



TECHNISCHE
UNIVERSITÄT
WIEN
Vienna University of Technology










VIE_INIT

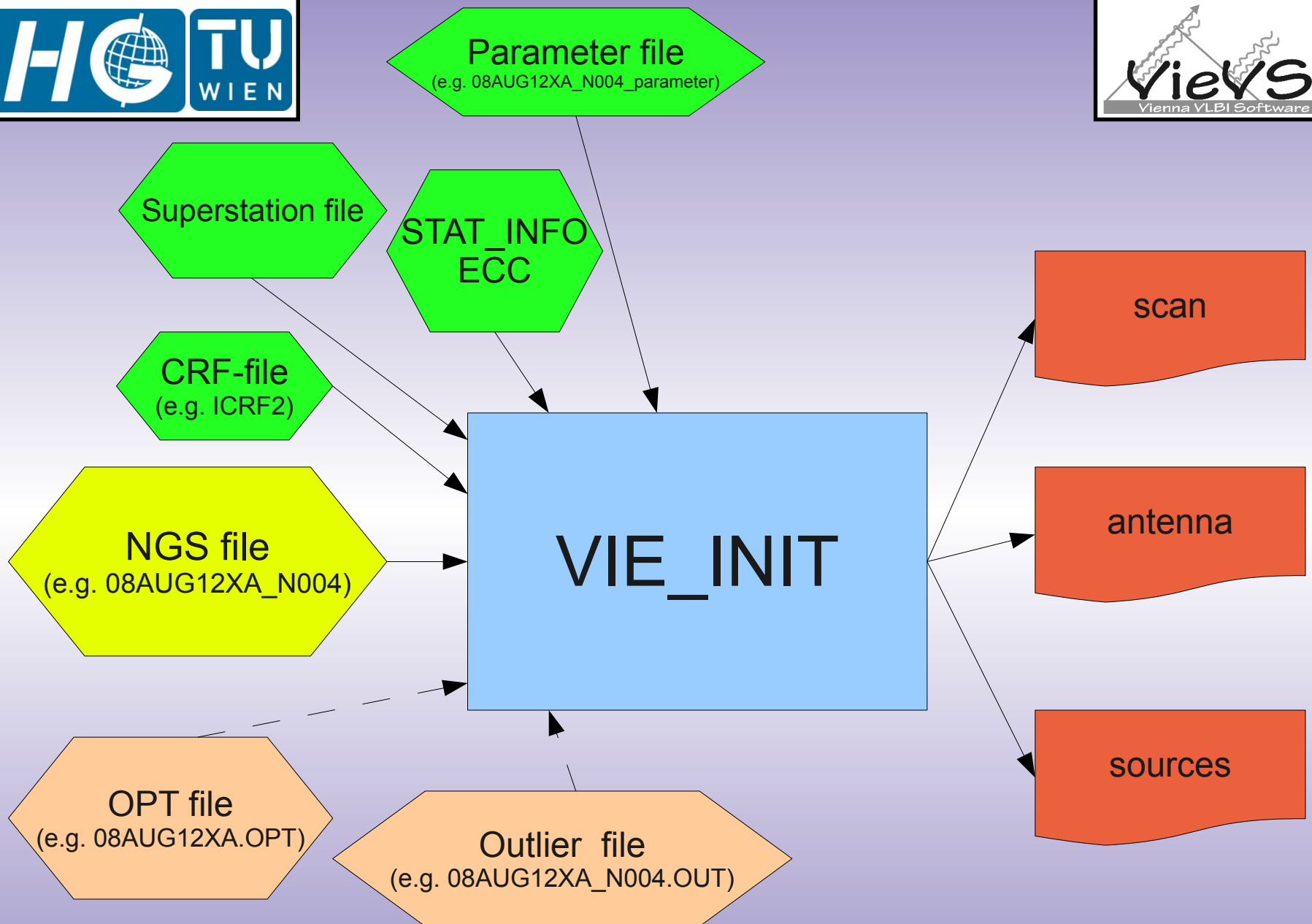
Tobias Nilsson

VieVS User Workshop
11 – 13 September, 2012
Vienna



What does VIE_INIT do?

