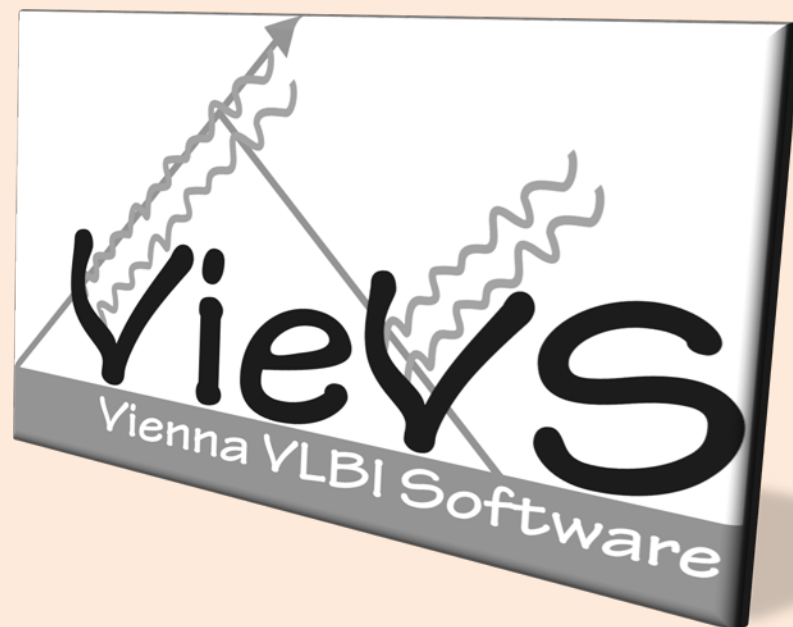


# Introduction to VieVS 2.3

Hana Krásná



# What is VieVS?

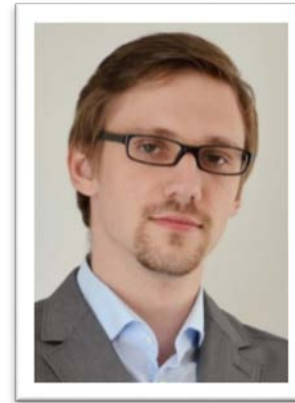
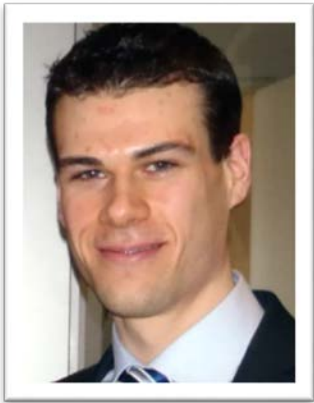
- VieVS = **Vienna VLBI Software**
  - A state of the art, geodetic VLBI data analysis software package
  - Written in Matlab
  - Since 2008 it is developed at the Department of Geodesy and Geoinformation (Research Group Advanced Geodesy), Technische Universität Wien
  - Close cooperation with former colleagues
- 
- Current reference:  
Böhm J., S. Böhm, T. Nilsson, A. Pany, L. Plank, H. Spicakova, K. Teke, H. Schuh (2012).  
The New Vienna VLBI Software VieVS. Proceedings of the 2009 IAG Symposium,  
Series: International Association of Geodesy Symposia. Vol. 136. Geodesy for Planet Earth. Steve  
Kenyon, Maria Christina Pacino and Urs Marti (Eds.). ISBN 978-3-642-20337-4. pp. 1007-1011.  
DOI: 10.1007/978-3-642-20338-1\_126 .

