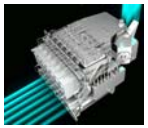
Welcome to HIFI Day

- Main goal is to give you a serviceable understanding of how to locate HIFI observation(s) of your favorite target(s), judge the data quality, and what to do next with interactive processing steps.
- We will help you do this with demos and hands-on time, preceded by short presentations.
- We do not tackle topics we consider advanced (taking more than an hour to demo/explain or required PhD jython scripting knowledge), but if they come up we will consult with you.
- Plenty of time! Coffee breaks interspersed.
- Webex is running and recording (later edited and posted, TBD).
- After lunch science talk by N. Flagey, *"Water Absorption in Galactic Translucent Clouds: Conditions and History of the Gas Derived from Herschel/HIFI PRISMAS Observations"*
- Quick poll: which OS's are here? What RAM? HSpot installed?
- Questions?



HIFI in the HSA, and Using HSpot as a Data Reduction Aid

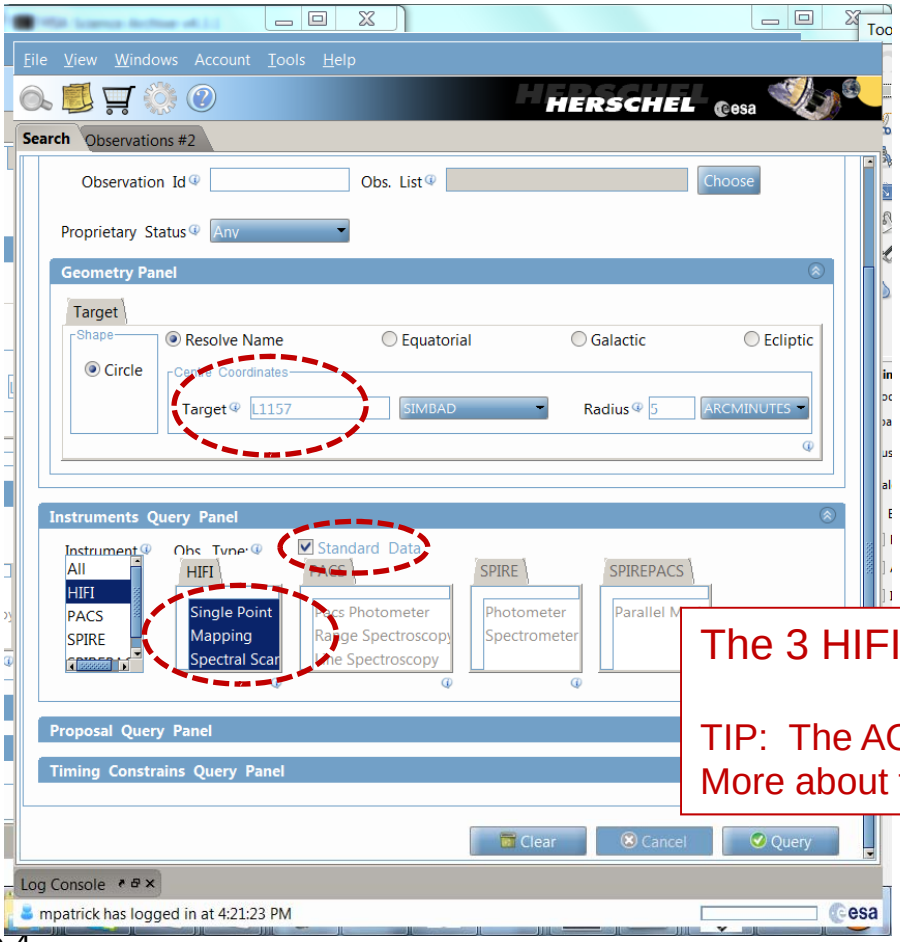
Pat Morris (NHSC)

Goals

- By now you have probably become grizzled veterans at using the HSA and the User Interface.
- Just a few more points about HIFI in the archive…
- Then we will play with HSpot as a valuable tool for schematically visualizing the sidebands and AOR overlays.

Starting at the HSA…

- It makes sense to first search on your interest area, *then* go to what you need to know about the way the data were taken (instrument setup and performances), the products you are offered, and data (re-)processing.



The front panel of the HUI is simple for **target and coordinate** based queries.

Target-based query.

TIP: verify first that the name can be resolved by SIMBAD, NED, or target name given by original proposer; on failure to resolve you will get "undesired" query results (a bug).

The 3 HIFI AOTs, standard modes (non-engineering).

