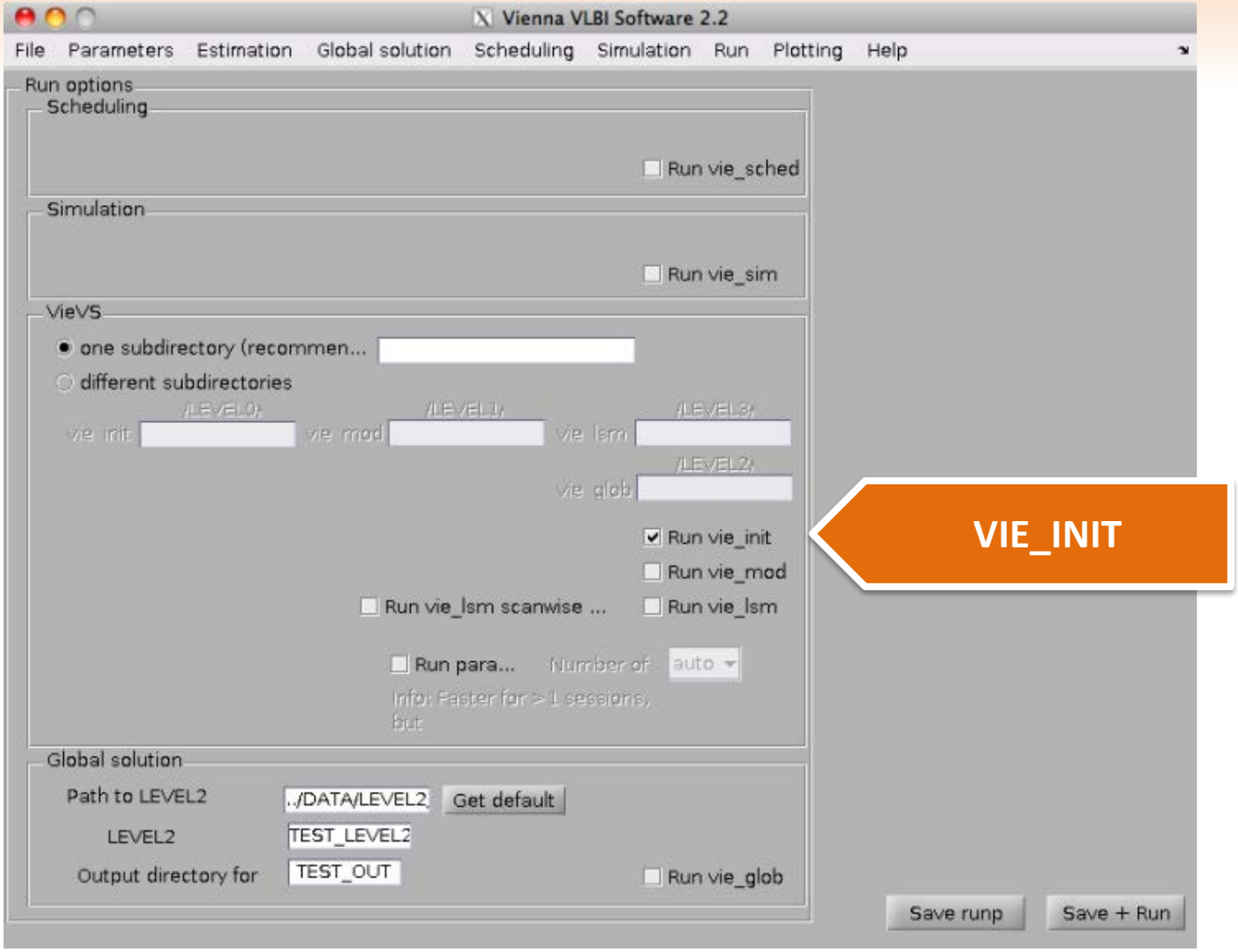
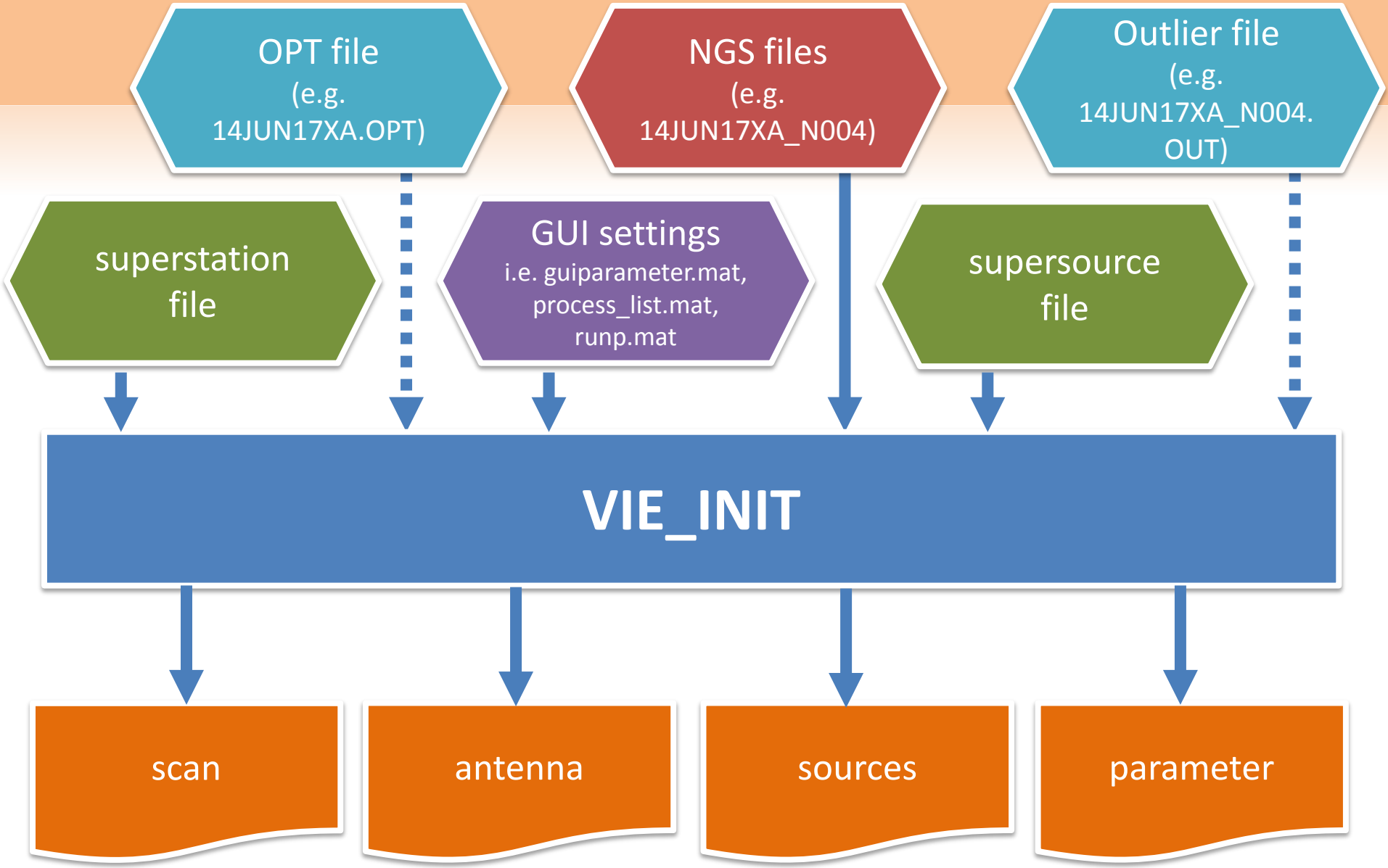
TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

