



Vienna VLBI Software VieVS - Version 1 released

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Introduction:

THE VIENNA VLBI SOFTWARE (VIEVS) IS A NEW VLBI DATA ANALYSIS SOFTWARE DEVELOPED AT THE INSTITUTE OF GEODESY AND GEOPHYSICS (IGG) AT THE UNIVERSITY OF TECHNOLOGY IN VIENNA. WRITTEN IN MATLAB, VIEVS IS CHARACTERIZED BY A DISTINCT SOURCE CODE, EASY HANDLING DUE TO ATTRACTIVE GRAPHICAL USER INTERFACES, AND IMPLEMENTATION OF THE MOST RECENT IERS CONVENTIONS TO THE HIGHEST DEGREE. VIEVS IS PERFECTLY SUITABLE FOR RESEARCH WORK, AS THE MANY BUILT-IN TOOLS IN MATLAB AS WELL AS ITS MODULAR STRUCTURE MAKE IT EASY TO EXPAND AND ADOPT THE SOFTWARE FOR SPECIFIC TASKS. ON THE OTHER HAND THE NEW SOFTWARE SHOULD ATTRACT PEOPLE WHO HAVE NOT BEEN DEALING WITH VLBI ANALYSIS BEFORE (E.G. STUDENTS), SINCE SEVERAL CONVERSION AND PLOTTING TOOLS ENABLE EVEN LESS EXPERIENCED USERS TO ACHIEVE ATTRACTIVE RESULTS.

After one year of evolution, VieVS Version 1 is now ready for routine geodetic VLBI processing. The parameterization and estimation of the variables as piece-wise linear offsets at integer hours constitutes a big step towards a coherent comparison and combination with other GGOS products. The poster outlines the performance, characteristics and handling of this first release. It should give you an idea of the basic workflow as well as an insight into present and future possibilities of VieVS.

REFERENCES:

Böhm, J., H. Spicakova, L. Plank, K. Teke, A. Pany, J. Wresnik, S. English, H. Schuh, T. Hobiger, R. Ichikawa, Y. Koyama, T. Gotoh, T. Otsubo, T. Kubooka: Plans for the Vienna VLBI Software VieVS, Proceedings of the 19th European VLBI for Geodesy and Astrometry Working Meeting, edited by G. Bourda, P. Charlot, A. Collioud, pp. 161-164, 2009
Böhm, J., S. Böhm, T. Nilsson, A. Pany, L. Plank, H. Spicakova, K. Teke, H. Schuh: The new Vienna VLBI Software VieVS, IAG Symposia Series, Buenos Aires 2009 (to be published)

Get it:

VIEVS IS LOCATED AND MAINTAINED AT A LOCAL SERVER AT IGG. THERE THE AUTOMATIC PROCESSING OF NEW VLBI-SESSIONS IS DONE AND REQUIRED A PRIORI INFORMATION (E.G. EARTH ORIENTATION PARAMETERS) ARE UPDATED REGULARLY. HOWEVER, ONCE DOWNLOADED FROM THE SERVER, VIEVS CAN BE RUN INDEPENDENTLY ON A STANDARD PC OR NOTEBOOK. EXTERNAL USERS ARE WELCOME TO USE VIEVS OR PARTS OF IT ON CONDITION OF SCIENTIFIC AND NON-COMMERCIAL PURPOSE. REGISTERED USERS RECEIVE A PASSWORD TO ACCESS THE SERVER VIA FTP.