# Why did we develop VieVS?

- Important that there exist several different types of VLBI analysis software
- Different software packages can validate each other. Helps identifying bugs etc.
- Analysts have a choice of what to use
- VLBI2010 / VGOS put new demands and challenges on the VLBI analysis software
- We want to have a VLBI software which is easy to use:
  - BSc, MSc, and PhD students can easily learn it and use it
  - Should be easy to add new models etc. for special investigations
  - Graphical User Interface (GUI)
  - Should have a clear structure

# Who develops VieVS?

- **current members** of the VLBI group at the Technische Universität Wien:

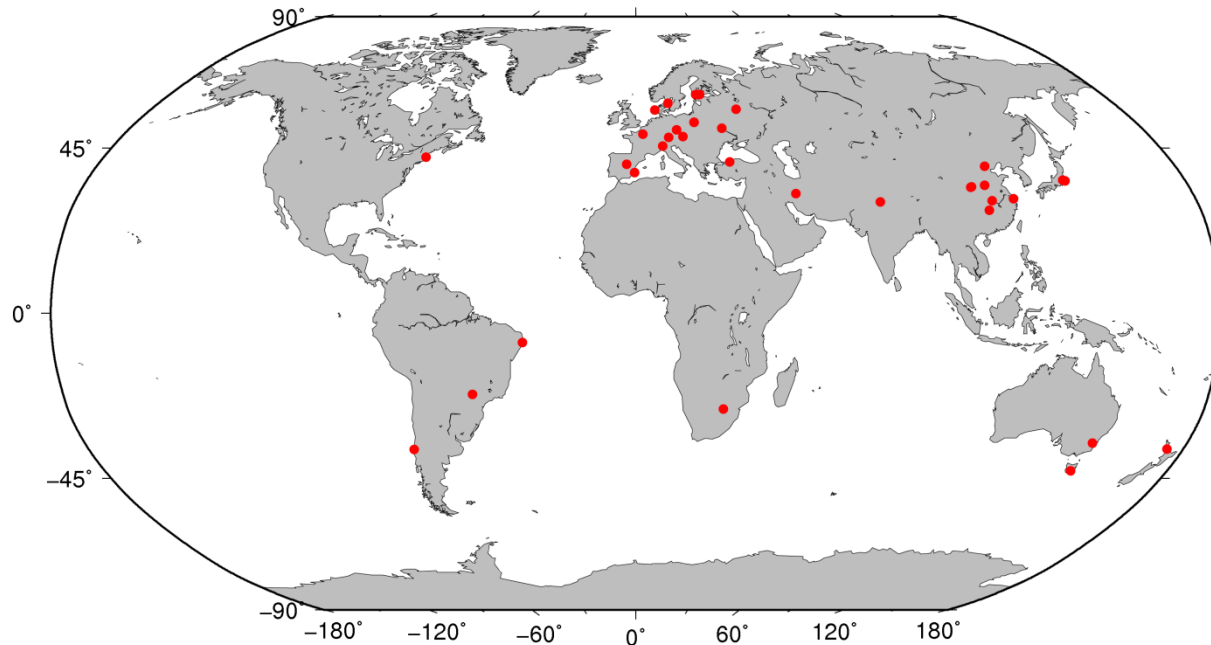


- **former members** of the VLBI group at the TU Wien
- contributions from many **external partners** from international universities worldwide

# VieVS development

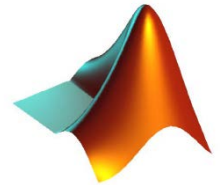
- Development started in 2008
- First version released in the end of 2009 (In the first version many parts were based on OCCAM. Now almost every subroutine is written from scratch)
- Current Version 2.3 was released in December 2015
- Freely available to registered users: <http://views.geo.tuwien.ac.at>
- Currently registered users from ~50 institutions worldwide

 7 years ago



# Why Matlab

- Advantages:
  - Easy to use
  - Easy to change source code
  - Good tools for plotting etc.
  - Matlab available on all major operating systems (Windows, Linux/UNIX, Mac OS)
- Disadvantages:
  - Matlab is an expensive commercial software  
(VieVS is in principle working on GNU Octave, but without GUI and it is much slower; Qt Interface (V. Choliy) )
  - Slower than C++ or Fortran. Not a major problem.



