Application of Pipeline Calibration

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D.Medlin/NRAO/AUI/NSF

What are we talking about?

- What to do after a Pipeline Processing Complete email or job completes.

- Extra flagging, re-derive & apply calibration.

- Rerun for known issues that cause problems.

- Apply existing pipeline calibration to raw data.

- Things to consider when running on your own.

- Remote access to NRAO computing.

Additional flagging

The pipeline may not flag everything needed …

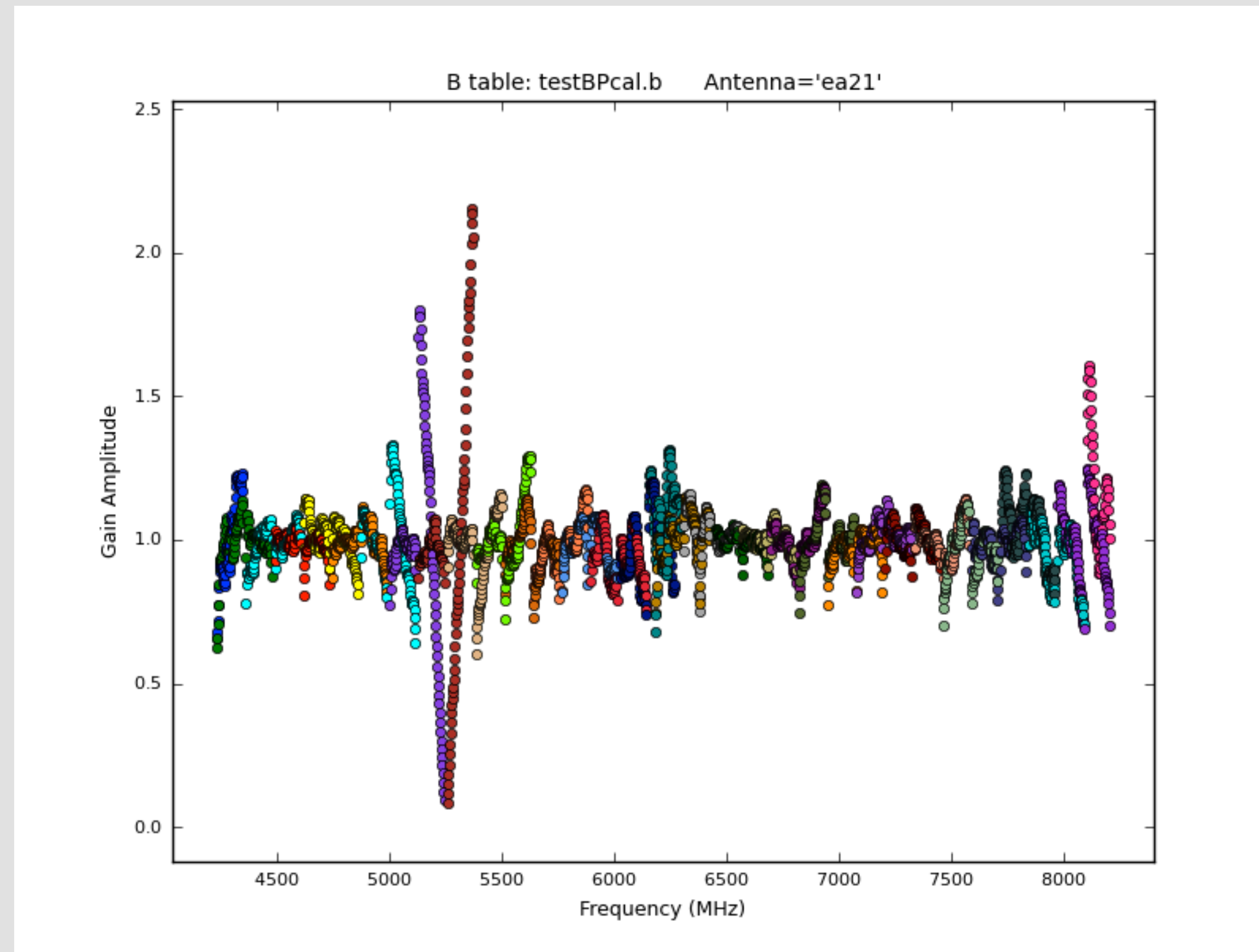Antenna hardware issues – RFI – may flag good data – ~~Alien signals*~~
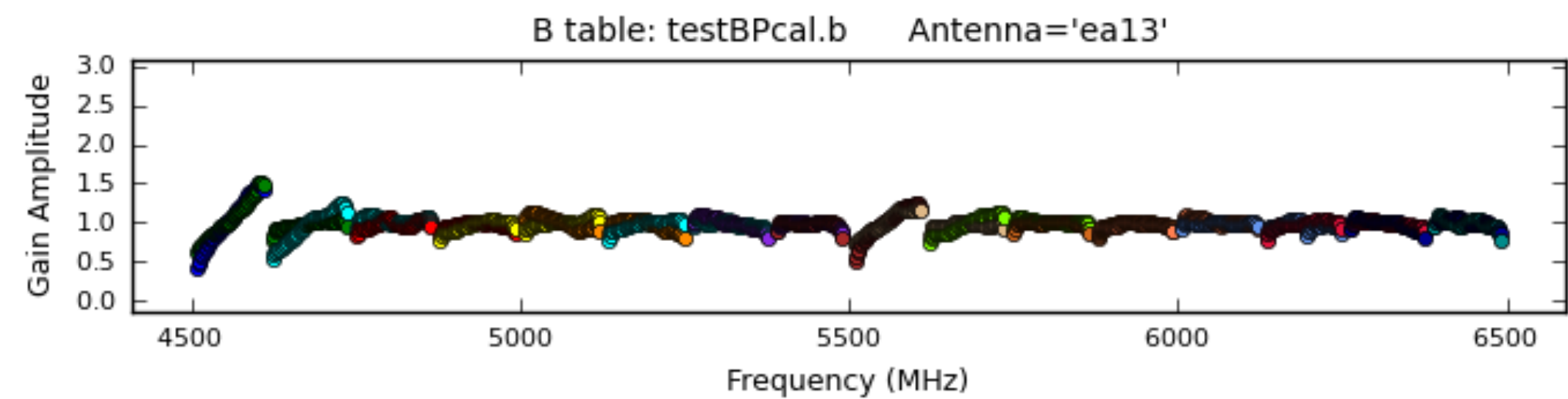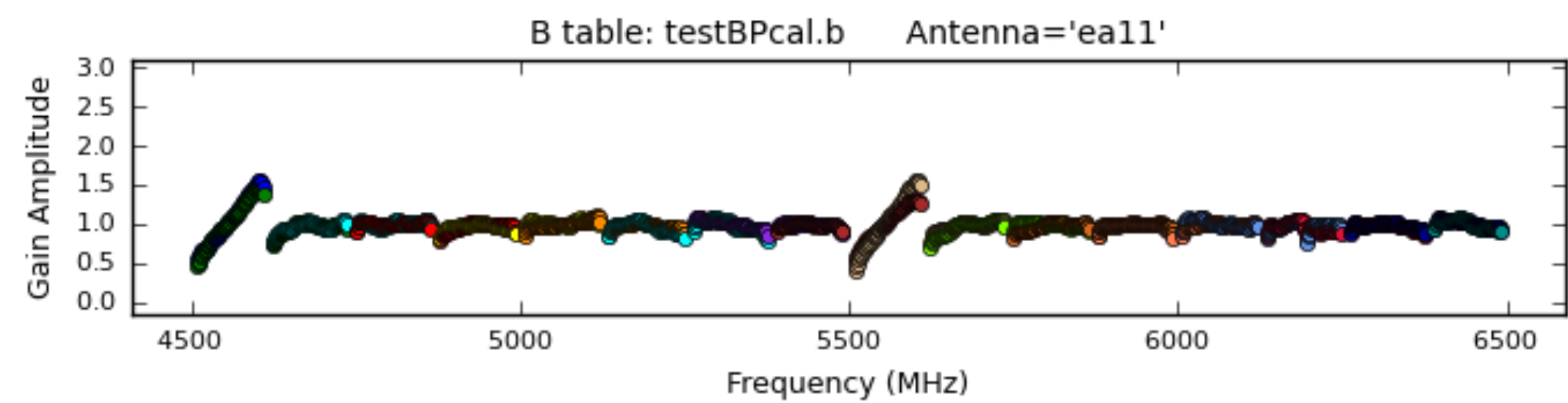