FOR MORE INFORMATION PLEASE VISIT: <http://mars.hg.tuwien.ac.at/~viesv/>

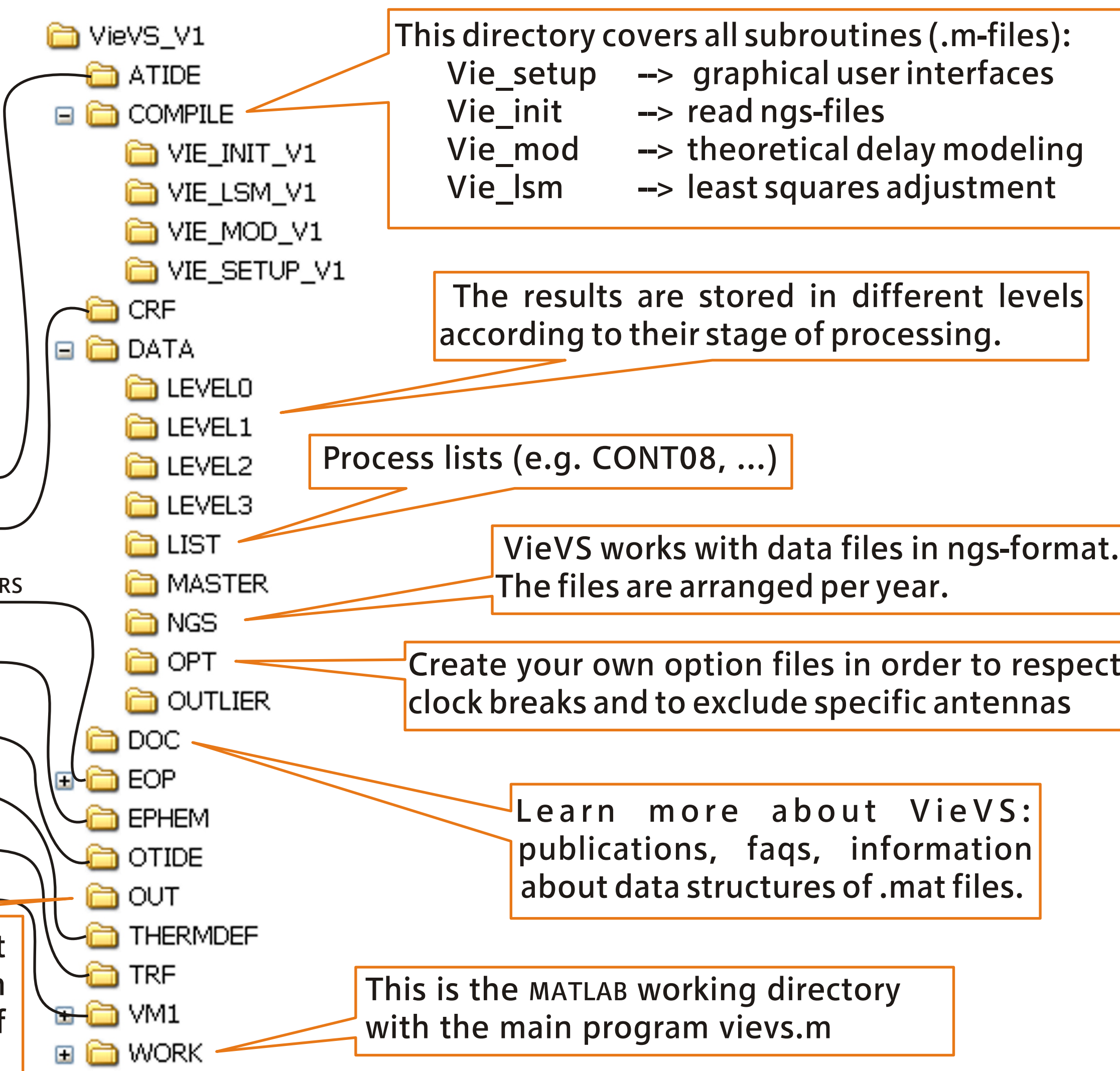
INSTALLATION:

SYSTEM REQUIREMENTS: VieVS was coded in the commercial programming language MATLAB. For the normal modus Release 2008b or beyond is required, in older versions VieVS can be run in batch mode. Alternatively, promising tests with executables of VieVS, which run on any machine without having MATLAB installed, and with non-commercial counterparts like Octave were carried out and can be continued if desired.

A priori information and models are stored as .mat files in the corresponding folders. Tools to convert new models into .mat files can also be found there.

TIDAL ATMOSPHERE LOADING
CELESTIAL REFERENCE FRAME
EARTH ORIENTATION PARAMETERS
EPHEMERIDES
TIDAL OCEAN LOADING
THERMAL ANTENNA DEFORMATION
TERRESTRIAL REFERENCE FRAME
MAPPING FUNCTION

Here you can find tools to convert the VieVS output to ascii or sinex format or plot the results with corresponding functions. Short pdf reports of automatic processing are also stored here.



