

ADDING A NEW RADIO SOURCE

1 | DESCRIPTION

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

2 | DATA

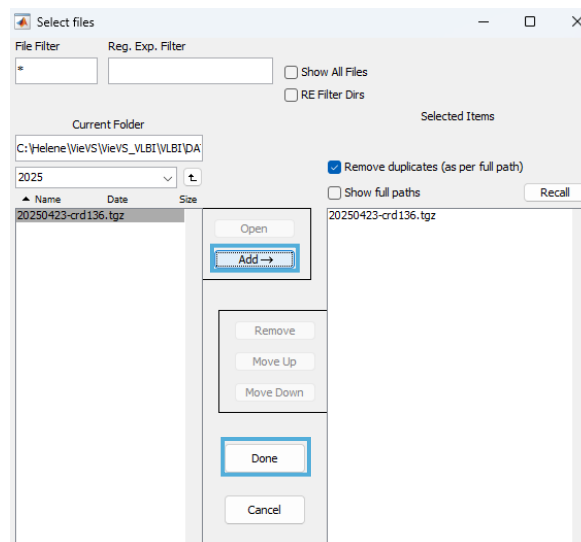
Download the following files from the TU Cloud (**VieVS Days 2026/HW/add_station_source/data_source**) and place them in the following directories:

- 20250423-crd136.tgz → ../VLBI/DATA/vgosDB/2025/
- supersource_broken.mat → ../VLBI/CRF/
- vievsCrf.txt → ../VLBI/CRF/data

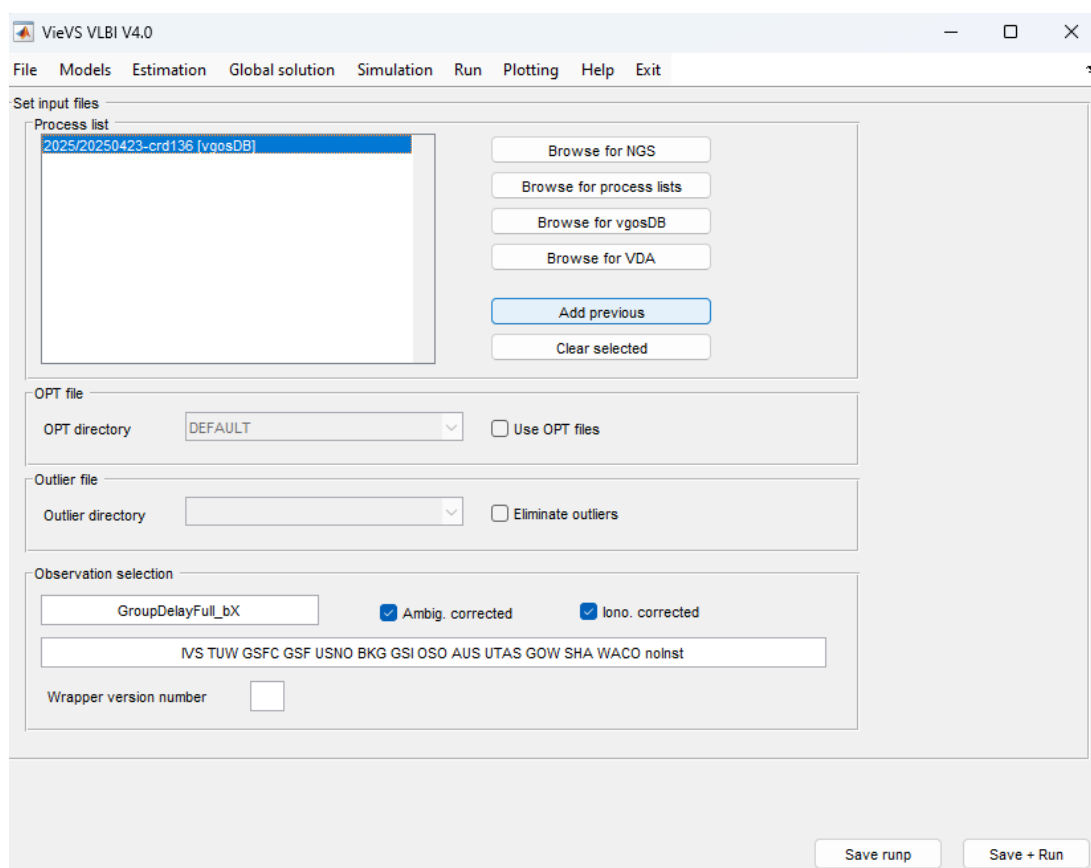
3 | SESSION

In this exercise, we will analyze the IVS-CRF-DS session **crd136** (observed on 23.04.2025). 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 **20250423-crd136** and press **Add →**.
- If the session is in **Selected Items**, press **Done**.



