ALMA Manual Calibration and Imaging Setup

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Tutorial Download Link

The data for the ALMA manual processing tutorial can be downloaded from this link:

https://bulk.cv.nrao.edu/almadata/public/SIS2024/

Download the file "ALMA_Manual_Tutorial.tgz" and place it in a directory you can use for the workshop.

In this directory, untar the file using the following tar command:

Tar -xvzf ALMA_Manual_Tutorial.tgz

Untar all files

Change into the directory that was extracted from the tar command. In this directory, several more tar files are present.

For the files ending in .tar, untar using

```
tar  -xvf analysis_scripts.tar
```

For the files ending in .tgz, untar all files using

```
tar –xvzf SDP81_B4_uncalibrated.ms.split.tgz
```

Untar all files using these commands but changing the file name of the tar archive, as necessary.

Create directory structure

Make directory called SDP81 where we will process our data:

```
mkdir SDP81
```

In your SDP81 directory create two sub-directories labeled /Calibration and /Imaging

```
cd SDP81
mkdir Calibration
mkdir Imaging
```

Directory Structure

Move the files you downloaded (or copied) as follows:

In /Calibration you should have:

- SDP81_B4_uncalibrated.ms.split (the data file containing uncalibrated data with minor initial processing applied)
- data_prep.py (script detailing the initial processing that has already been applied)
- calibration.py (the script we will work through together to calibrate the data)

In /Imaging you should have:

- SDP.81_Band4_continuum.ms (fully calibrated continuum measurement set ready for imaging)
- SDP.81_Band4.ms (fully calibrated measurement set containing both continuum and line emission ready for imaging)
- SDP.81_Band4_COline.ms.contsub (fully calibrated line-only measurement set)
- imaging.py (the script we will work through together to image the data)
- combination.py (a script detailing the steps taken to create the measurement sets ready for imaging: this is just for reference we won't be using it!)

Download CASA

The CASA version used for this tutorial is 6.5.4 and can be downloaded from the following link:

https://casa.nrao.edu/casa_obtaining.shtml

Also download the Analysis Utilities package and edit CASA initialization file following the instructions at the following link.

https://casaguides.nrao.edu/index.php/Analysis_Utilities

Test your CASA install

Before arriving at the workshop, you will also need to test your CASA installation.

If you are using your own machine:

/path/to/your/casa/installation/casa-6.5.4-9-pipeline-2023.1.0.125/bin/casa

Or create an alias to make starting CASA faster.

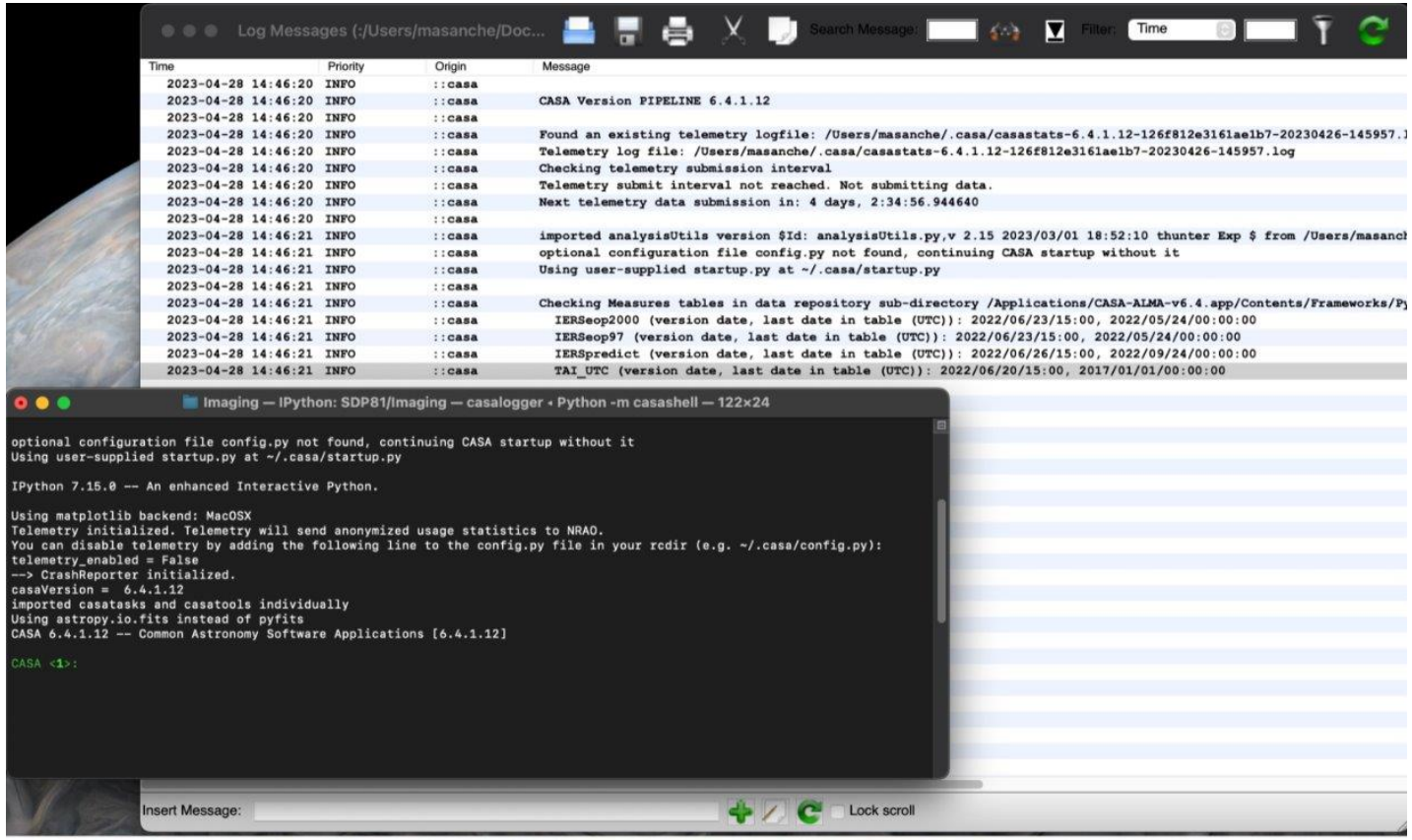
CASA at NRAO

On NRAO machines, you can begin casa by typing *casa* on the command line.

To start the ALMA or VLA pipeline version of CASA type *casa-alma or casa-vla* respectively

Ensure that CASA starts correctly

Make sure CASA starts without errors and the logger window opens.



Install CARTA

- Cube Analysis and Rendering Tool for Astronomy (CARTA). CARTA is replacing the old imview / viewer from CASA.
- Go to https://cartavis.org/ and sellect installation.
- Follow the directions to install CARTA on your machine.
- Finally, go to https://carta.readthedocs.io/en/4.1/installation_and_configuration.html#how-to-run-carta and test CARTA before arriving at the tutorial session.