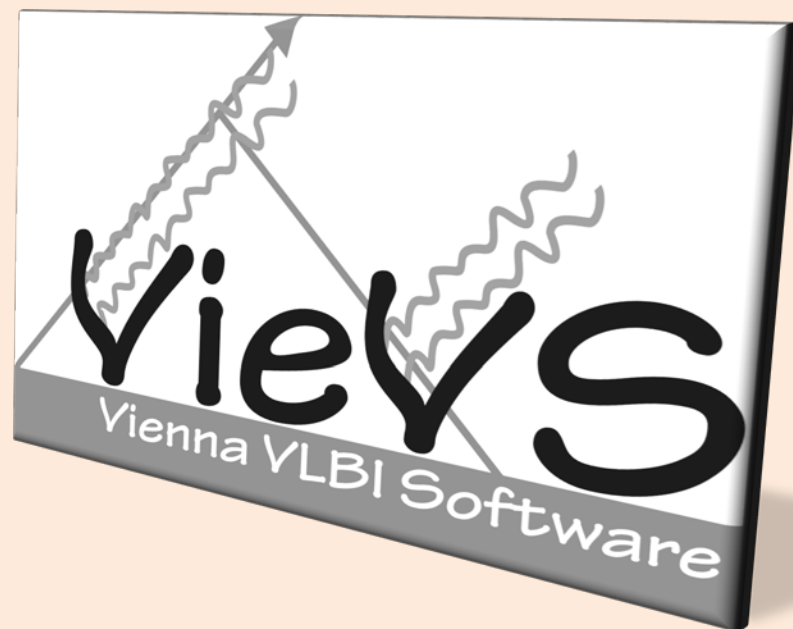
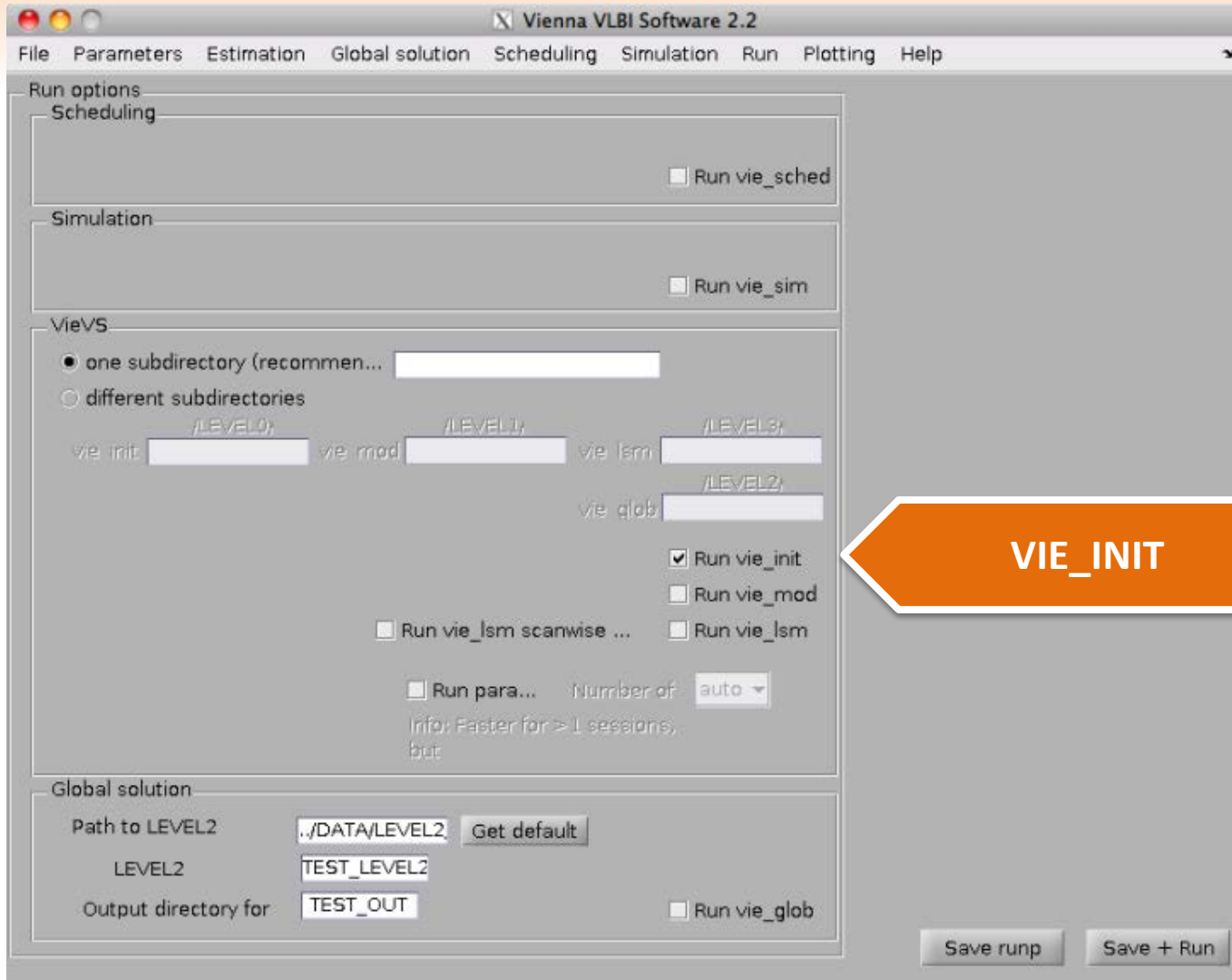