-  Reads observations from the NGS file
-  Reads station coordinates and velocities from the supstations file
-  Read source coordinates from CRF file
-  Possible to:
 -  Remove outliers (specified in an outlier file)
 -  Exclude stations, sources, baselines (specified in OPT-file)
 -  Introduce an elevation cut-off angle



The parameter file

- ❑ Contains the options for VIE_INIT (and the other parts of VieVS)
- ❑ Created by VIE_SETUP
- ❑ The parameter file used in VIE_INIT is stored in the **DATA/LEVEL0** directory

The NGS file

- An NGS file (version >3 or 4) contain:
 - Observed delay (and delay rate). Ambiguities already resolved
 - Ionospheric delay (and rate)
 - Additional measurements, e.g. temperature, pressure, cable wrap, quality code



The NGS file



DATA IN NGS FORMAT FROM DATABASE 09AUG22XK_V003

Observed delays and rates in card #2, modified errors in card #9

TSUKUB32 -3957408.75200 3310229.36700 3737494.78900 AZEL .00000

WETTZELL 4075539.88300 931735.26100 4801629.37100 AZEL .00000

\$END

0955+476 9 58 19.671641 47 25 7.842440

1128+385 11 30 53.282613 38 15 18.546970

\$END

.8212990000000D+04 GR PH

\$END

TSUKUB32	WETTZELL	0955+476	2009	08	22	07	58	6.0000000000			101
-7231560.78088789	.02291	-1338669.4166866930	.07389	0	I	102					
.00054	.00000	.00000	.00000	-2.778901538421864	0.	103					
.00	.0	.00	.0	.00	.0	.00	.0	104			
-.00010	.00146	.00000	.00000	.00000	.00000	105					
28.390	14.600	999.751	951.200	86.511	97.900	0	0	106			
-.1289037990	.09754	.0165501479	.01593	0	108						
-7231560.78088789	.07573	-1338669.4166866930	.37717	0	I	109					
TSUKUB32	WETTZELL	1128+385	2009	08	22	07	59	42.0000000000			201
1087121.30123478	.00796	-1583101.4780455410	.01725	0	I	202					
.00127	.00000	.00000	.00000	.165474166106772	0.	203					
.00	.0	.00	.0	.00	.0	.00	.0	204			
-.00068	.00029	.00000	.00000	.00000	.00000	205					
28.345	14.600	999.800	951.200	86.489	97.900	0	0	206			
.0427781143	.10365	-.0570984871	.01060	0	208						
1087121.30123478	.07262	-1583101.4780455410	.37026	0	I	209					

TRF files

- Superstations file
 - Contain station coordinates and velocities
 - Itrf2005, itr2008, vtrf2008, VieTRF10a, vievsTrf
 - If a station is not found in the chosen trf, the coordinates from vievsTrf are used
- .txt files in TRF directory:
 - User defined TRF in ascii format
- The STAT_INFO.mat file (TRF directory):
 - Information about the antenna (mount, axis offset etc.)
- The ECC.mat file (TRF directory) contains eccentricities

- 🐎 .mat files in the CRF directory:
 - 🐎 ICRF_Ext2 and ICRF2
 - 🐎 Contain source coordinates
 - 🐎 If a source is not found in the CRF file, the coordinates from the NGS header is used
- 🐎 .txt files in CRF directory:
 - 🐎 User defined CRF in ascii format