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

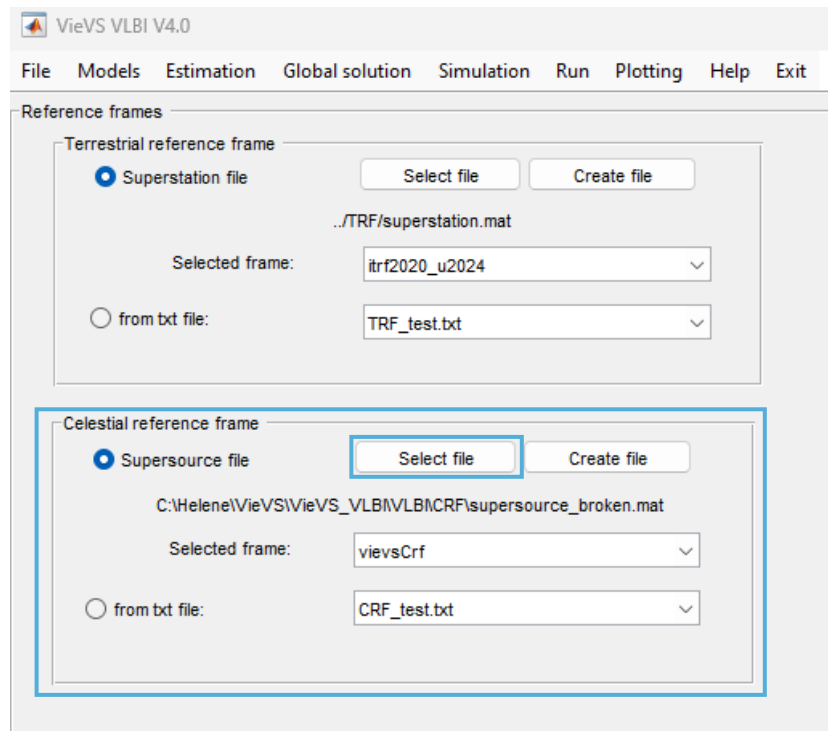


4 | USE SUPERSOURCE FILE WITHOUT SOURCE 2350-483

To demonstrate the error that occurs when a source is missing in the supersource file, follow these steps to intentionally load an incomplete file:

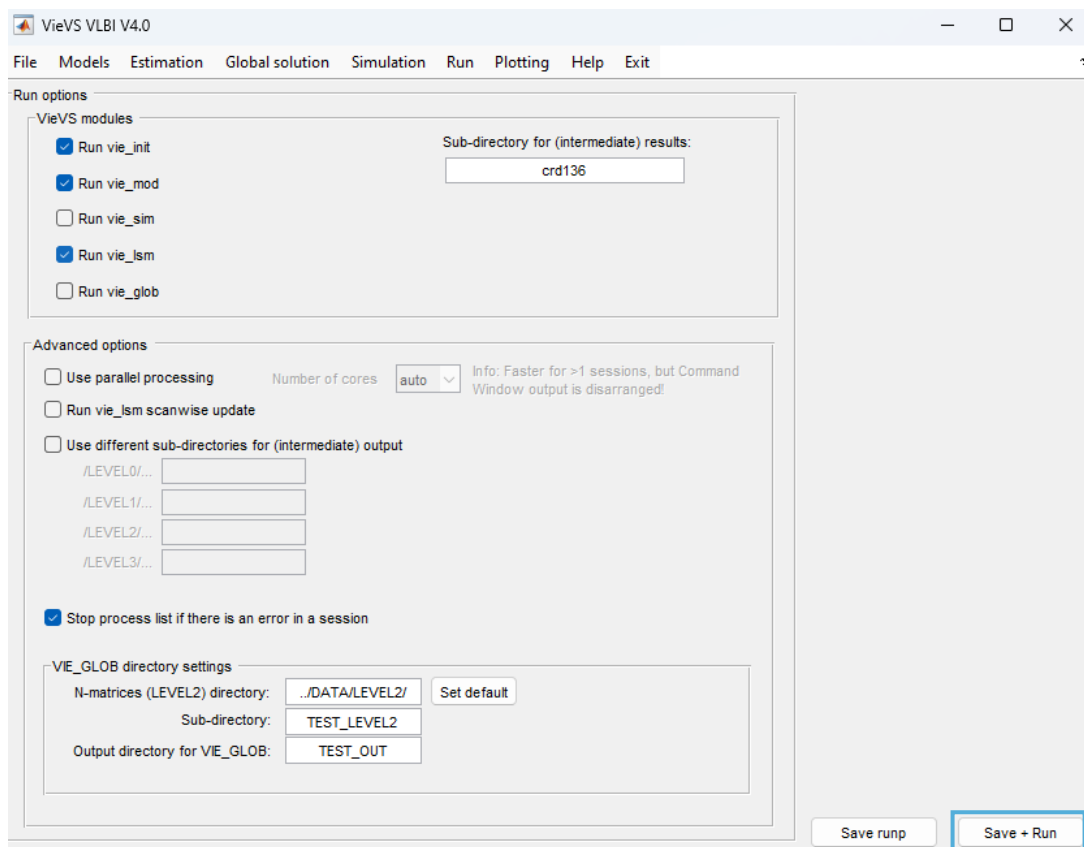
- Navigate to **Models** → **Reference frames**.
- Locate the **Celestial reference frame** section.
- Press **Select file** and choose **supersource_broken.mat** from the **../VLBI/CRF** directory.

Note: This file does not include the source **2350-483**, 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., crd136).
- Press **Save + Run** to start the process.



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

```
Warning: ERROR: source 2350-483 not found in supersource file!
Add source to supersource file!
```

6 | EXTRACTING RADIO SOURCE COORDINATES

1. Manual Entry Format

If a source is missing from the supersource file, it must be manually added to the following text file: **VieVS/CRF/data/viewsCrf.txt**

(Note: Please use spaces instead of tabs.)

The necessary information comes from the vgosDB file, for instance.

New sources must follow the existing format in the file. Provide the parameters in order:

- **Source Name:** 8 characters.
- **Right Ascension:** hh mm ss.ssss
- **Declination:** +/-dd mm ss.ssss
- **Epoch:** yyyy.y
- **Source File/Session:** The name of the file containing the coordinates (e.g., the NGS session name).
- **NNR Condition:** 1 (if coordinates are taken in NNR condition) or 0.

2. Automated Method (Recommended)

To simplify the process, use the MATLAB function **check_sources_in_vgosDB_file.m** to retrieve coordinates directly from the vgosDB file.

- Open the **Command Window**.
- Run the following command (replace <sessionname> with your actual session name):
check_sources_in_vgosDB_file('<sessionname>', 'supersource.mat');
- The source position will be printed in the window.
- When prompted: Add source to viewsCrf.txt? [Y/N], type **Y** to automatically append the source to the file.

```
>> check_sources_in_vgosDB_file('20250423-crd136', 'supersource_broken.mat');
2350-483      23 53 11.123220  -48  6  4.601860 2000.0 0.0 20250423-crd136      0
Add sources to viewsCrf.txt file? [Y,n]Y
Now generate new CRF file in VieVS
VieVS -> Models -> Reference frames -> Celestial reference frame
click 'create file', click create
```

CAUTION

Critical Formatting Rule for Declination:

If a source has a negative declination with a single digit (e.g., - 4 in the NGS file), it will cause errors in VieVS-VLBI. You **must** remove the space or add a leading zero (e.g., -4 or -04) before saving.