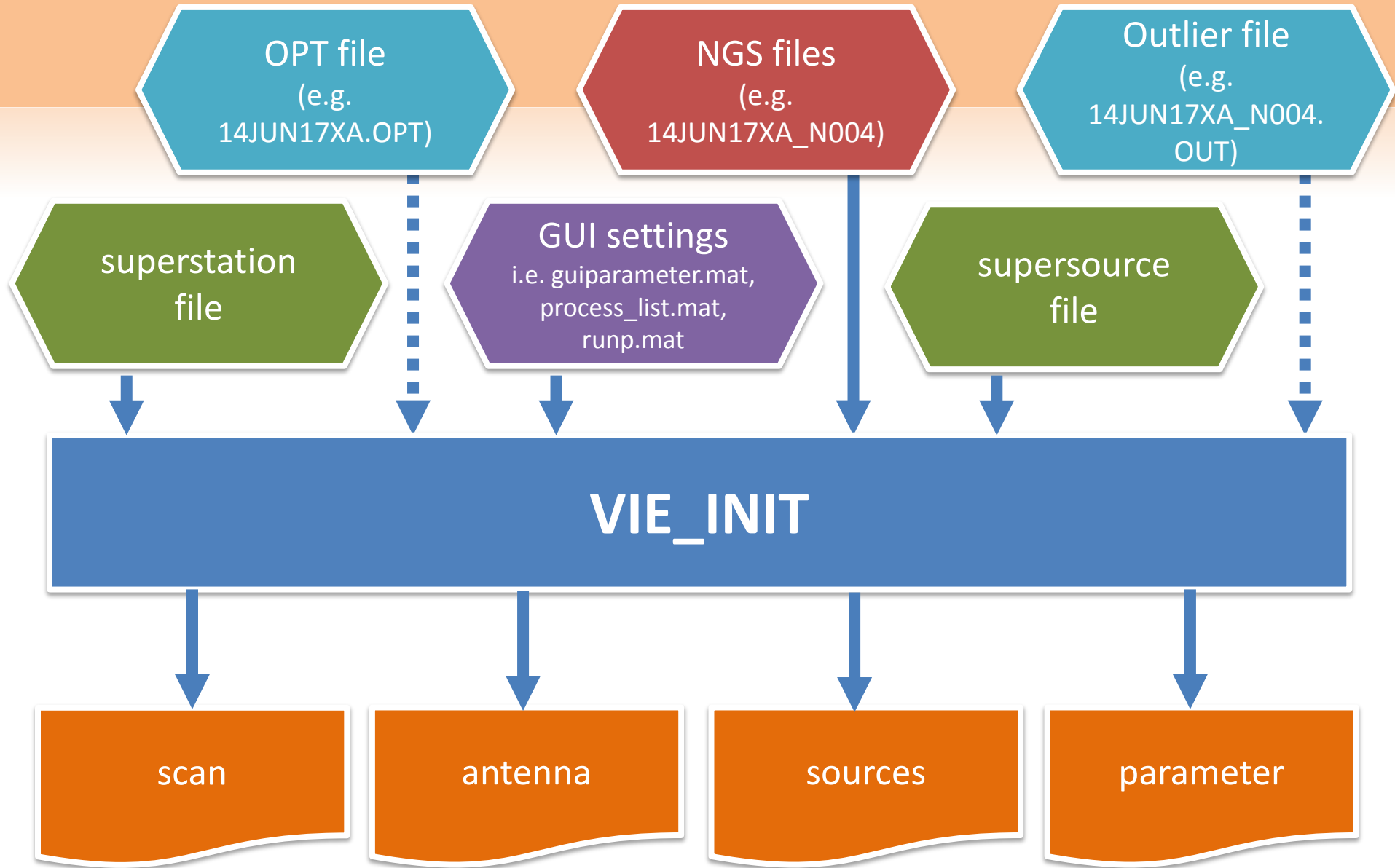
# VIE\_INIT\_V22

Younghee Kwak



# VIE\_INIT





# VIE\_INIT

- Reads basic files
  - Reads observations from the **NGS** file
  - Reads station coordinates and velocities from the ***superstations*** file
  - Read source coordinates from ***supersource*** file
- Sets exceptions
  - Removes outliers (specified in an outlier file)
  - Excludes stations, sources, baselines (specified in OPT-file)
  - Introduces an elevation cut-off angle