# System Requirements

- MATLAB 7.6 (R2008a) or later.
- About 10 GB of disk space, including all data files (NGS files 1979-now: ~9 GB, source code: <10 MB)
- Should work with any operating system able to run the chosen MATLAB version (tested on Windows and Linux)
- Possible to run on older MATLAB versions or the free counterpart GNU-Octave if the Graphical User Interface is not used – not tested conceptually within our group

# Policy

- VieVS is freely available to registered users:
  - Easier to get feedback
  - Easy to spread information about new updates, bugs, etc.
  - Nice to know how many and who are using the software
- For information, see VieVS homepage <http://views.geo.tuwien.ac.at>
- We are open for cooperation:
  - Modules etc. can be written at other institutions



# Downloading and installing VieVS

- 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 (scientific and non- commercial only)
- VieVS can be downloaded using ssh/sftp from the server:  
**views.hg.tuwien.ac.at**
- or from the VieVS website:  
<http://views.geo.tuwien.ac.at/>  
--> Get VieVS
- Log in as user *users* and download the **VieVS directory**.

# Downloading VieVS using rsync

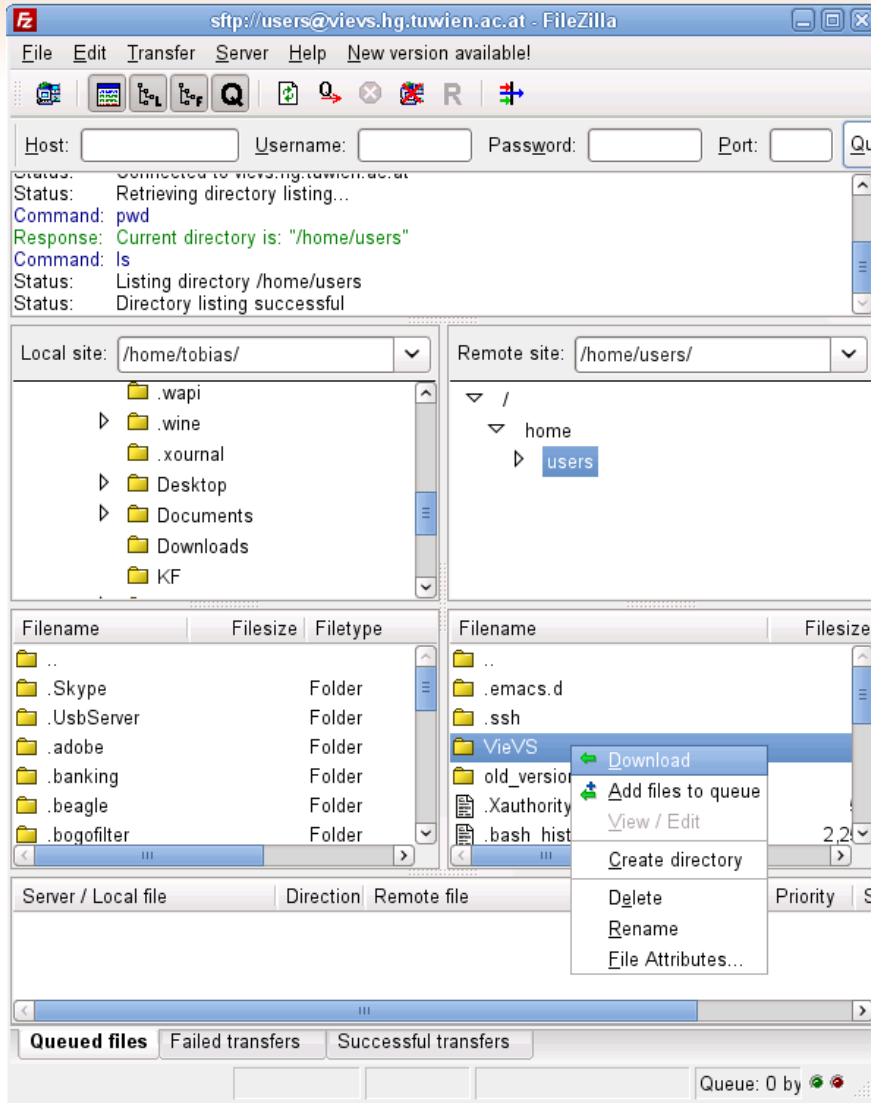
- On Unix/Linux systems, VieVS can easily be downloaded using the rsync command:

```
rsync -aL users@views.hg.tuwien.ac.at:VieVS
```