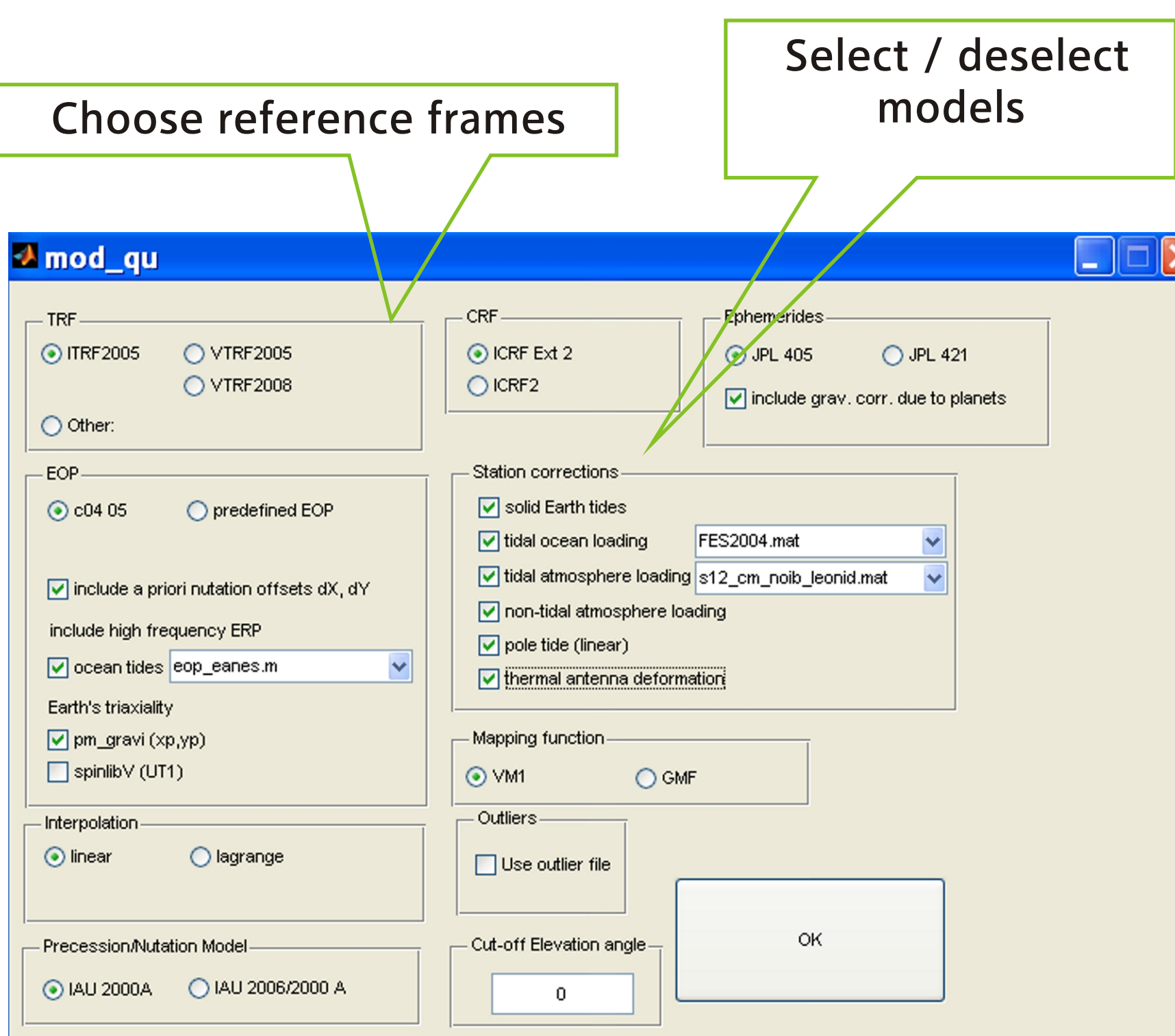
Use it:

START

Open MATLAB and run viesv.m



VIE_MOD



Add-ons:

DUE TO ITS MODULAR STRUCTURE IT IS EASY TO EXPAND VIEVS AND INVOLVE ADDITIONAL TOOLS IN THE CALCULATION PROCESS. THE FOLLOWING ARE DEVELOPED AT THE IGG:

VIE_GLOB

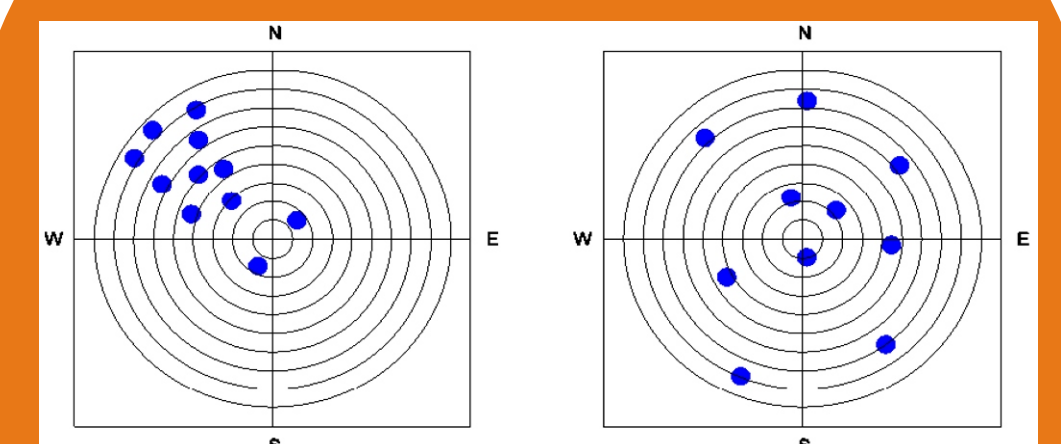
Estimation of global parameters like Love and Shida numbers by stacking of the normal equations. See EGU2010-4483, Spicakova et al.: Global adjustment of geodetic and geodynamical parameters in the VLBI software VieVS

VIE_SIM



Simulation tool (e.g. of new antennas)

