

## VIEPROJ1 - A Students' VLBI Project

*Wolfgang Winkler, Boris Bogensberger, Wilfried Karel, Michael Kistenich, Gerold Pacher, Andrea Pany, Andreas Roncat, Gerhard Summer, Johannes Boehm, Thomas Hobiger, Robert Weber, Harald Schuh*

*IGG, Vienna University of Technology*

*Contact author: Harald Schuh, e-mail: [harald.schuh@tuwien.ac.at](mailto:harald.schuh@tuwien.ac.at)*

### Abstract

The VLBI project VIEPROJ1 was planned and executed involving university students doing the main work in every step. It was part of the lecture (diploma course) “Auswertung geodätischer Weltraumverfahren” (space geodetic techniques), within the curriculum of Vermessung und Geoinformation (geodesy and geoinformation) at the Vienna University of Technology. The lecture was held by Prof. Harald Schuh and Prof. Robert Weber.

### 1. Scheduling

After the date of the session had been fixed and the participating stations had been chosen, Dorothee Fischer from the University of Bonn advised the students how to make an appropriate schedule for a 3 hours VLBI session, using the SKED software (Fig. 1). The final schedule was produced by the students; the skyplots can be seen in Fig. 2.



Figure 1. Introduction to SKED: Dorothee Fischer from Bonn University explained the principles of scheduling.

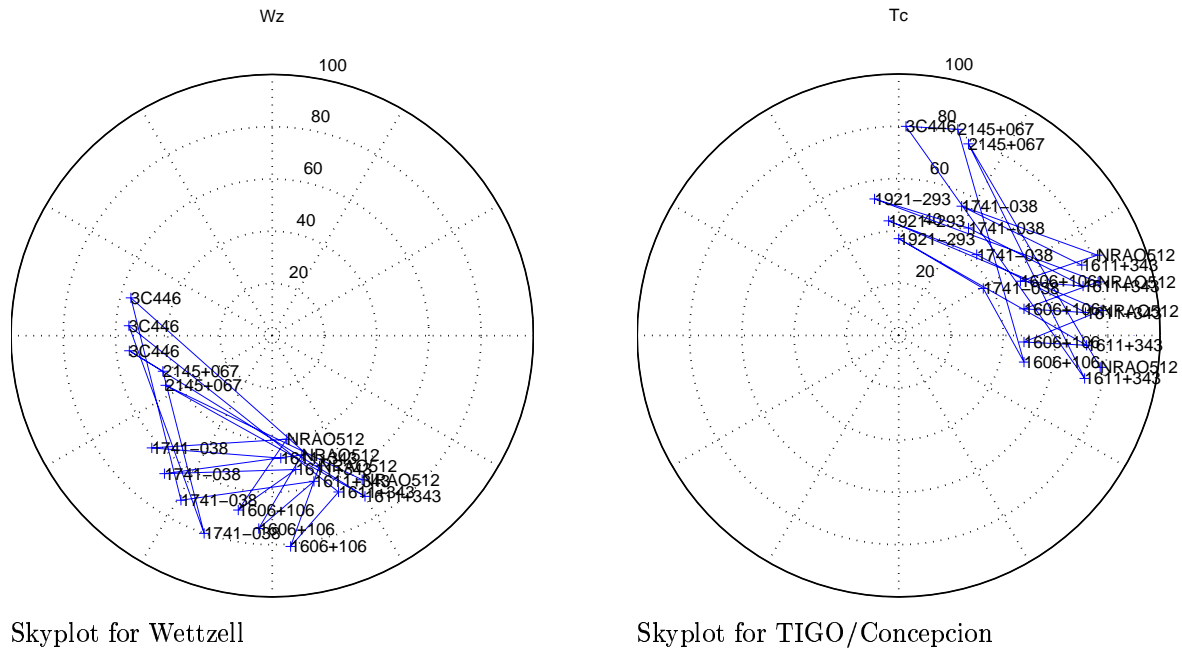


Figure 2. Skyplots for the stations Wetzell and TIGO/Concepcion during the session.

## 2. Observation

On November 27, 2003 the radio telescopes of Wetzell, TIGO/Concepcion and O'Higgins observed about 20 different scans within 3 hours. Four Students visited the Fundamental Station Wetzell while the experiment took place (Fig. 3,4).



Figure 3. During the observation, TIGO was watched via webcam, and some students went to Wetzell. Left: Students are watching the TIGO antenna via webcam in a lecture room of the Vienna University of Technology. Right: Boris Bogensberger in front of the Wetzell antenna.



Figure 4. Gerhard Summer in the operators room.

### 3. Correlation

So far, the tapes from Wettzell and TIGO have been correlated at Bonn correlator. The tape from O'Higgins is still on its way there.

### 4. Analysis

The observed delays were analyzed with the OCCAM software (Titov et al., 2001 [2] at the Vienna University of Technology. Estimates for DUT1 and the station coordinates of TIGOCONC were calculated.



Figure 5. Students Pacher, Summer, Roncat and Winkler working with OCCAM.

## 5. Results

The following set-up was used to estimate the coordinates of TIGOCONC and DUT1:

- Vienna Mapping Function (VMF, Boehm and Schuh, 2004, [1])
- cutoff elevation angle  $3^\circ$
- VLBI Terrestrial Reference Frame (VTRF)

Table 1. Estimated station coordinates of TIGOCONC with formal errors in m.

x	$149205410.89 \pm 0.076$
y	$-488796089.96 \pm 0.092$
z	$-380354133.09 \pm 0.092$

Table 2. Estimated DUT1 and deviation from IERS-C04.

DUT1	$-0.3810 \text{ sec}$	$0.3 \text{ msec}$
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## 6. Acknowledgements

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- O'Higgins team
- Arno Mueskens and the correlator team in Bonn

## References

- [1] Boehm, J., and H. Schuh, Vienna Mapping Functions in VLBI analyses, *Geophys. Res. Lett.*, 31, L01603, doi:10.1029/2003GL018984, 2004.
- [2] Titov, O., V. Tesmer, and J. Boehm, OCCAM 5.0: User's Guide, In: *AUSLIG Technical Notes*, 7, 2001.