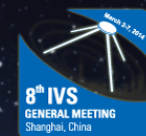
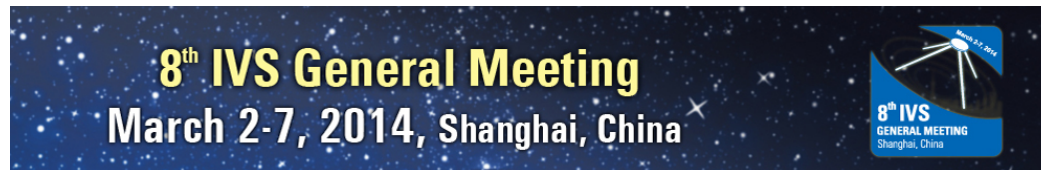
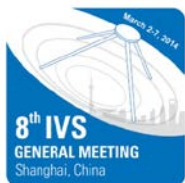




# Vienna VLBI Software - Current release and plans for the future

J. Böhm, H. Krásná, S. Böhm, V. Choliy, A. Hellerschmied,  
A. Hofmeister, M. Karbon, D. Mayer, J. McCallum, M. Madzak,  
T. Nilsson, L. Plank, S. Shabala, B. Soja, J. Sun, K. Teke



# Vienna VLBI Software (VieVS)

- VLBI data analysis software
- Developed since 2008 at TU Vienna
- Important contributions from other groups worldwide
- Version 2.1 (release in Summer 2013)
- Freely available to registered users
- <http://views.geo.tuwien.ac.at>

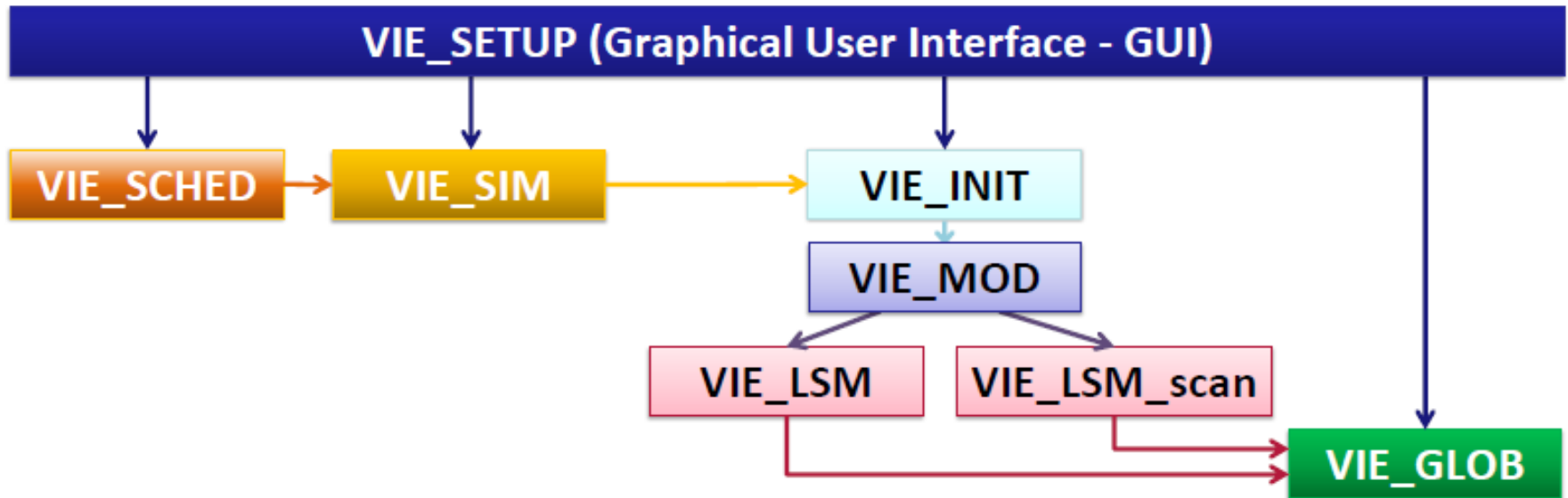


# Written in Matlab: Pros and Cons

- ☑ Easy to understand/use/modify
- ☑ Many built-in functions
- ☑ Graphical User Interface
  
- ✗ Slow
- ✗ Expensive (! Octave)



# VieVS Structure



- One common GUI, including plotting tools
- Separate **batch mode** to be used after the setup

# Calculation of Theoretical and Partial

- IERS Conventions
  - A priori EOP at 0 UT
- Playing ground for model testing
  - Ray-traced delays
  - Empirical Earth rotation models
  - Loading models
  - ...