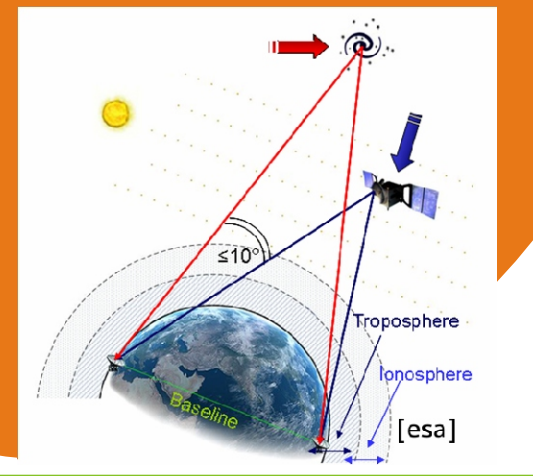
VIE_SCHED



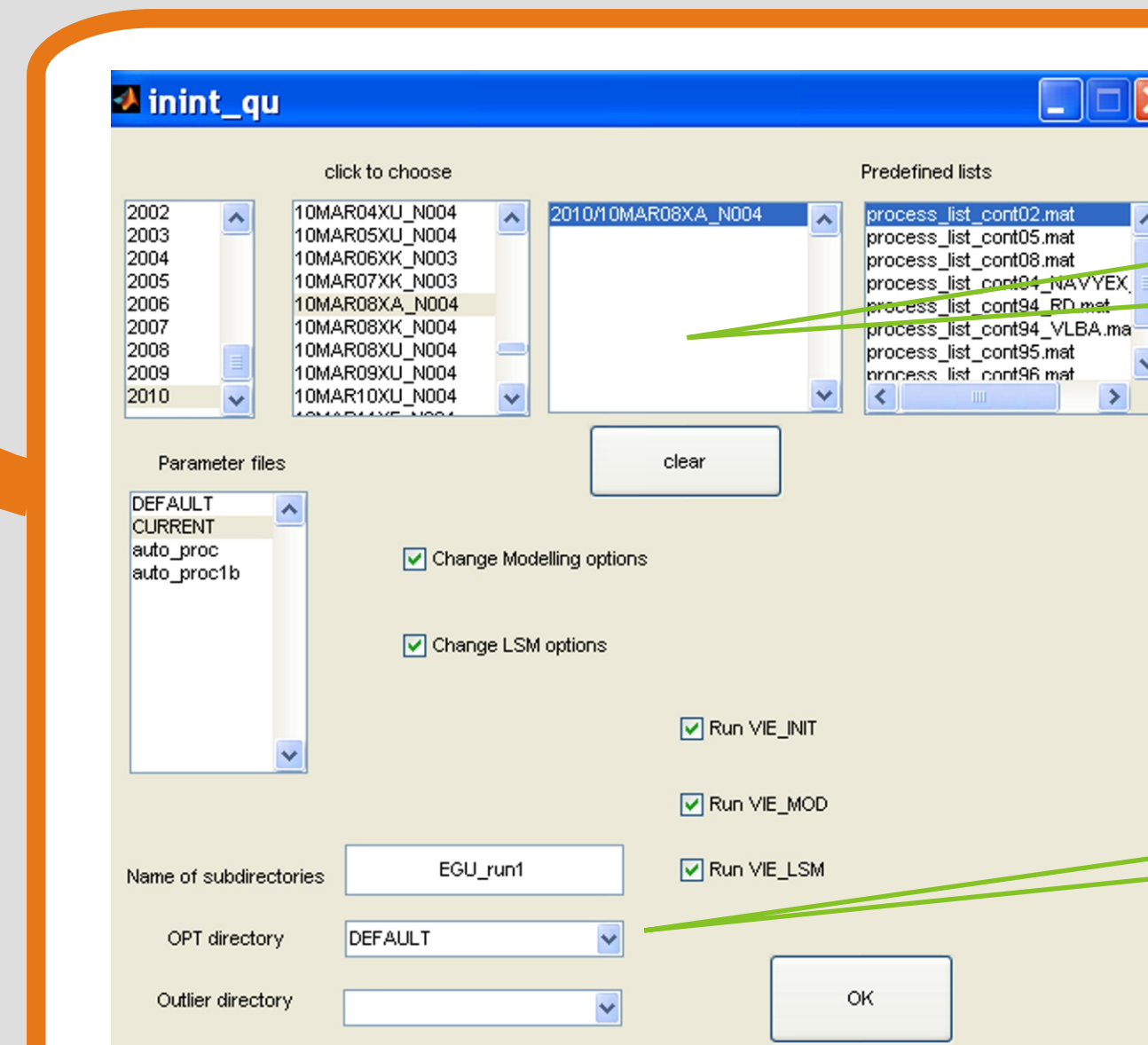
Realize new scheduling strategies (e.g. uniform sky)

D-VIEVS

VieVS will be expanded for the possibility to process differential VLBI data. This can be used for precise spacecraft navigation and hence to find ties between kinematic and dynamic reference frames.