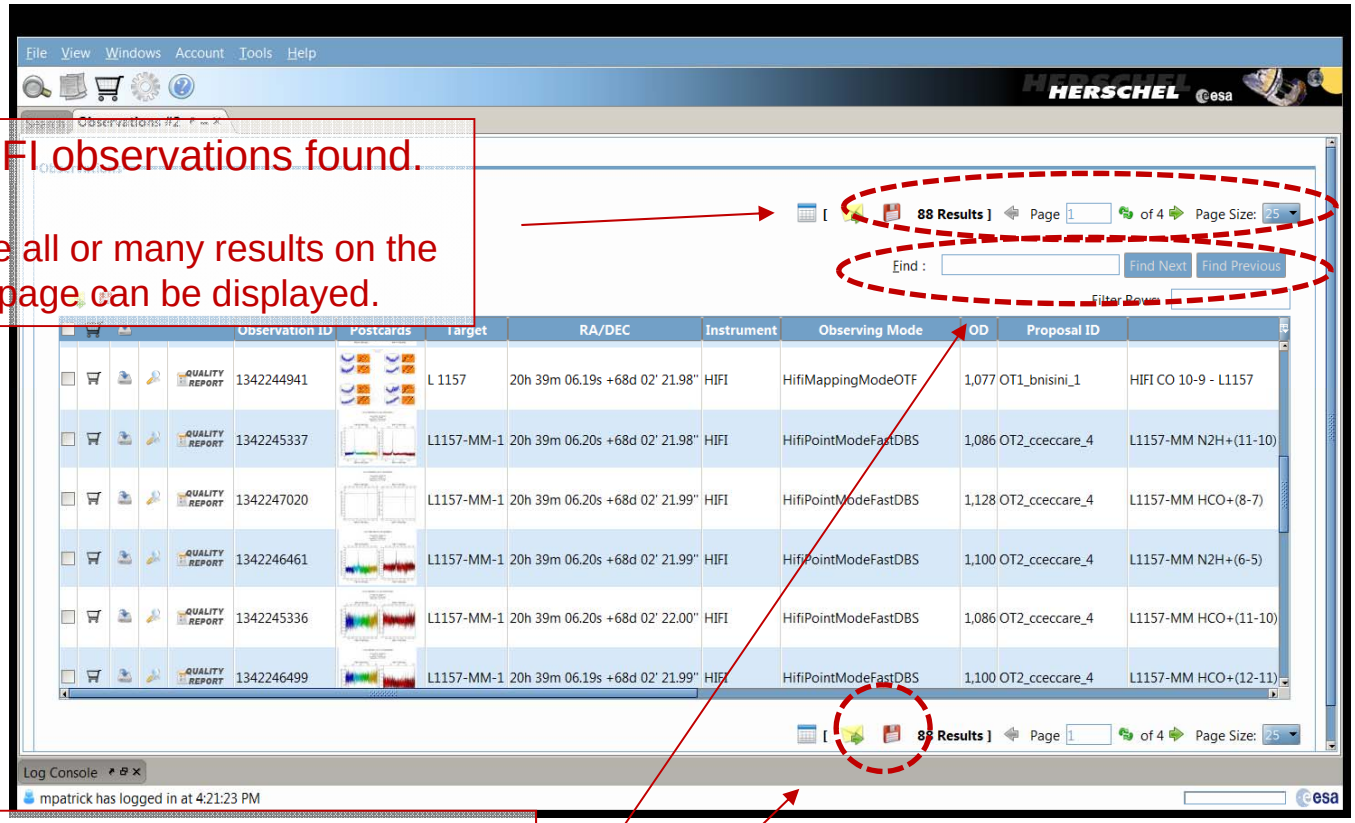
TIP: The AOTs can be individually (de-)selected.
More about the AOTs later.

Managing Query Results

(see slides re HSA and query output by D. Ardila)

For target L1157, 88 HIFI observations found.

TIP: you may prefer to see all or many results on the same page, up to 100 per page can be displayed.



For searching on column contents, e.g. “CO”, should be possible with the Find utility.

TIP: Output can be saved in table form, also as a VO Table that can be viewed in HIPE.

More Advanced Searching

- At this time (version 4.3.1) advanced, and still some *basic,* searching is limited with the HUI.
- Example: What excited CO ($J_u > 8$) has been observed around 10 of my most favorite AGB stars?
  1. A list of obsids can be loaded into the HUI.
  2. **Observed sky frequency range,** the **tuned instrument frequency, species names or rest frequecies** cannot be searched. Query should proceed on the obsid list.
  3. Similarly, in the output, neither sky frequency nor tuned frequency are present. There are 3 options:
     1. Save the output to a table, and search for strings like "CO" the AOR labels. This is unreliable since the AOR labels have been"free-form", at the discretion of the original proposers, sometimes unrevealing.
     2. **Open the Browse Product images (jpgs) if they are present, and check for coverage of the observed frequency ranges over the transitions of interest, taking redshift into account if needed.**
     3. Dave Shupe's mining script – not ready for prime time.

Using HSpot

- HSpot is a valuable tool to have open on your desktop alongside HIPE sessions with HIFI.