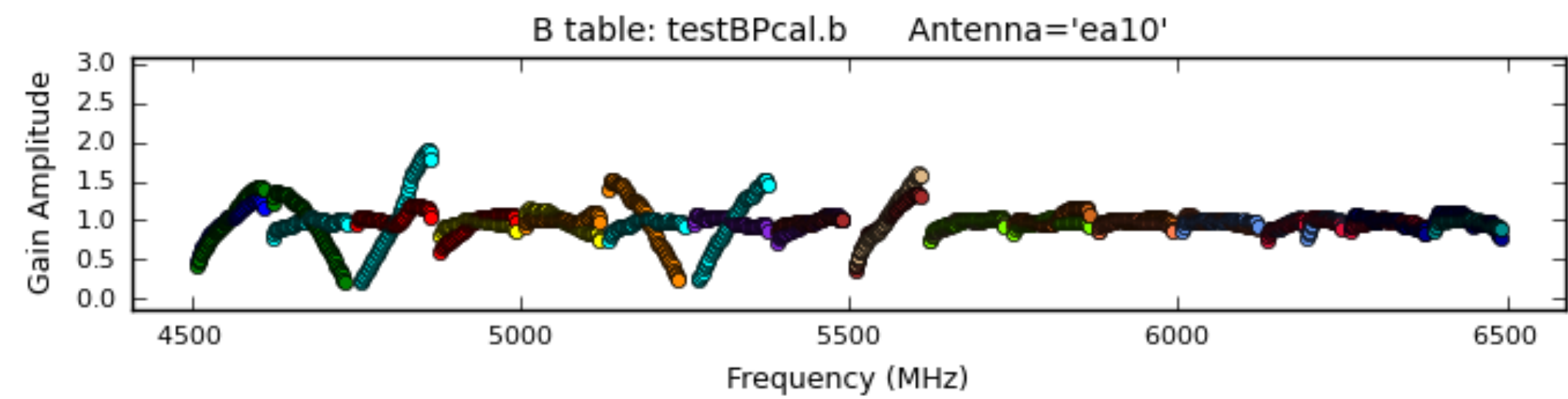D.Medlin/NRAO/AUI/NSF

*Theoretical only at this time

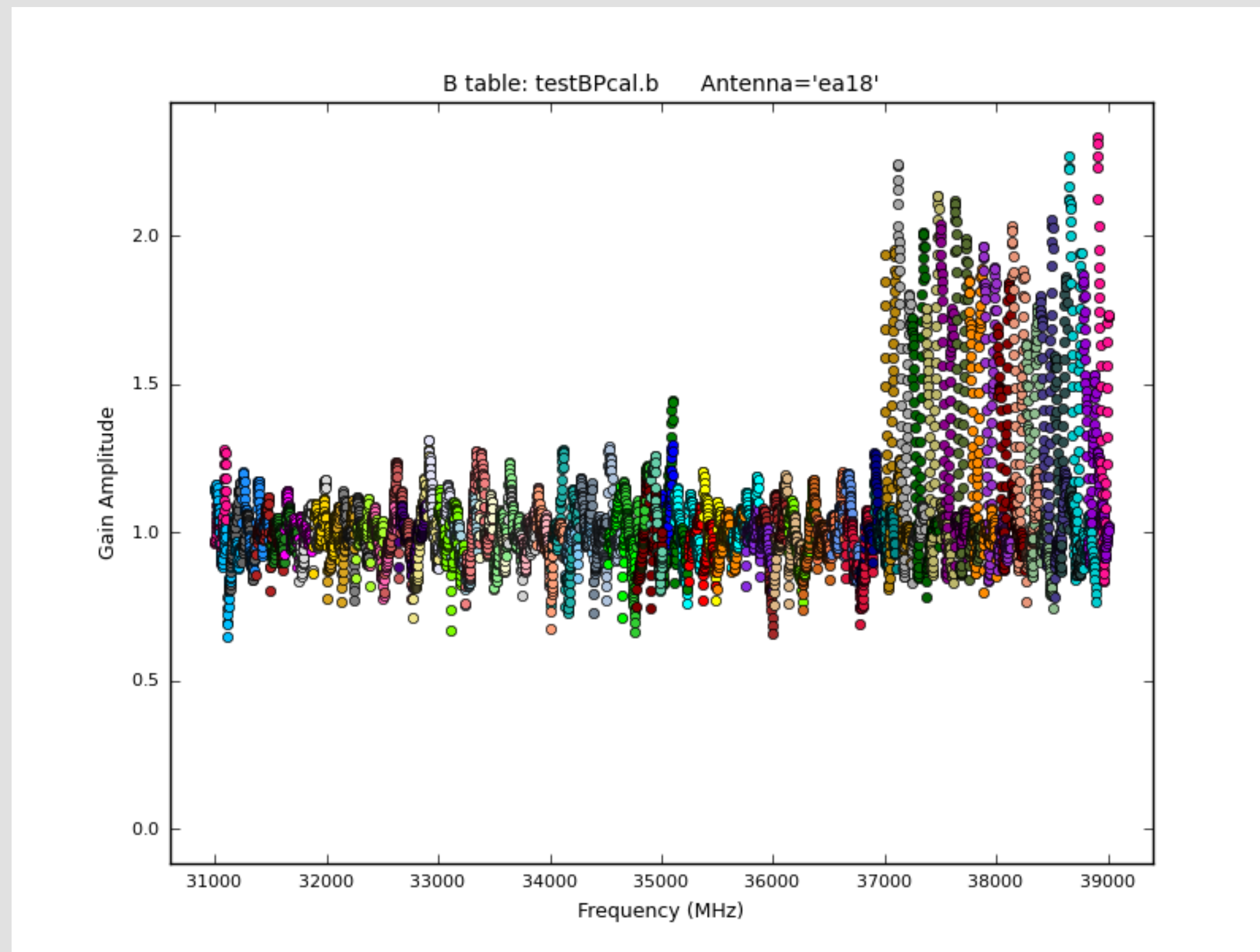# Additional flagging

ea21 bandpass, bad data (DTS issue)