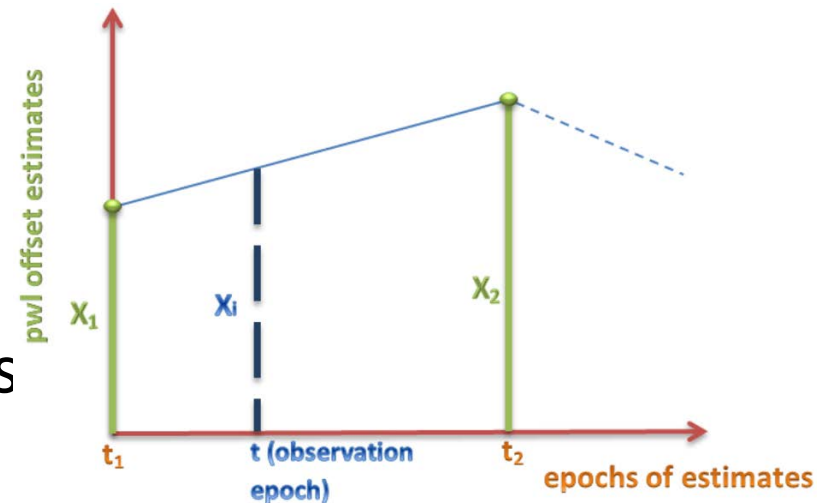


*International Earth Rotation and  
Reference Systems Service*

# Piece-Wise Linear Offsets (PWLO)

- PWLO possible for all parameters
- Station and source coordinates also possible as offsets
- **No rates!**
- PWLO at integer hours
  - .. intervals 5 minutes to 2 days
- Constraints to estimate offsets

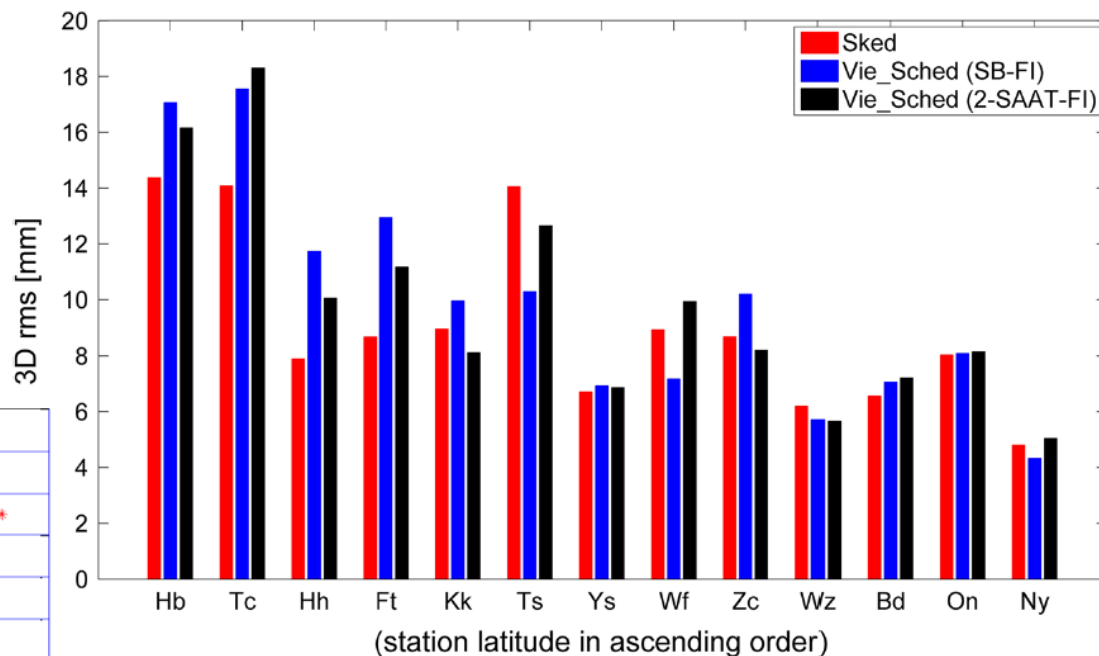
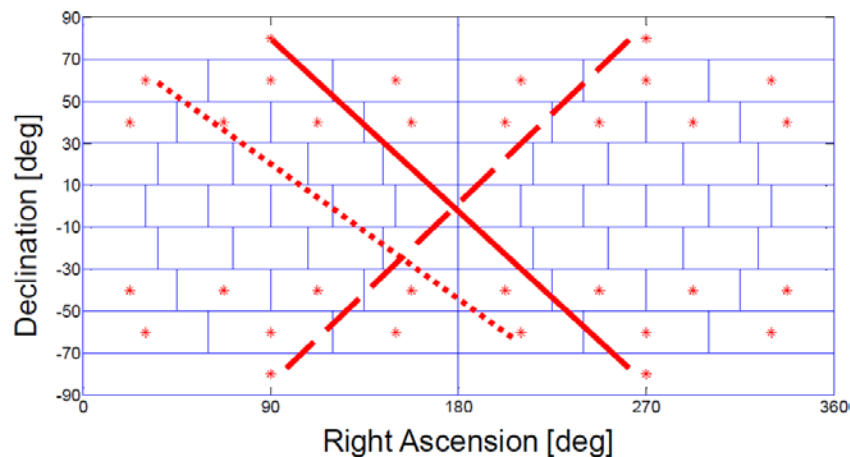
$$x_i = x_1 + \frac{(t - t_1)}{(t_2 - t_1)} (x_2 - x_1)$$