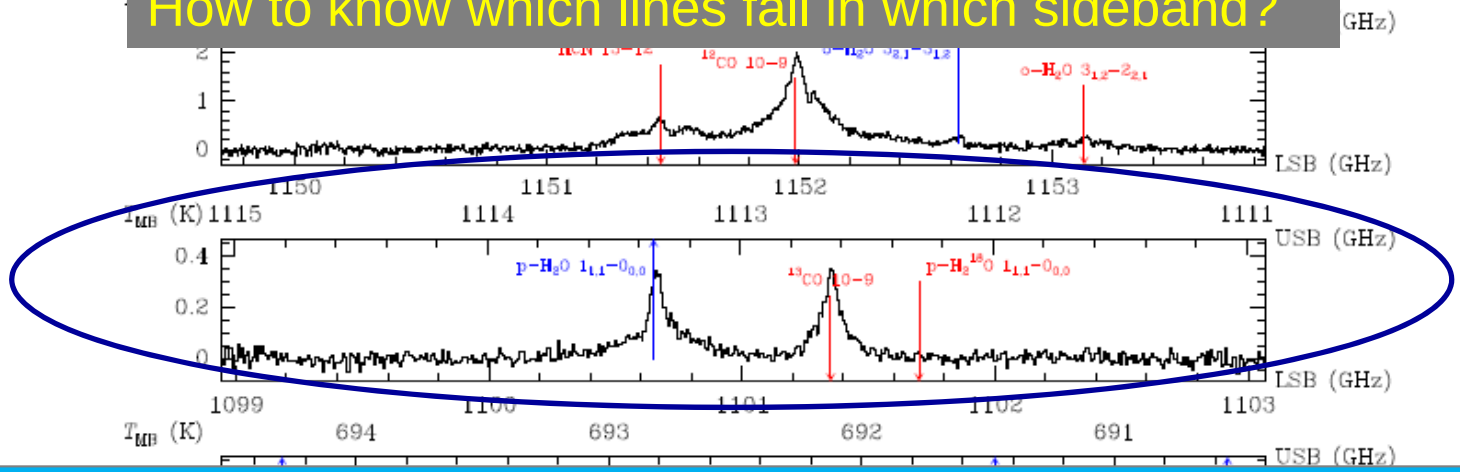
1. The Frequency Editor.
2. Visualizing AORs

Will use a mapping example, however this is generally recommended to check even fixed beam observations to see the environment and in particular where the OFFs are placed.

PPN CRL618 (5 different obsids shown)

Note broad profiles and lines from both sidebands

How to know which lines fall in which sideband?



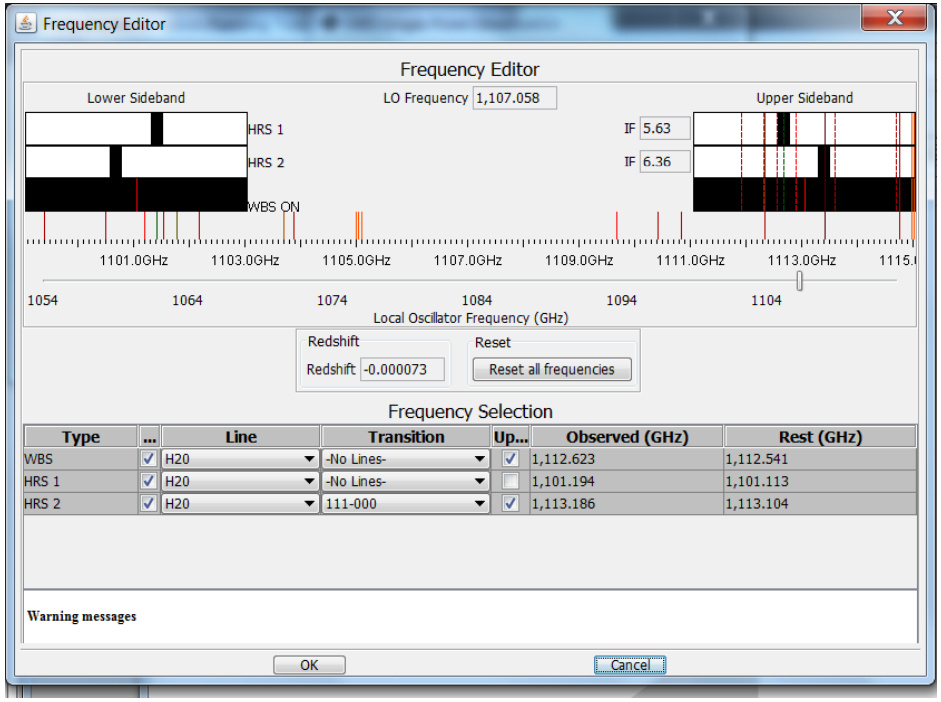
Let's use this spectrum as an example: a search for fundamental water in this target.

