Observing with the GBT

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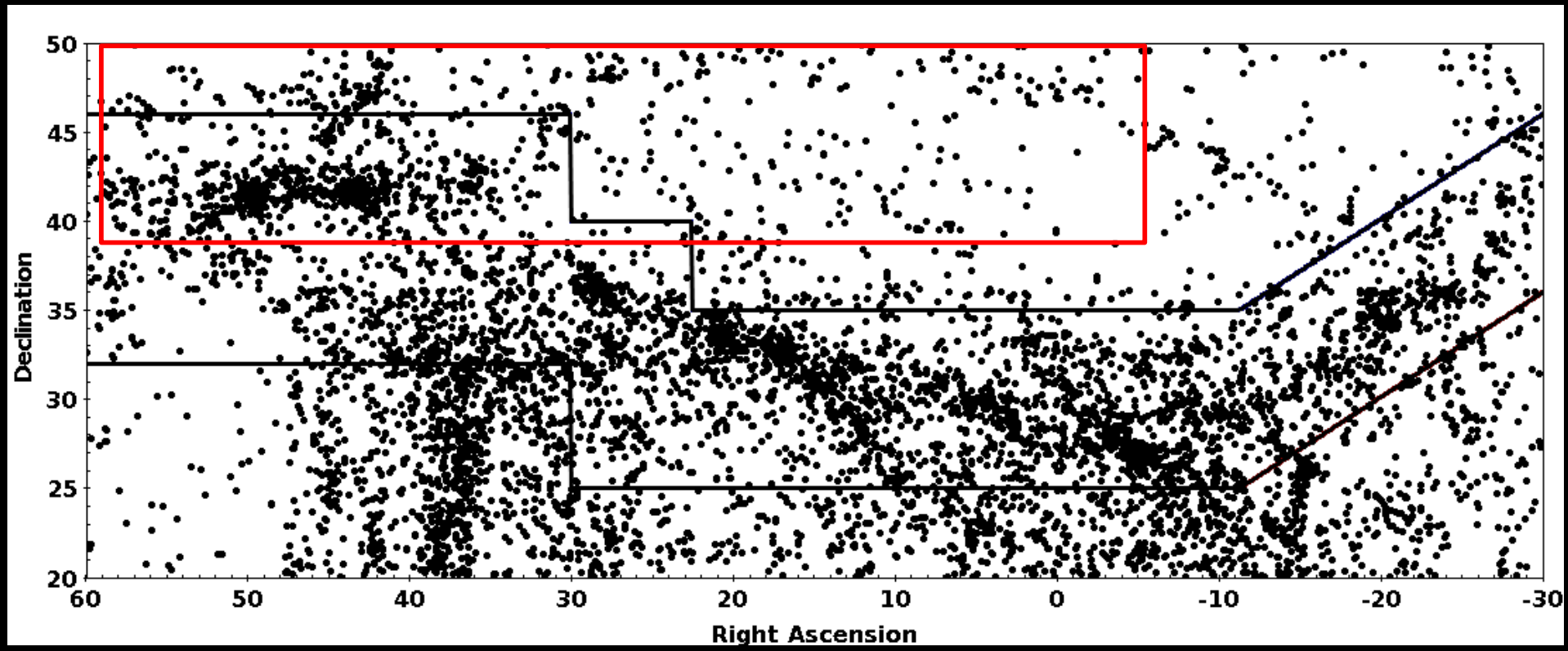
Your task:

- Measure HI in galaxies in the Perseus-Pisces Supercluster that are not visible to Arecibo



Your resources

- We have 4 hours of GBT time allocated to our project from 7:30am-11:30am on Friday.
- This is time purchased by WVU for our use.
- Either myself or Evan (or both of us) will be present to assist with observations.

- Also, for the faculty, we have 2 hours of drift scan observing from 5:30-7:30pm for practice.

GBT vs. Arecibo

- Arecibo is really big (really sensitive). Why use GBT for HI?
  - Can observe more of the sky.
  - Unblocked aperture means you can get good data during the day.