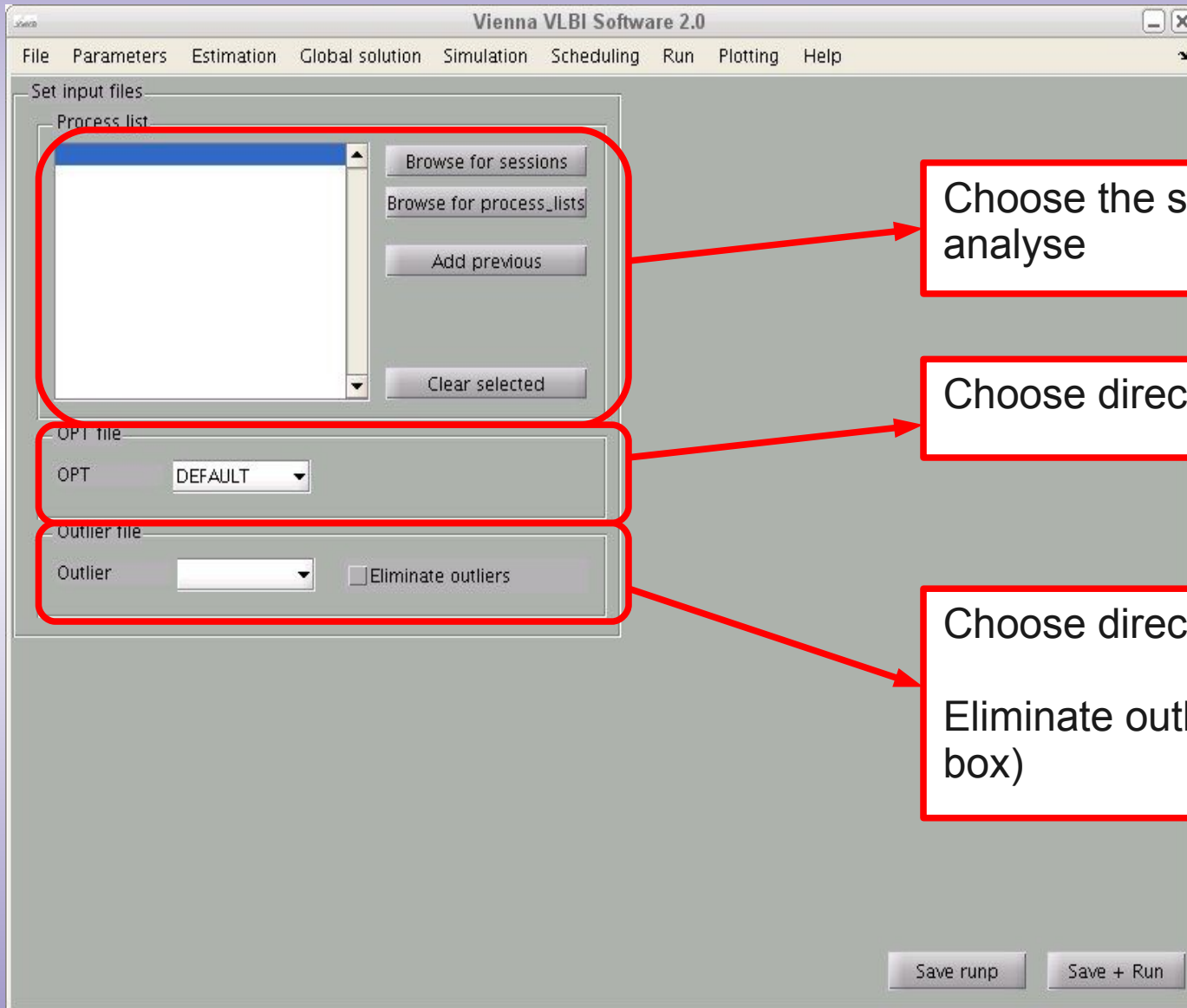
OPT file

- ▣ Contains information of clock breaks (not used in VIE_INIT), stations to be excluded, sources to be excluded etc.
- ▣ See separate presentation

Outlier file

- Contains list of outliers for the session
- Created in VIE_LSM
- Outliers are removed in VIE_INIT. To detect and remove outliers you need to run VieVS twice:
 - In the first run outliers are detected in VIE_LSM and saved it in an outlier file
 - In the second run this file run is used in VIE_INIT for removing the outliers