7 | UPDATE SUPERSOURCE FILE

- Navigate to **Models → Reference frames**.
- Press the **Create file** button in the **Celestial reference frame** section.
- Once the separate window opens, you can manually configure all required files.
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.
- In the path field (bottom right), specify the directory where you wish to save the **new supersource file**.
- Press **Create**. The Command Window will display progress and details about generating the new supersource file.

Create Supersources file

Celestial reference frames

ICRF2 - non VCS
☐ Download newest file
☒ Specify:

ICRF2 - VCS only
☐ Download newest file
☒ Specify:

ICRF3sx
☐ Download newest file
☒ Specify:

VieCRF13 file
☐ Download newest file
☒ Specify:

viewsCrf.txt (BACKUP)
☐ Download newest file
☒ Specify:

GSFC2015b
☐ Download newest file
☒ Specify:

user crf
☐ Download newest file
☒ Specify:

Source names in the User CRF
☒ IERS names ☐ IVS names

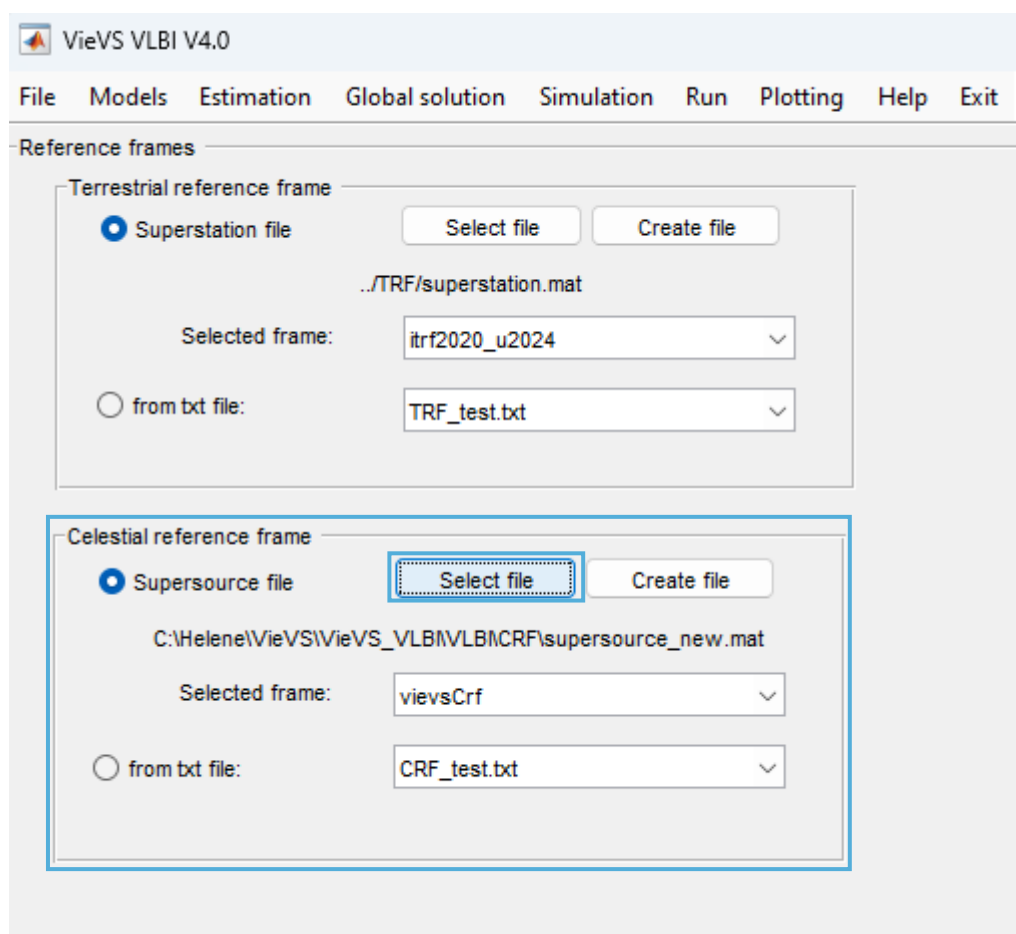
Translation table
☐ Download newest file
☒ Specify:

Create supersource file

8 | PROCESS SESSION

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

- Navigate to **Models → Reference frames**.
- Press the **Select file** button in the **Celestial 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!