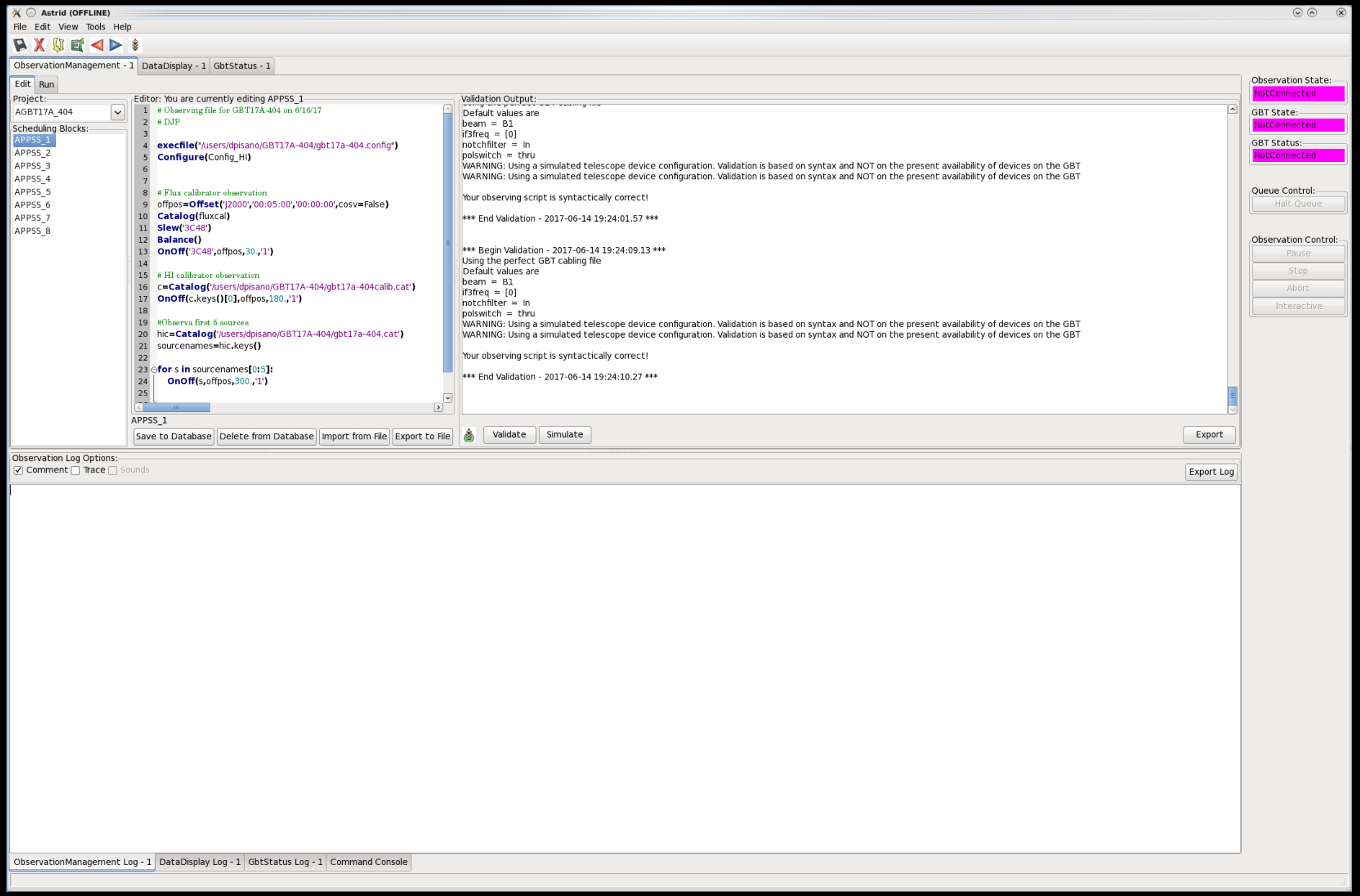
How will this work?

- ASTRID: Use to control the telescope
- CLEO: Use to monitor/control telescope
- GBTIDL: Use to look at our data

We will be observing on titania

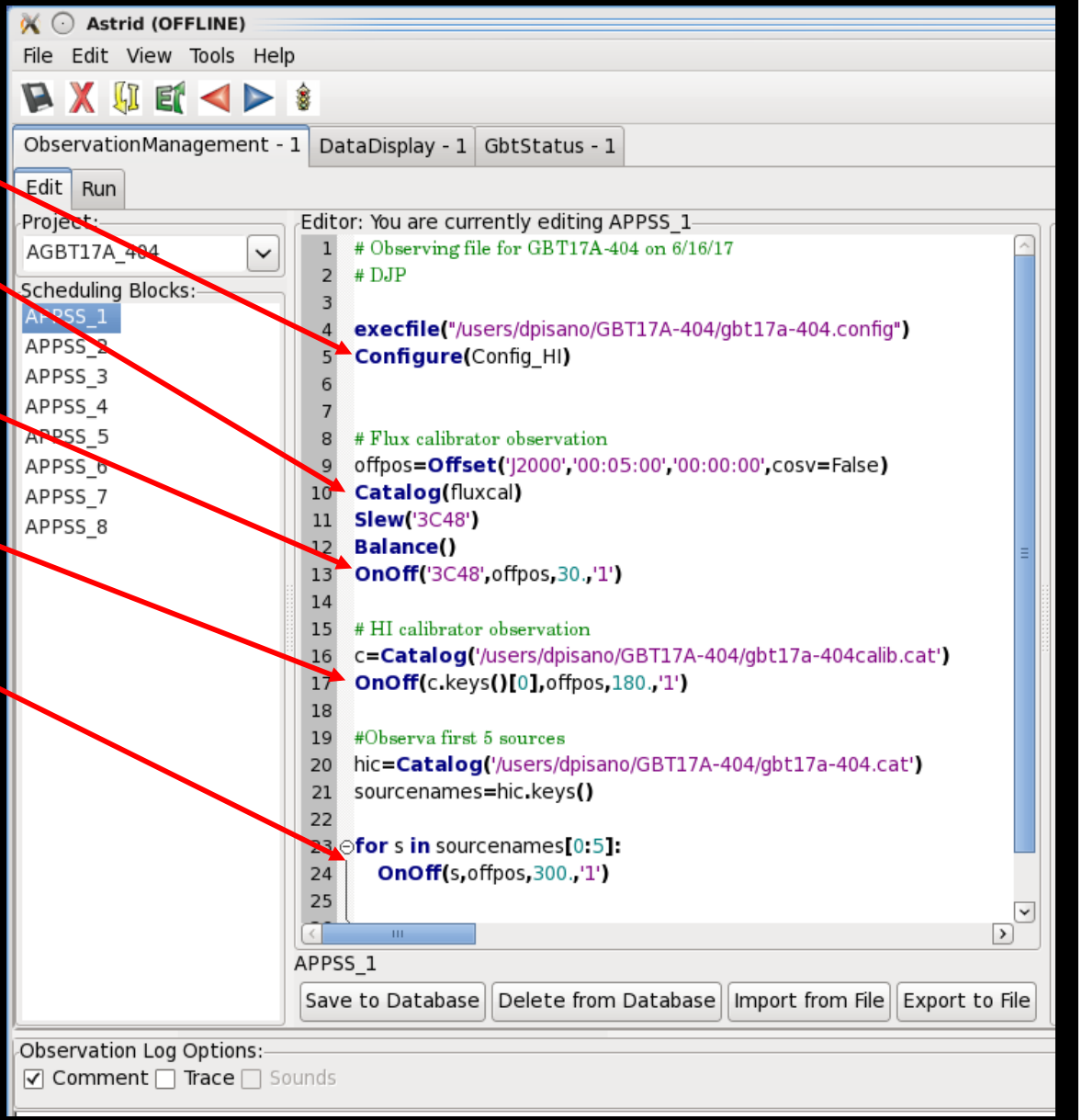
We can run GBTIDL on any computer; during observing we will use ariel for this.