**File/
Set input files**

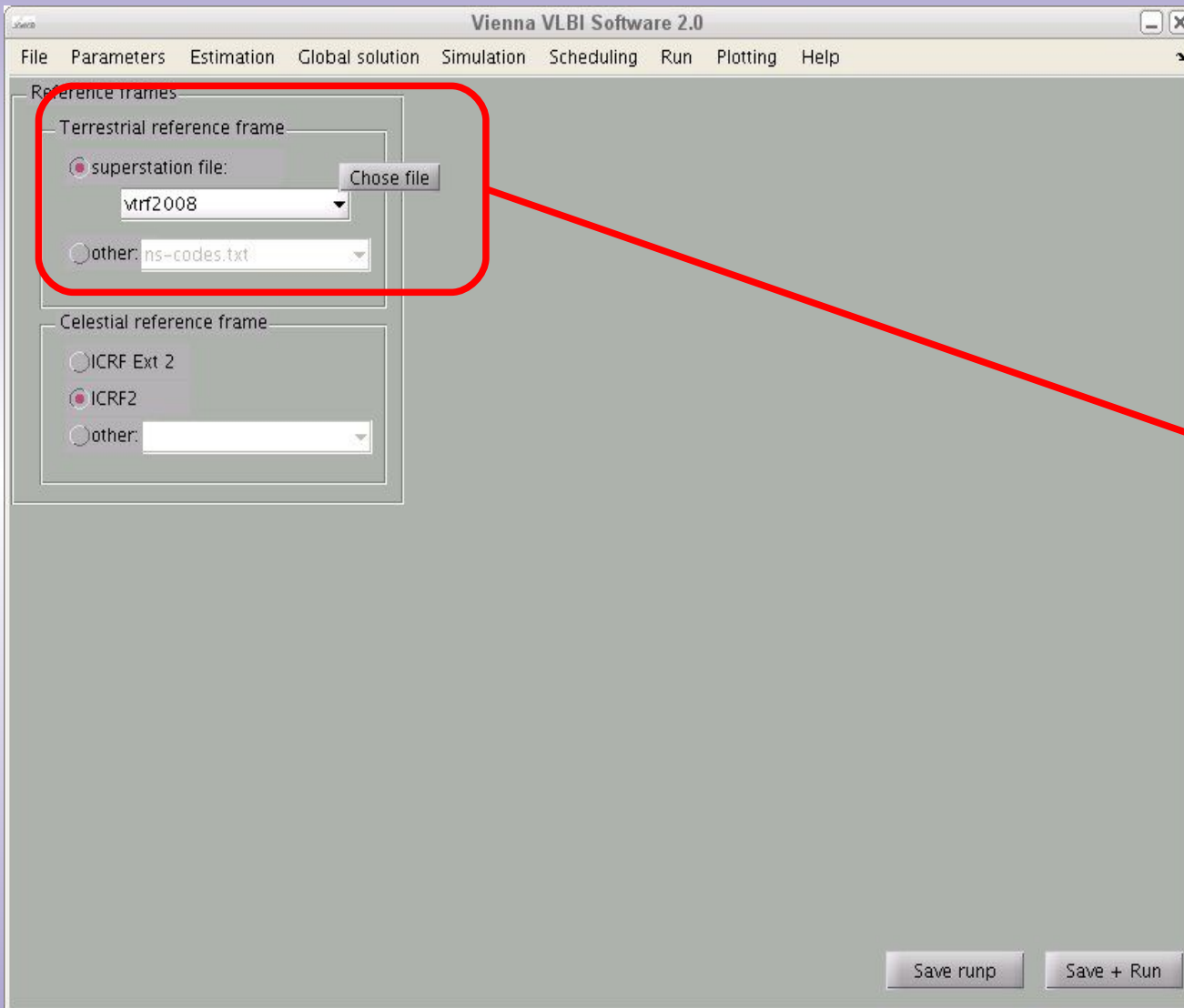


Choose the sessions you want to analyse

Choose directory with OPT-files

Choose directory with outliers

Eliminate outliers or not (check box)

