VIEVS DAYS 2026

ADDING A NEW STATION

1 | DESCRIPTION

This section demonstrates how to handle a new station in a session when its coordinates are not yet available. In VieVS-VLBI, station coordinates are managed within a so-called **superstation file**. This guide will show you how to extract the required station coordinates and add the new station to this file to ensure the station is correctly registered for future use.

2 | DATA

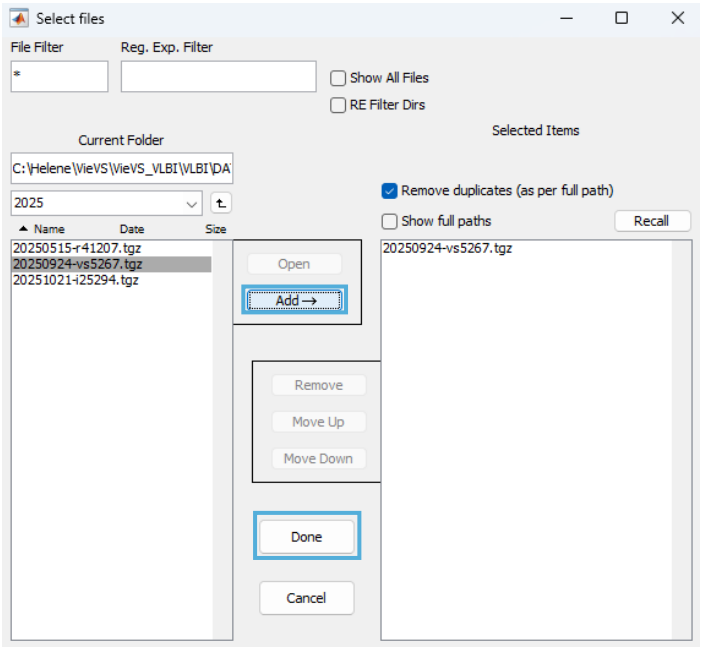
Download the files from the TU Cloud (***VieVS Days 2026/HW/add_station_source/data_station***) and move them to the following locations:

- 20250924-vs5267.tgz → ../VLBI/DATA/vgosDB/2025/
- superstation_noMb.mat → *../VLBI/TRF/*
- vievsTrf.txt → *../VLBI/TRF/data*