VIE_INIT_V22

Younghee Kwak

VIE_INIT

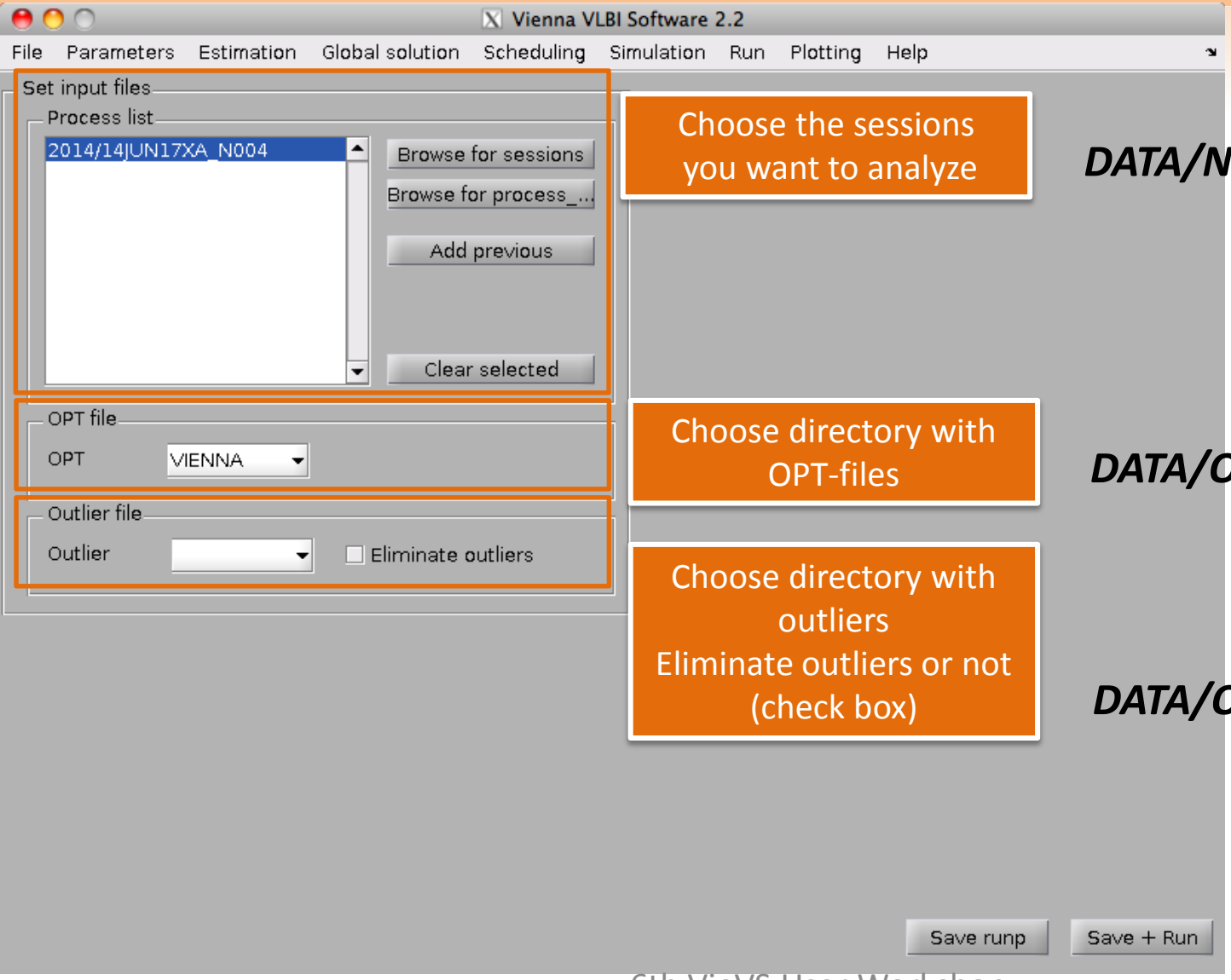

Vienna VLBI Software 2.2
File
Parameters
Estimation
Global solution
Scheduling
Simulation
Run
Plotting
Help
Run options
Scheduling
Run vie_sched
Simulation
Run vie_sim
VieVS
one subdirectory (recommen...
different subdirectories
/LEVEL0/
vie_init
/LEVEL1/
vie_mod
/LEVEL3/
vie_lsm
/LEVEL2/
vie_glob
Run vie_init
Run vie_mod
Run vie_lsm scanwise ...
Run vie_lsm
Run para...
Number of
auto
Info: Faster for > 1 sessions, but
Global solution
Path to LEVEL2
../DATA/LEVEL2
Get default
LEVEL2
TEST_LEVEL2
Output directory for
TEST_OUT
Run vie_glob
Save runp
Save + Run
VIE_INIT