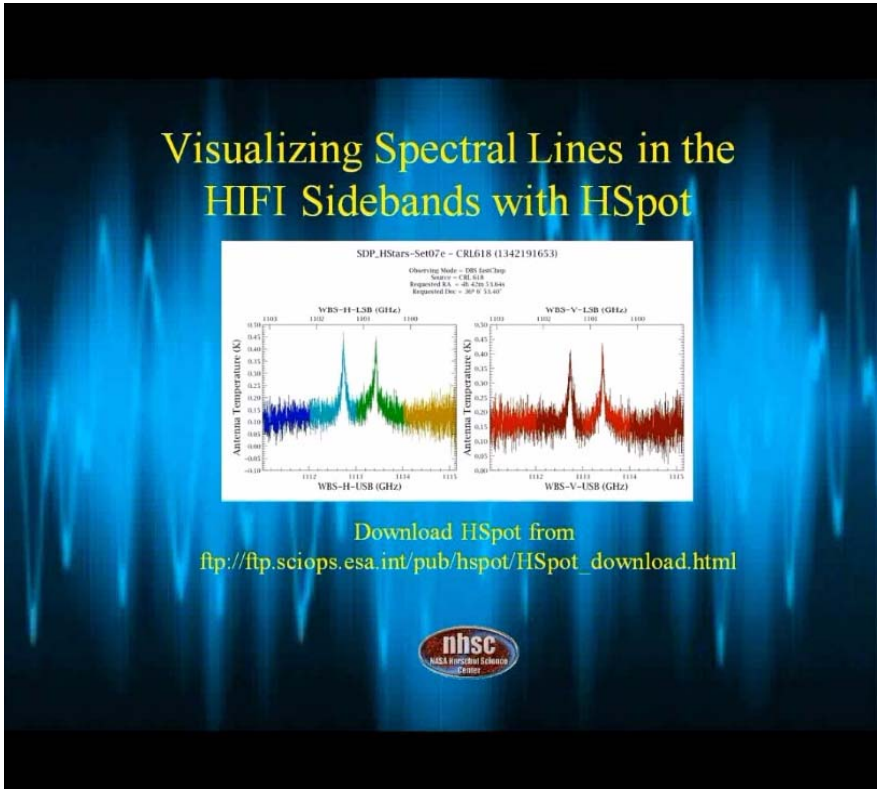
2 options:

-Search spectral line databases (JPL, CDMS, …) over USB & LSB freq. ranges, here 1099 – 1103 and 1111 – 1115 GHz, if you have a good idea of what species will be present. Searching all possibilities over 8 GHz gives huge output.

-Visualize with the HIFI Frequency Editor in HSpot.

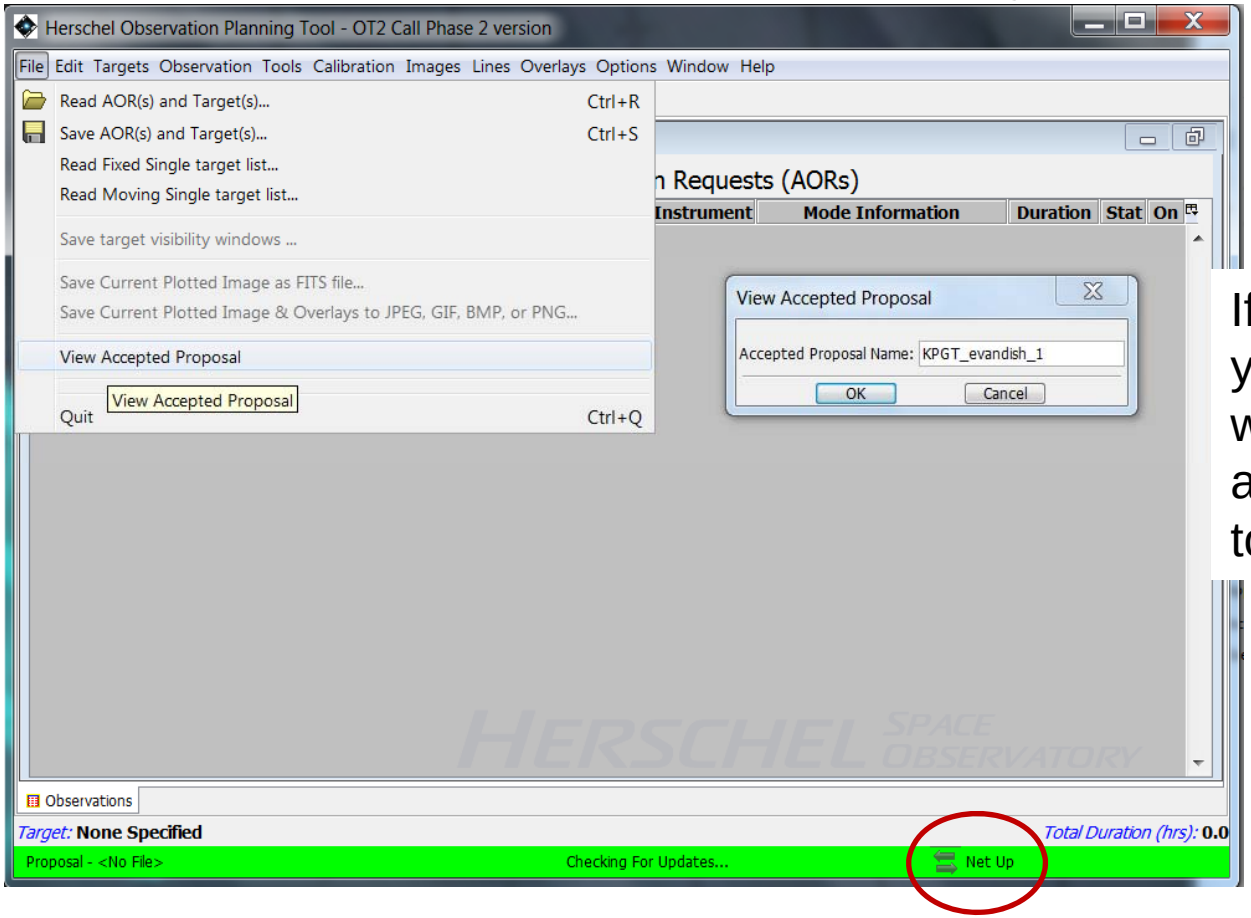
HIFI Frequency Editor





Video tutorial on the workshop wiki.