# Scheduling

- Implementation of source-based scheduling approach
- Tag along mode

2 sources simultaneously



CONT11 simulations (Sun et al. 2014)

# Scheduling

- Scheduling of real sessions extremely beneficial
  - thanks to Goddard! (John, Dirk, Ed, ..)
  - 7 R&D sessions in 2012
  - AUSTRAL sessions since July 2013 (AUST10)
  - Continuous AUST campaign in Nov/Dec 2013
- Master students at Onsala working on twins
  - plans for schedules with two twins: Ho/Hb - Ha/Ht

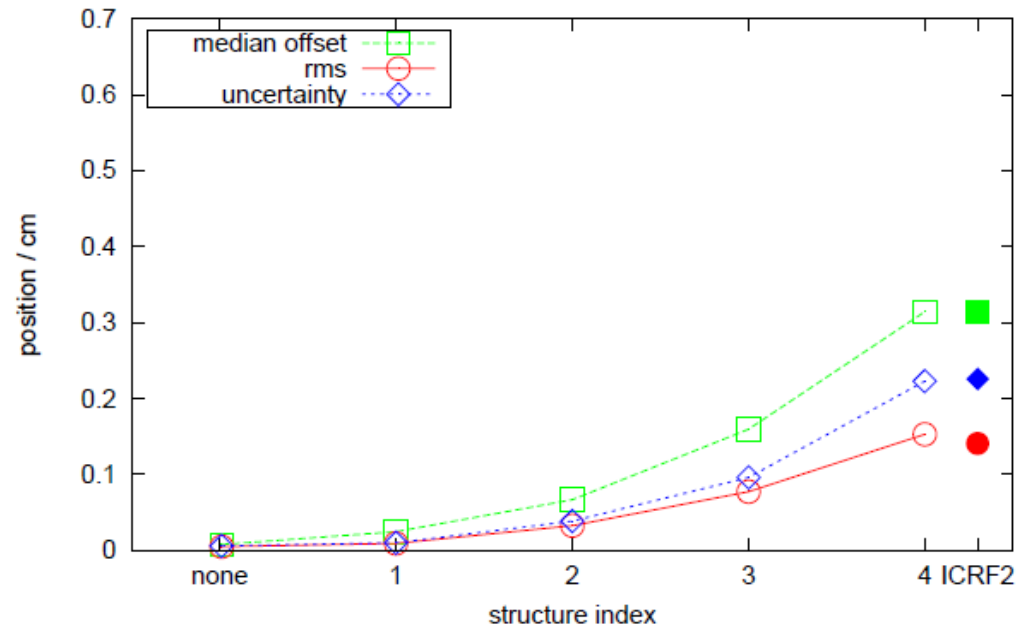
Many updates  
with VieVS 2.2



# Simulations

- Create simulated observations
- Write NGS files
- Simulate
  - Tropospheric delays
  - Clock errors
  - Measurement noise
  - **Source structure**

See presentation  
by Stas Shabala



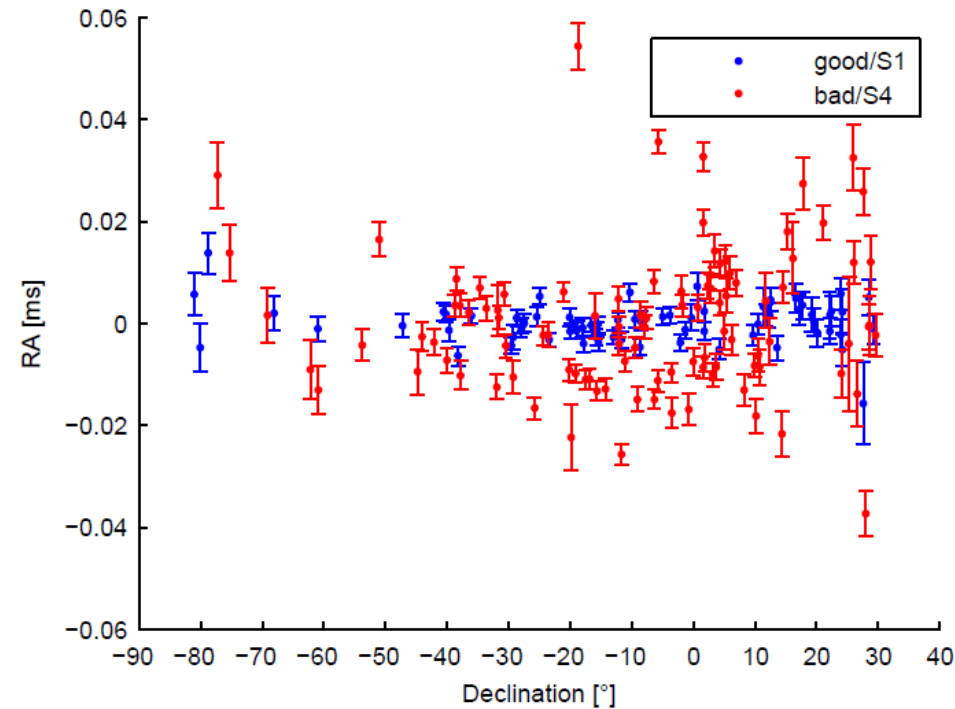
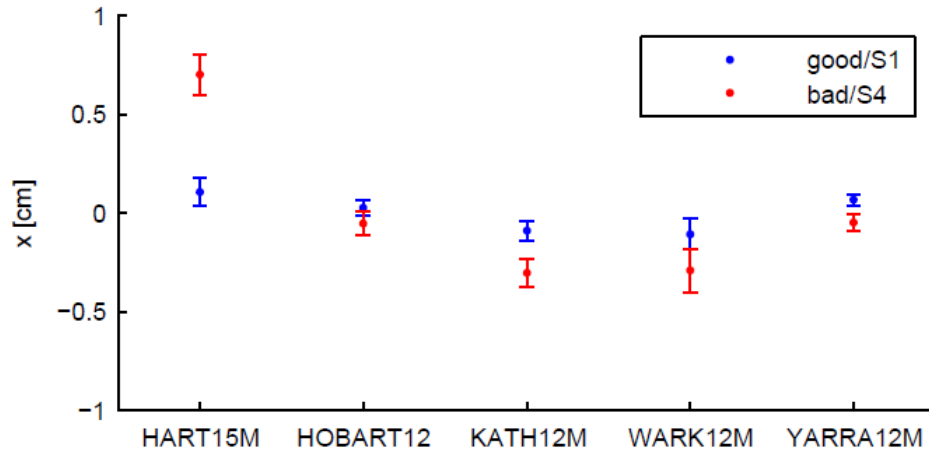
(Shabala et al. 2014)

