschungsinstitut DGFI, Munich) a group was set up in summer 2000 to test, develop and further enhance the OCCAM software. At IGG, we extended the classical least-squares approach of the Gauss-Markov model in OCCAM by allowing the estimation of piecewise linear functions for the clocks, the zenith path delays and horizontal tropospheric gradients (Böhm et al., 2000).
- **Modeling of tropospheric refraction**
Based on the classical least-squares estimation procedure we compared tropospheric gradients determined by GPS and VLBI. Different software packages for the two techniques were applied (OCCAM and SOLVE for VLBI, BERNESE and GIPSY for GPS). Moreover several constraints were used for the piecewise linear functions to check their impact on the estimation of gradients. The results are described in Böhm et al. (2000) and Böhm et al. (2001) and one example of good agreement between gradients derived by GIPSY and OCCAM is shown in Figure 1.

4. Outlook

During the year 2001 the plans of the IVS Special Analysis Center at IGG include:

- Further development of OCCAM, e.g. the implementation of a free network solution and its datum definition.

- Contributions to the IVS working group on geophysical models.
- Research on new tropospheric models which correspond to the traditional usage of mapping functions and gradients.
- Comparisons of tropospheric parameters derived by VLBI, GPS and WVR data based on NEOS-A, IRIS-S and EUROPE sessions.
- Contributions to special IVS projects, e.g. the pilot project 2000 by delivering EOP estimates for 1999.

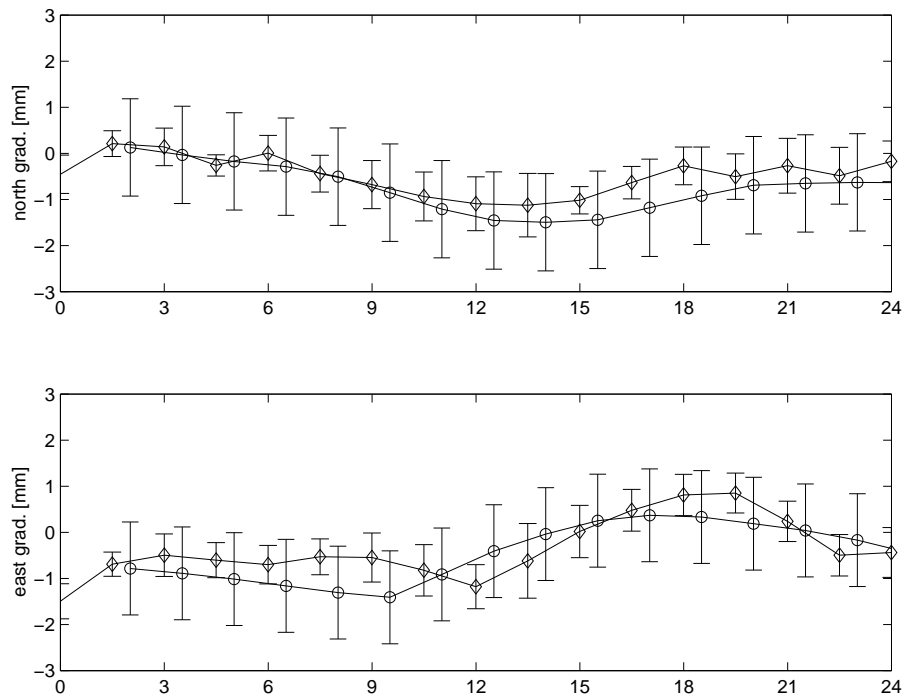


Figure 1. North and east gradients at Wettzell station for the VLBI session IRIS-S 136 on 15 March 1999 and simultaneous GPS measurements. For the estimation of tropospheric parameters a 3 hours' time interval was chosen and the constraints for the gradients were set to 0.6 mm/sqrt(h). Diamonds are used as markers for GPS (GIPSY), circles for VLBI (OCCAM). Acknowledgement: Ruediger Haas from Onsala Space Observatory, Chalmers University of Technology, Sweden, provided the gradients obtained by GIPSY for this comparison.

5. References

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