Additional flagging
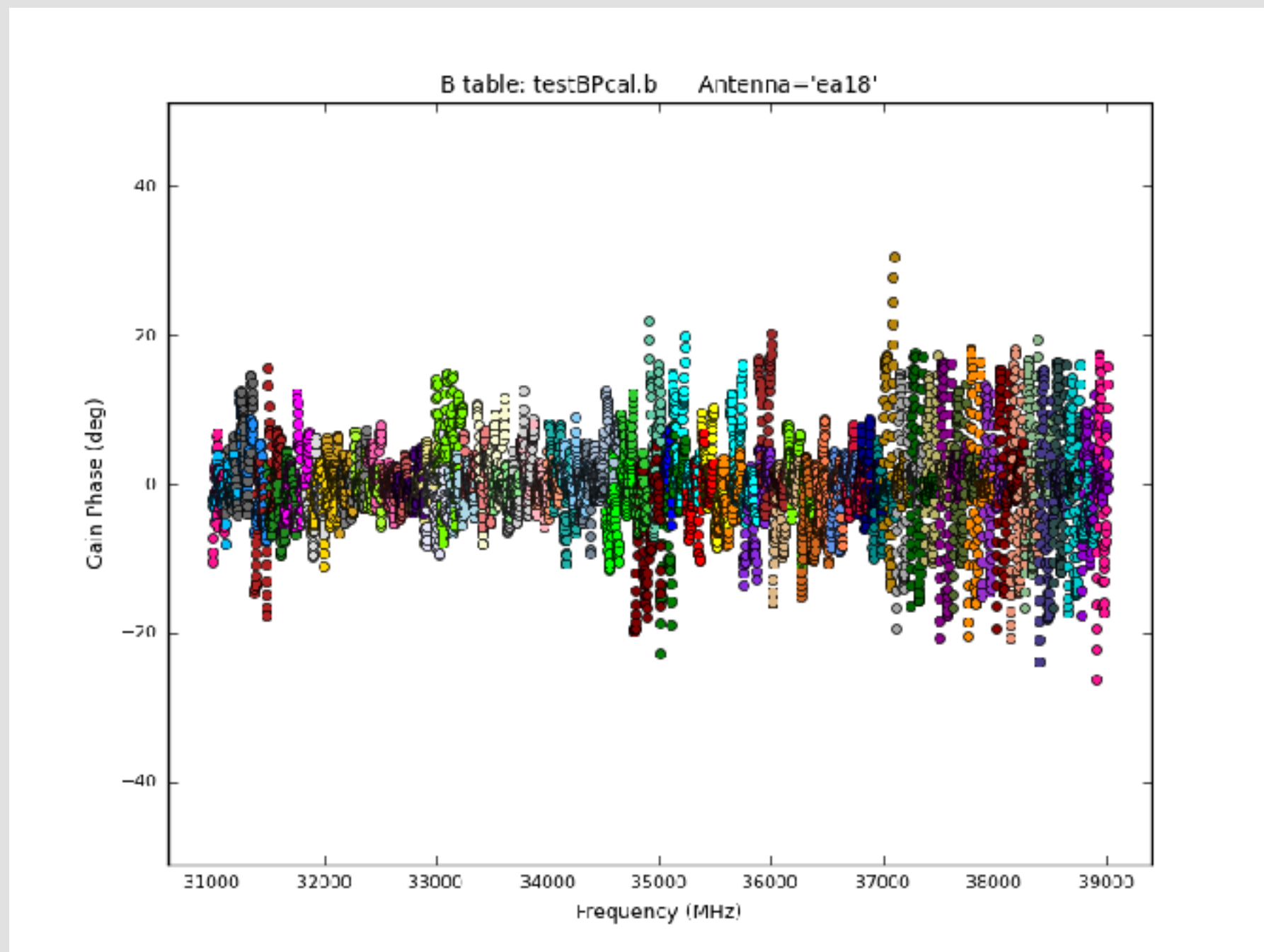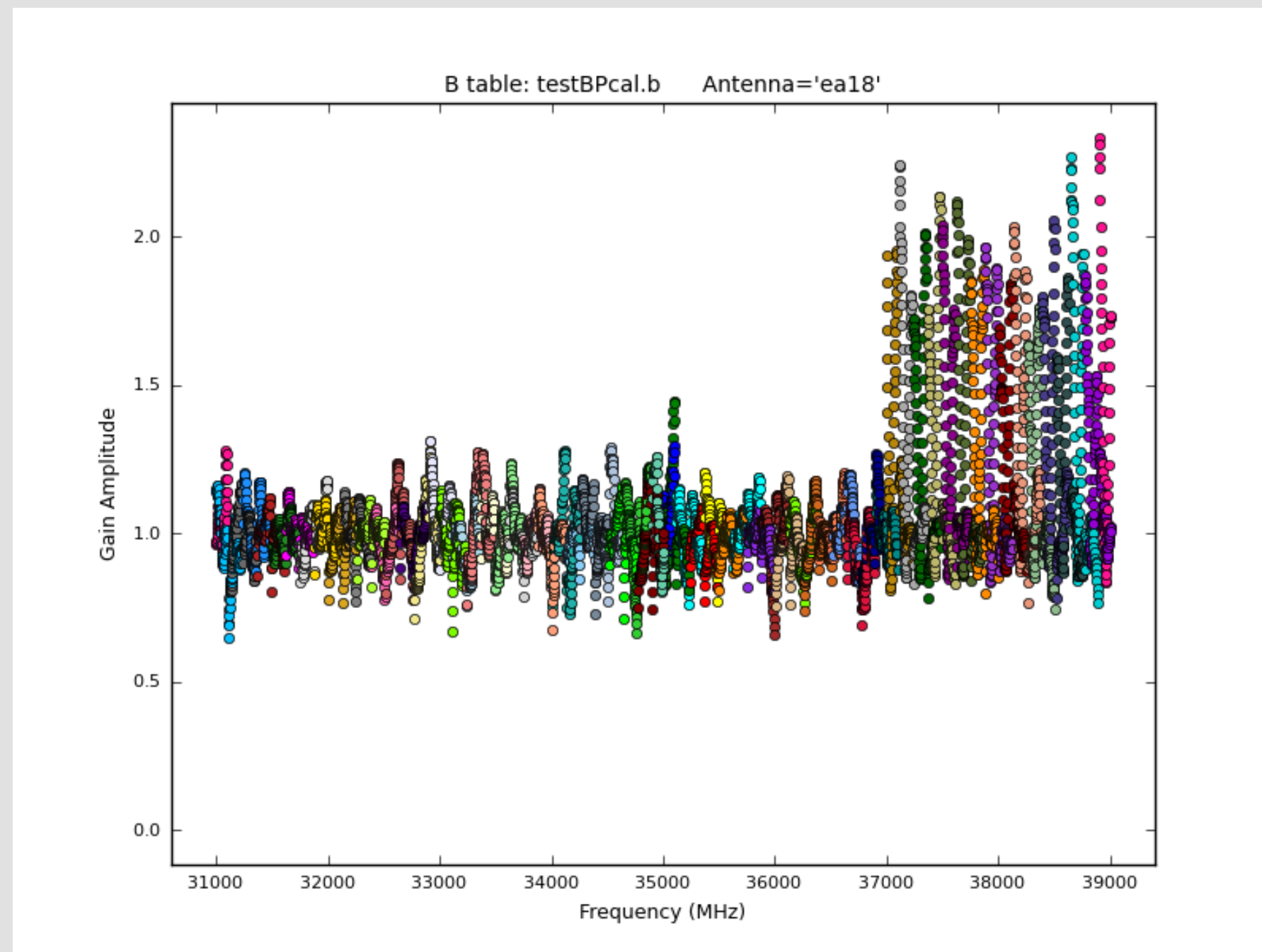
ea10 bandpass, bad data (DTS issue); ea11, ea12 OK