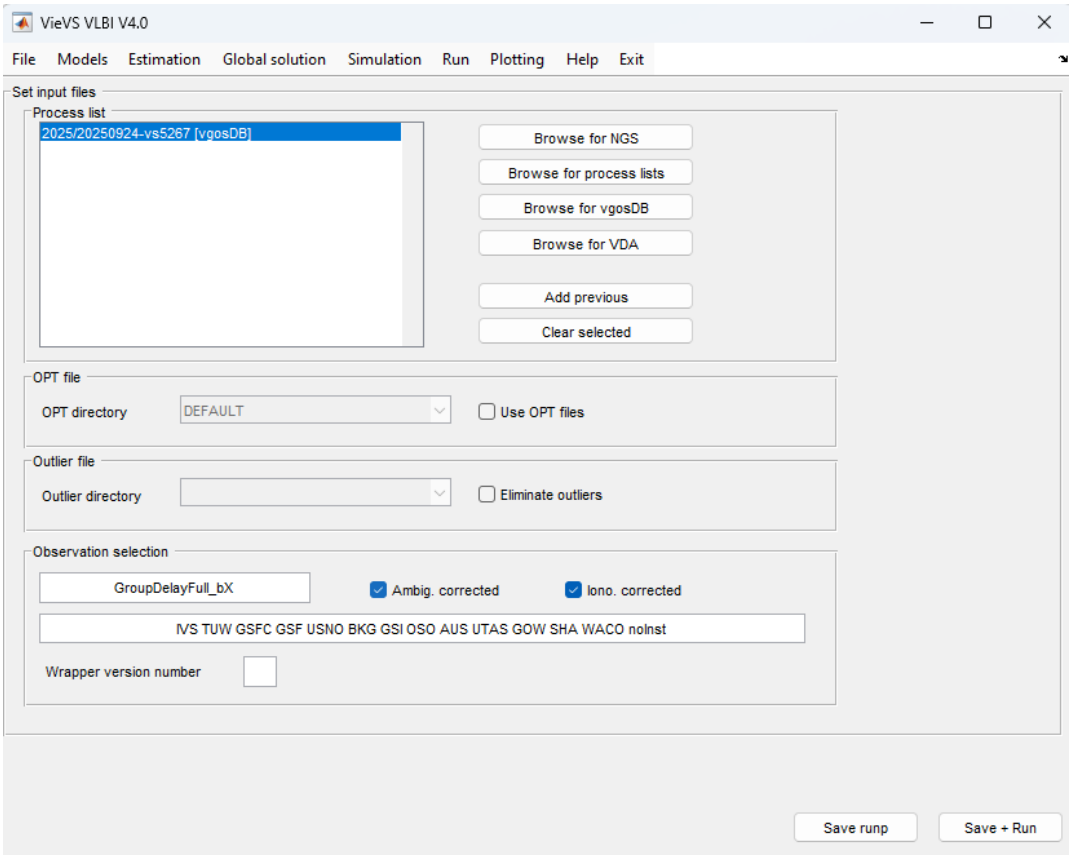
3 | SESSION

In this section, we will analyze the VGOS-OPS session **vs5267** (observed on 24.09.2025).
To load the session, follow these steps:

- Go to ***File → Set input files***.
- Press ***Browse for vgosDB*** to open a new window for file selection.
- **Navigate** to the **2025** folder in the left pane.
- **Select** session ***20250924-vs5267*** and press ***Add →.***
- If the session is in **Selected Items**, press ***Done***.



Now the file should be listed in the “Process list”.

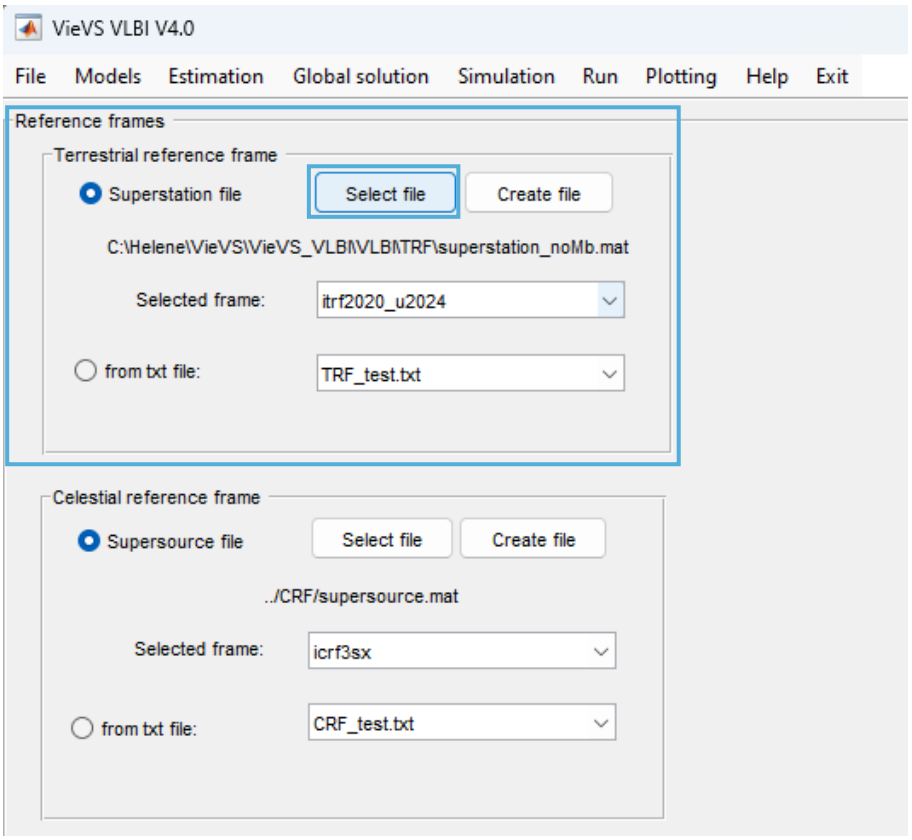


4 | USE SUPERSTATION FILE WITHOUT MATVGOS

To demonstrate the error that occurs when a station is missing from the superstation file, follow these steps to intentionally load an incomplete file:

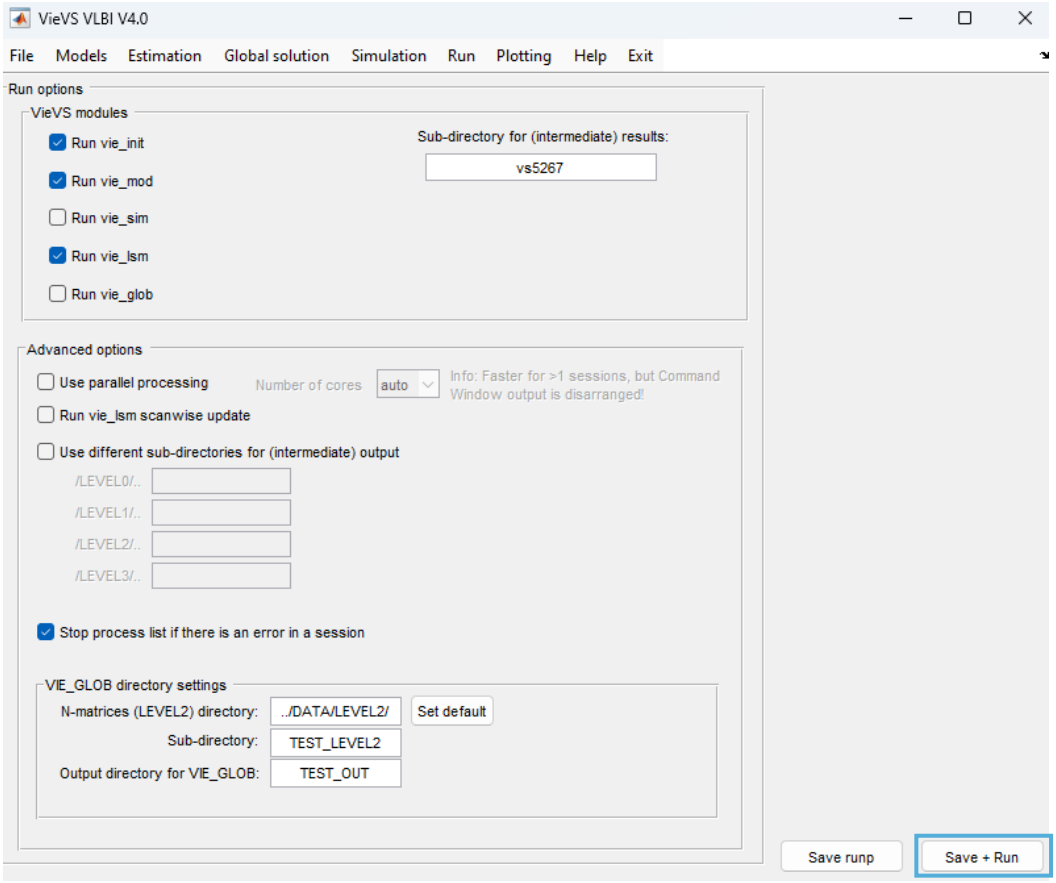
- Navigate to the ***Models → Reference frames*** tab.
- Locate the **Terrestrial reference frame** section.
- Press ***Select file*** and choose ***superstation_noMb.mat*** from the *../VLBI/TRF* directory.

Note: This file does not include the station **MATVGS (Mb)**, which will trigger an error during processing.



5 | RUN SESSION

- Navigate to ***Run → Run options***.
- In the module selection list, select the modules **vie_init, vie_mod** and **vie_lsm**.
- In the sub-directory field, enter a new name for your results (e.g., vs5267).
- Click ***Save + Run*** to start the process.