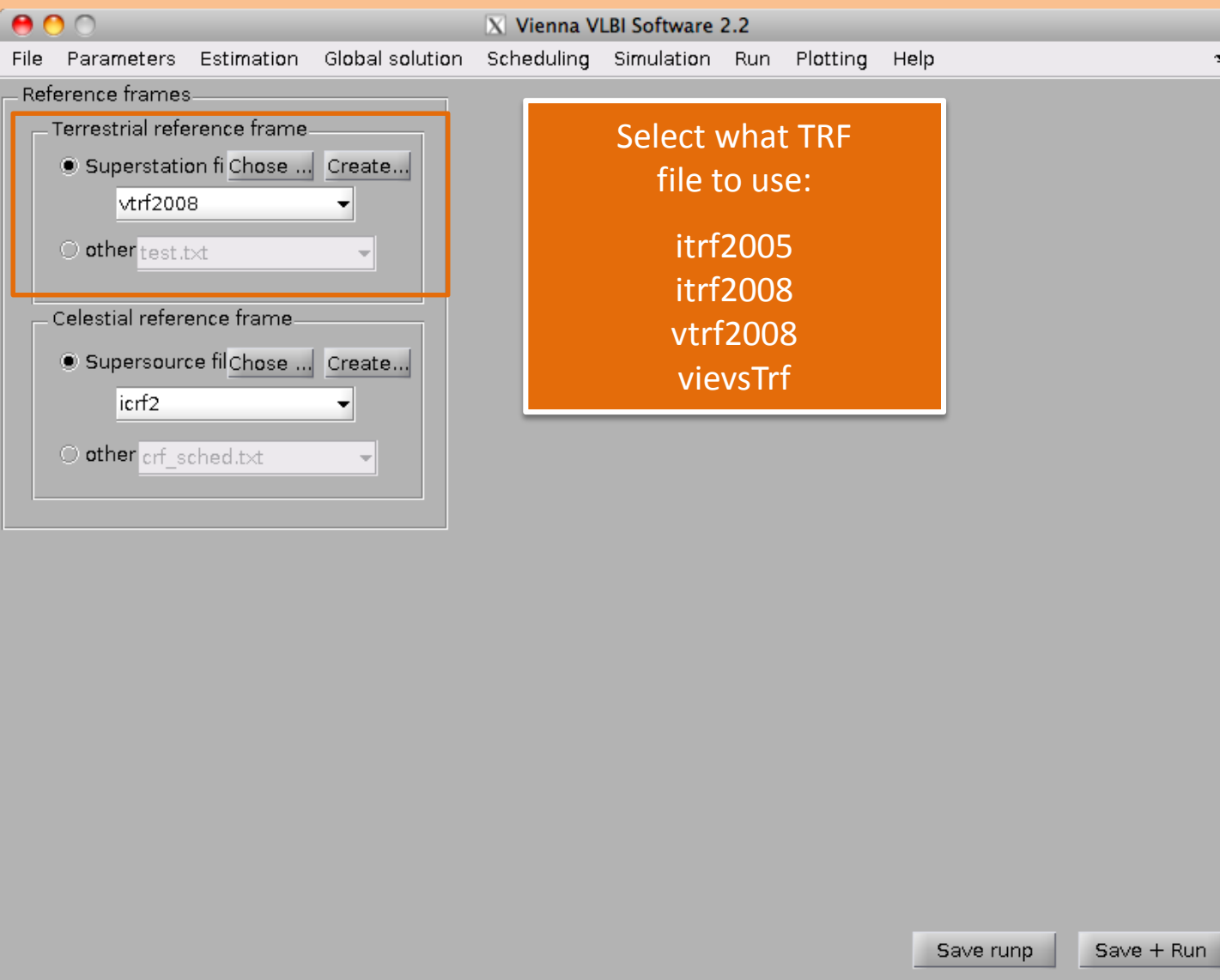
# VIE\_INIT options

The screenshot shows the 'Set input files' dialog box in Vienna VLBI Software 2.2. The dialog has a menu bar (File, Parameters, Estimation, Global solution, Scheduling, Simulation, Run, Plotting, Help) and a title bar. The main area is divided into three sections, each highlighted with an orange border and annotated with an orange box and text:

- Process list:** A list box containing '2014/14JUN17XA\_N004'. To its right are buttons: 'Browse for sessions', 'Browse for process\_...', 'Add previous', and 'Clear selected'. An orange box contains the text: 'Choose the sessions you want to analyze'. To the right of this box is the label **DATA/NGS/**.
- OPT file:** A section with a label 'OPT' and a dropdown menu currently set to 'VIENNA'. An orange box contains the text: 'Choose directory with OPT-files'. To the right of this box is the label **DATA/OPT/**.
- Outlier file:** A section with a label 'Outlier' and a dropdown menu. To its right is a checkbox labeled 'Eliminate outliers'. An orange box contains the text: 'Choose directory with outliers Eliminate outliers or not (check box)'. To the right of this box is the label **DATA/OUTLIER/**.