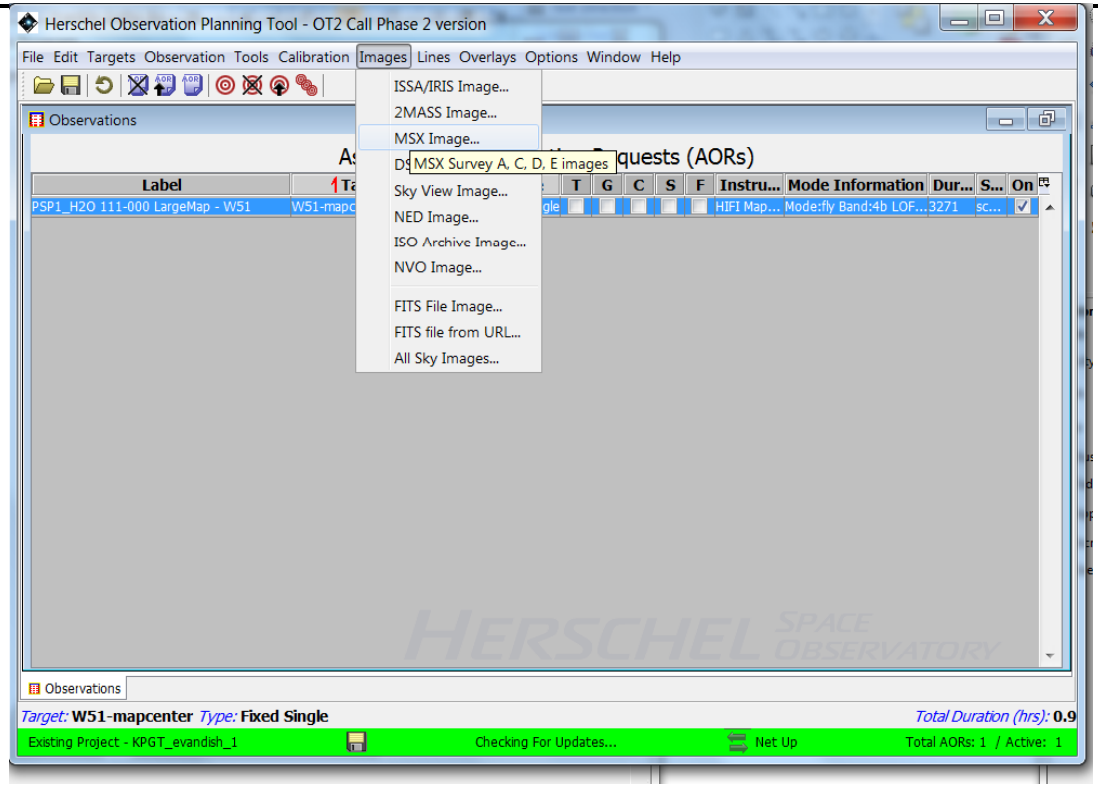
- Let's retrieve the mapping AOR corresponding to the observation we will demo later today.



If this goes correctly, you will get a pop-up with the proposal abstract and a button to "View AORs"