Astrid


Astrid (OFFLINE)
File Edit View Tools Help
ObservationManagement - 1
DataDisplay - 1
GbtStatus - 1
Edit
Run
Project:
AGBT17A_404
Scheduling Blocks:
APPSS_1
APPSS_2
APPSS_3
APPSS_4
APPSS_5
APPSS_6
APPSS_7
APPSS_8
Editor: You are currently editing APPSS_1
# Observing file for GBT17A-404 on 6/16/17
# DJP
execfile("/users/dpisano/GBT17A-404/gbt17a-404.config")
Configure(Config_HI)
# Flux calibrator observation
offpos=Offset('J2000','00:05:00','00:00:00',cosv=False)
Catalog(fluxcal)
Slew('3C48')
Balance()
OnOff('3C48',offpos,30.,'1')
# HI calibrator observation
c=Catalog('/users/dpisano/GBT17A-404/gbt17a-404calib.cat')
OnOff(c.keys()[0],offpos,180.,'1')
#Observa first 5 sources
hic=Catalog('/users/dpisano/GBT17A-404/gbt17a-404.cat')
sourcenames=hic.keys()
for s in sourcenames[0:5]:
OnOff(s,offpos,300.,'1')
APPSS_1
Save to Database
Delete from Database
Import from File
Export to File
Validation Output:
Default values are
beam = B1
if3freq = [0]
notchfilter = In
polswitch = thru
WARNING: Using a simulated telescope device configuration. Validation is based on syntax and NOT on the present availability of devices on the GBT
WARNING: Using a simulated telescope device configuration. Validation is based on syntax and NOT on the present availability of devices on the GBT
Your observing script is syntactically correct!
*** End Validation - 2017-06-14 19:24:01.57 ***
*** Begin Validation - 2017-06-14 19:24:09.13 ***
Using the perfect GBT cabling file
Default values are
beam = B1
if3freq = [0]
notchfilter = In
polswitch = thru
WARNING: Using a simulated telescope device configuration. Validation is based on syntax and NOT on the present availability of devices on the GBT
WARNING: Using a simulated telescope device configuration. Validation is based on syntax and NOT on the present availability of devices on the GBT
Your observing script is syntactically correct!
*** End Validation - 2017-06-14 19:24:10.27 ***
Validate
Simulate
Export
Observation State:
NotConnected
GBT State:
NotConnected
GBT Status:
NotConnected
Queue Control:
Halt Queue
Observation Control:
Pause
Stop
Abort
Interactive
Observation Log Options:
Comment
Trace
Sounds
Export Log
ObservationManagement Log - 1
DataDisplay Log - 1
GbtStatus Log - 1
Command Console

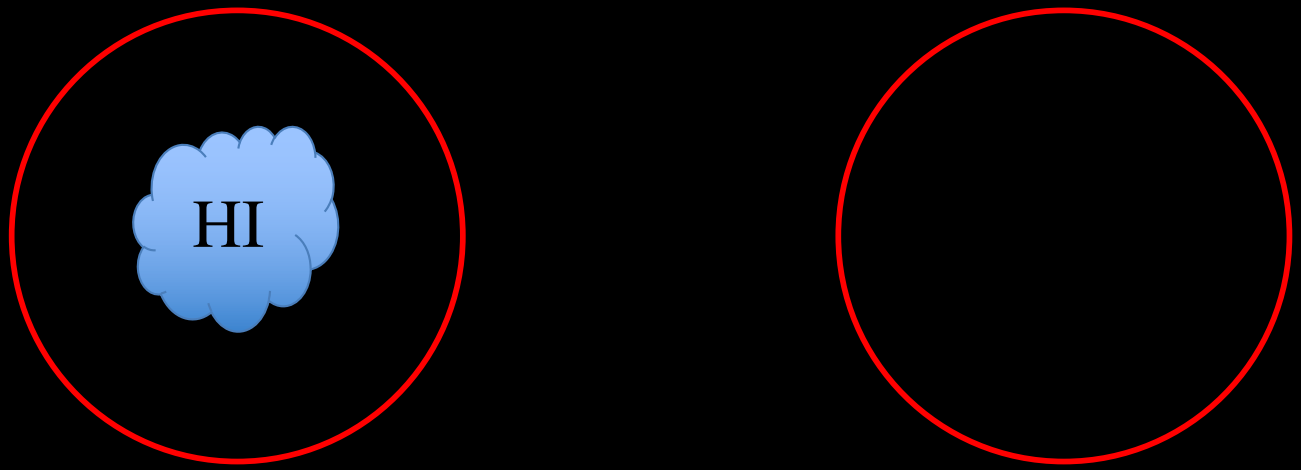
Observing Procedure

- Configure Instrument
- Load Catalogs
- Observe flux calibrator (with known flux).
- Observe known HI source.
- Observe science targets.
- Not all 8 scripts include all of these. Each should run about 1 hour.