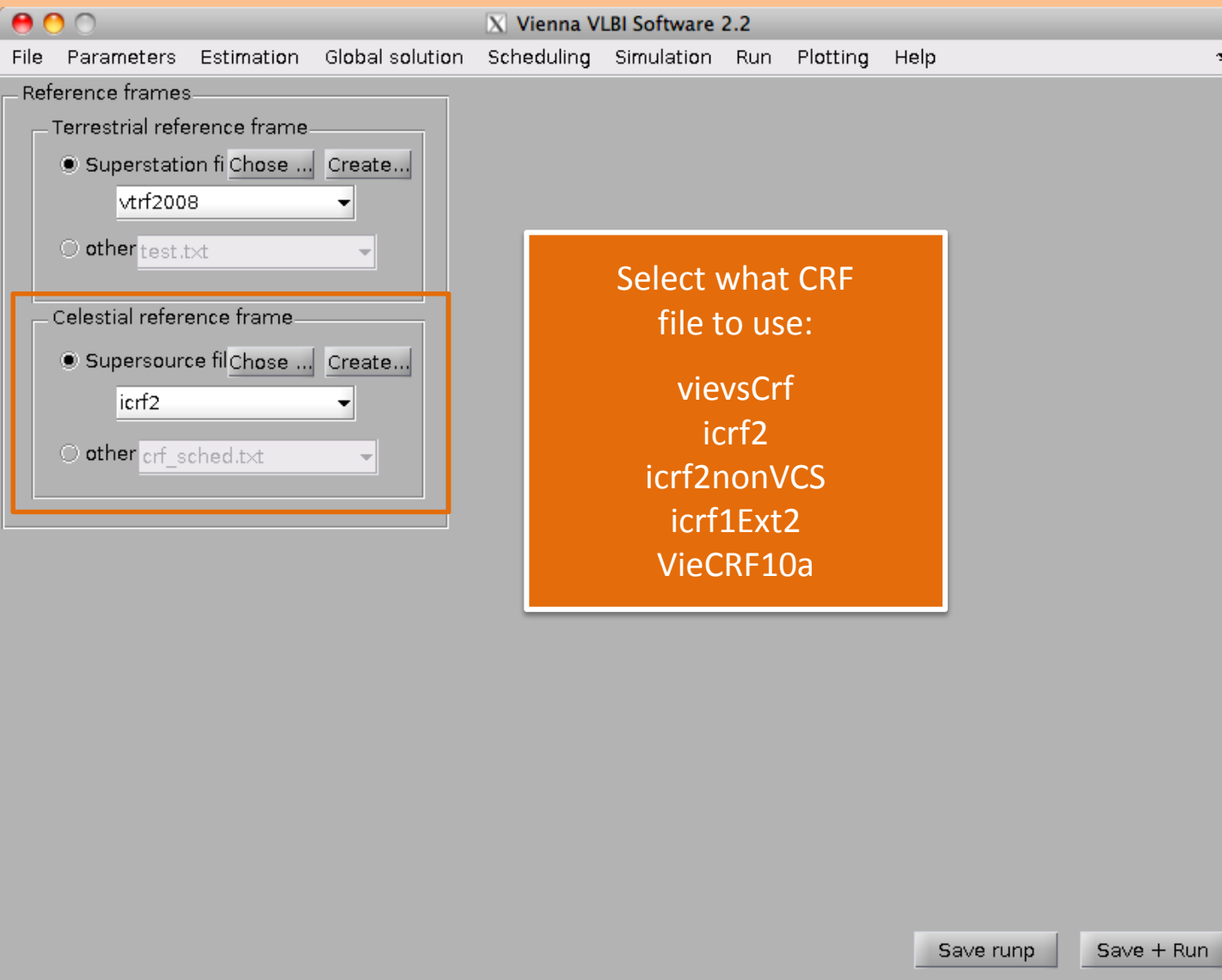
At the bottom right of the dialog are two buttons: 'Save runp' and 'Save + Run'. In the top right corner of the overall image, the text 'File > Set input files' is displayed.

# VIE\_INIT options



Parameters >  
Reference frames

# VIE\_INIT options



Select what CRF  
file to use:

- viewsCrf
- icrf2
- icrf2nonVCS
- icrf1Ext2
- VieCRF10a

Parameters >  
Reference frames

# VIE\_INIT options

The screenshot shows the 'Vienna VLBI Software 2.2' window with a menu bar (File, Parameters, Estimation, Global solution, Scheduling, Simulation, Run, Plotting, Help) and a 'Parameters' panel. The 'Observation restrictions' section is highlighted with an orange box and contains three input fields: 'Quality code limit' (value: 0), 'Cut-off elevation' (value: 0), and 'Jet angle [none, 0-90]' (value: none). A large orange text box is overlaid on the right side of the window, providing instructions on the quality code limit.