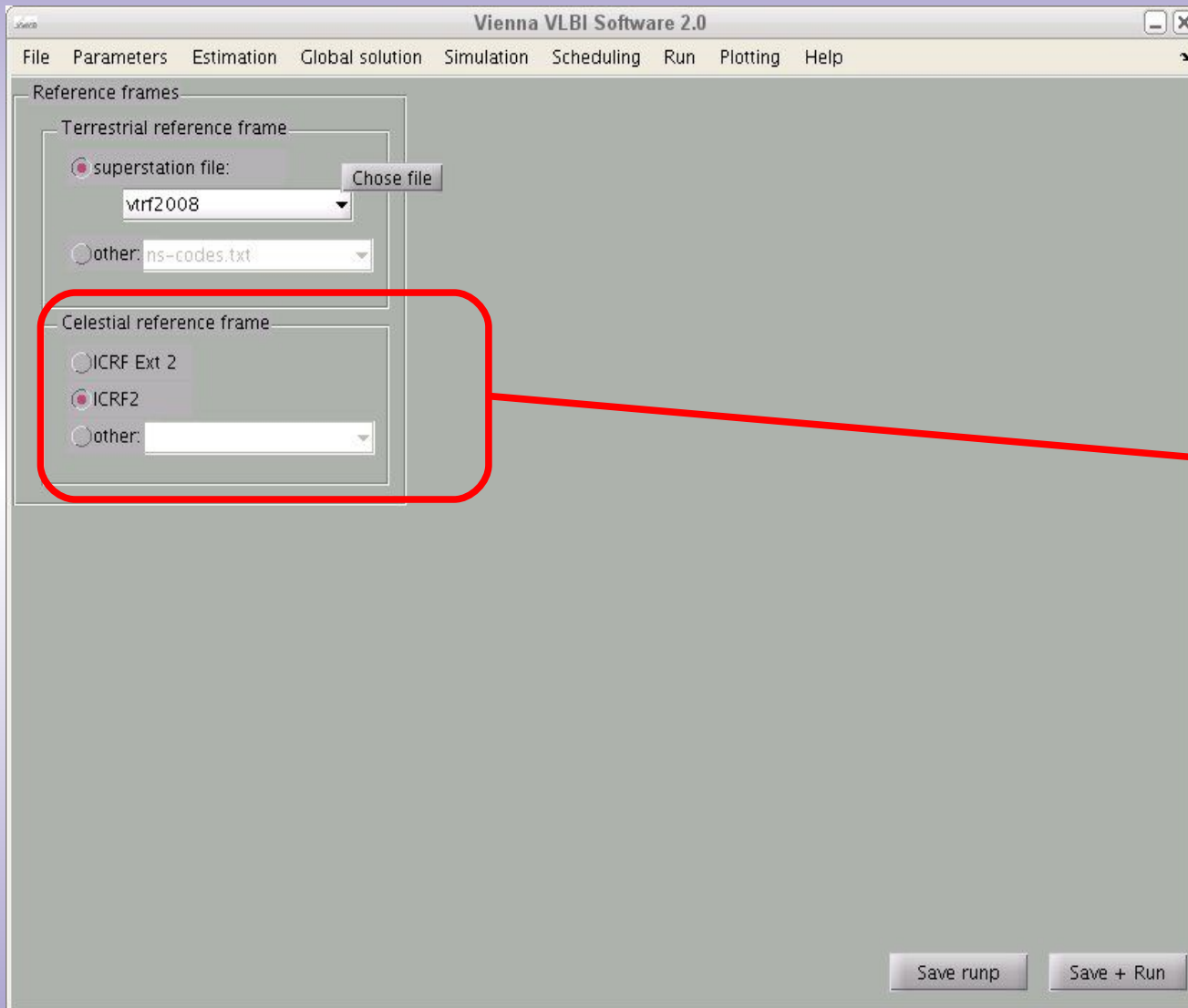


Parameters/ Reference frames

Select what TRF
file to use:

itrf2005
itrf2008
vtrf2008

other: User defined
TRF file (ascii file
in TRF directory)