OPT file
(e.g.
14JUN17XA.OPT)
NGS files
(e.g.
14JUN17XA_N004)
Outlier file
(e.g.
14JUN17XA_N004.
OUT)
superstation
file
GUI settings
i.e. guiparameter.mat,
process_list.mat,
runp.mat
supersource
file
VIE_INIT
scan
antenna
sources
parameter

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



File > Set input files

Choose the sessions you want to analyze

DATA/NGS/

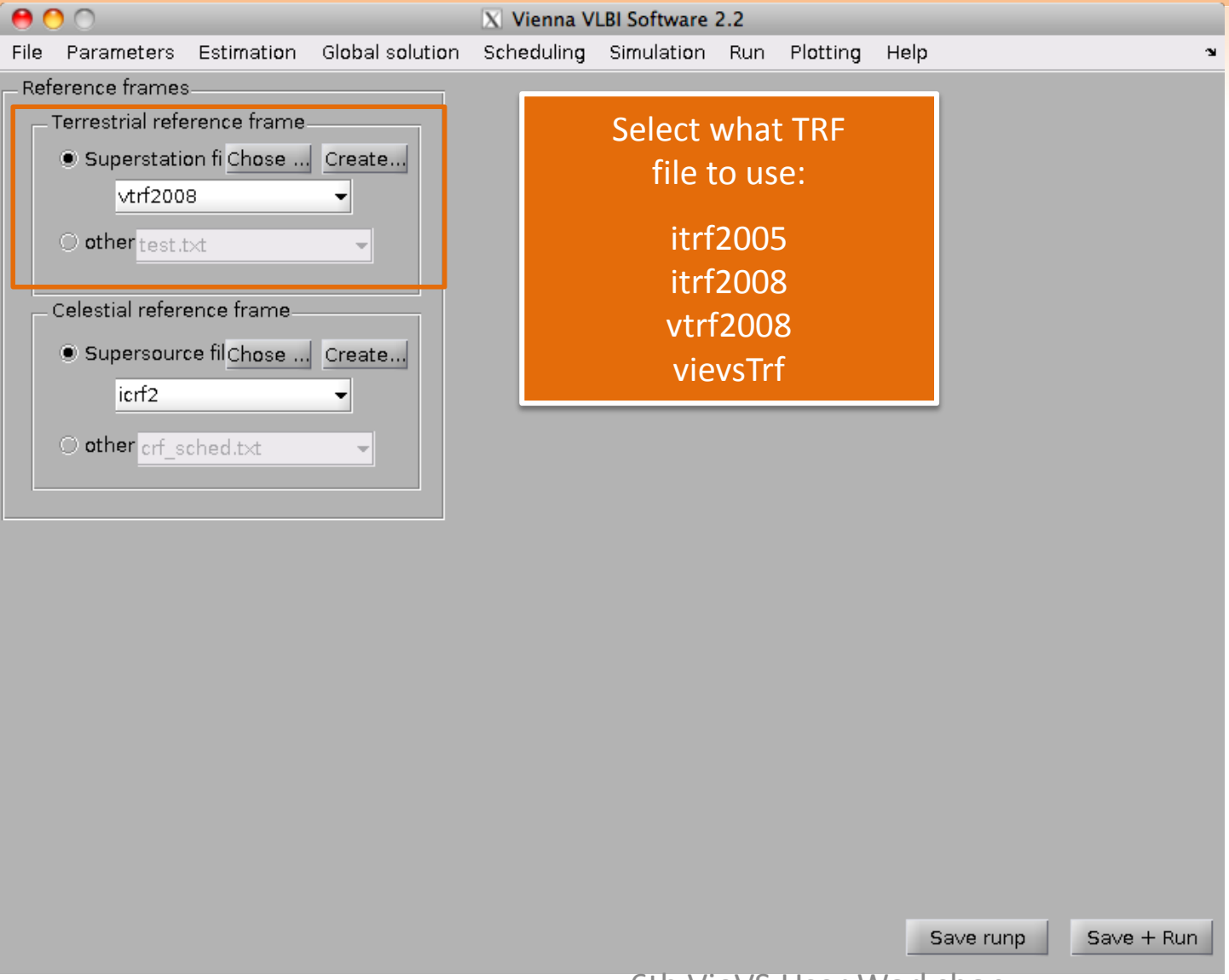
Choose directory with OPT-files

DATA/OPT/

Choose directory with outliers
Eliminate outliers or not (check box)