# AUST Campaign (1)

- 15 Sessions from 28 Nov to 15 Dec 2013
  - with Hb, Ht, Ke, Yg, Ww
  - to demonstrate the capabilities of the telescopes in the South
  - to investigate source structure effects on geodetic parameters
- Alternate observations of 8 "good" (SI 1) and 7 "bad" (SI 4) sources

# AUST Campaign (2)

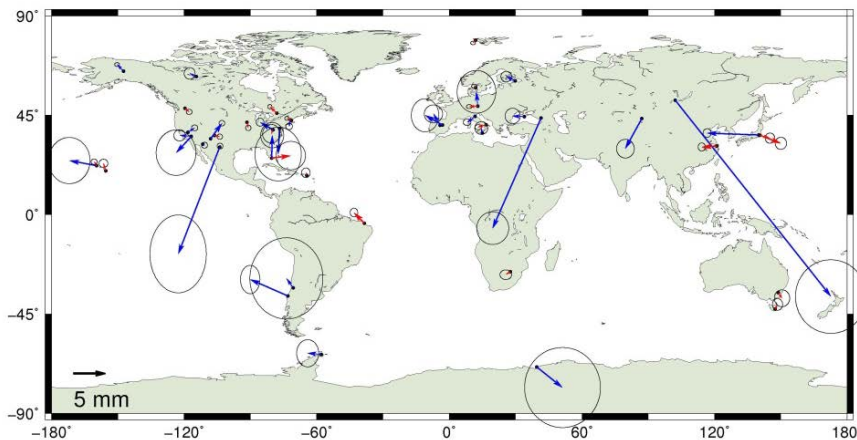
- Source structure simulator (30 realizations)



See poster  
by Jim Lovell

# Global Solution

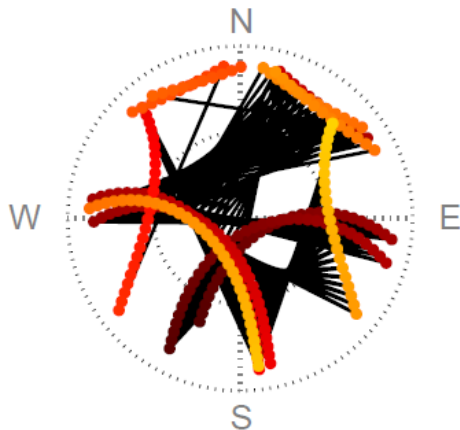
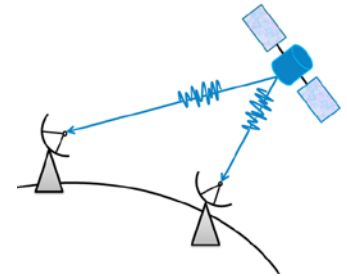
- Multi-session combination
  - TRF, CRF, EOP
  - Contribution to ITRF2013
- Geodynamical parameters
  - FCN period, Love and Shida numbers



(Krásná et al. 2014)

# Spacecraft Tracking

- VLBI observations to satellites
  - scheduling, simulations, processing
- Ongoing activity
  - Difficult to add to the operational version of VieVS