OnOff Observations

$$T_A = \frac{ON - OFF}{OFF} T_{sys}$$



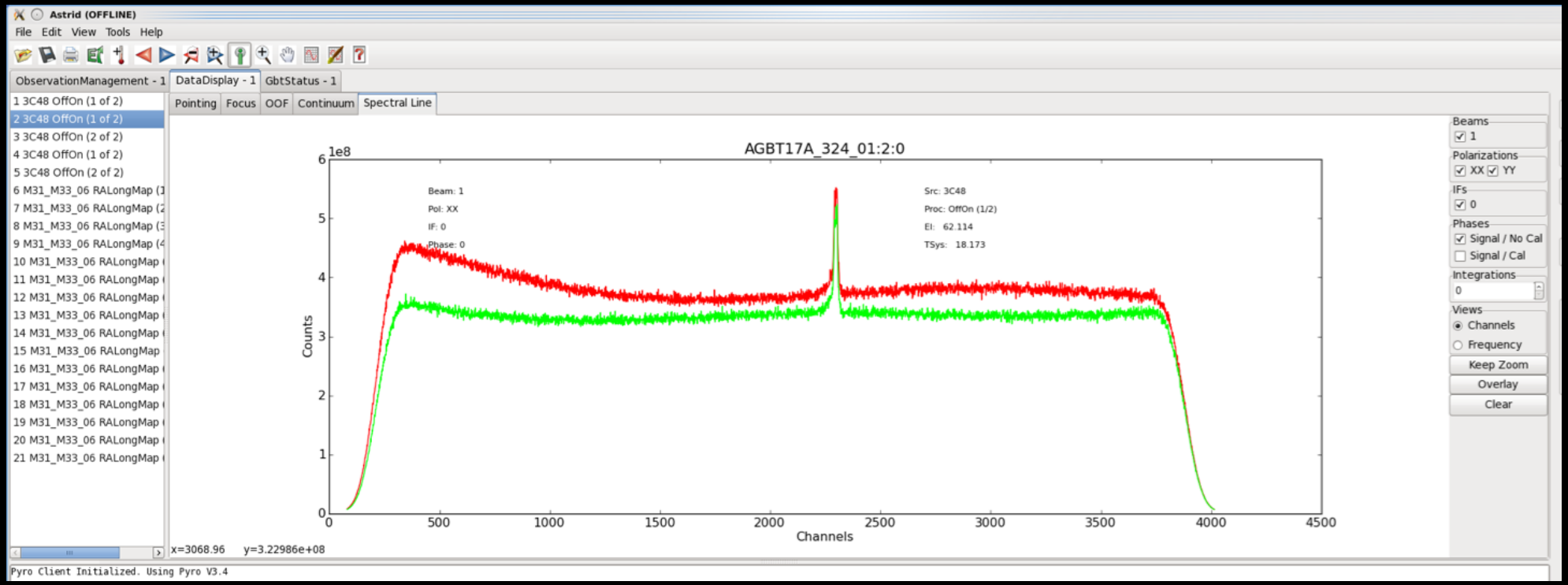
OnOff Observations

$$T_A = \frac{ON - OFF}{OFF} T_{sys}$$

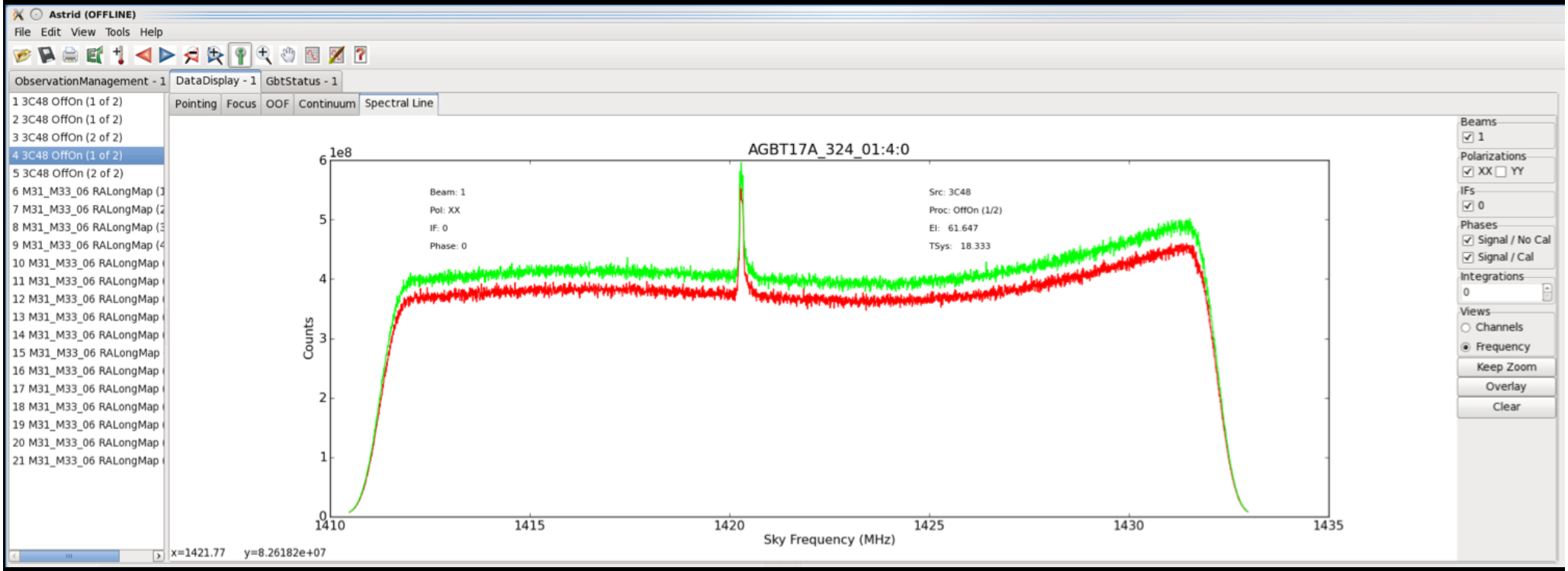
Can also form “OFF” in other ways:

Track your source and switch your observing frequency, i.e. frequency-switching.

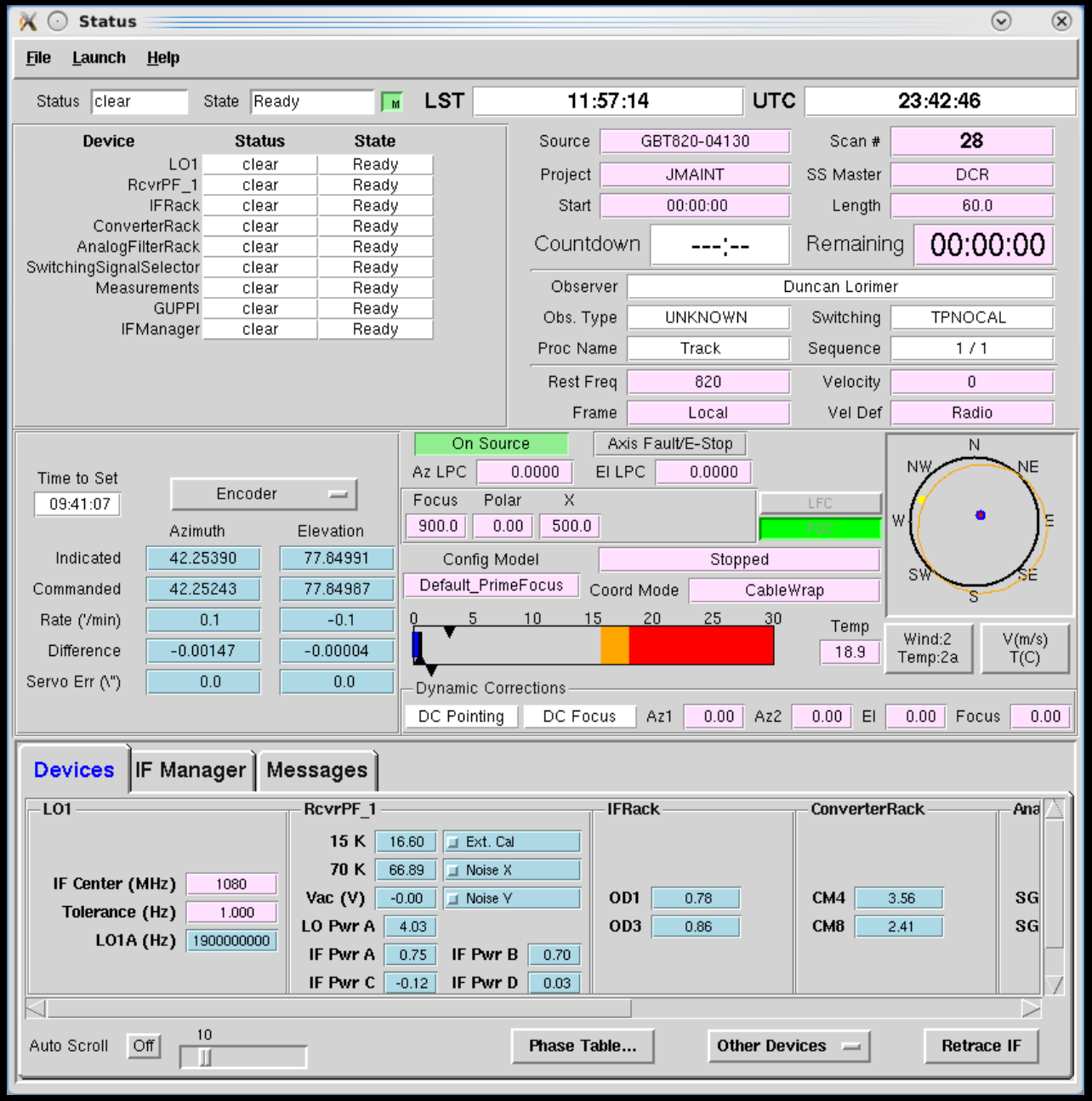
Monitoring Observations



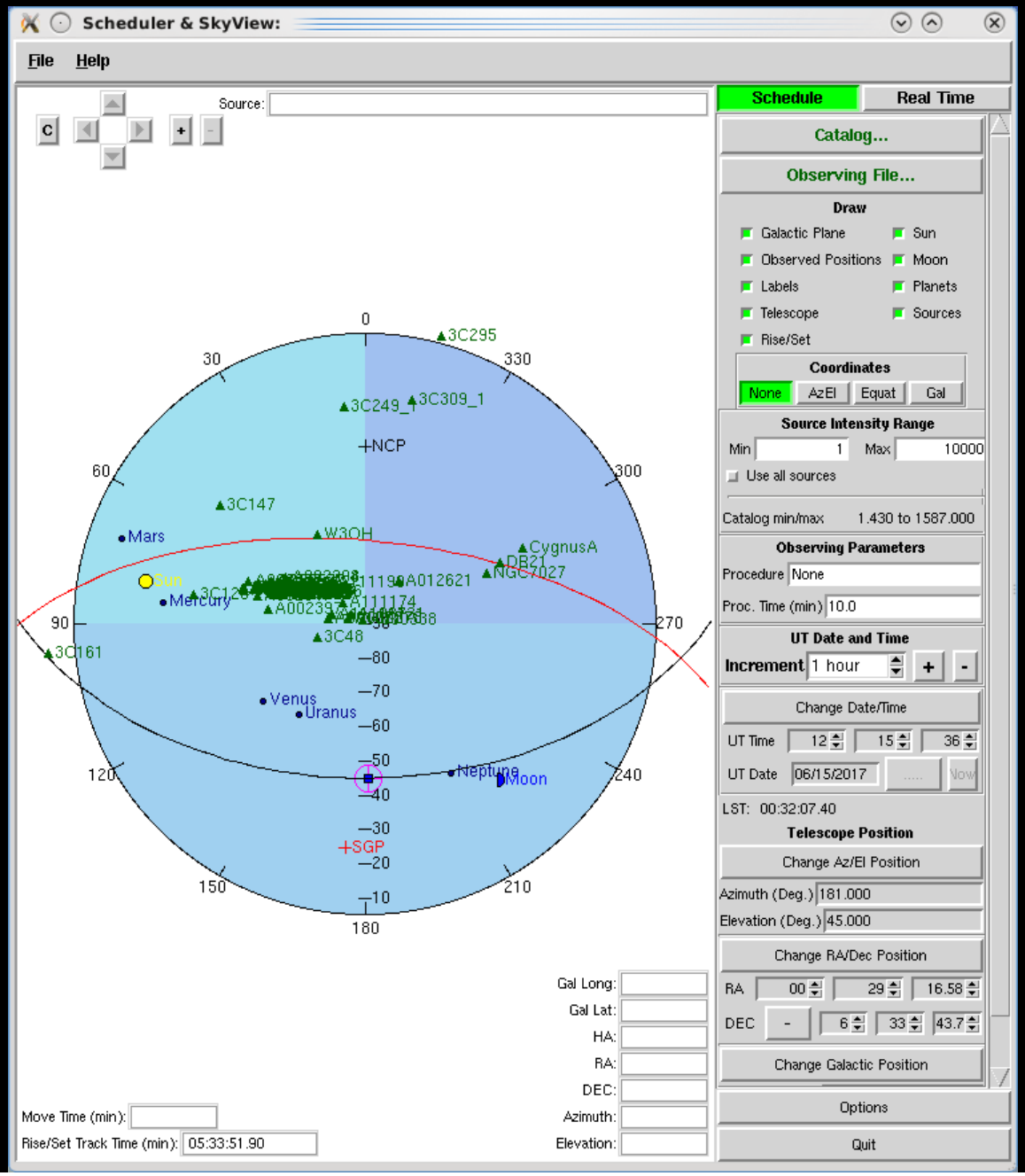
Monitoring Observations



Monitoring the GBT: cleo status

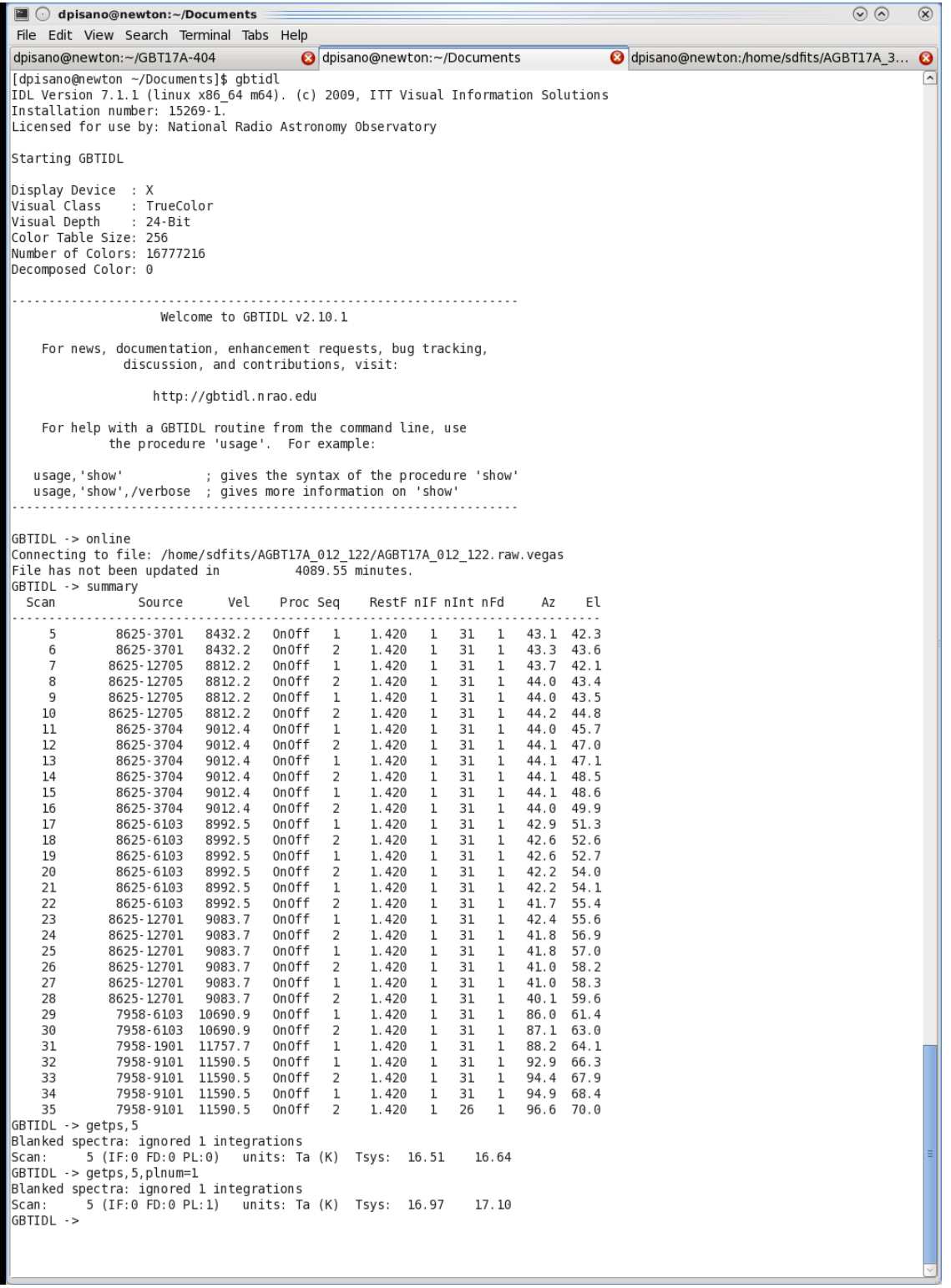


Monitoring the GBT: cleo scheduler