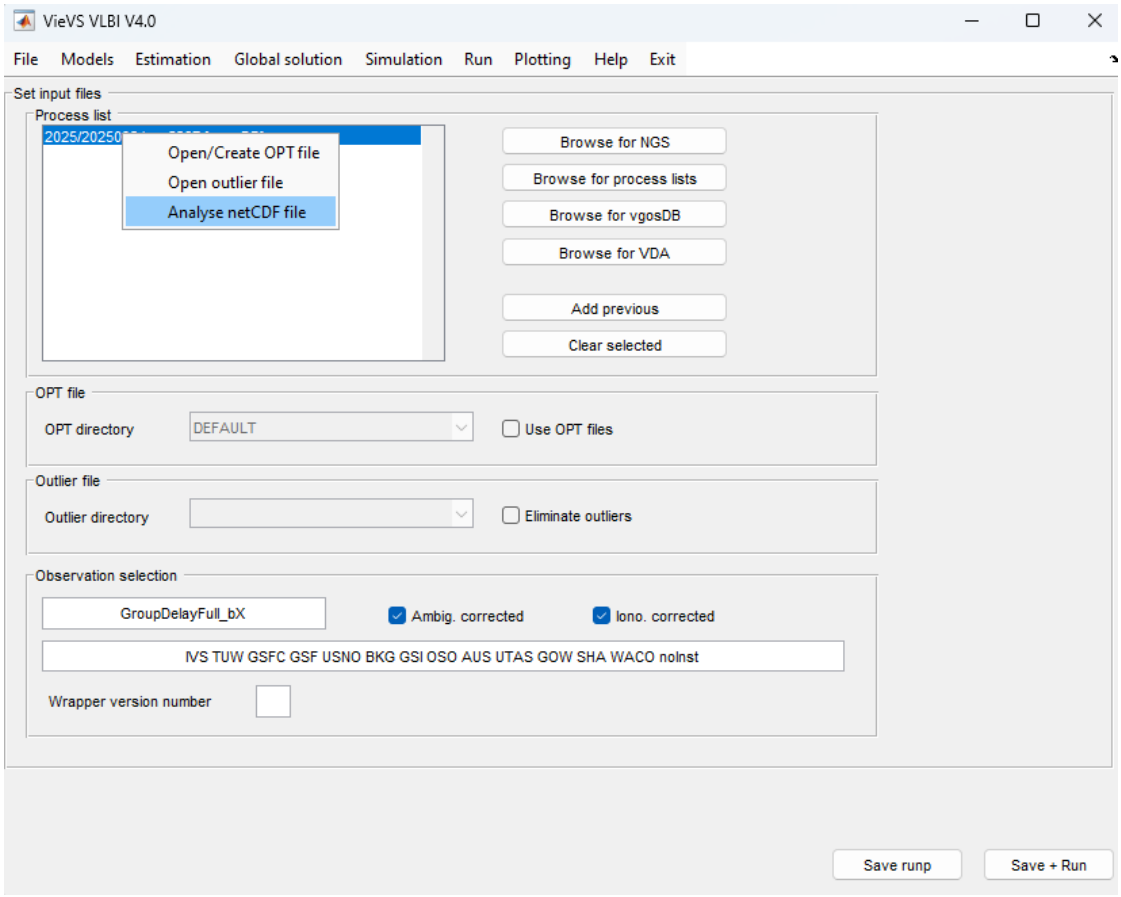
When VieVS-VLBI starts, it attempts to fetch all station coordinates required for the session. Due to the intentional omission of the station in our setup, the Command Window will return the following error:

```
No valid itrf2020_u2024 coordinates for MATVGOS  => get vievsTrf coordinates (no NNT/NNR conditions applied!)
Error using vie_batch (line 507)
Error using nc2antenna (line 125)
Station MATVGOS  not found in the superstation file (vievsTRF).
Add this station to the superstation file by following the steps described at:
https://vievswiki.geo.tuwien.ac.at/VLBI-Analysis/Input-data#create-a-superstation-file
```

