**VieVS 2.3 – status of the Vienna VLBI Software and plans for the future**

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**VieVS structure**

- **VIE_SETUP (GUI)**
  - The processing setup is realized in one common graphical user interface (GUI).
  - Start single session solution as well as single modules (scheduling, simulation, global solution).

- **VIE_SCHED**
  - 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_SCHED.

- **VIE_INIT**
  - Reading of observations, station coordinates and velocities, source coordinates.
  - Removing of outliers and bad observations, exclusion of stations, sources or baselines.

- **VIE_MOD**
  - Calculation of theoretical delay and partial derivatives.
  - 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).
  - Setup and storing of normal equations for global solution.

- **VIE_GLOBAL**
  - Stacking of single session normal equations to obtain global parameters.

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**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 Böhmi (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://vievvs.geo.tuwien.ac.at/](http://vievvs.geo.tuwien.ac.at/)


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**VieVS features**

**Session analysis**

- Single session analysis
- Select observation and parameters via a simple GUI.
- Estimate Parameters as continuous piecewise linear offsets:
  - EOP
  - Station and source coordinates
  - Zenith wet delays
  - Clock offsets

**Multi session analysis**

- Calculation of theoretical delay and partial derivatives.
- Accounting for station corrections.

**Scheduling and simulation**

- New: Refined scheduling for satellite observations
- Prepare schedules for VLBI observing sessions automatically:
  - Include twin telescopes
  - Station- or source based strategy
  - AUST sessions are scheduled with VIE_SCHED

**Simulation**

- Monte-carlo simulations
- Simulated parameters:
  - Clocks
  - White noise
  - Troposphere

**Plotting tool**

- Plot residuals and parameters per station, baseline etc.
- Interactive selection of outliers and clock breaks
- Analyse sessions
  - Plot network
  - Plot correlation matrices
  - Plot baseline length repeatability

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**Future plans**

- More sophisticated scheduling module
  - Schedules for VGOS
  - Mixing legacy and new antennas

**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).

**Global Solution**

- Estimate parameters which are common to all VLBI sessions
  - New: Tidal ERP terms
  - Station coordinates and velocities (TRF)
  - Source coordinates (CRF)
  - Earth orientation parameters (EOP)

**Plot**

- Ray-tracing
  - Ray-traced delays for all VLBI observations

**Improving scheduling of satellite observations**

- Interactive scheduling approach
- Orbit calculation based on Two Line Element (TLE)
- Generation of scheduling files (VEX) capable of performing satellite observations with VLBI antennas

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**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 2.3.

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**User workshop**

The next VieVS user workshop will be held September 2016 in Vienna!