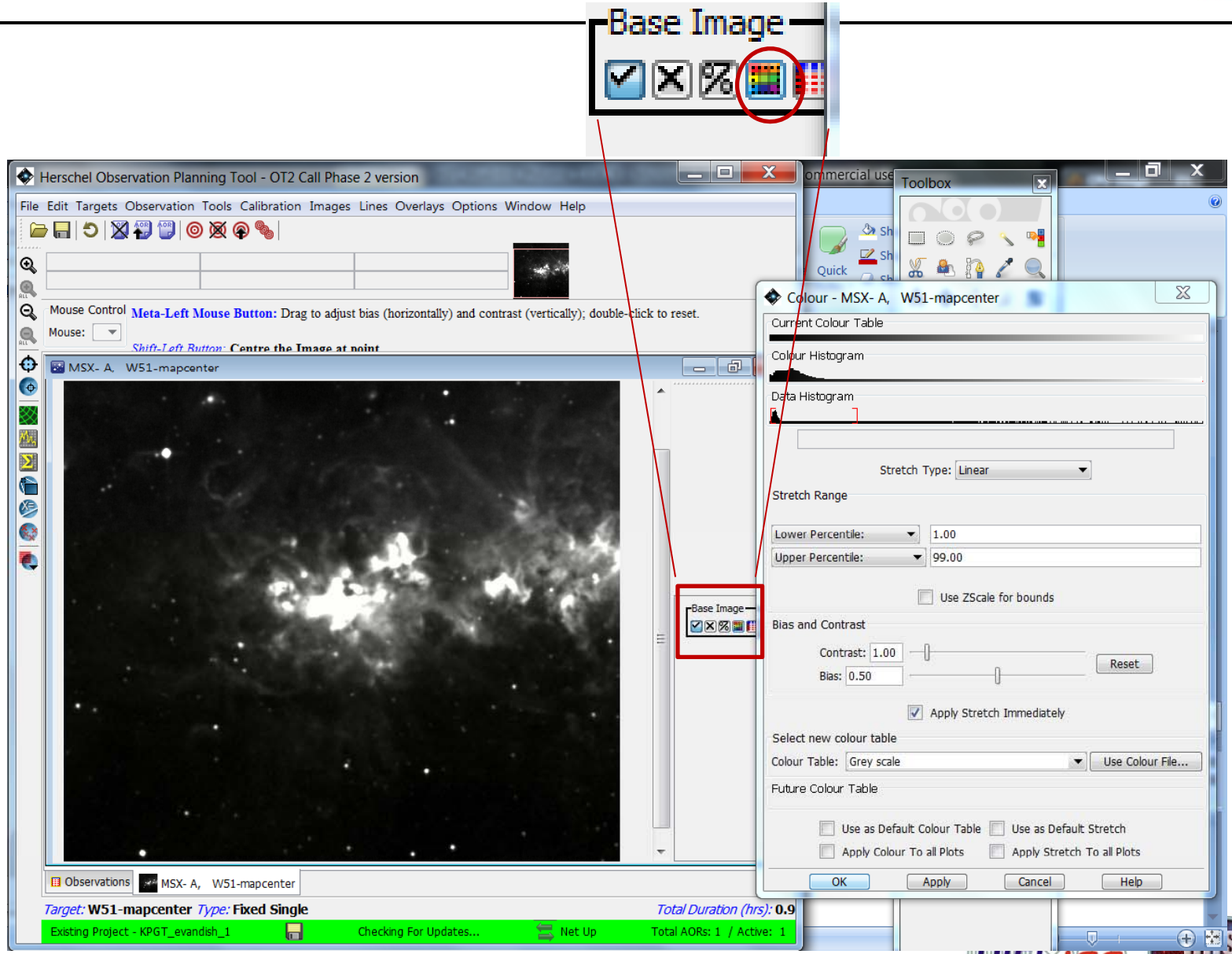
- Now follow the rest of the video tutorial to open the frequency editor and expand your spectral line list.