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

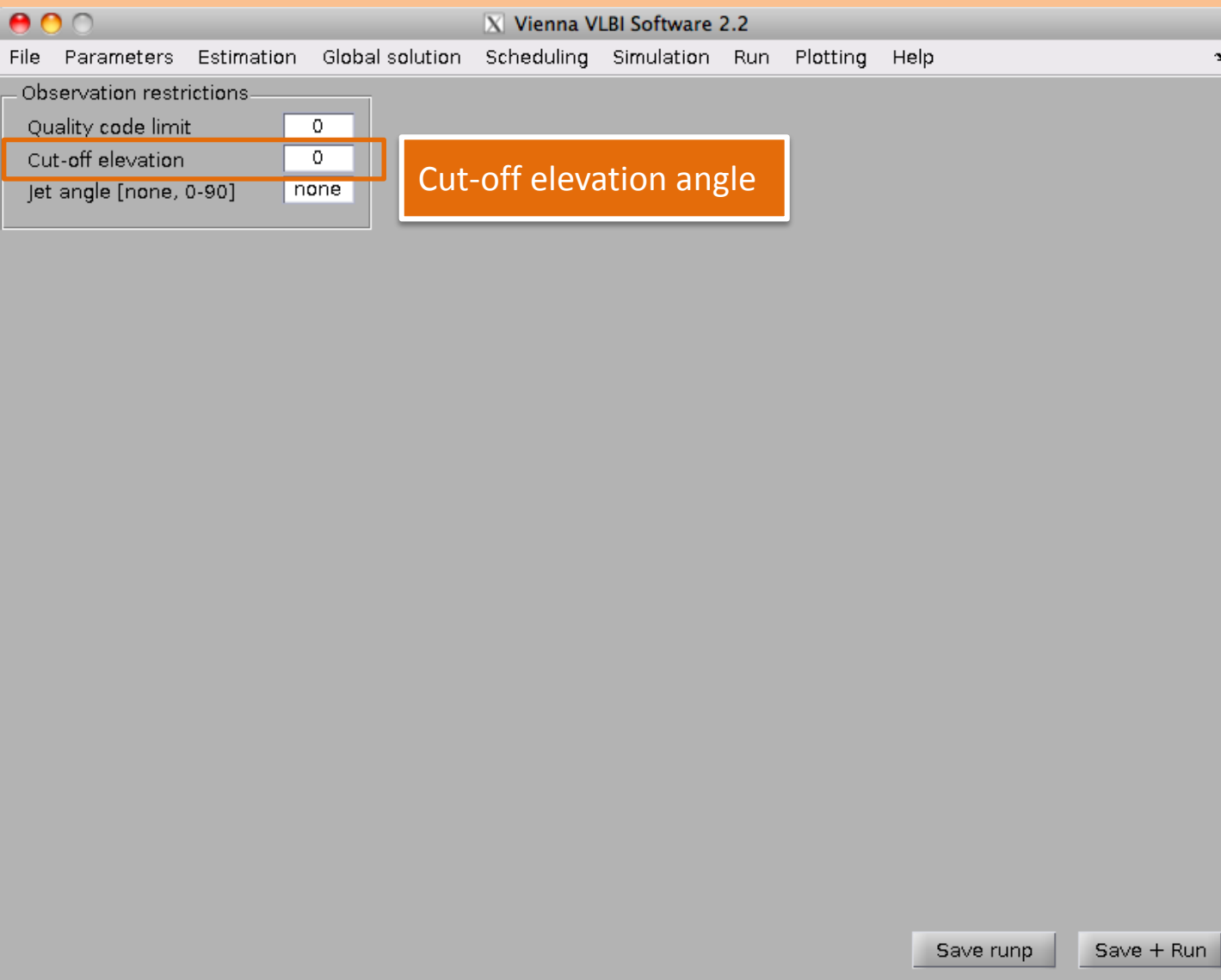
Normally use quality code limit 0

Save runp    Save + Run

Parameters >  
Observation  
Restrictions



# VIE\_INIT options

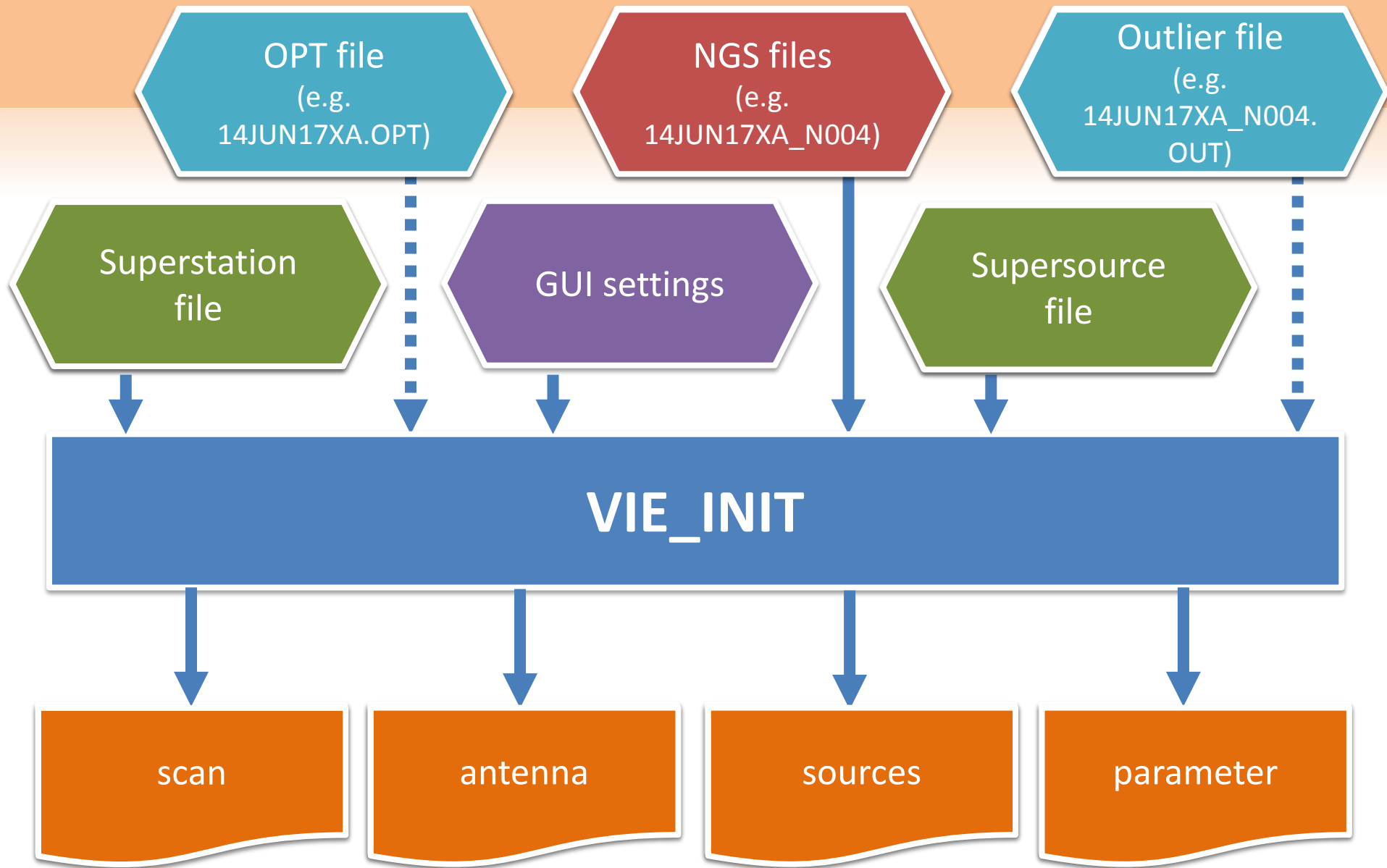


Parameters >  
Observation  
Restrictions

# GUI Settings

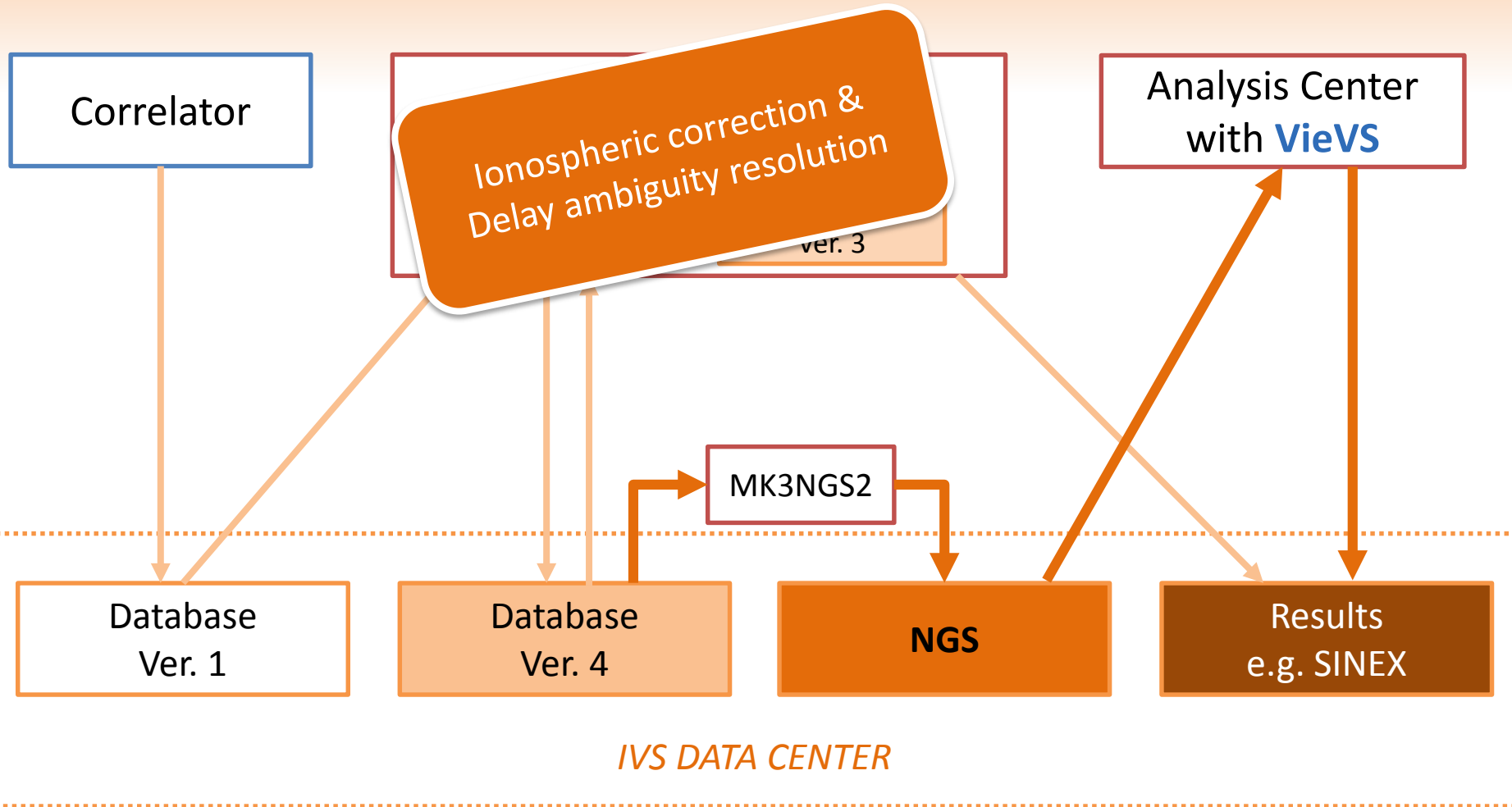
*WORK/  
DATA/LEVEL0/*

- Created by GUI (VIE\_SETUP)
  - `guiparameter.mat`
  - `session_list.mat`
  - `runp.mat`
- Contain the options for VIE\_INIT  
(and the other parts of VieVS)
- The parameter file used in VIE\_INIT is stored in the ***WORK/*** and copied to ***DATA/LEVEL0/*** directory



# NGS file

*DATA/NGS/*



# NGS file

*DATA/NGS/*

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

# NGS file example

DATA IN NGS FORMAT FROM DATABASE 14JUN17XA\_V004

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

```

NYALES20      1202462.52700    252734.52100    6237766.20500  AZEL      .52050
WETTZELL      4075539.63200    931735.53700    4801629.52900  AZEL      .00000
  
```

...

\$END

```

OJ287         8 54      48.874927    20 6      30.640890
1954-388     19 57      59.819275   -38 45     6.355760
  
```

...