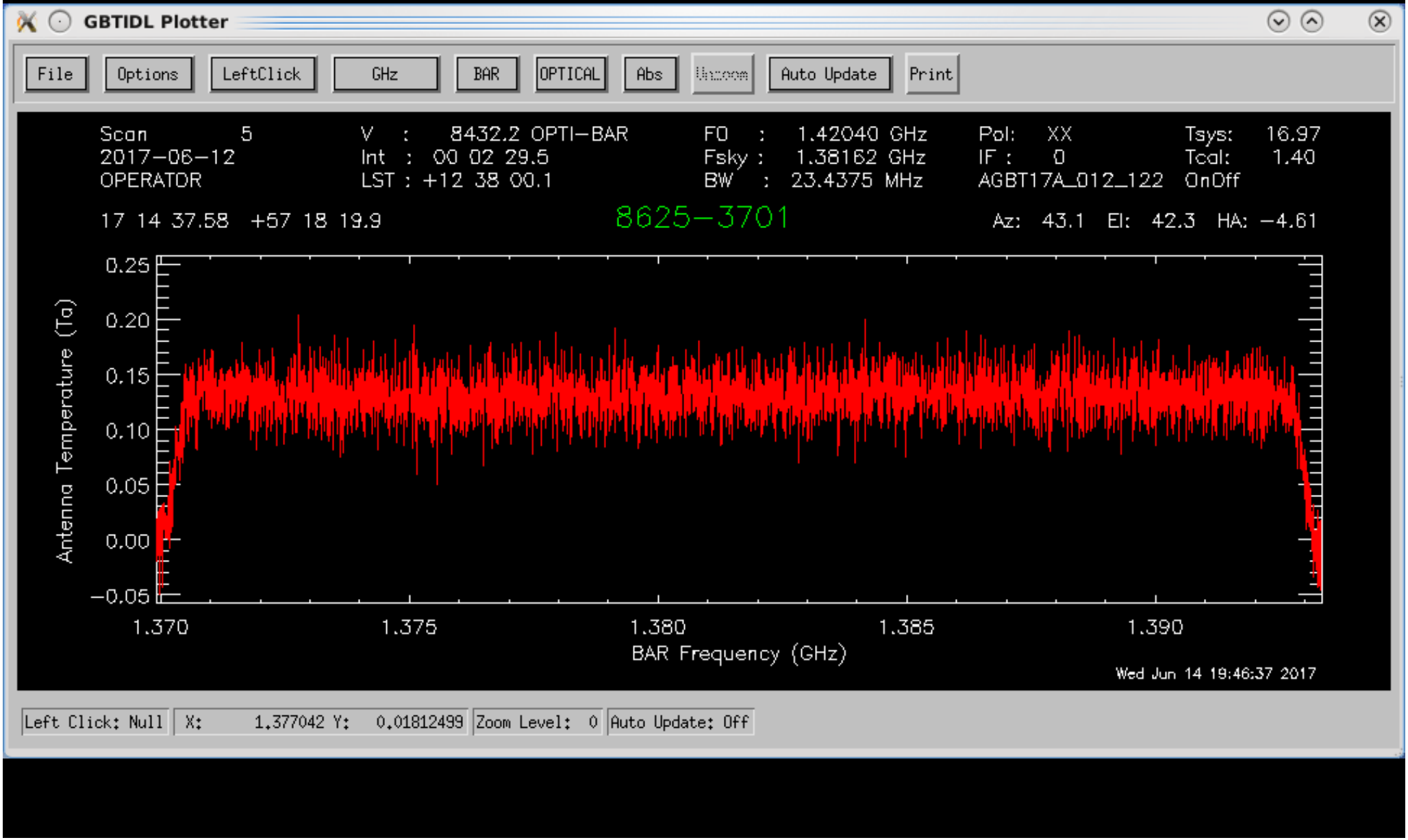


Looking at your data: GBTIDL

- Start by typing “gbtidl” from command line.
- To access data in near real time, type “online” in GBTIDL.
- To look at data (after On and Off observed): GBTIDL> getps,scan#,plnum=0 or 1
- This does the ON-OFF calibration.



getps output



getps output

- Can change the x-axis between Frequency, Channels, and Velocity: freq, chan, velo.
- Can change y-axis to “Jy” by setting units in getps: getps,scan,plnum=0,units=‘Jy’
- Can zoom in on features: setx, sety.
- Can combine both polarizations by typing: “accum” after “getps” for both plnums. Then “ave” to see combined spectrum.