- The same command can also be used to update your VieVS installation
- To skip the NGS files (e.g. slow connections):

```
rsync -aL --exclude 'DATA/NGS/*' users@views.hg.tuwien.ac.at:VieVS
```

# Downloading VieVS using an sftp/scp client

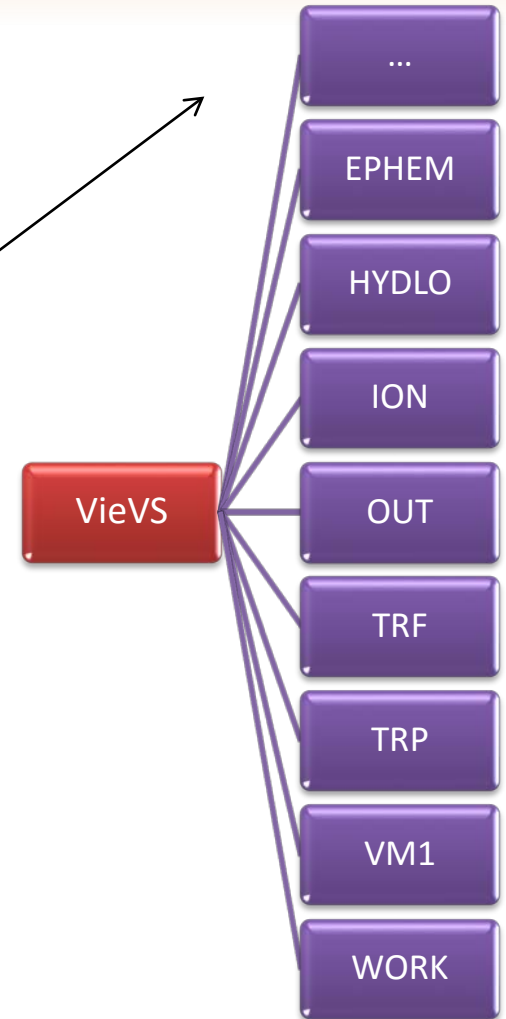
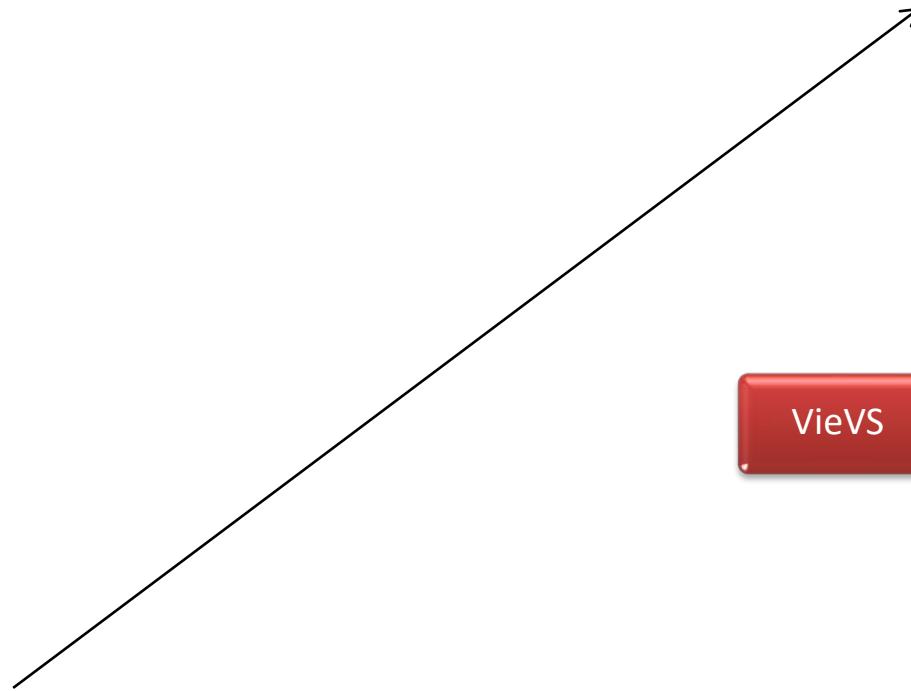
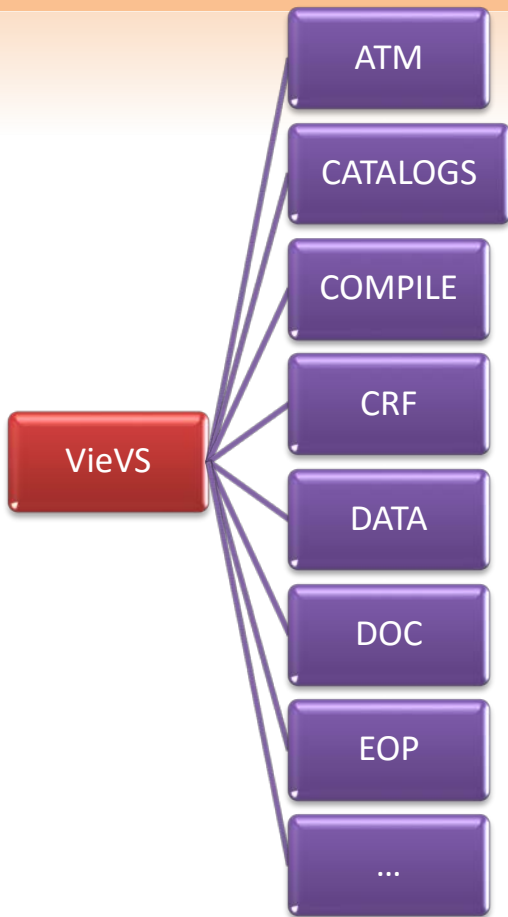