VIE_INIT

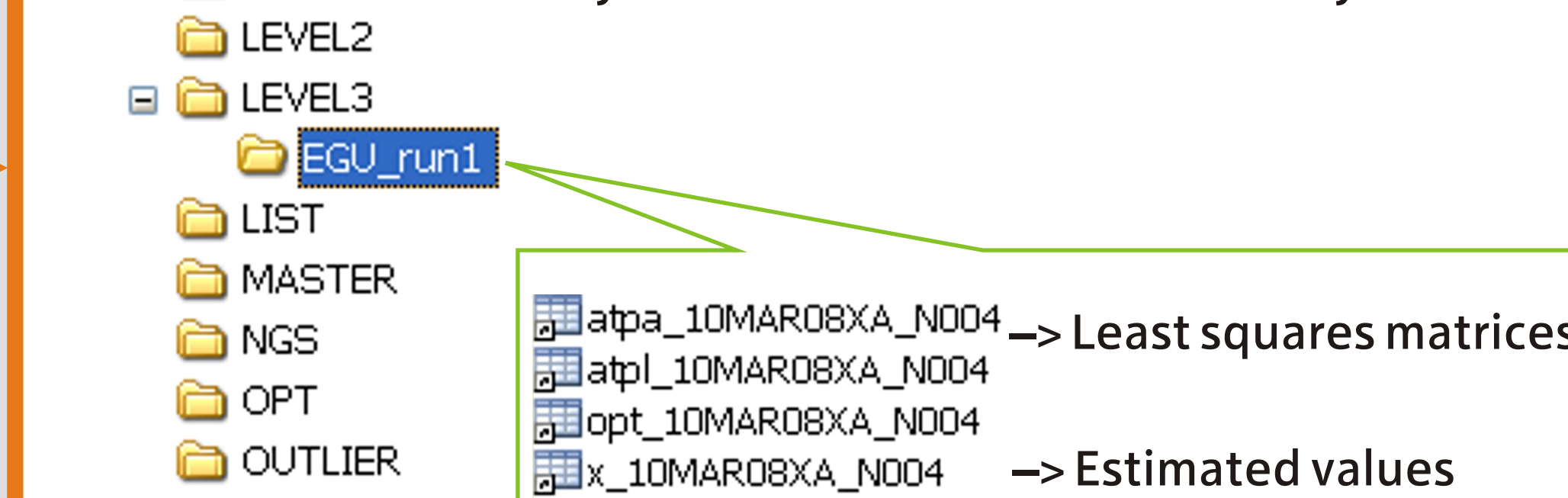


Choose ngs file(s) from yearly folders or from predefined process lists

Specify directories

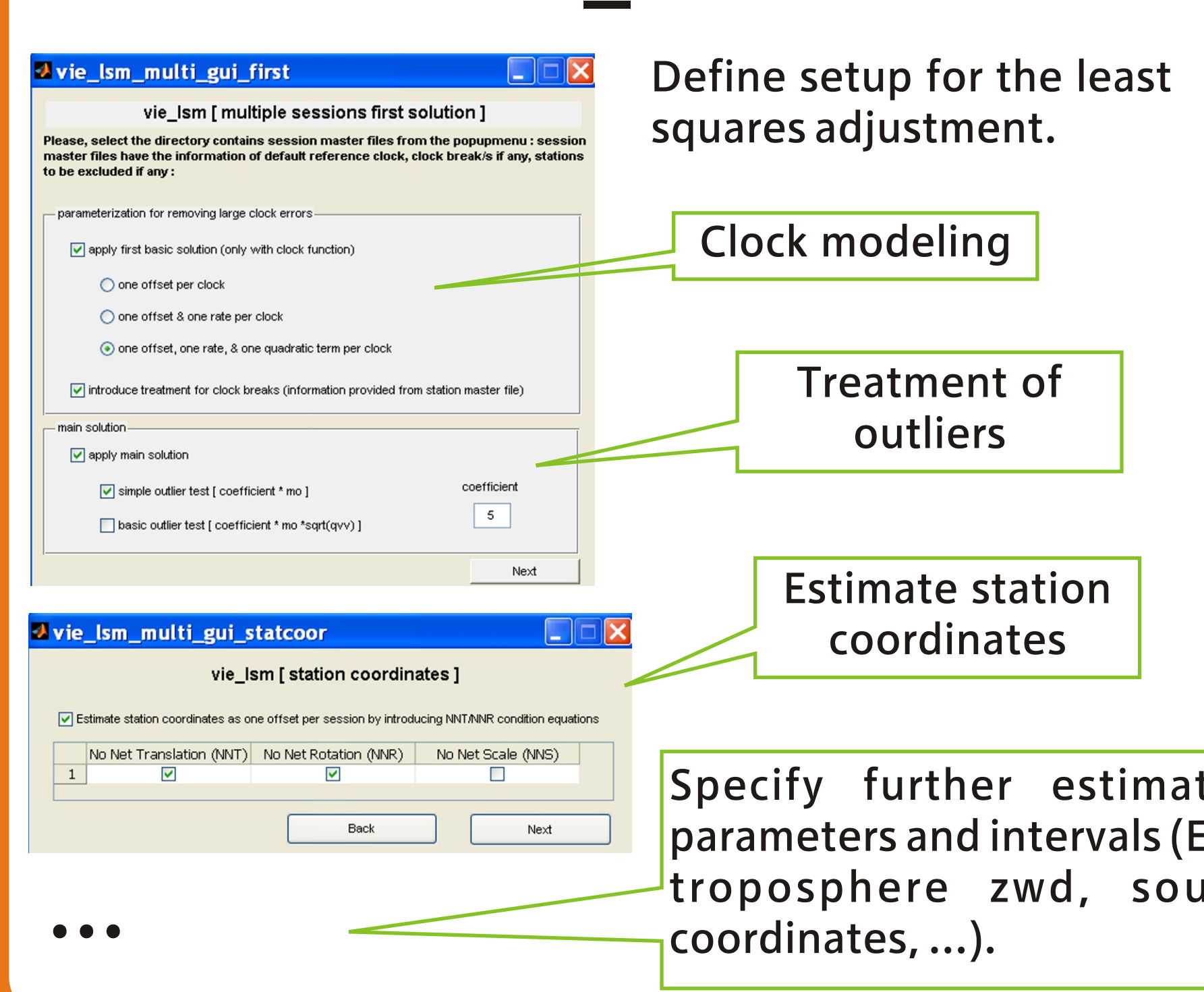
RESULTS

The final results are stored as matlab structure arrays in /DATA/LEVEL3/subdirectory/.