6 | Extracting Station Coordinates

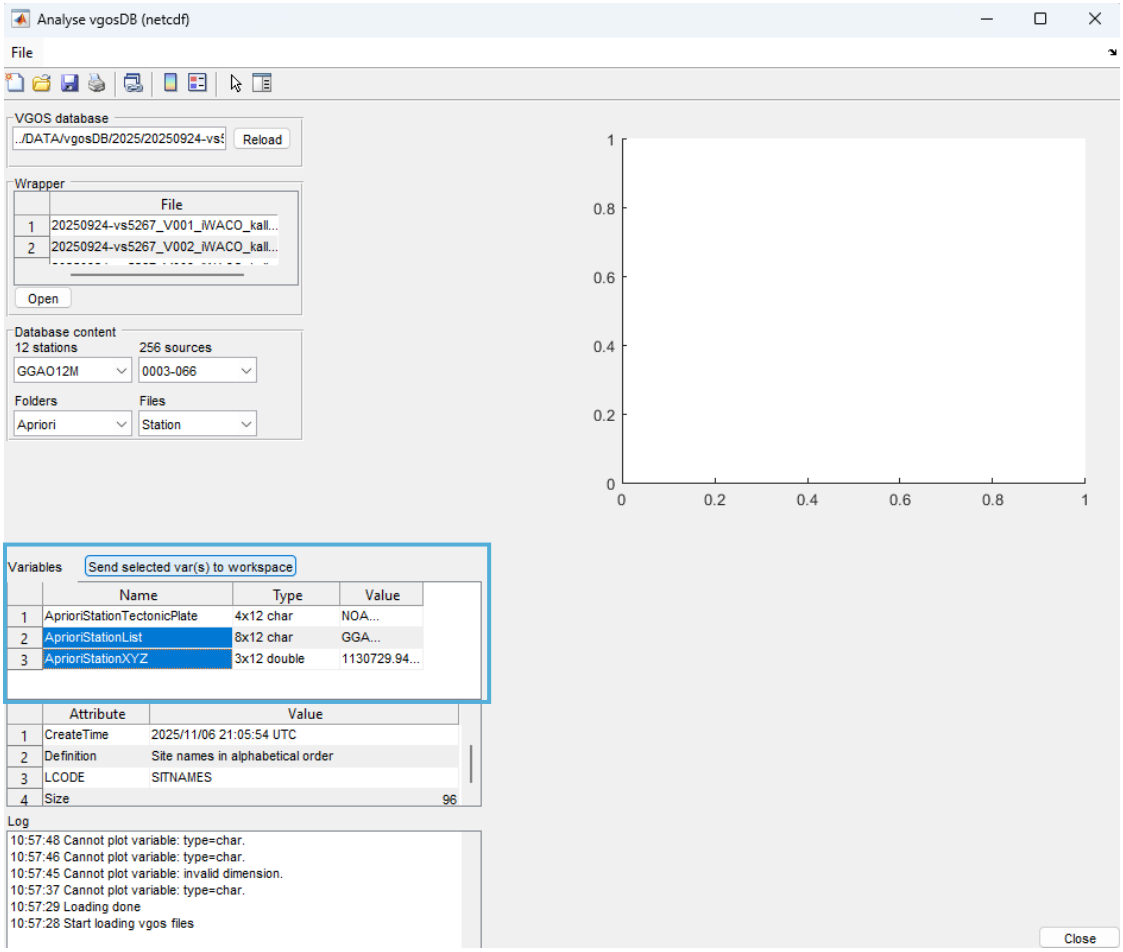
To obtain the missing coordinates:

- Navigate to ***File → Set input files***.
- **Right-click** the session in the **Process List** and select ***Analyse netCDF file***.



A new window will appear. Follow these steps to load the required variables:

1. In the **Folders** selection, choose ***Apriori.***
2. In the **Files** selection, choose ***Station***.
3. From the list of variables, **mark** the boxes ***AprioriStationList*** and ***AprioriStationXYZ.***
4. Press ***Send selected var(s) to workspace***.



The two variables will now appear in your workspace:

- **AprioriStationList**: Contains the names of all stations included in the session.
- **AprioriStationXYZ**: The coordinates for these stations, aligned with the order of names in AprioriStationList

In order to extract the station coordinates of MATVGOS:

- Go to the Command Window.
- Enter the following command to display the coordinates, substituting idx with the index number 5 (the position of the **MATVGOS** station in AprioriStationList):
  fprintf('%13.4f %13.4f %13.4f\n', AprioriStationXYZ(: , idx))

The following coordinates for station **MATVGOS** will be printed:

```
Command Window
>> fprintf('%13.4f %13.4f %13.4f\n', AprioriStationXYZ(:,5))
  4641823.6410  1393011.3620  4133445.4120
```

7 | UPDATE SUPERSTATION FILE

1. Manually Update the TRF File

Open *../VLBI/TRF/data/vievsTrf.txt* in a text editor and append the new station's coordinates to the end of the file. (Note: Please use spaces instead of tabs.)