\$END

.8 **Baseline** 0D+0 **Source** GR PH **Time**

\$END

Station	Delay	Formal error	Cable	Temperature, pressure, humidity	Quality code (0=good)
NYALES20	-5499609.16960164	.00209		2014 06 17 17 00 21.0000000000	101
WETTZELL	.00000			436726.1034947177 .00433	102
OJ287	.0			.0000 2.282089902332018	103
	.01226	-.00126		.00 .0 .00 .0	104
	1.921	17.381	1003.300	.00000 .00000 .00000	105
	-2.8661048048	.00387		946.800 92.420 62.828 0 0	106
				000000000000 000000	108
					109
H	15410620.78242612	.01309		14 06 17 17 00 21.0000000000	201
	.00098	.00000	.00000	-111567.0006381021 .04170 0	202
	.00	.0	.00 .0	.00000 4.468080169360745	203
	.00000	-.00477	.00000	.00 .0 .00 .0	204
	11.695	21.020	1016.500	.00000 .00000 .00000	205
				1002.600 75.700 96.000 0 0	206

# TRF files

*TRF/*

- Superstation file (`superstation.mat`)
  - Can be created/updated using the GUI
  - **Contain station coordinates, velocities, and additional antenna info (mount, axis offset, eccentricity, etc.)**
  - `itr2005`, `itr2008`, `vtrf2008`, `viewsTrf`, ...
  - If a station is not found in the chosen `trf`, the coordinates from `viewsTrf` are used



afternoon  
session!

# CRF files

*CRF/*

- Supersource file (`supersource.mat`)
  - Can be created/updated using the GUI
  - **Contain source coordinates**
  - `icrf2`, `icrf2nonVCS`, `icrf1Ext2`, `VieCRF10a`, `viewsCrf`, ...
  - If a source is not found in the chosen catalogue, the `viewsCrf` coordinates are used.




afternoon  
session!