Additional flagging

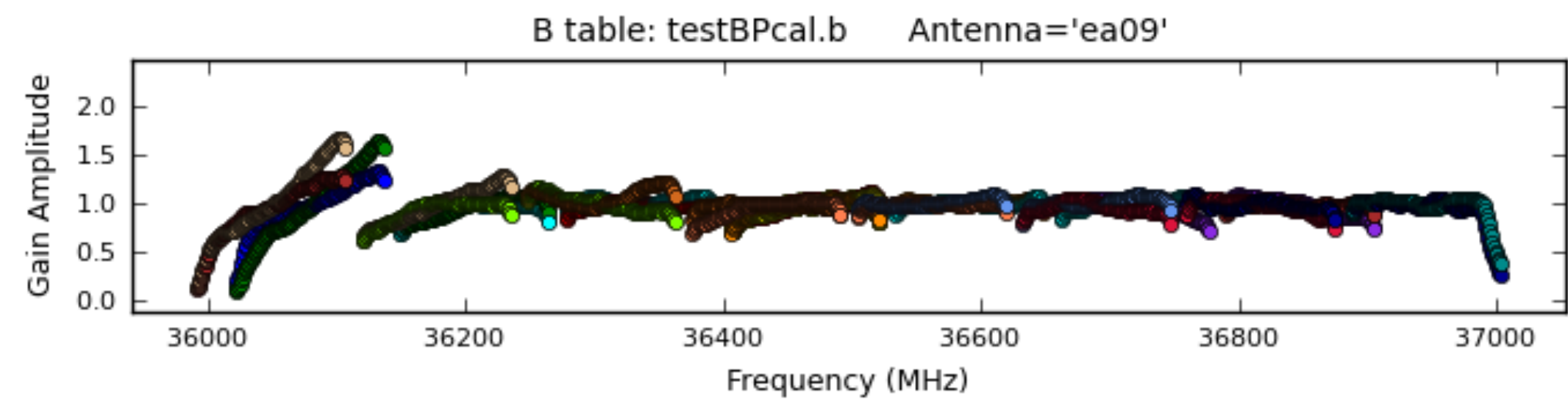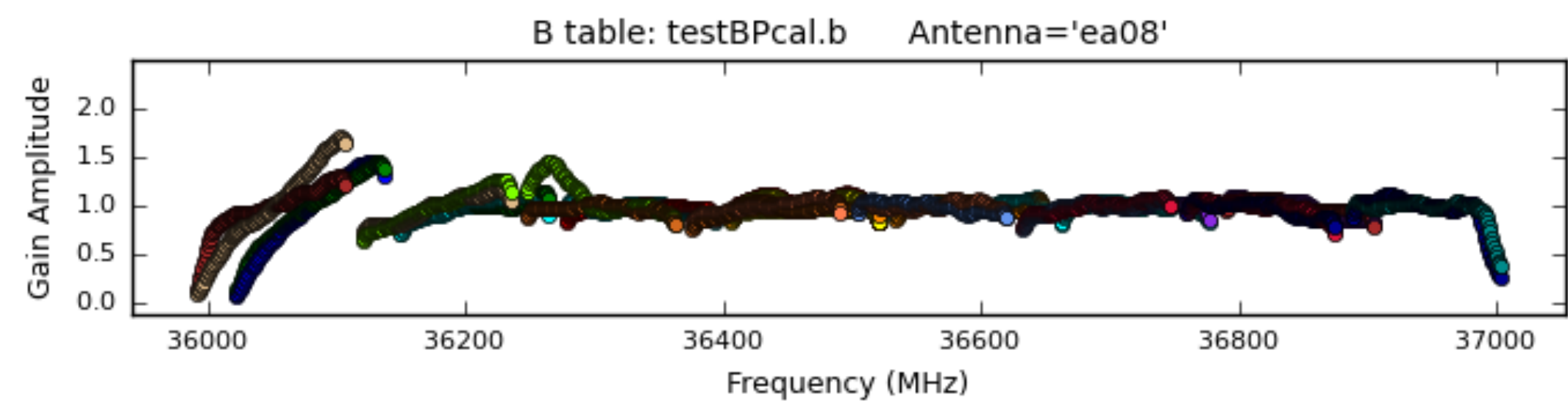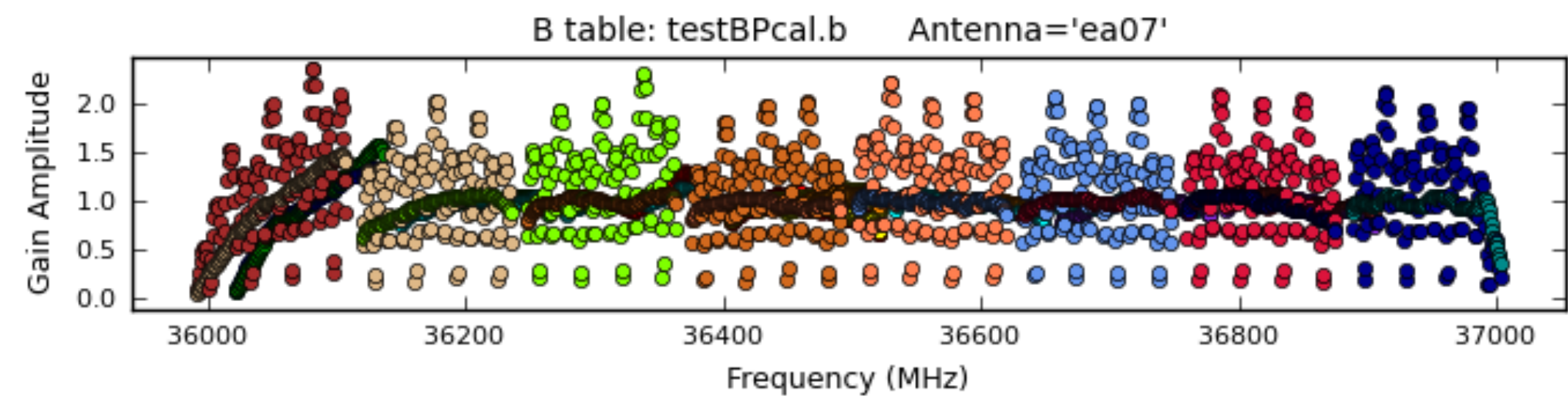ea18 bandpass, bad data (DTS issue for 37-39GHz)

