Status and plans for the future of the Vienna VLBI and Satellite Software (VieVS 3.0)

J. Gruber1, J. Böhm1, S. Böhm1, A. Girdiuk1, A. Hellerschmied1, A. Hofmeister1, H. Krásná1, Y. Kwak5, D. Landskron1, M. Madzak1, D. Mayer1, J. McCallum2, L. McCallum2, M. Schartner1, S. Shabala2, J. Sun3, K. Teke4

1Vienna University of Technology, Austria
2University of Tasmania, Australia
3Shanghai Astronomical Observatory, China
4Hacettepe University, Turkey
5Technical University of Munich, Germany

VieVS is available free of charge for registered users.

Registration: If you want to have access to VieVS, take a look at the requirements for external users and send a letter to Johannes Böhm (signed by the head of your institution) where you describe for which purposes you would like to have access to VieVS.

The requirements for external users and a template for the application can be downloaded from the VieVS webpage (http://vievswiki.geo.tuwien.ac.at/) under the heading “Get VieVS”.


Introduction

The Vienna VLBI Software VieVS has been developed by the VLBI group at the Vienna University of Technology since 2008. VieVS is designed for the analysis of geodetic VLBI observation data as well as for scheduling and simulation of different VLBI sessions. The software incorporates the latest IERS Conventions and uses the concept of continuous piecewise linear offsets at integer hours for the parameter setup, consistent with the terms of reference of the GGOS. We present the status of the software focusing on the capabilities of the newest release 3.0.

VieVS structure

- **VIE_SETUP**: The processing setup is realized in one common graphical user interface (GUI).
- **VIE_INIT**: Start single session solution as well as single modules (scheduling, simulation, global solution).
- **VIE_SCH**: Scheduling of observations → ngs-files for simulation, skd-files for antenna steering.
- **VIE_SIM**: Simulation of observations from real sessions or sessions scheduled with VIE_SCH.
- **VIE_MOD**: Calculation of theoretical delay and partial derivatives.
- **VIE_GLOB**: Accounting for station corrections.
- **VIE_LSM & VIE_LSM scan**: Computation of least squares adjustment (inversion of whole design matrix or scan-wise update of normal equation matrix).
- **VIE_LSM**: Setup and storing of normal equations for global solution.

How can I become a user?

- VieVS is available free of charge for registered users.
- Registration: If you want to have access to VieVS, take a look at the requirements for external users and send a letter to Johannes Böhm (signed by the head of your institution) where you describe for which purposes you would like to have access to VieVS.
- The requirements for external users and a template for the application can be downloaded from the VieVS webpage (http://vievswiki.geo.tuwien.ac.at/) under the heading “Get VieVS”.

VieVS features

**Session analysis**

- Single session analysis:
  - Select session and parameters via a simple GUI.
  - Estimate Parameters as continuous piecewise linear offsets

**Multi session analysis**

- Analysis of a predefined process list with the same parameterisation
- Correct for source structure
- vgosDB-ready
- Ray-traced delays for all VLBI observations
- Delay model and dedicated file format for VLBI observations of near-field target

**Scheduling and simulation**

- Refined scheduling for satellite observations
- New graphical user interface to create schedules manually or semi-manually
- Possibility to automatically create multiple schedules with different parametrization and multicore support
- New graphical user interface to analyze schedules
- New optimization parameters, which can improve the schedule significantly
- New independent checking tool, which verifies the computed schedule
- New astronomic scheduling optimization strategy: star scheduling mode

**Simulation**

- deeper integration of the scheduling and simulation module in the present architecture of VieVS

Future plans

**Addition of a SLR module in VieVS**

- Single SLR analysis
- Combined solution of SLR and VLBI data

**System requirements**

- MATLAB 7.6 (R2008a) or later.
- About 7.5 GB of disk space, including all data files
- Should work with any operating system able to run this MATLAB version (tested on Windows and Linux).

CONTACT

http://vievswiki.geo.tuwien.ac.at/doku.php
For upcoming dates and news have a look at our website

How can I become a user?

- VieVS is available free of charge for registered users.
- Registration: If you want to have access to VieVS, take a look at the requirements for external users and send a letter to Johannes Böhm (signed by the head of your institution) where you describe for which purposes you would like to have access to VieVS.
- The requirements for external users and a template for the application can be downloaded from the VieVS webpage (http://vievswiki.geo.tuwien.ac.at/) under the heading “Get VieVS”.