- Log in to `views.hg.tuwien.ac.at` with your favourite sftp client (e.g. Filezilla).
- Download the **VieVS** directory

# Updating VieVS

- Regularly updates (to be able to analyze the latest sessions):
  - **VieVS/DATA/NGS/**
  - **VieVS/ATM/ , VieVS/VM1/**
  - **VieVS/EOP/**
  - **(VieVS/HYDLO/ - not updated automatically on the server)**
- For a session with a new station or source
  - check for updated **superstation.mat** file in **VieVS/TRF** and/or updated **supersource.mat** file in **VieVS/CRF**
- When a new VieVS version is released:
  - **VieVS/COMPILE/**
  - **VieVS/OUT/**
  - **VieVS/WORK/**
  - Possible other directories... Preferably the whole VieVS directory.

# VieVS directories



# Modules of VieVS

Vie\_SETUP

Vie\_SCHED

Vie\_INIT

Vie\_MOD

Vie\_LSM

Vie\_LSM\_scan

Vie\_SIM

Vie\_GLOB

# Modules of VieVS

Vie\_SETUP

Graphical User Interface for all modules;  
allows to choose the options and parameterization

Vie\_SCHED

Vie\_MOD

Vie\_LSM

Vie\_LSM\_scan

Vie\_SIM

Vie\_GLOB

## Modules of VieVS

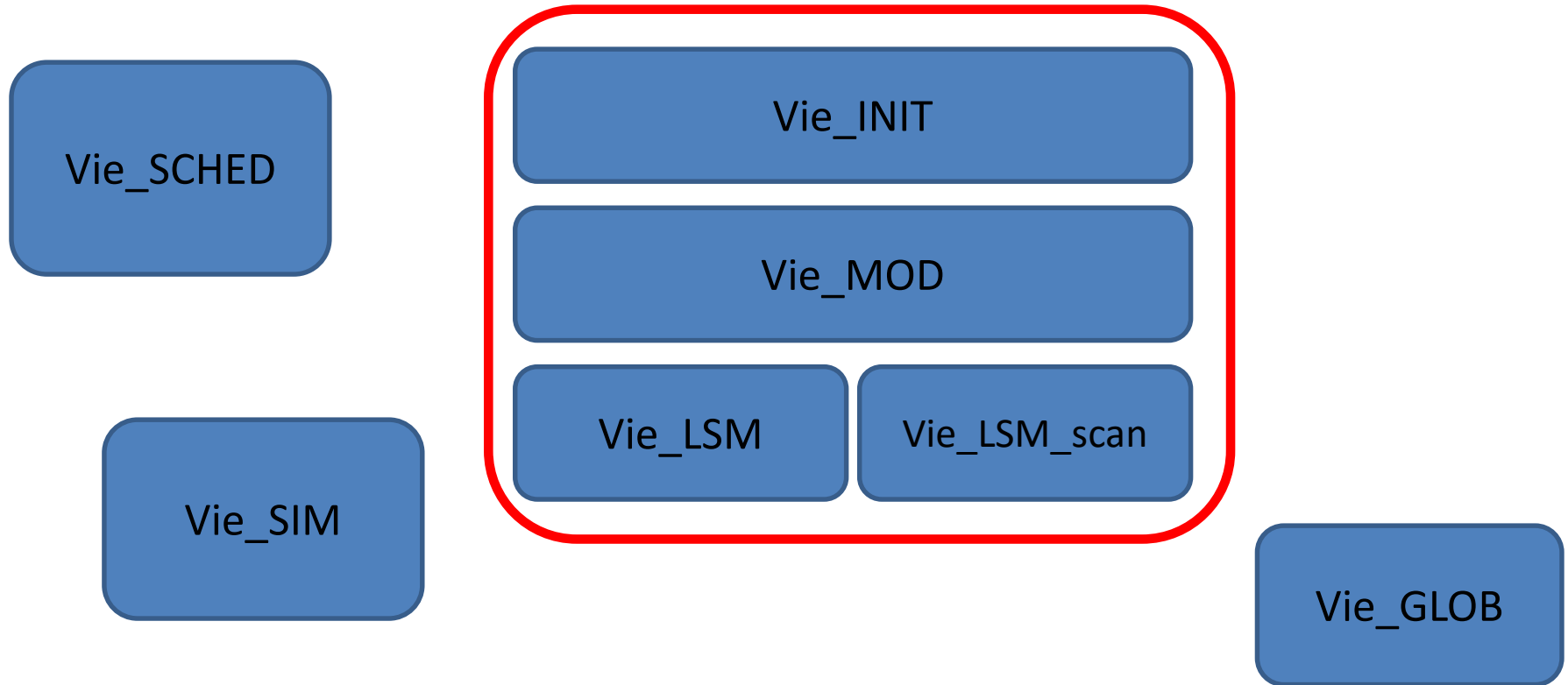
The 3 core modules for analyzing a session

Vie\_INIT- reads in data

Vie\_MOD - calculates the theoretical time delay and builds up the partial derivatives

Vie\_LSM – estimates the unknown parameters with Least Squares

Vie\_LSM\_scan – similar to Vie\_LSM but uses a scan-wise update of the A matrix  
(useful for large sessions)