DATA/OUTLIER/

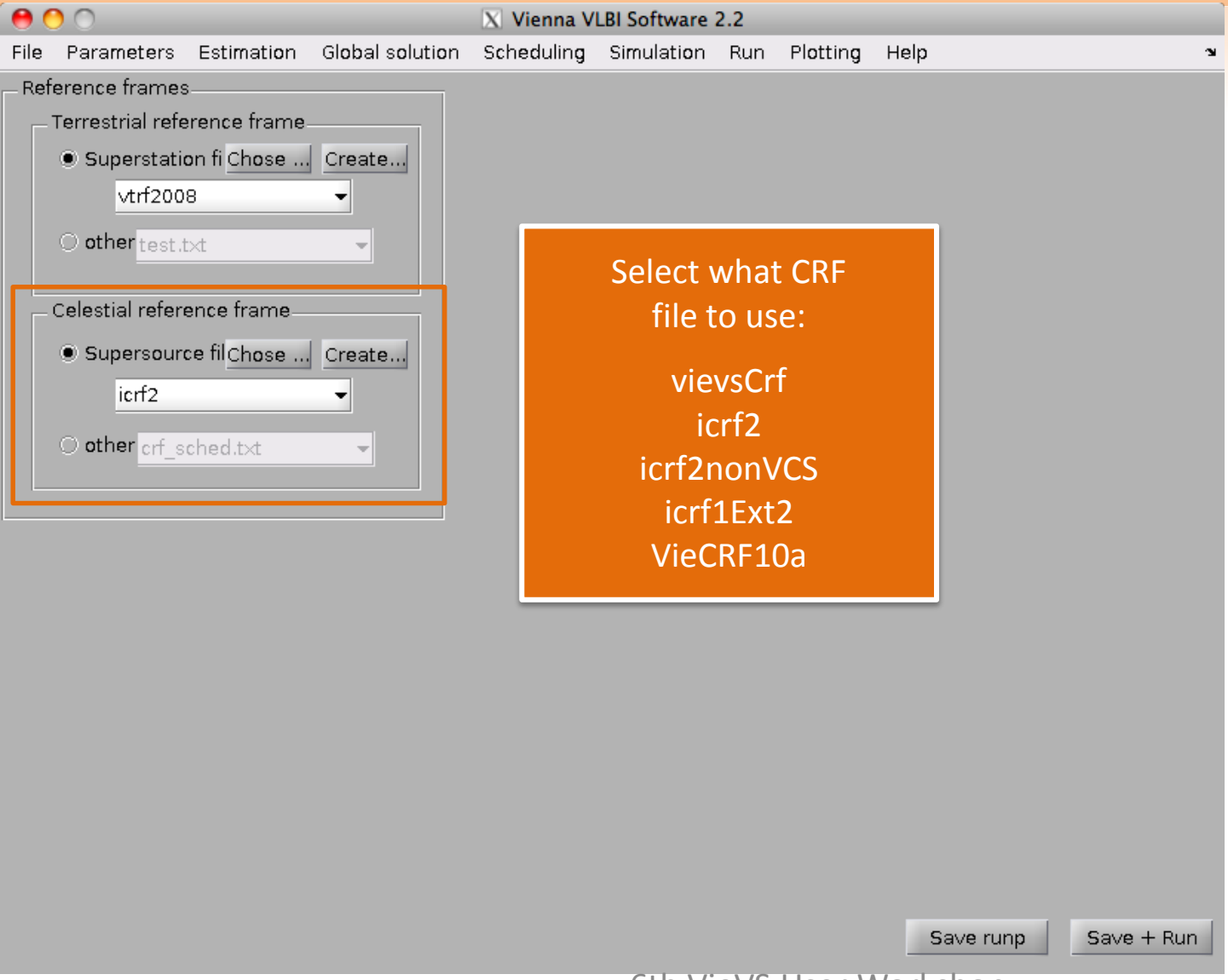
VIE_INIT options



Parameters >

Reference frames

VIE_INIT options



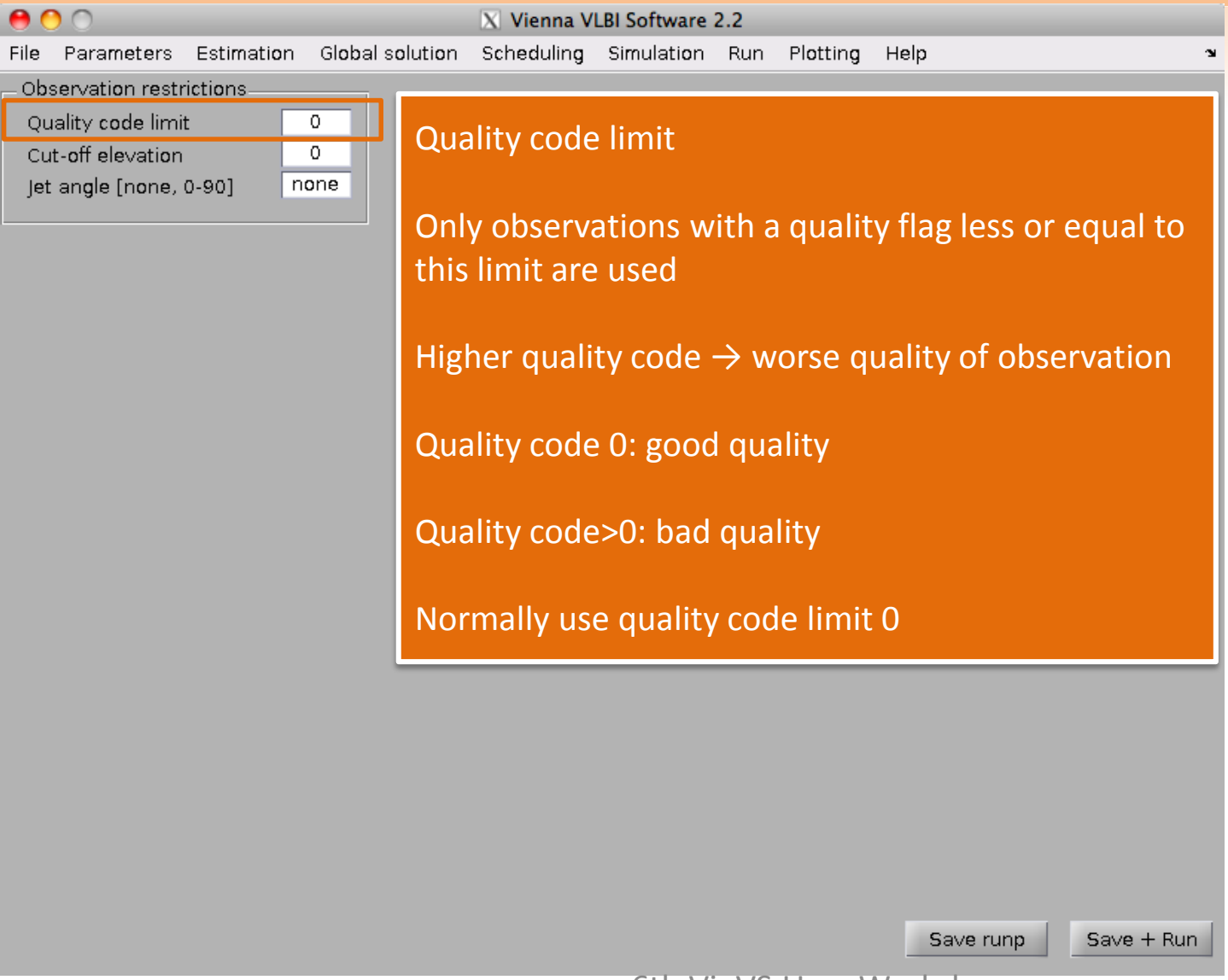
Select what CRF file to use:

vievsCrf
icrf2
icrf2nonVCS
icrf1Ext2
VieCRF10a

Parameters >

Reference frames

VIE_INIT options



Quality code limit

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

Higher quality code → worse quality of observation

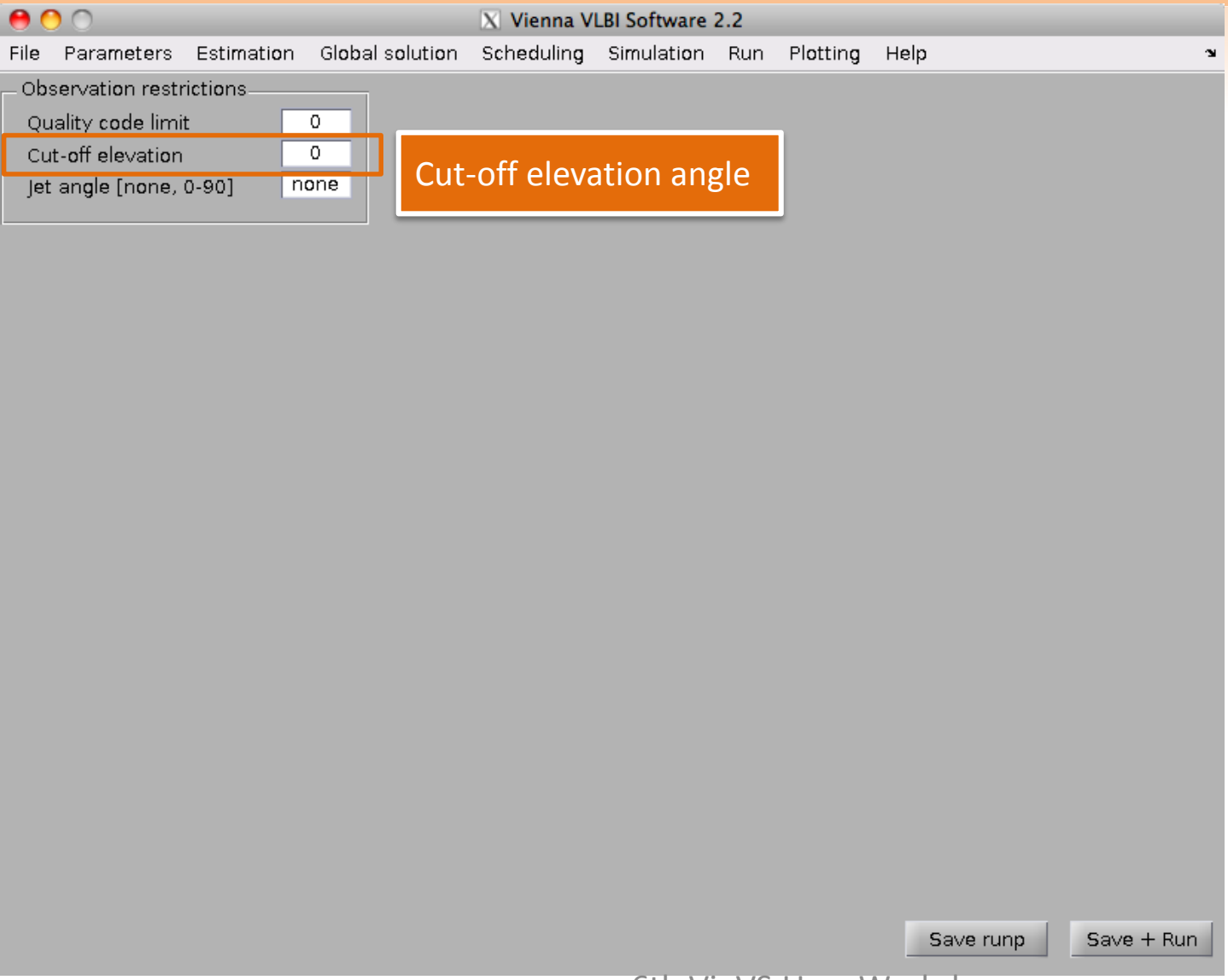
Quality code 0: good quality

Quality code>0: bad quality

Normally use quality code limit 0