AOR visualization – importing images

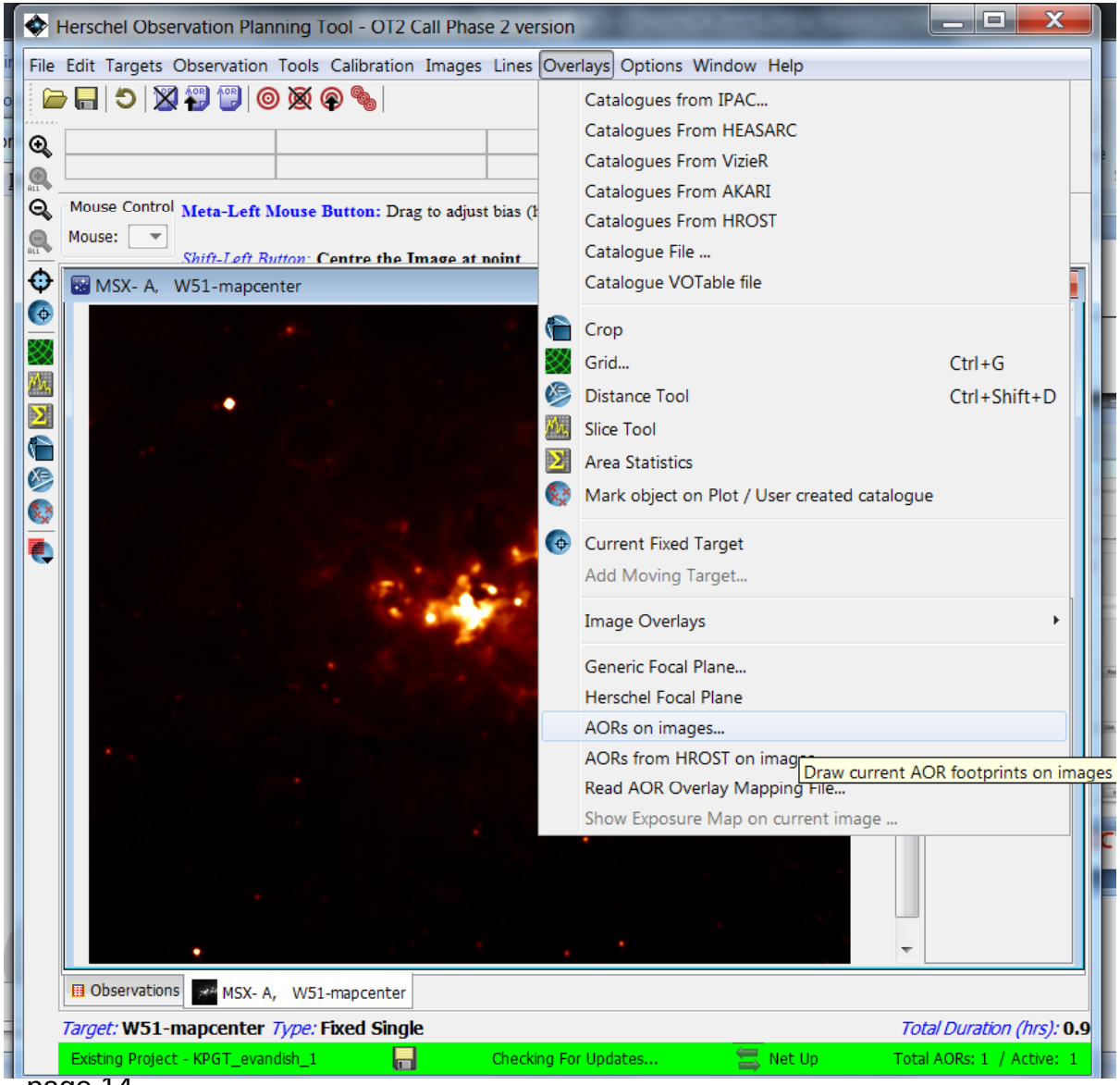


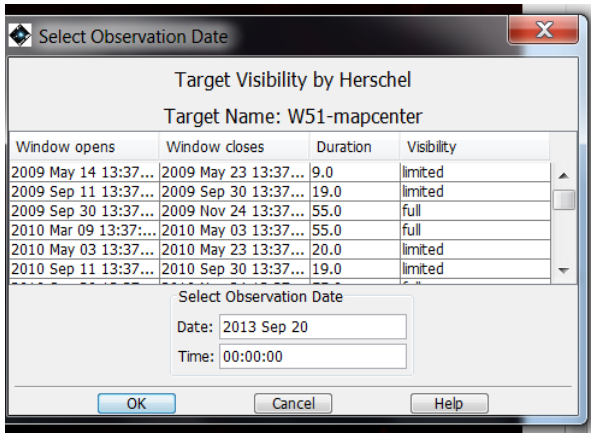
- With our AOR filtered from the full KP set of AORs, we can import an image from one of the archives to which HSpot has a connection, or one of your own.
- Select the AOR (to set the target), and we take an MSX image.

