# Global Solution exercise

We will use data of CONT11 which we already analysed. The normal equation matrices are stored in the **CONT11** folder in the **LEVEL2 directory**.

If you would process the data yourself you should do the following:

- Select CONT11 NGS files
    - File/Set input files → Browse for process_list → process_list_cont11
- Use OPT files
    - File/Set input files → OPT directory → DEFAULT
- You could create outlier files in a first run and remove them in a second run
- Don't forget to create the normal equation matrices
    - Estimation/Global parameters → Prepare N_global and b_global for global solution
- Run with default settings
    - Run/Run options
        - Choose subdirectory
        - Tick "Run vie_init", "Run vie_mod" and "Run vie_lsm"

## Do the global solution:

Select parameters which you want to estimate:
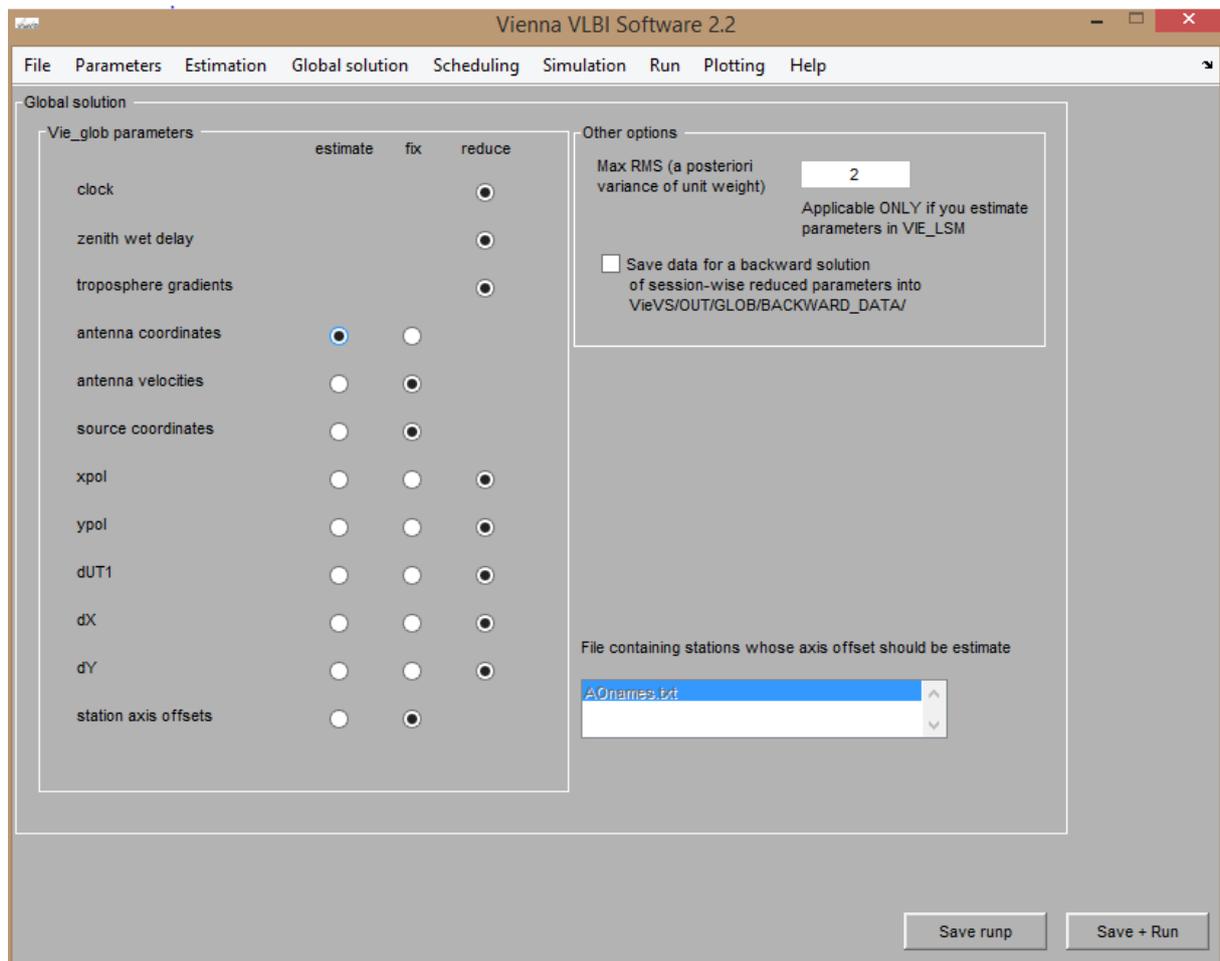
We only want to estimate antenna coordinates. The rest should be reduced or fixed. Note that you have several other options in this GUI:

- You can exclude sessions which have a higher RMS than 2 (or whatever number you specify).
- You can save data for the backward solution
- If you estimate axis offsets you can specify a list with stations in *.txt* format

Select constraints and reduce specified stations/sources:
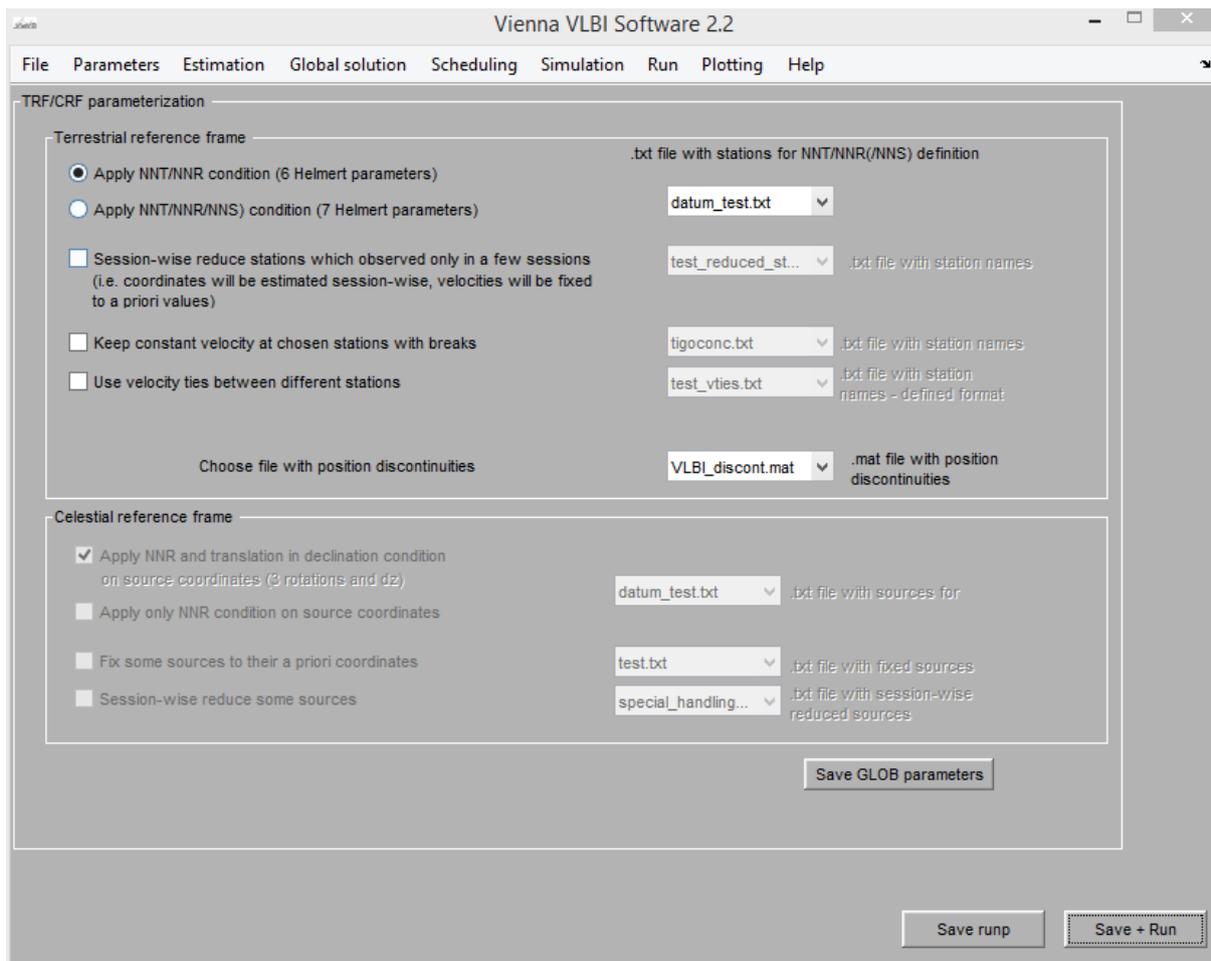
All datum files etc. can be found in *DATA\GLOB* and its subdirectories.

We need to specify which stations we want to use for the datum, usually we would select stations which are known to be stable and have a long and reliable time series. This is done in the *datum_test.txt* file as a simple list of station names (IVS 8 character names). VieVS has two options for the definition of the datum. You can either select NNT/NNR which translates into **n**o **n**et **t**ranslation and **n**o **n**et **r**otation or you can use NNT/NNR/NNS which also includes **n**o **n**et **s**cale.

We also have to provide information about position discontinuities (earthquakes, antenna repairs etc.) which is done in the *VLBI_discont.mat* file. In our case the default can be used, if you want to create your own file use the *DATA\GLOB\TRF\DISCONT\temp_discont\vlbi_antbreaks.m* script.