Parameters > Observation Restrictions

VIE_INIT options



Parameters >

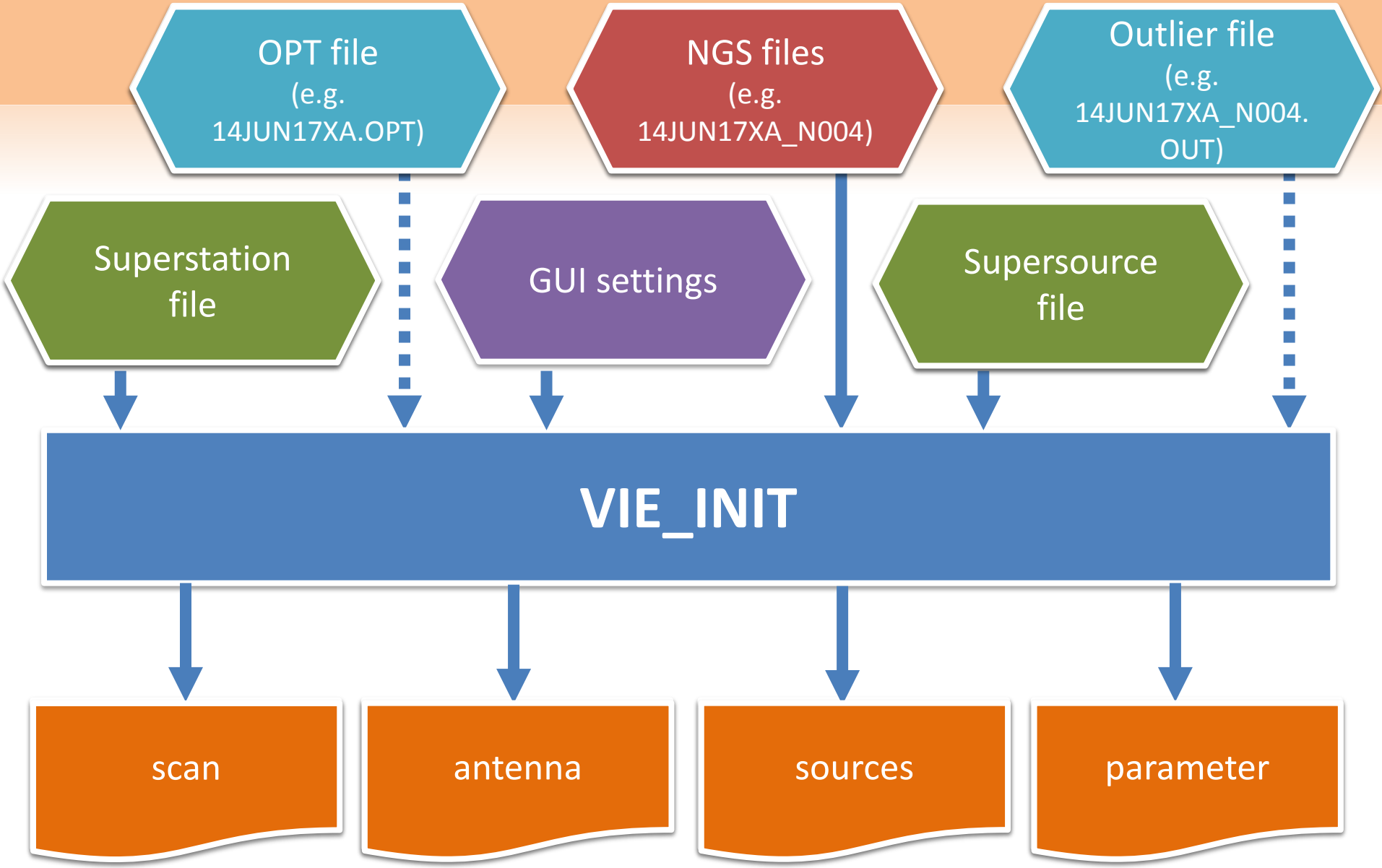
Observation

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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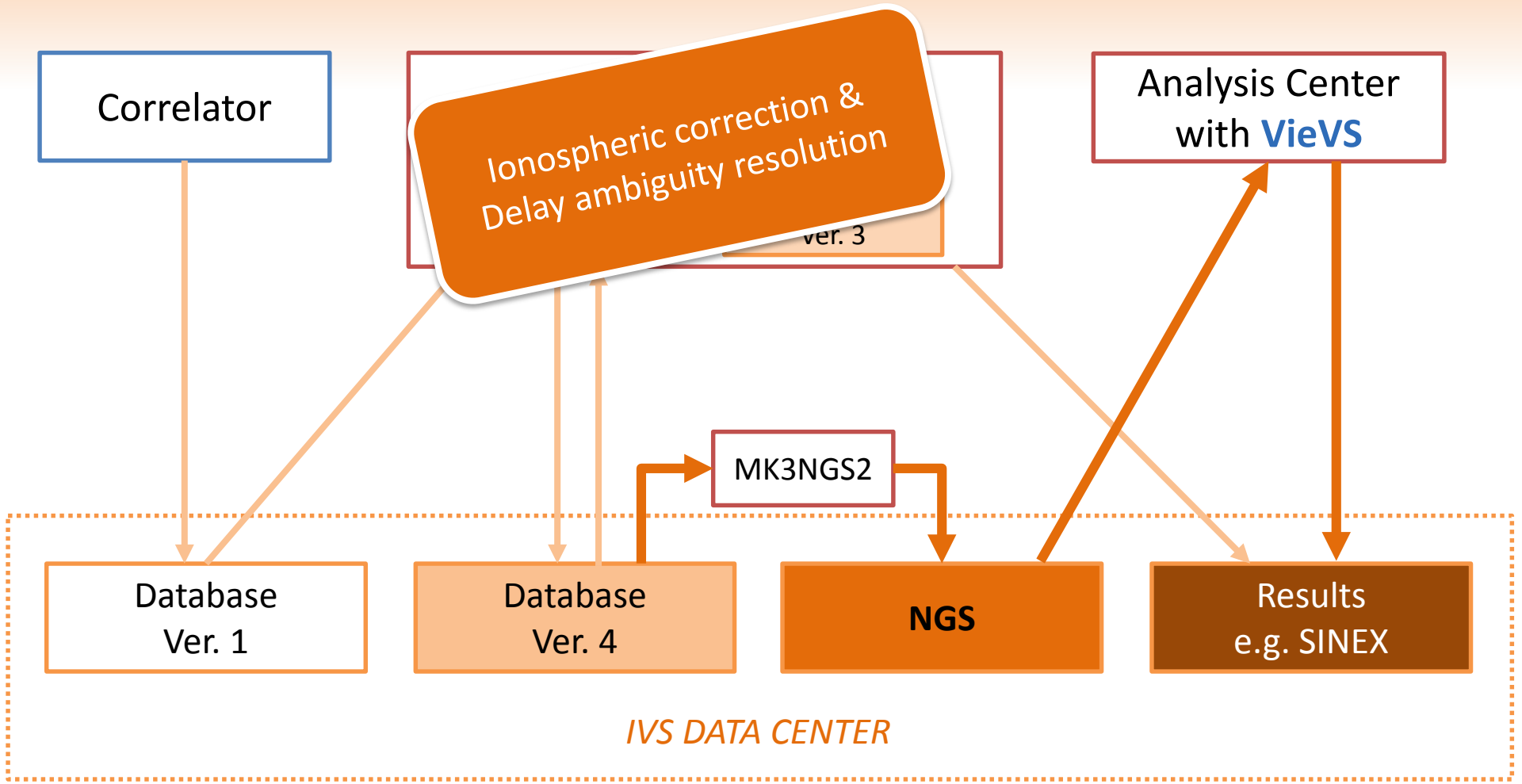
14JUN17XA_N004.
OUT)
Superstation
file
GUI settings
Supersource
file
VIE_INIT
scan
antenna
sources
parameter