Additional flagging
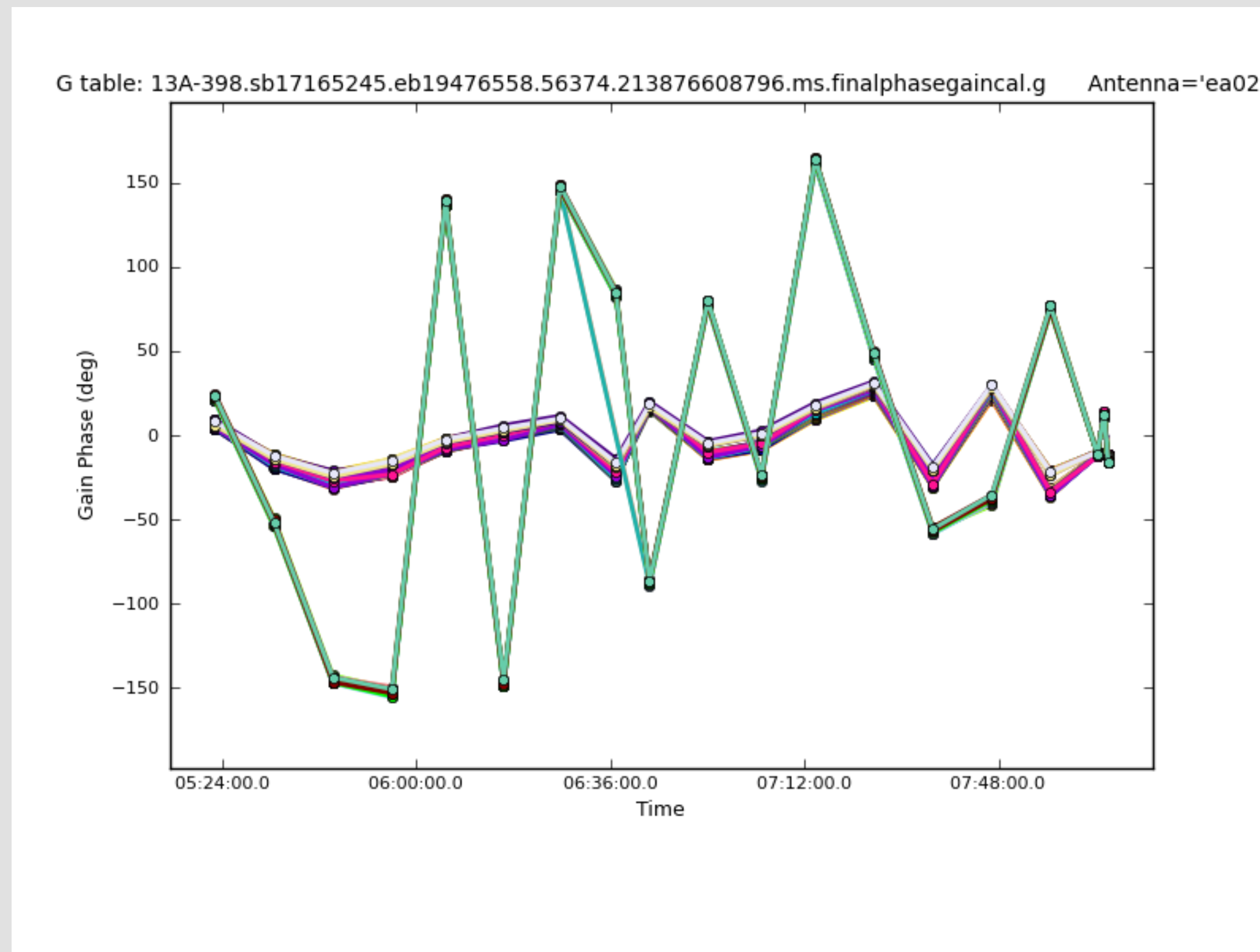
ea18 bandpass **and** phase affected, bad data (DTS issue)

Additional flagging

ea07 bandpass, bad data (DTS issue); ea08, ea09 OK

Additional flagging

ea02 phase jumps for some spws

Additional flagging

- Carefully check your data and the calibration from the pipeline.

- If extra flagging **ONLY** on your science target(s), no recalibration of your data required: flag the targets and move on.

- If any of your **calibrator sources** require additional flagging, you should re-derive the calibration with your additional flagging included.

- To recalibrate your data using the VLA Calibration Pipeline, there are two good starting points:

      - Pipeline calibrated MS

      - Raw data (SDM-BDF)

Additional flagging: Cal'd MS

1. Create a pipeline script **without** Hanning smoothing:

   - Use the casa_pipescript.py file (pipeline web page or from a previous run) and comment out the call to hifv_hanning.

     - Make sure the SDM name matches.

2. Inspect the calibrated MS and flag as needed in CASA.

3. Create a **new directory** and copy **ONLY** the calibrated and fully flagged MS to this new directory and your edited casa_pipescript.py file. **No** other files should be copied.

4. CD to this new directory and start CASA.

Additional flagging: Cal'd MS

5. Clear the *calibration* using **clearcal** with addmodel=False.
    *See the pipeline web page for details.

6. Next, run the **clearstat** task in CASA.

5. execfile('casa_pipescript.py')

5. Wait again while the pipeline runs.

Additional flagging: SDM-BDF

1. Create file: mySDM.flagtemplate.txt   (default name)

   - Add flagging commands, line by line, as needed

   mode='manual' spw='3:42~56' reason='UFO_over_array'

   - Must have **mode flagging reason**.