Other options which could be set in this GUI are (all are simple lists in *.txt* format):

- Session-wise reduce bad stations
- Keep constant velocities at stations with breaks
    - This can be set for stations where the velocity did not change after an earthquake
- Use velocity ties between different stations
    - When stations are on the same physical ground it can be assumed that they move at the same velocity
- Select datum options for sources
    - Either NNR alone or NNR + dz (declination factor)
- Some sources can be fixed to the a priori coordinates
    - This is usually done when sources do not have a sufficient number of observations to estimate a reliable position
- Session-wise reduce some sources
    - Here usually the so called "special-handling" sources, which are known to be instable are selected

Run the global solution:
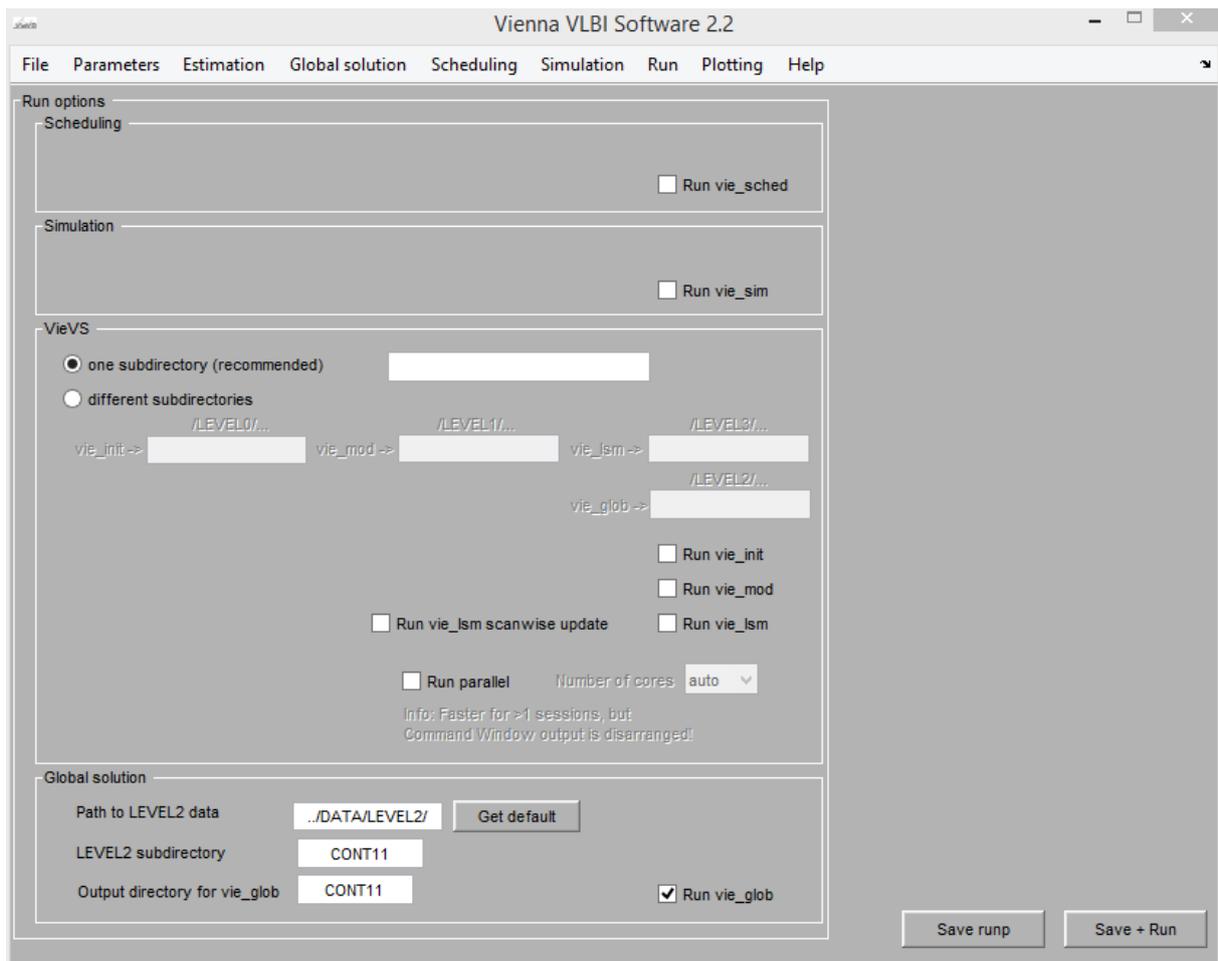
Select the subdirectory where the data is stored (*DATA\LEVEL2* subdirectory), select an output directory and press "Save + Run".

Look at the results:

The results can be found in *OUT\GLOB* and its subdirectories.