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
0J287         8 54     48.874927  20   6     30.640890
1954-388   19 57     59.819275 -38 45      6.355760
                                        ...
$END
   .8          0D+0            GR PH
$END
NYALES20  WETTZELL  0J287    2014 06 17 17 00  21.0000000000                    101
   -5499609.16960164      .00209    436726.1034947177     .00433 0       I       102
                  .00000              0000   2.282089902332018                   103
                  .0                   .00    .0         .00    .0               104
     .01226     -.00126               .00000     .00000     .00000               105
      1.921      17.381   1003.300   946.800     92.420     62.828 0 0           106
          -2.8661048048       .00387                                  0          108
                                                                      I          109
H                                14 06 17 17 00  21.0000000000                   201
   15410620.78242612      .01309  -111567.0006381021     .04170 0     I          202
     .00098     .00000     .00000     .00000   4.468080169360745      0.         203
        .00    .0         .00    .0          .00    .0         .00    .0         204
     .00000    -.00477     .00000     .00000     .00000     .00000               205
     11.695     21.020   1016.500   1002.600     75.700     96.000 0 0           206
```

Baseline

Source

Time

Delay

Formal error

Cable

Quality code (0=good)

Temperature, pressure, humidity

Ionospheric delay and formal error

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.)**
  - itrf2005, itrf2008, vtrf2008, vievsTrf, …
  - If a station is not found in the chosen trf, the coordinates from vievsTrf 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, vievsCrf, …
  - If a source is not found in the chosen catalogue, the vievsCrf coordinates are used.

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

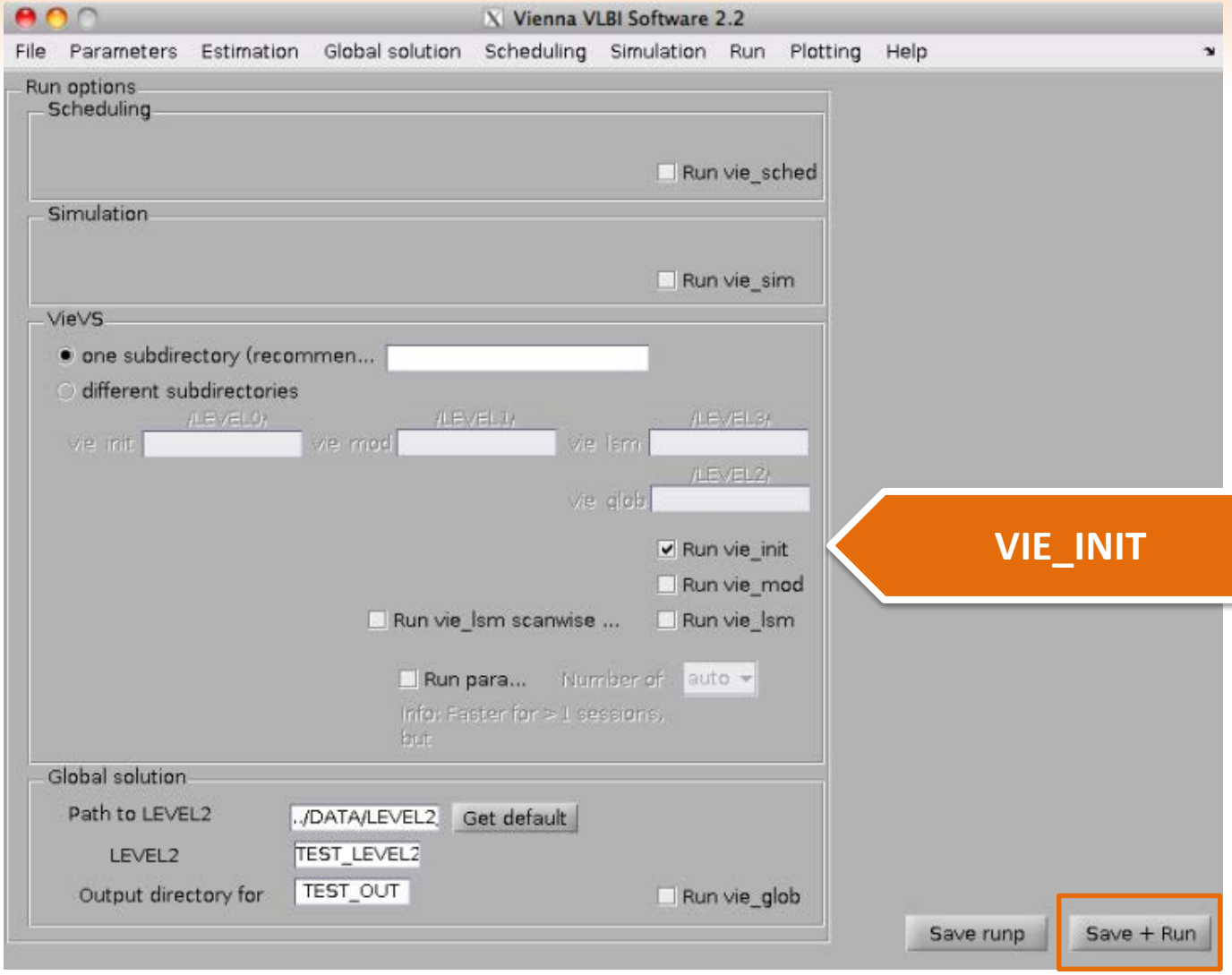
DATA/OUTLIER/

- Contains list of outliers for the session
- Created in VIE_LSM
- **Outliers are removed in VIE_INIT.**

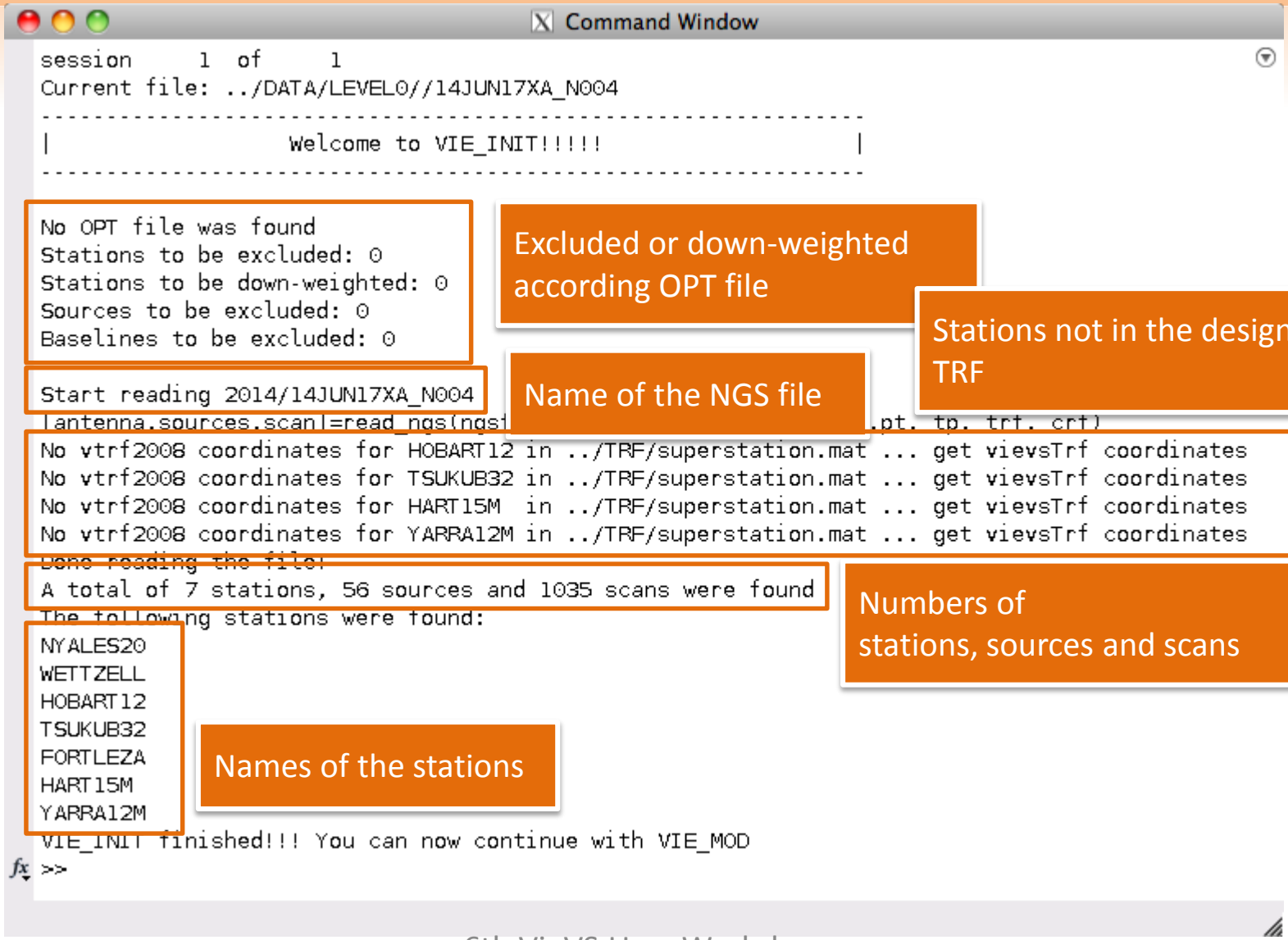
To detect and remove outliers you need to run VieVS twice:

  - 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



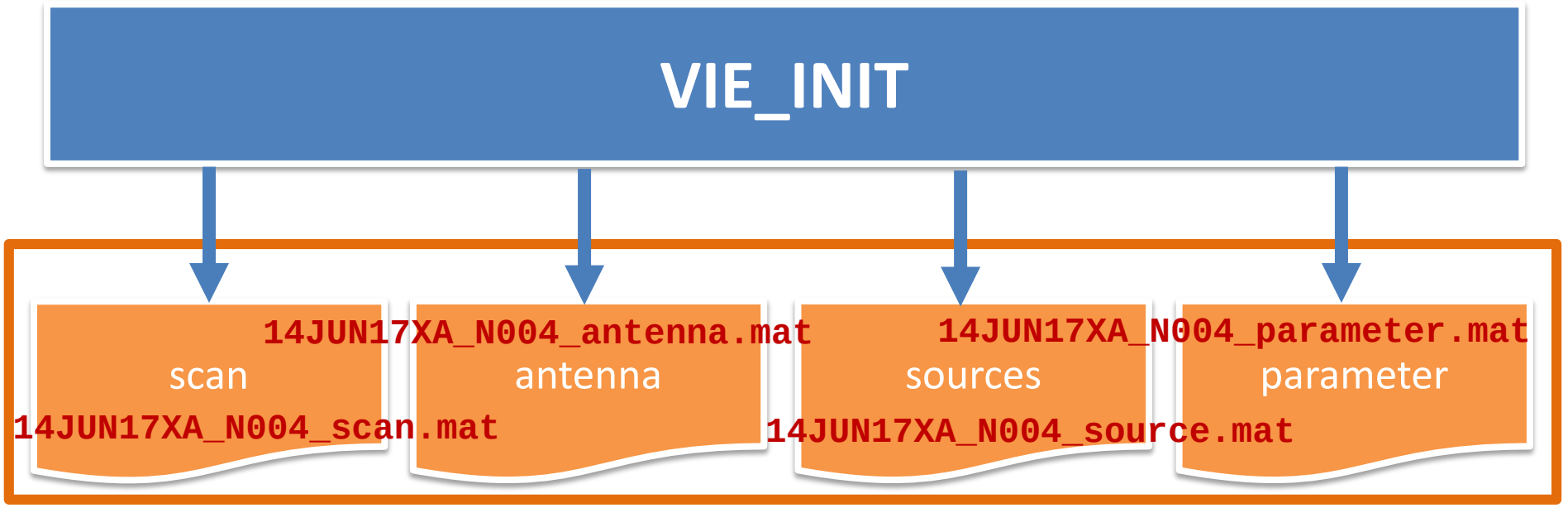
Processing example



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