   - NO space in text used for reason

   - Format help, use CASA task **flagdata**, save your edits!

2. Flagging template will be picked up automatically and applied in the hifv_flagdata stage.

3. In CASA, execfile('casa_pipescript.py')

Rerun for known issues

The pipeline may choose the worst possible option …
- Bad reference antenna or setup issues

- Problems during the flux or delay calibration scan(s)

- If all fails, try Scripted Pipeline (see Scripted Pipeline webpage)

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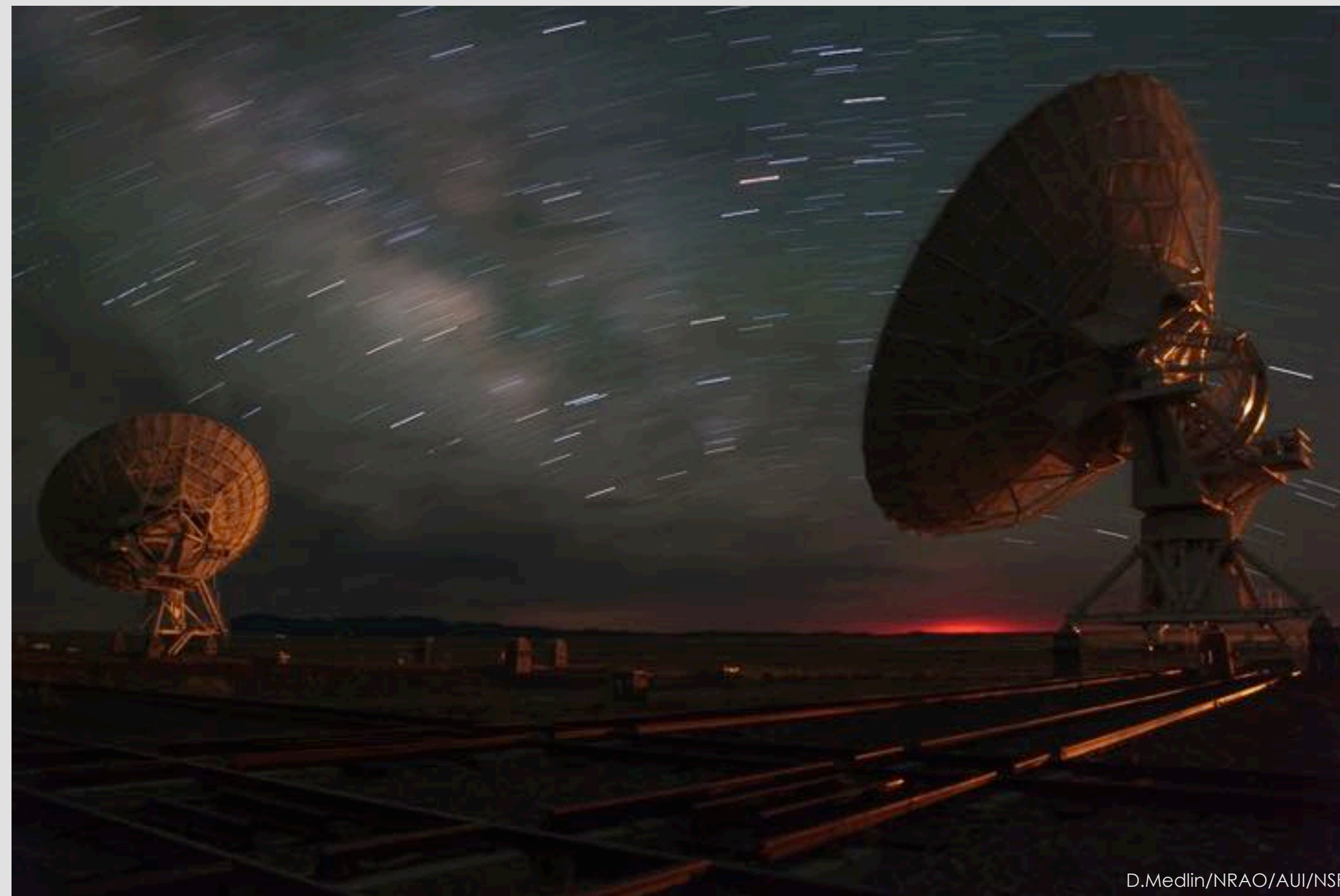
Rerun for known issues | bad refant

1. Make a copy of the casa_pipescript.py file.

2. Add task parameter "refantignore" to the following stages:

   hifv_testBPdcals(refantignore='ea24')

   hifv_semiFinalBPdcals(refantignore='ea24')

   hifv_semiFinalBPdcals(refantignore='ea24')

   hifv_solint(refantignore='ea24')

   hifv_fluxboot(refantignore='ea24')

   hifv_finalcals(refantignore='ea24')

Rerun for known issues

Issues with scan intents? Edit the scan intents in the SDM-BDF. For instructions, see the pipeline web page.

Modifications for spectral line observations ... see pipeline web page.

Other flagging abilities ... see pipeline web page.

Known issues with pipeline release versions ... pipeline web page.

https://science.nrao.edu/facilities/vla/data-processing/pipeline
- CASA Integrated Pipeline & Scripted Pipeline available

Apply to Raw Data

May only have pipeline calibration & flag tables, no MS

- Calibrated MS held by NRAO for only 15 days:
    Calibration tables, flag tables, weblog archived!

- Local storage limitations:
    Reduced storage needs by only keeping the tables.