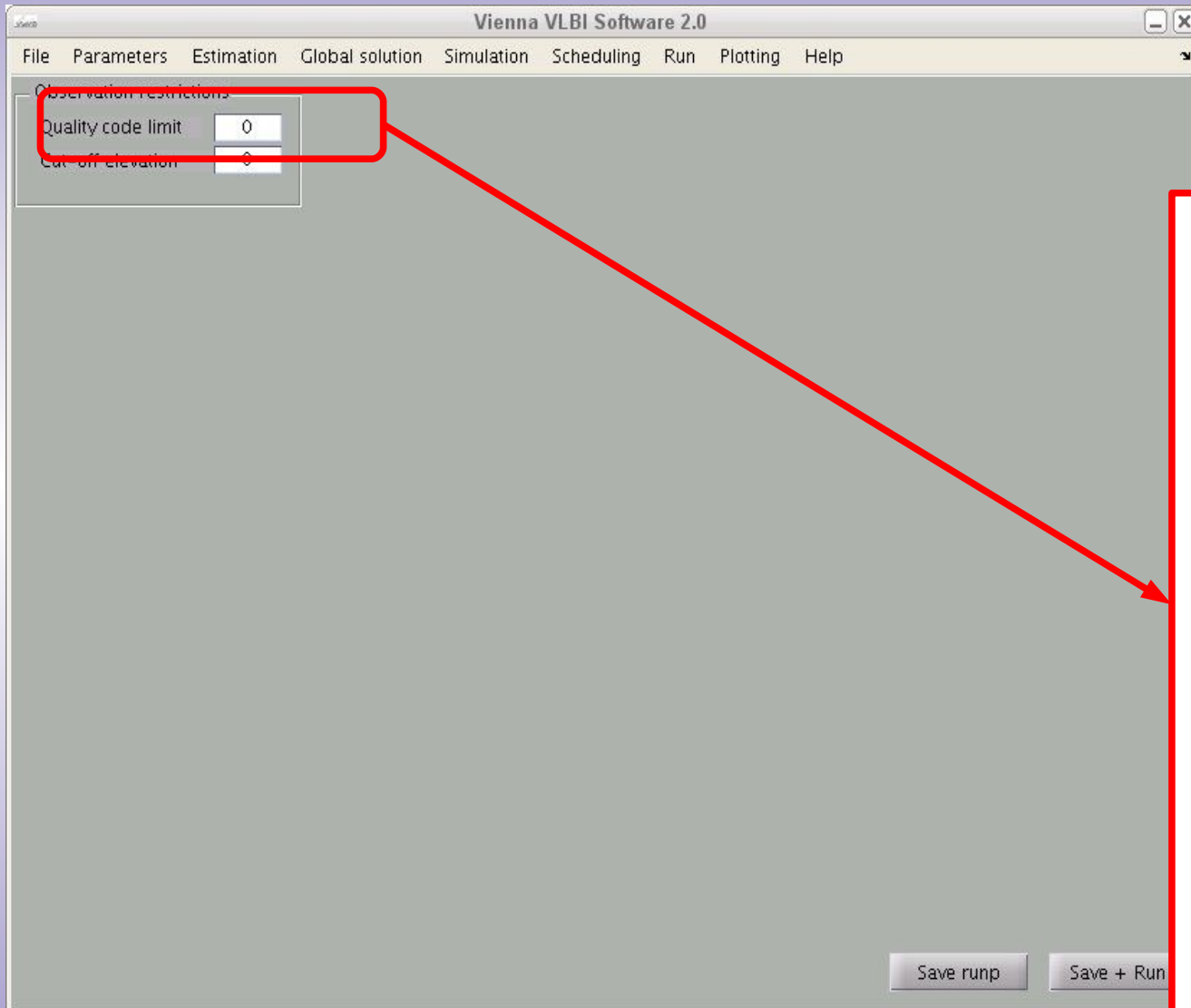


Parameters/ Reference frames

Select what CRF
file to use:

ICRF Ext 2
ICRF2

Other: User
defined CRF file
(ascii file in CRF
directory)