- **Note on Velocity/Epoch:** If velocity information is unavailable, enter 0. Set both the **Epoch** and the **Start** values to 0, and the **End** value to 9999.

The last character in the line acts as the NNT/NNR Condition flag: '1' indicates that coordinates are taken in NNT/NNR condition, while '0' indicates otherwise.

%station	x [m]	y [m]	z [m]	vx [m/y]	vy [m/y]	vz [m/y]	epoch	start	end	
MATVGOS	4641823.6410	1393011.3620	4133445.4120	0.0000	0.0000	0.0000	0	0	99999	0

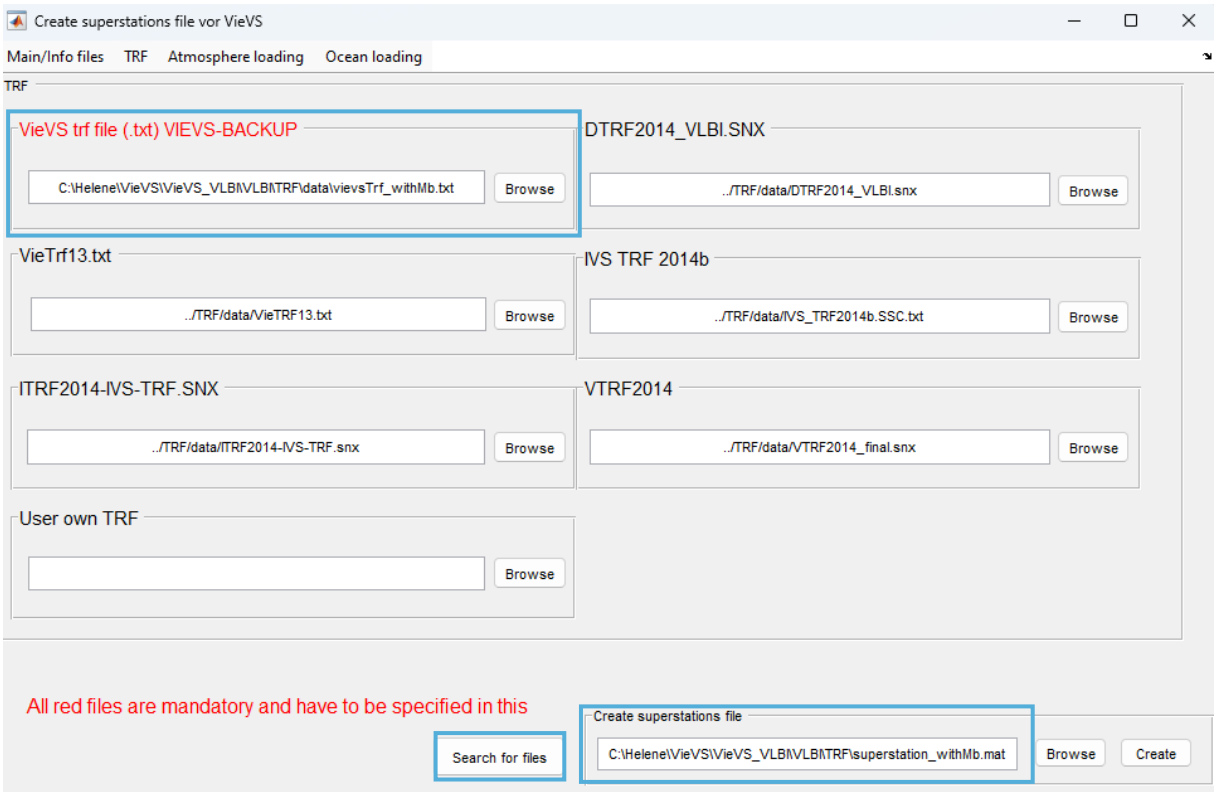
2. Update ns-codes

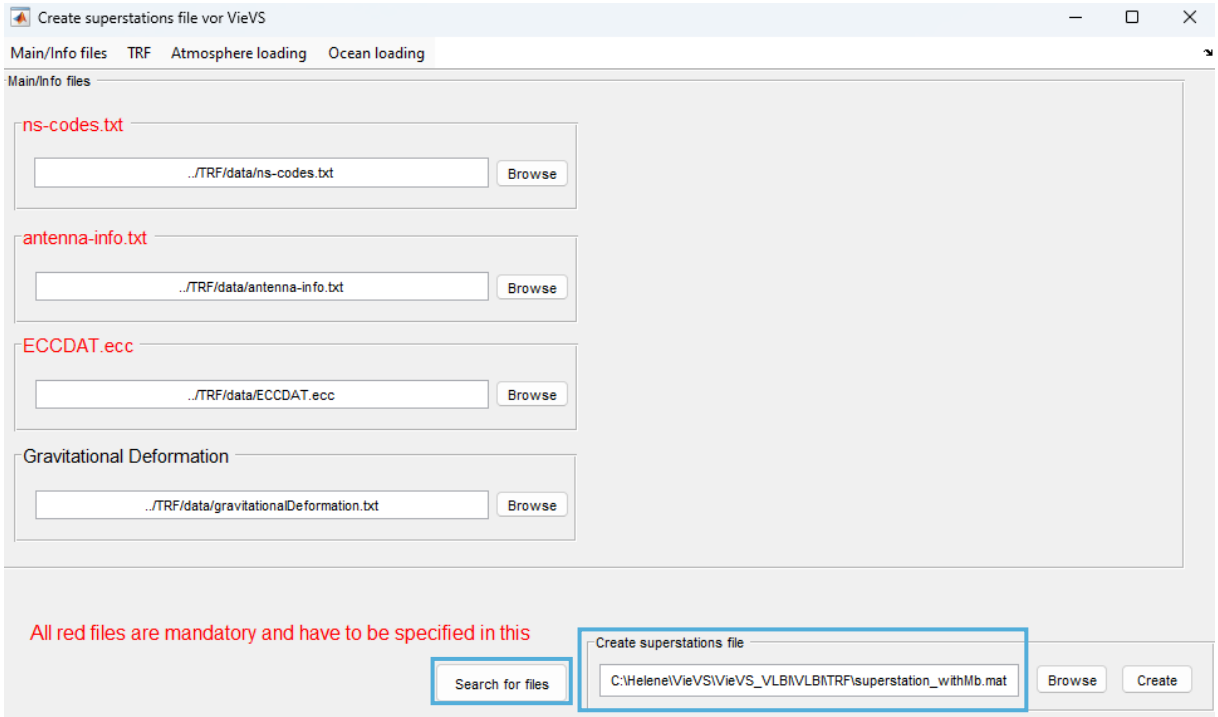
Check if the ns-code list has been updated at the CDDIS Archive (https://cddis.nasa.gov/archive/vlbi/ivscontrol/ns-codes.txt).

- If a newer version is available, download and replace your local file.
- If no update is found, manually add the new antenna code to your local ../VLBI/TRF/data/ns-codes.txt.

3. Generate the New Superstation File

- Navigate to ***Models → Reference frames***.
- Press the ***Create file*** button in the **Terrestrial reference frame** section.
- Once the separate window opens, you can manually configure all required files. (e.g., atmosphere and ocean loading).
  To save time, press ***Search for files*** to automatically populate the paths with default settings. If you need to use custom files, you may manually override any specific path in the interface.
- If you edited the default ***vievsTrf.txt*** file, you are finished. If a custom file is used, ensure it is selected under the **TRF** tab in the **VieVS trf file** section.
- In the path field (bottom right), specify the directory where you wish to save the new superstation file.
- Press ***Create***. The Command Window will display progress and details about generating the new superstation file.