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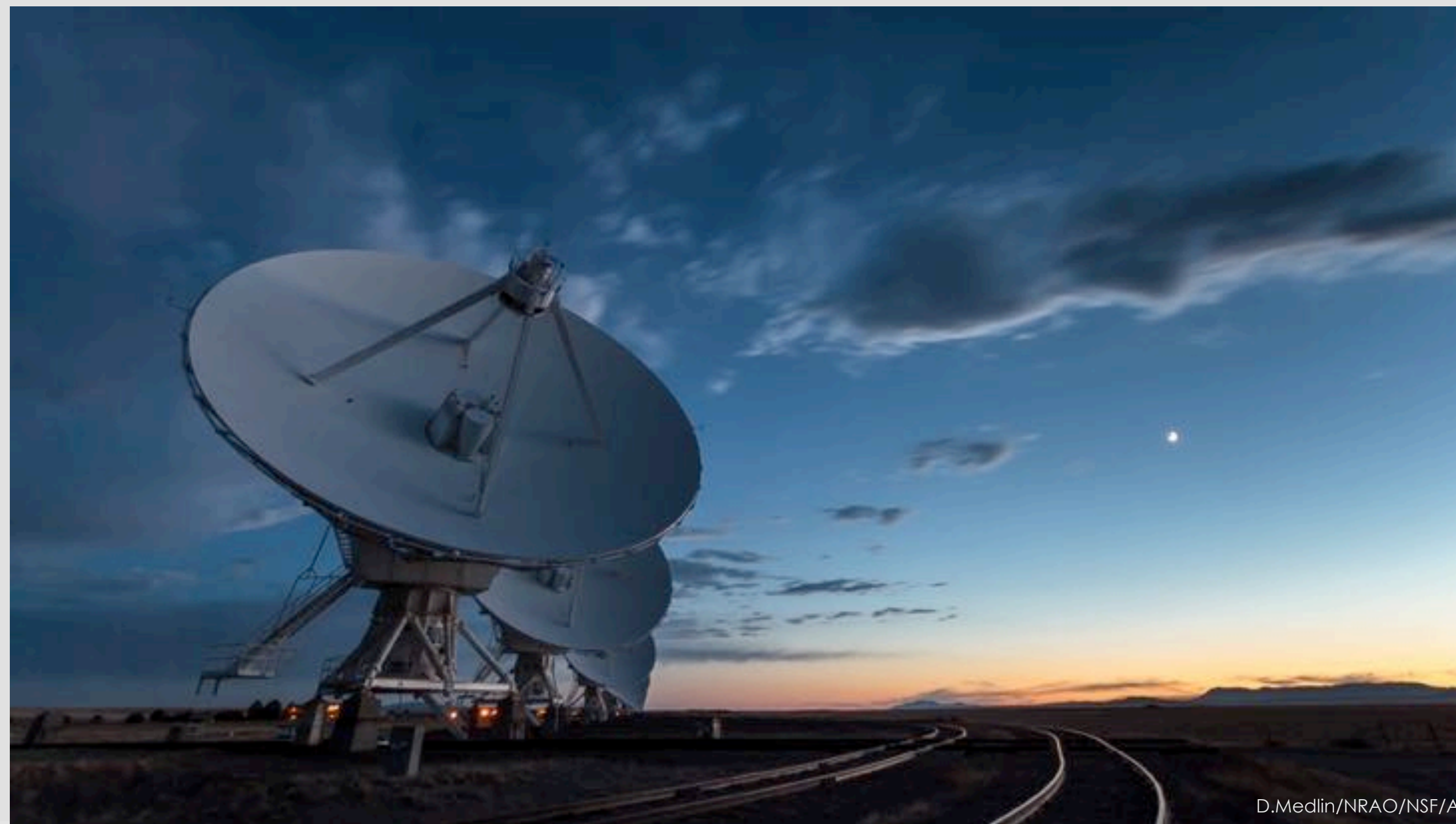
Apply to Raw Data

1. Download the correct CASA version with the pipeline.

1. You will need the following, bold items in cal. tar file in archive
   - SDM-BDF
   - **unknown.session_1.caltables.tgz**
   - **mySDM.ms.flagversions.tgz**
   - **mySDM.ms.calapply.txt**
   - **casa_piperestorescript.py**
   - **unknown.hifv_cal.pipeline_manifest.xml**

2. Make a directory called "restore".

3. cd to restore, and create three more directories inside:

   rawdata, working, products < names must be exact!

Apply to Raw Data

5. Put your SDM-BDF into the "rawdata" directory.

6. Put all the *.tgz, *.xml and *.txt files into the "products" directory.

7. Put casa_piperestorescript.py into the "working" directory.

8. Go to the "working" directory and edit casa_piperestorescript.py:

   • Insert "../rawdata/" before the SDM-BDF name (mySDM) in the call to hifv_restoredata.

   • **Save** your changes.

Apply to Raw Data

9. From the "working" directory, start CASA with the pipeline

   casa --pipeline

10. Execute the casa_piperestorescript.py file:
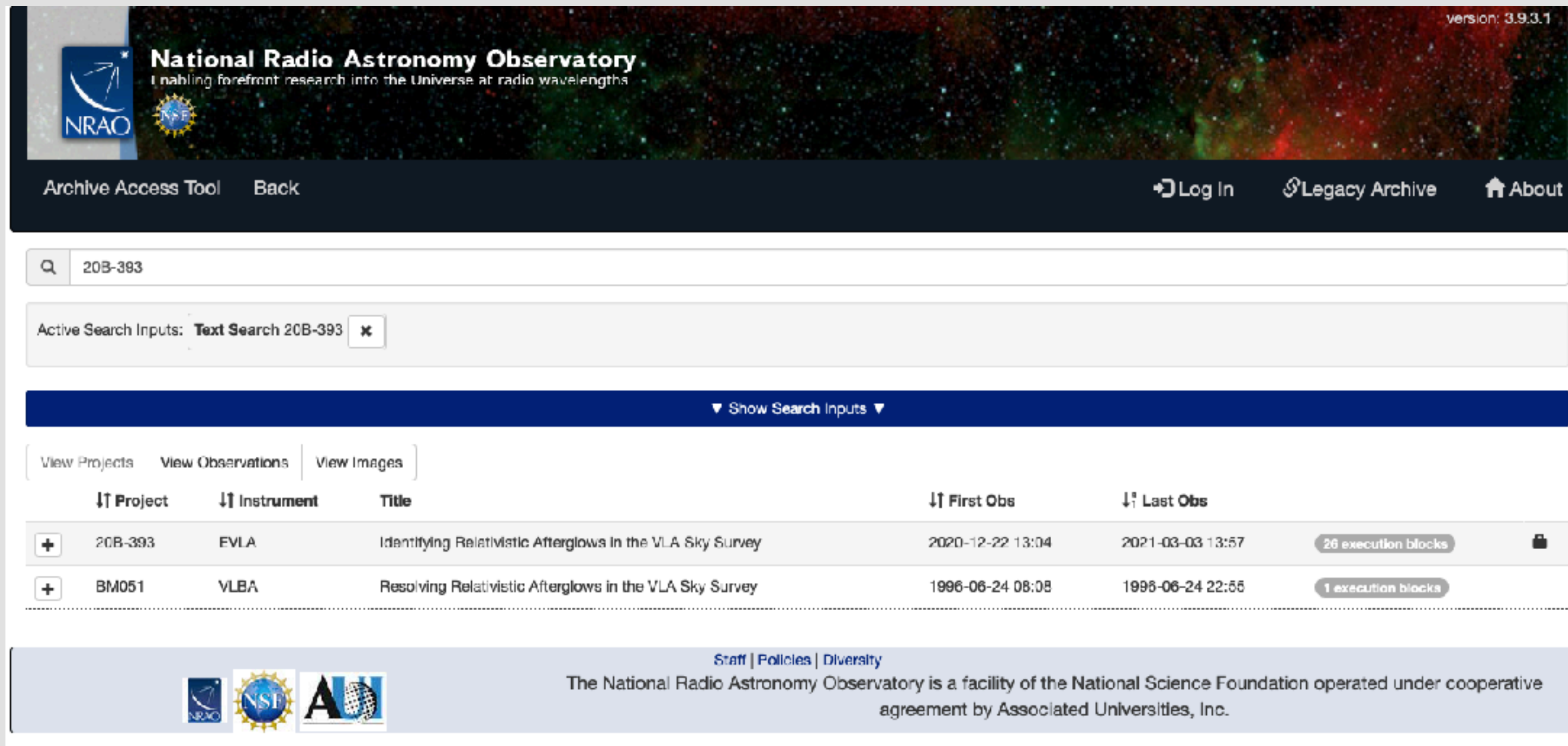
   execfile('casa_piperestorescript.py')

11. Enjoy calibrated data once the process completes.

New Archive for Calibrated Data

We archive pipeline calibration tar files at https://data.nrao.edu/

Can get just the tar file or a fully calibrated MS in place of manual restore

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New Archive for Calibrated Data

Scroll down to view observations

New Archive for Calibrated Data

The Expanded project view shows all observations

New Archive for Calibrated Data

Cals column shows if pipeline calibration is available

New Archive for Calibrated Data

Click here to download the calibration tar file only.