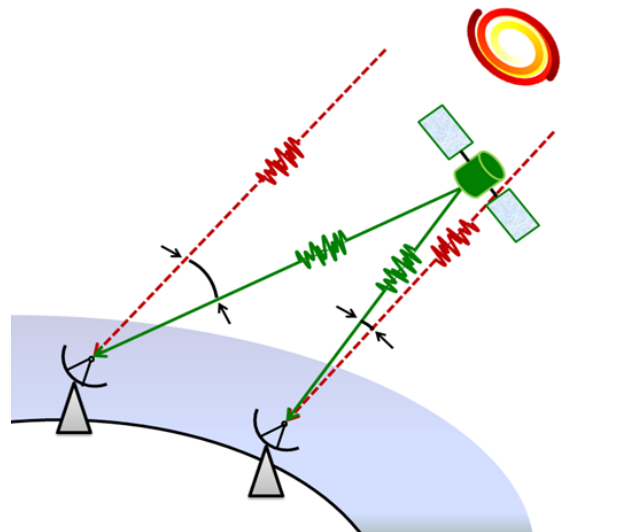
(Plank et al. 2014)

See e.g. presentation by  
Hellerschmied et al.

# Future Plans

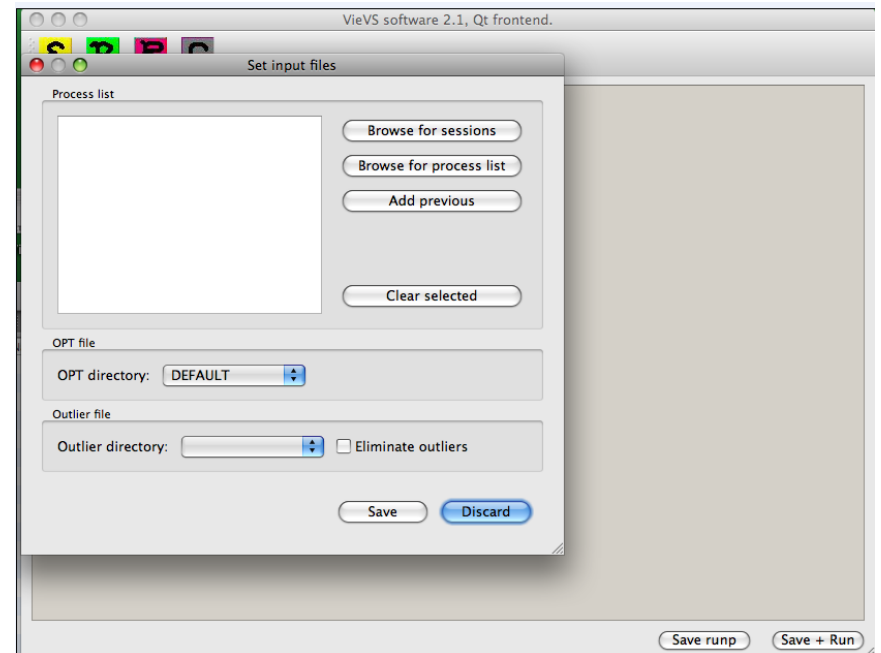
- Kalman filter (@ GFZ)
- Scheduling (continue)
- Satellite observations (continue)
- Geophysical parameter estimation (e.g. galactic rotation)
- ICRF3
- ...

See e.g. presentation by  
Karbon et al.



# Future Plans

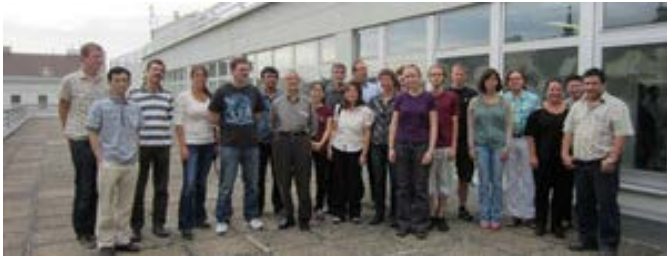
- Implement VGOS-DB format
- Qt Interface (V. Choliy) & Octave
  - to remove MatLab dependency



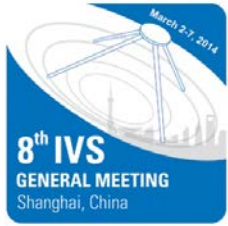
# VieVS User Workshop

- 5th User Workshop scheduled for 17-18 Sep 2014
- With new version VieVS 2.2
- Everybody is welcome!

<http://views.geo.tuwien.ac.at/>







Thanks for your attention!

**8<sup>th</sup> IVS General Meeting**  
March 2-7, 2014, Shanghai, China