More on GBTIDL

- There is a tutorial for GBTIDL available on the meeting webpage.
- To do this you will be working on reducing the data we collected last year.
- You can follow this to reduce the data we will be collecting on Friday as well.

Summary

Today:

- Groups of 3 faculty each will get to practice observing (although the GBT will be stationary).

Friday:

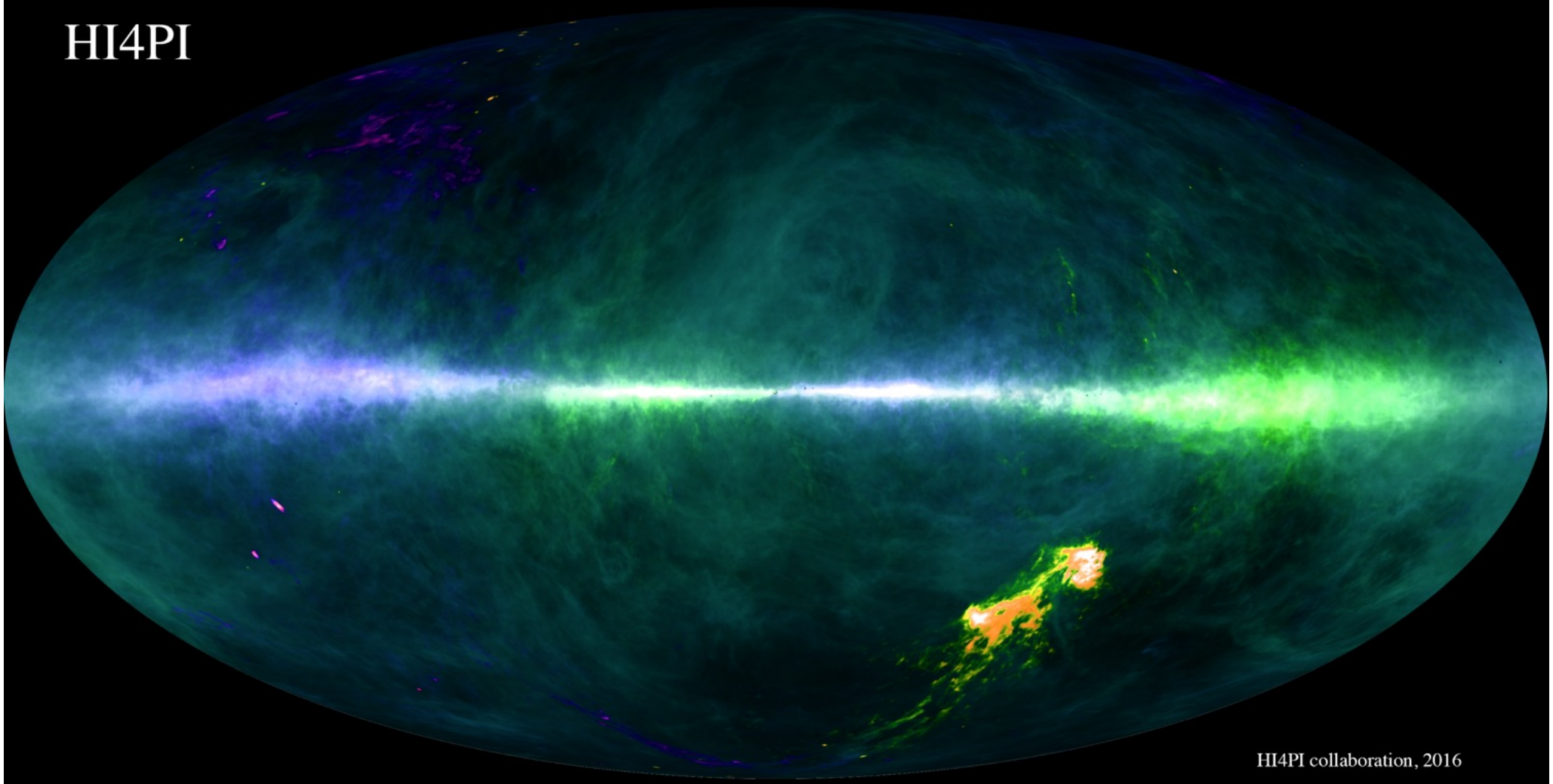
- Each group will get to start an observing script.
- Each group will look at one known HI source.
- Each group will then examine/reduce the science targets as they are observed in GBTIDL.

Today's Faculty Groups

Group A	Group B	Group C
Joe	Luke	Becky
David	Aileen	Grant
Martha	Greg	Adriana
~5:30pm	**~6:10pm**	**~6:50pm**

- Each group will have ~40 minutes on GBT.
- Meet with Evan or myself to go over scripts first.

HI4PI



HI4PI collaboration, 2016