New Archive for Calibrated Data

Add to clipboard

New Archive for Calibrated Data

Add to clipboard

New Archive for Calibrated Data

Click Download

New Archive for Calibrated Data

Select Calibrated
Measurement Set
for pipeline calibration

New Archive for Calibrated Data

Uncheck Create tar file if you are working with your visitor account (nm-####)

New Archive for Calibrated Data

Submit Request

Note: only one calibration may be requested at a time.

Considerations

Scan intents correct?

Hanning Smoothing?

Computing time?

Disk space – 3-4X raw size(!)

PL version differences.

CASA version differences.

NRAO cluster available for
remote Access

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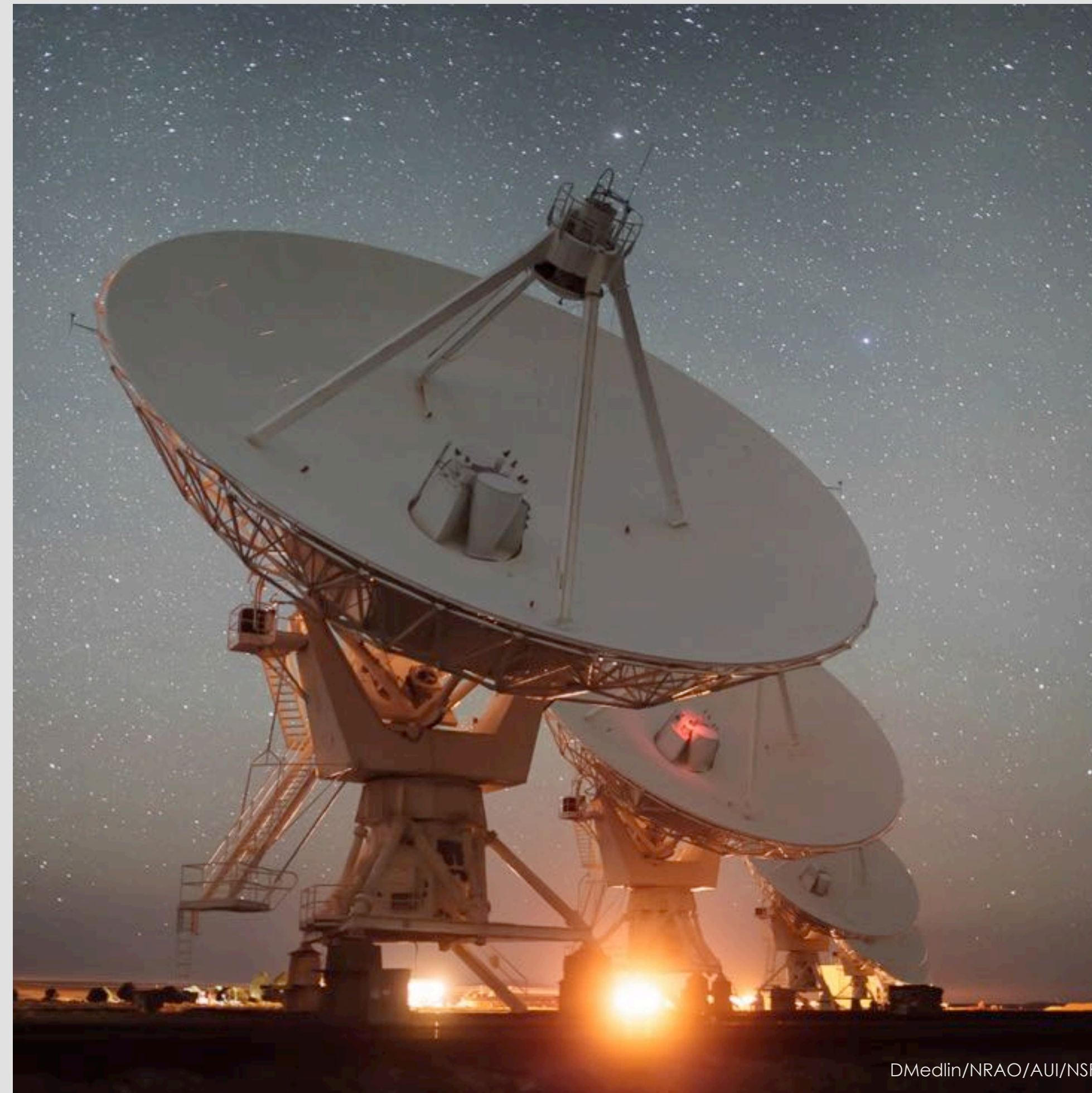
Remote Access: Accounts

Use your **visitor account** (what you're using now)

- Remote processing

- Data staging for download

- Short term work, **NOT** long term storage.

Use your account's **"data" directory**:

- Archive deliveries directly to your account

- Pipeline data requests

- **DO NOT** change permissions of this directory!

Remote Access: Node Request

Login with your account username

- ssh nm-####@login.aoc.nrao.edu

Go to nmpost-master and request a node

- ssh nm-####@nmpost-master

- nodescheduler --request 14 1

If you get no email, you are probably **queued …**

- Don't keep requesting more nodes

Exit nmpost-master, then ssh to your assigned node

- ssh nm-####@nmpost###

Remote Access

Interact with your data for reduction and analysis

- SSH and VNC available for working with your data.

Download your data:

- RSYNC, SFTP, SCP, LFTP available.

Need help?

- https://info.nrao.edu/computing/guide/cluster-processing

Questions?

- VLA CASA Calibration Pipeline information at:

https://science.nrao.edu/facilities/vla/data-processing/pipeline
    - CASA Integrated Pipeline & Scripted Pipeline available

- Have Questions?
- Need Help?
- Report a bug?

- Use the **NRAO HelpDesk**: **https://help.nrao.edu/**

- Submit your ticket under the **VLA Pipeline Department.**

- Please include specific details when submitting HelpDesk tickets.
  (Project code, SB number, CASA/PL versions, log file, errors, etc.)