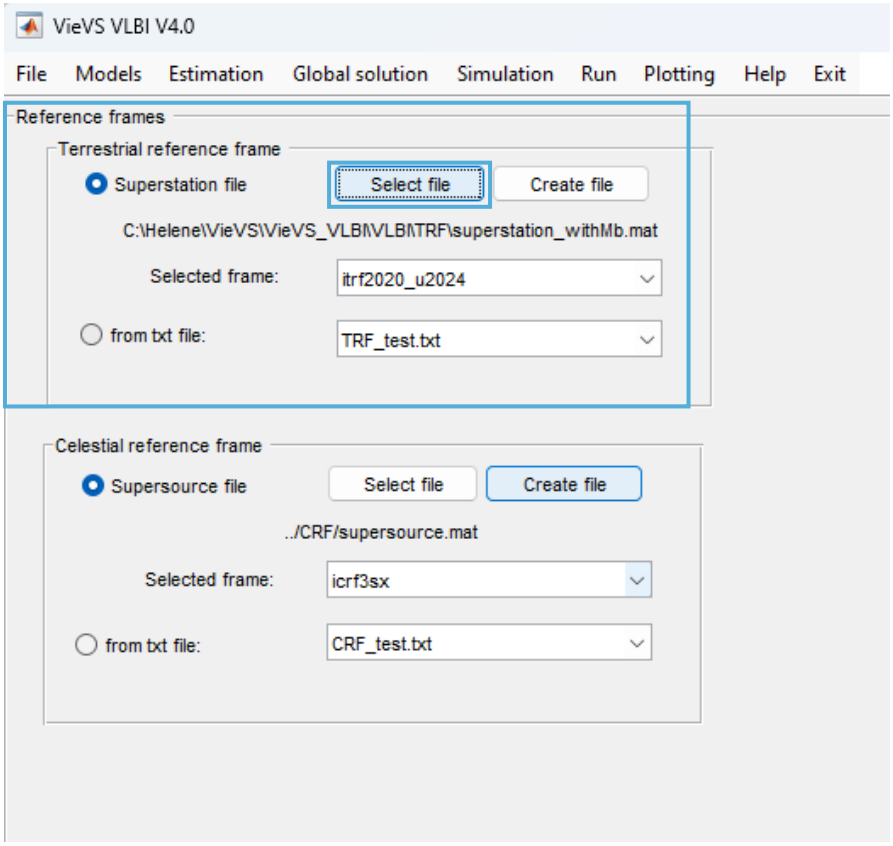

Create superstations file vor VieVS
Main/Info files
TRF
Atmosphere loading
Ocean loading
TRF
VieVS trf file (.txt) VIEVS-BACKUP
C:\Helene\VieVS\VieVS_VLBI\VLBI\TRF\data\vievsTrf_withMb.txt
Browse
DTRF2014_VLBI.SNX
../TRF/data/DTRF2014_VLBI.snx
Browse
VieTrf13.txt
../TRF/data/VieTRF13.txt
Browse
IVS TRF 2014b
../TRF/data/IVS_TRF2014b.SSC.txt
Browse
ITRF2014-IVS-TRF.SNX
../TRF/data/ITRF2014-IVS-TRF.snx
Browse
VTRF2014
../TRF/data/VTRF2014_final.snx
Browse
User own TRF
Browse
All red files are mandatory and have to be specified in this
Search for files
Create superstations file
C:\Helene\VieVS\VieVS_VLBI\VLBI\TRF\superstation_withMb.mat
Browse
Create


Create superstations file vor VieVS
Main/Info files
TRF
Atmosphere loading
Ocean loading
Main/Info files
ns-codes.txt
../TRF/data/ns-codes.txt
Browse
antenna-info.txt
../TRF/data/antenna-info.txt
Browse
ECCDAT.ecc
../TRF/data/ECCDAT.ecc
Browse
Gravitational Deformation
../TRF/data/gravitationalDeformation.txt
Browse
All red files are mandatory and have to be specified in this
Search for files
Create superstations file
C:\Helene\VieVS\VieVS_VLBI\VLBI\TRF\superstation_withMb.mat
Browse
Create

8 | Process Session

To process the session using your **new superstation file**, follow these steps:

- Navigate to ***Models → Reference frames*.**
- Press the ***Select file*** button in the **Terrestrial reference frame** section.
- Select the newly created supersource file you prepared in the previous steps.
- Press ***Save + Run***.



The session should run without problems now!