Adjusting the image colors



Adding the AOR overlay

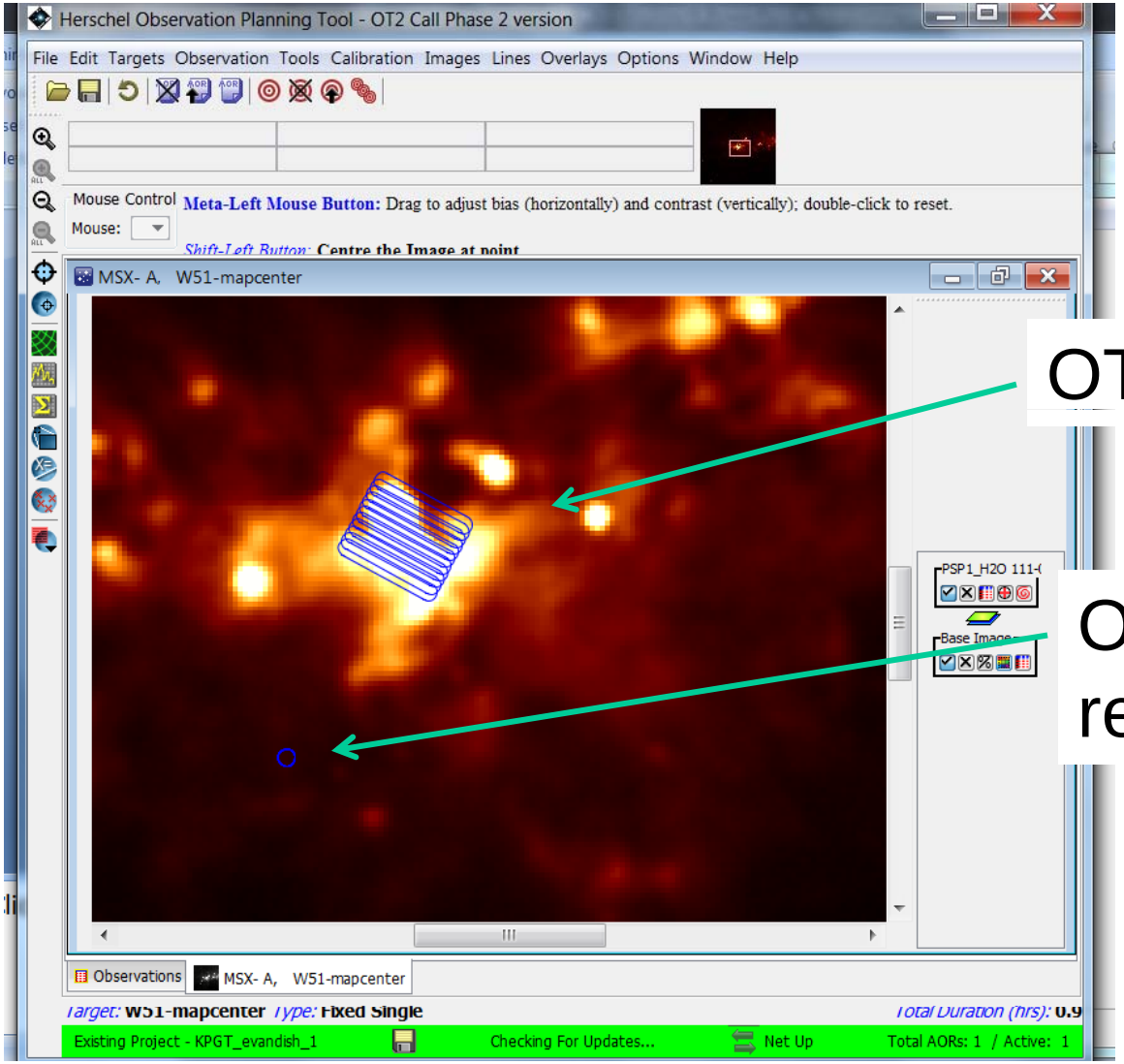




Selecting this will bring up a visibility selection window.

Enter 2010 Oct 27, and “OK”

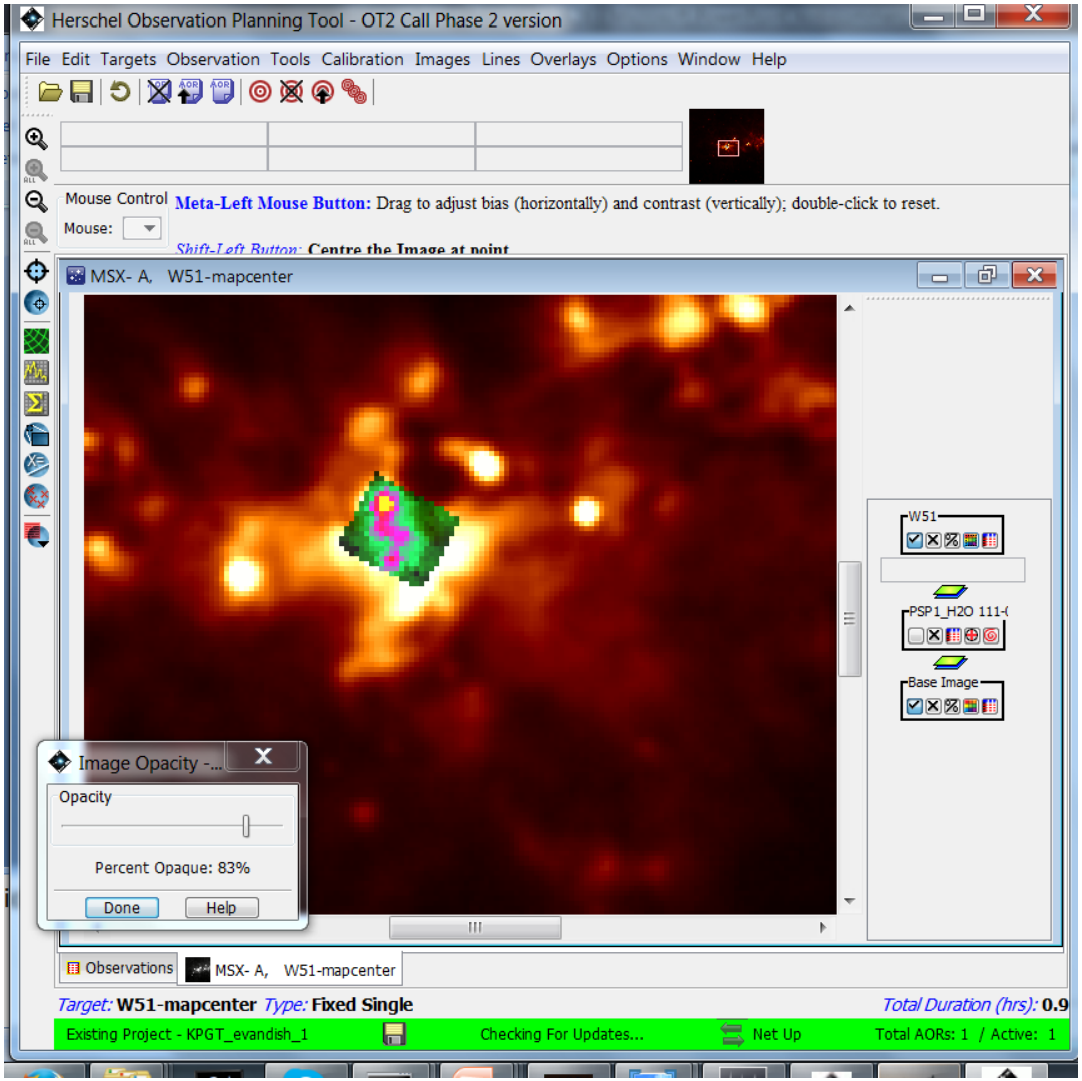
AOR over-laid



OTF Map “ON”

OTF Map “OFF” reference

More overlaying



This is the 13CO 10-9 map we will create later today, exported from HIPE to FITS, and imported using the Overlays menu.

The image can be adjusted for color, opaciity, etc.

Neat! And pretty easy.

Questions?