# OPT file

*DATA/OPT/*

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

# Outlier file

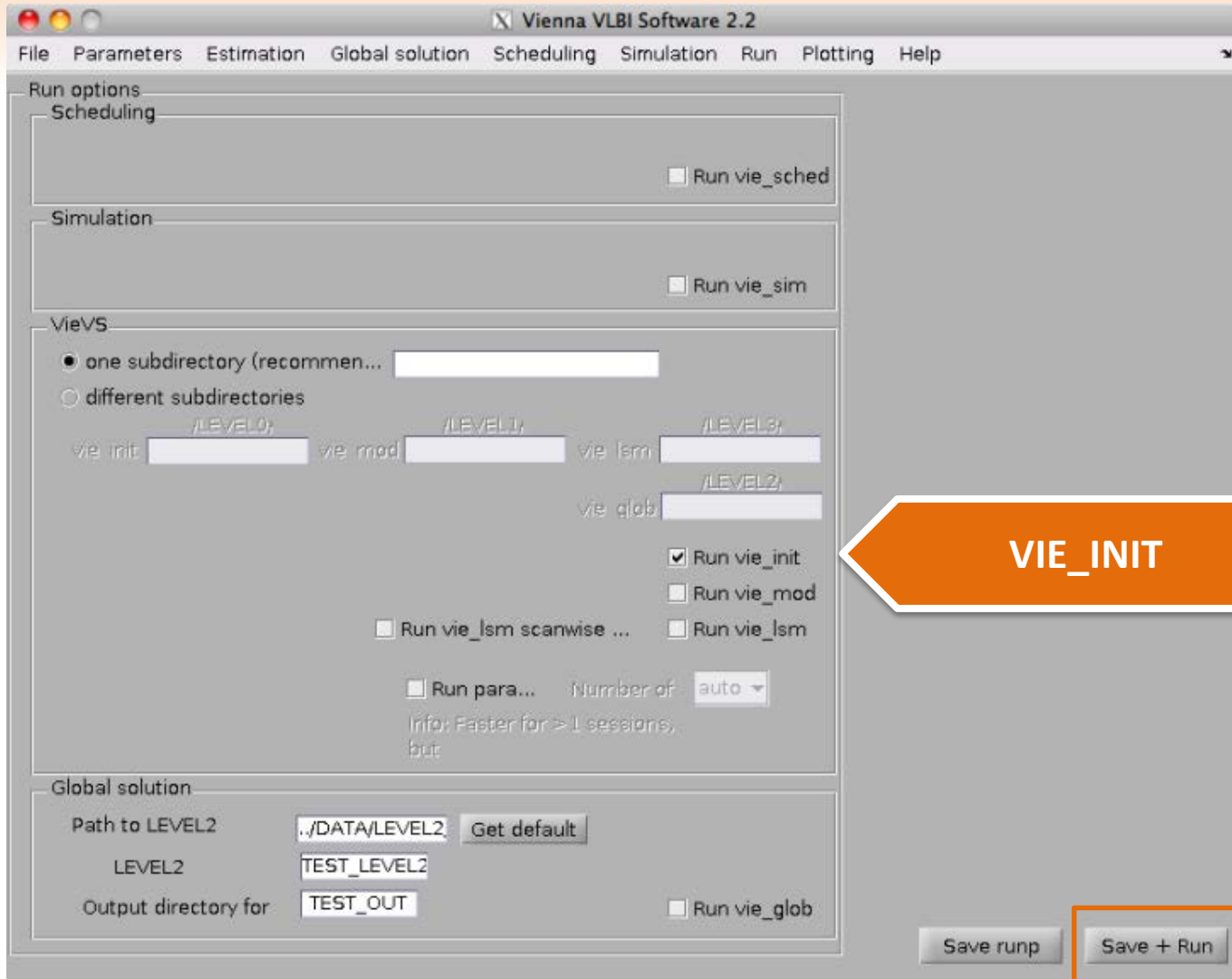
*DATA/OUTLIER/*

- 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

# Processing example



# Processing example

```
Command Window
session 1 of 1
Current file: ../DATA/LEVEL0//14JUN17XA_N004
-----
|                welcome to VIE_INIT!!!!    |
-----
No OPT file was found
Stations to be excluded: 0
Stations to be down-weighted: 0
Sources to be excluded: 0
Baselines to be excluded: 0

Start reading 2014/14JUN17XA_N004
[antenna.sources.scan]=read_ngs(ngs1.mat, pt, tp, trf, crt)
No vtrf2008 coordinates for HOBART12 in ../TRF/superstation.mat ... get viewsTrf coordinates
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get viewsTrf coordinates
No vtrf2008 coordinates for HART15M in ../TRF/superstation.mat ... get viewsTrf coordinates
No vtrf2008 coordinates for YARRA12M in ../TRF/superstation.mat ... get viewsTrf coordinates
Done reading the file:
A total of 7 stations, 56 sources and 1035 scans were found
The following stations were found:
NYALES20
WETTZELL
HOBART12
TSUKUB32
FORTLEZA
HART15M
YARRA12M
VIE_INIT finished!!! You can now continue with VIE_MOD
fx >>
```

No OPT file was found  
Stations to be excluded: 0  
Stations to be down-weighted: 0  
Sources to be excluded: 0  
Baselines to be excluded: 0

Excluded or down-weighted according OPT file

Stations not in the designated TRF

Start reading 2014/14JUN17XA\_N004

Name of the NGS file

No vtrf2008 coordinates for HOBART12 in ../TRF/superstation.mat ... get viewsTrf coordinates  
No vtrf2008 coordinates for TSUKUB32 in ../TRF/superstation.mat ... get viewsTrf coordinates  
No vtrf2008 coordinates for HART15M in ../TRF/superstation.mat ... get viewsTrf coordinates  
No vtrf2008 coordinates for YARRA12M in ../TRF/superstation.mat ... get viewsTrf coordinates

A total of 7 stations, 56 sources and 1035 scans were found

Numbers of stations, sources and scans

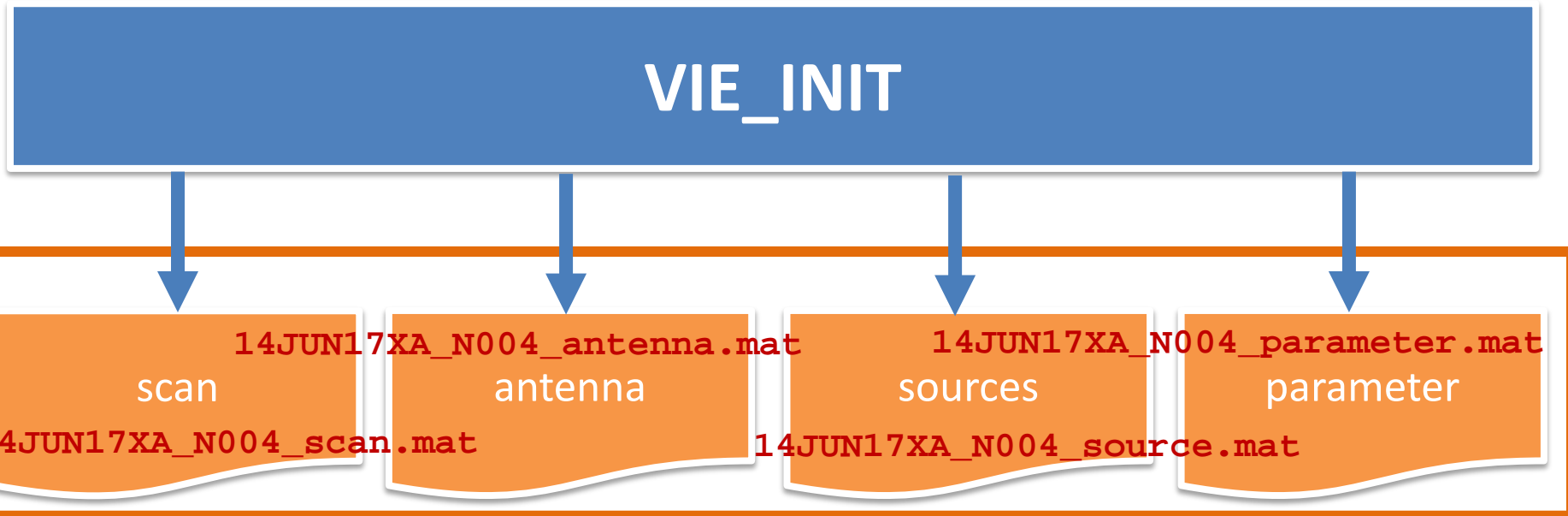
NYALES20  
WETTZELL  
HOBART12  
TSUKUB32  
FORTLEZA  
HART15M  
YARRA12M

Names of the stations

# Output of VIE\_INIT

- Matlab structure arrays: scan, antenna, sources and parameters
- Saved in ***DATA/LEVEL0/***

file names: *NGSFILENAME\_output.mat*



For detailed description, see [DOC/structures.xls](#) & [DOC/VieVS\\_variables.pdf](#)

# The *scan* structure array

Contains the information for all usable 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 GPT2 (Global Pressure and Temperature model 2).

**Thank you!**

**Now we continue with VIE\_MOD**