Parameters/ Observation Restrictions

Quality code limit

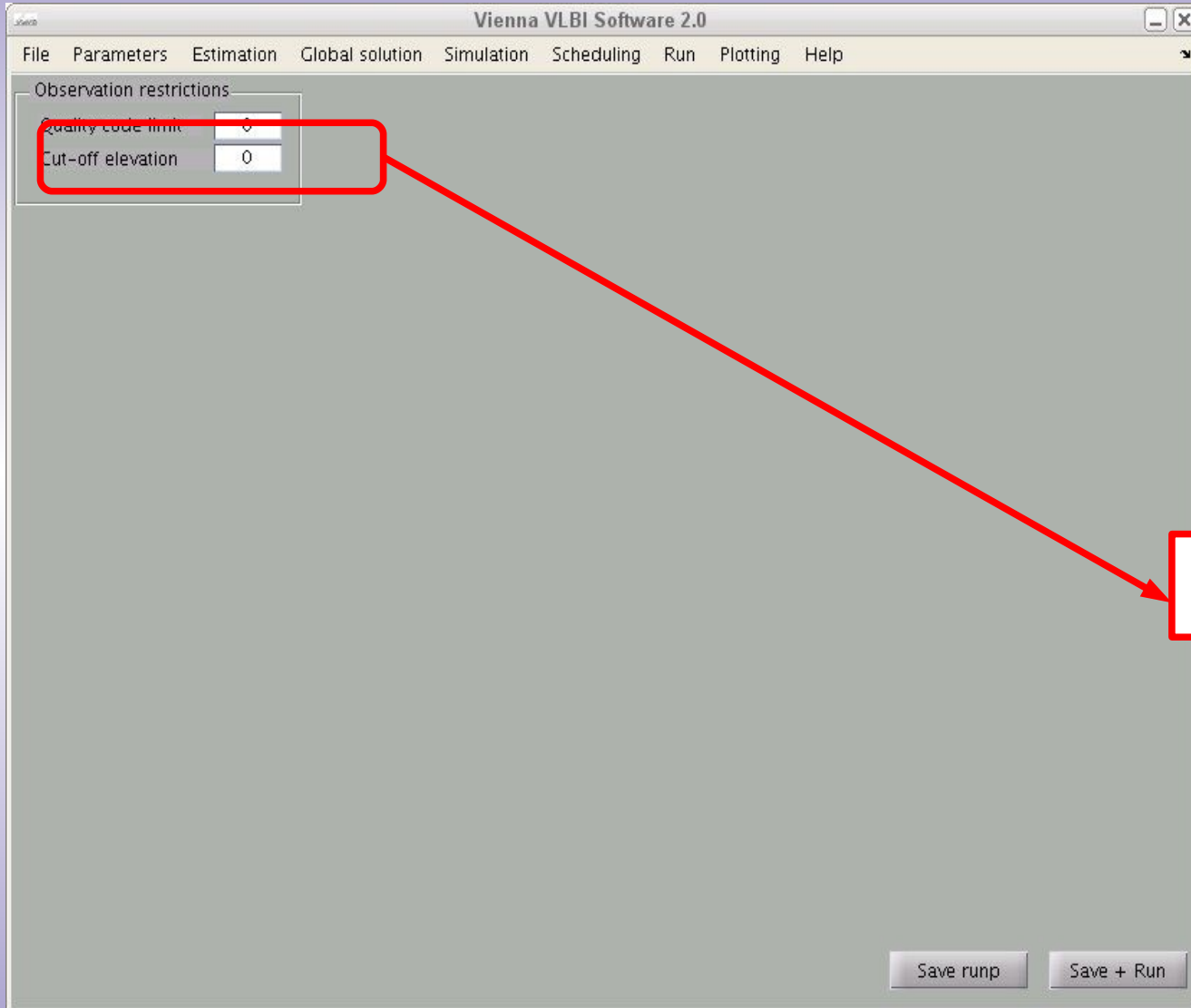
Only observations with a quality flag less or equal to this limit are used

Higher quality code → worse quality of observation

Quality code 0: good quality

Quality code > 0: bad quality

Normally use quality code limit 0



**Parameters/
Observation
Restrictions**

Cut-off elevation angle

```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.
session 1 of 1
Current file: ../DATA/LEVEL0//12APRO3XA_N004
-----
|                               Welcome to VIE_INIT!!!!!!                               |
-----

Stations to be excluded: 0
Sources to be excluded: 0
Baselines to be excluded: 0

Start reading 2012/12APRO3XA_N004
[antenna,sources,scan]=read_ngo(ngsfile,trffile,infofile,crffile,ini_opt)
No vtrf2008 coordinates for TIGOCNC in ../TRF/superstation.mat ... get vieTrf coordinates
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get vieTrf coordinates
Done reading the file!
A total of 8 stations, 113 sources and 927 scans were found
The following stations were found:
KOKEE
NYALES20
TIGOCNC
WESTFORD
ONSALA60
WETTZELL
HARTRAO
TSUKUB32
fx VIE_INIT finished!!! You can now continue with VIE_MOD
```



```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.
session 1 of 1
Current file: ../DATA/LEVEL0//12APRO3XA_N004
-----
|                               Welcome to VIE_INIT!!!!!!                               |
-----

Stations to be excluded: 0
Sources to be excluded: 0
Baselines to be excluded: 0

Start reading 2012/12APRO3XA_N004
[antenna,sources,scan]=read_nqs(nqsfile,trffile,infofile,crffile,ini_opt)
No vtrf2008 coordinates for TIGOCNC in ../TRF/superstation.mat ... get vieTrf coordina
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get vieTrf coordina
Done reading the file!
A total of 8 stations, 113 sources and 927 scans were found
The following stations were found:
KOKEE
NYALES20
TIGOCNC
WESTFORD
ONSALA60
WETTZELL
HARTRA0
TSUKUB32
fx VIE_INIT finished!!! You can now continue with VIE_MOD
```