# Modules of VieVS

Vie\_SETUP

Scheduling module

Vie\_SCHED

Vie\_INIT

Vie\_MOD

Vie\_LSM

Vie\_LSM\_scan

Vie\_SIM

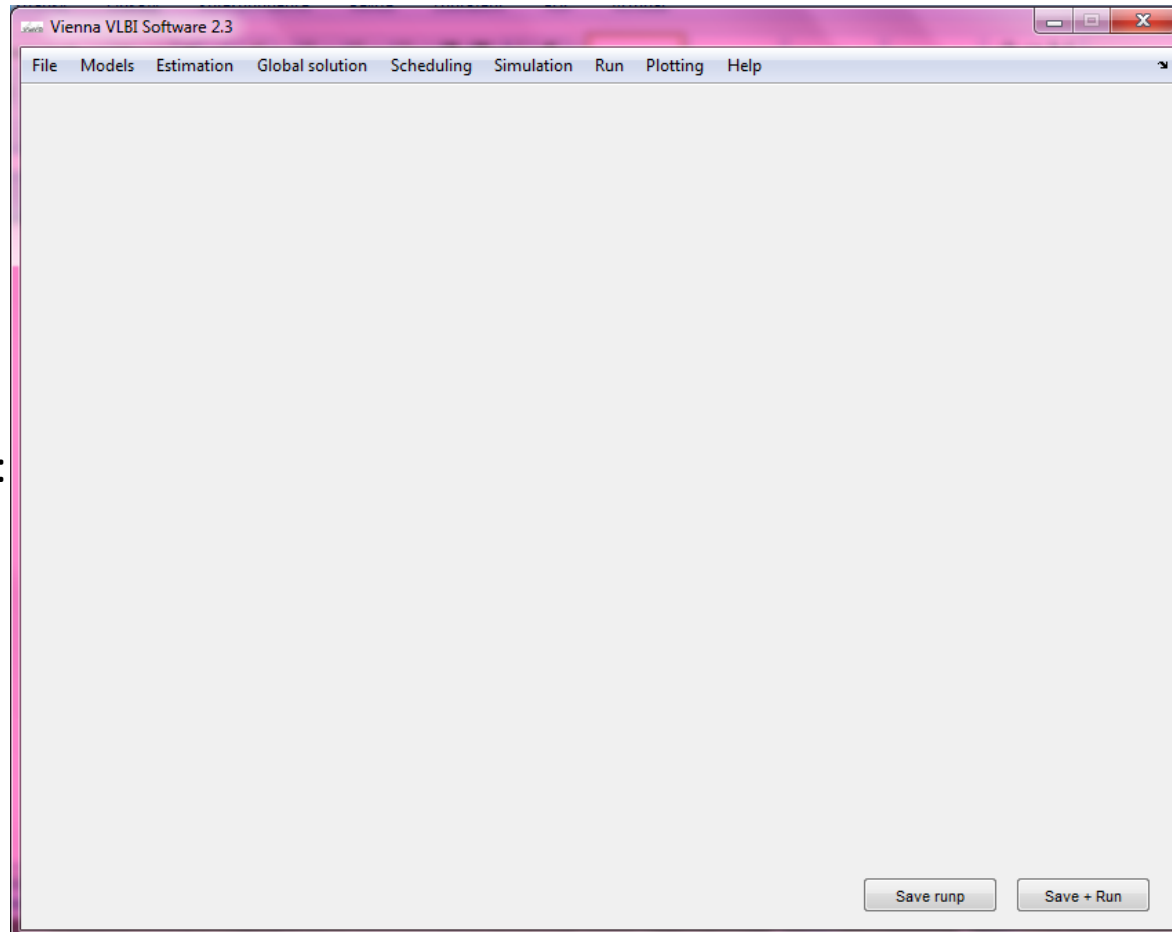
Simulation tool  
creating artificial  
observations

Global solution

Vie\_GLOB

# How to start VieVS

- Start MATLAB
- Change directory to **VieVS/WORK/**
- Start VieVS with the command:  
*views*
- The VieVS GUI will now appear



# Running VieVS in batch mode

- Run: ***vievs('batch')***
- The processing starts directly, GUI is not displayed
- Requires that all option files (process list, parameter files, runp) have already been created (e.g. from a previous run)

# What is new in the 2.3 Version

- vgosDB-ready  
new data format (netCDF) incorporated
- ray-tracing: ray-traced delays for all VLBI observations
- correction for source structure (in coop. with UTAS)  
the simulator newly includes the effect of source structure which can also be corrected for in the analysis
- refined scheduling for satellite observations
- tidal ERP variation coefficients in global solution

Thank you for your attention!