Convert results in ascii-format (e.g. Table of EOP).

VIE_LSM

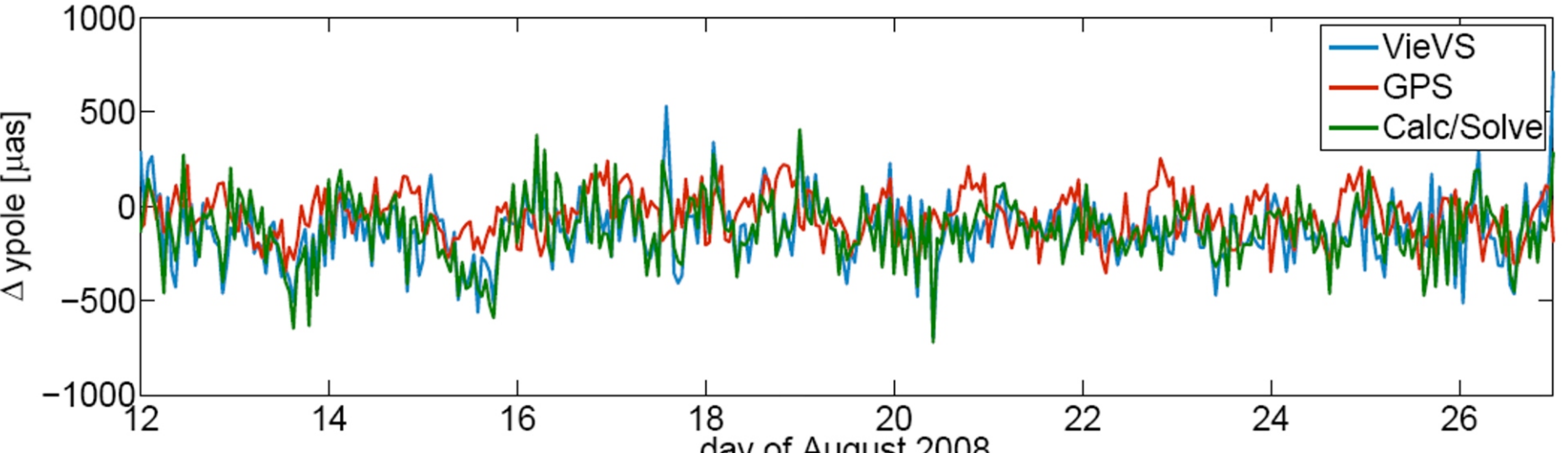


CALCULATE

Performance:

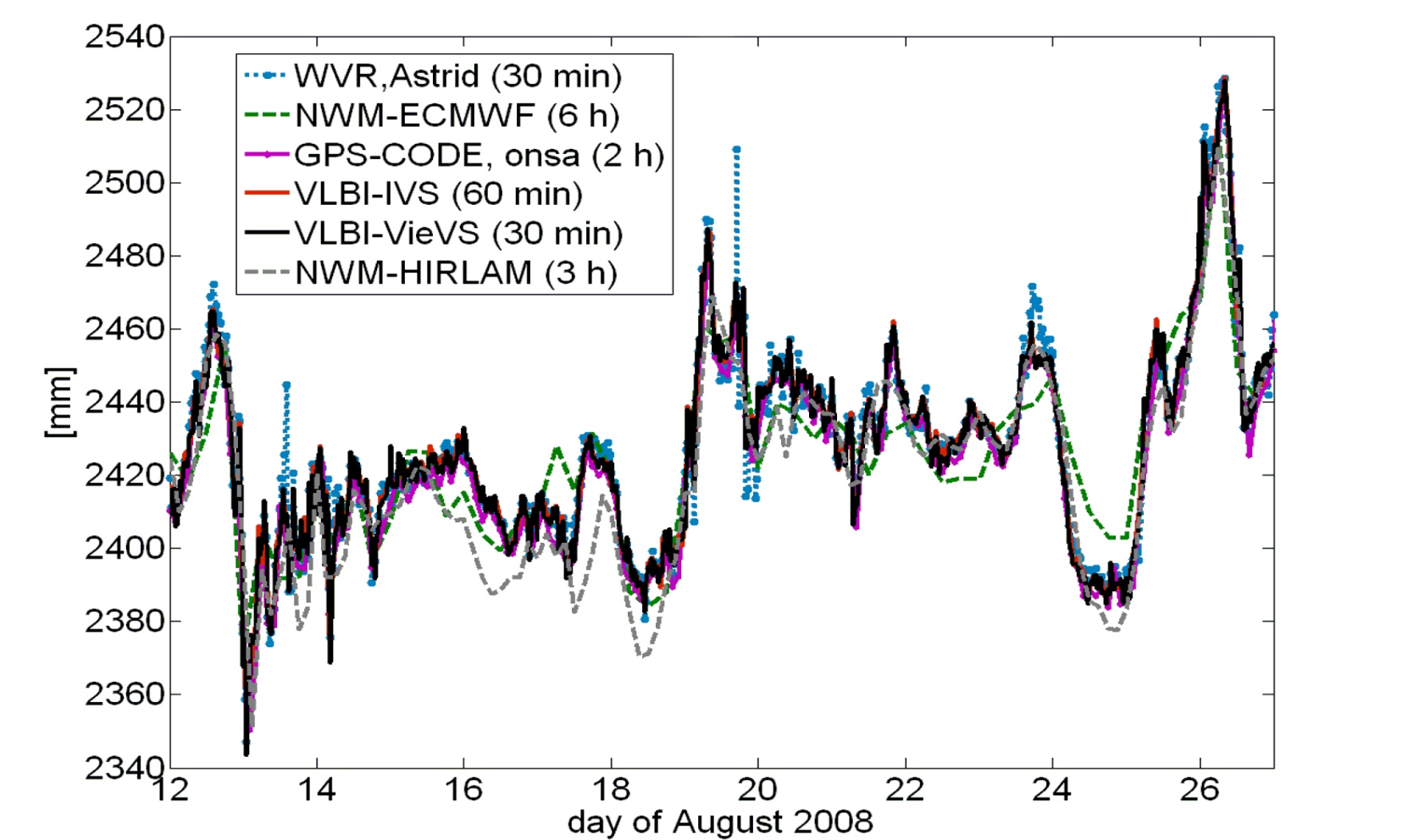
EOP

VieVS has been successfully used to estimate Earth orientation parameters. The level of accuracy is comparable with those of other software. The plooon the right shows the good agreement of VieVS, Calc/Solve and a GPS solution when estimating pole coordinates during CONT08. See also EGU2010-4645, Nilsson et al.: Single-Baseline VLBI Observations for the Estimation of Universal Time.



TROPOSPHERE:

Piecewise linear offsets of zenith wet delays and troposphere gradients can be estimated at integer hours and integer fractions of integer hours. The adjoining figure shows the zenith path delay for the station Onsala during CONT08 estimated with VieVS, a water vapour radiometer, GPS and two numerical weather models. Learn more about this comparison in the presentation of Teke et al.: Multi-technique comparison of troposphere zenith delays and gradients during CONT08(EGU2010-9088).



DeDeCC:

The Delay and partial Derivatives Comparison Campaign was created as a result of the various comparisons during the development of VieVS. It was officially announced within the International VLBI Service (IVS) recently. The goal is to compare different geodetic analysis software on basis of the computed time delay. As a result of its high flexibility, with VieVS it is easily possible to adapt the results in a way to match those of other analysis software regarding the applied models. Shown in the figure is an early result of the Campaign, the difference in theoretical time delays calculated with VieVS and Calc/Solve (D. Gordon, GSFC), respectively Occam 6.1 (IGG). Furthermore DeDeCC is used to verify all implemented models separately. For more information about DeDeCC visit: <http://mars.hg.tuwien.ac.at/~lplank/DeDeCC>.