These stations have no TRF coordinates

```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.

session 1 of 1
Current file: ../DATA/LEVEL0//12APRO3XA_N004

-----
|                               Welcome to VIE_INIT!!!!!!                               |
-----

Stations to be excluded: 0
Sources to be excluded: 0
Baselines to be excluded: 0

Start reading 2012/12APRO3XA_N004
[antenna,sources,scan]=read_ngs(ngsfile,trffile,infofile,crffile,ini_opt)
No vtrf2008 coordinates for TIGOCNC in ../TRF/superstation.mat ... get vieTrf coordinates
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get vieTrf coordinates
Done reading the file!
A total of 8 stations, 113 sources and 927 scans were found
The following stations were found:
KOKFF
NYALES20
TIGOCNC
WESTFORD
ONSALA60
WETTZELL
HARTRA0
TSUKUB32
fx VIE_INIT finished!!! You can now continue with VIE_MOD
```

Number of stations, sources, and scans

```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.
session 1 of 1
Current file: ../DATA/LEVEL0//12APRO3XA_N004
-----
|                               Welcome to VIE_INIT!!!!!!                               |
-----

Stations to be excluded: 0
Sources to be excluded: 0
Baselines to be excluded: 0

Start reading 2012/12APRO3XA_N004
[antenna,sources,scan]=read_ngs(ngsfile,trffile,infofile,crffile,ini_opt)
No vtrf2008 coordinates for TIGOC0NC in ../TRF/superstation.mat ... get vieTrf coordinates
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get vieTrf coordinates
Done reading the file!
A total of 8 stations, 113 sources and 927 scans were found
The following stations were found:
KOKEE
NYALES20
TIGOC0NC
WESTFORD
ONSALA60
WETTZELL
HARTRA0
TSUKUB32
fx VIE_INIT finished!!! You can now continue with VIE_MOD
```

Names of the stations

Output form VIE_INIT

- ❑ Matlab structure arrays: **scan**, **antenna** and **sources**.
- ❑ Saved in **DATA/LEVEL0/** (file names: *NGSFILENAME_structure.mat*, e.g. **10AUG02XA_N004_antenna.mat**).
- ❑ For detailed description, see **DOC/structures.xls** and **DOC/VieVS_variables.pdf**



The scan structure array

- Contains the scans
 - Observed delays (and sigmas), corrected for ionosphere and cable wrap (*scan.obs.obs*)
 - All observations in the NGS file with quality code below or equal to the limit, above minimum elevation angle, not in list of outliers, stations not excluded etc.
 - Also contains additional measurements, like pressure and temperature
 - More quantities added in VIE_MOD



The antenna structure array

- Contains information for all stations which is participating in at least one scan in the scan structure array
- Station positions and velocities
- Additional information, e.g. antenna mount, eccentricities, axis offset

The sources structure array

-  Information about the sources. Contains all sources observed in at least one scan in the scan structure array
-  Contains the source positions

Things that can be good to know

-  If station/source n is not in the TRF/CRF, the field:
antenna(n).in_trf/sources(n).in_crf
will be zero (otherwise one)
-  If the pressure and the temperature for station n are missing in the NGS file, this will be calculated from GPT (Global Pressure and Temperature model).
The fields *antenna(n).gptpres* and *antenna(n).gpttemp* will then be one

Now we continue with VIE_MOD