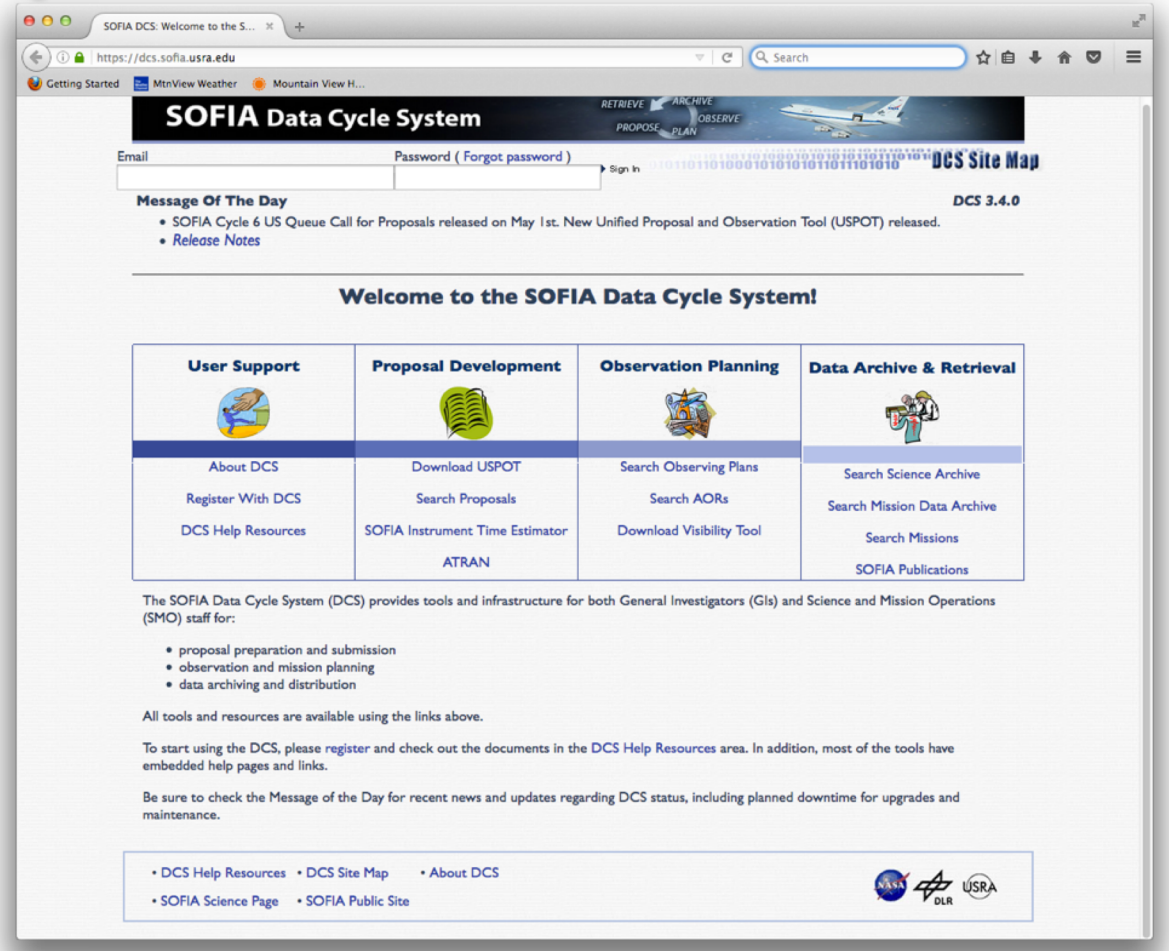
Proposal Tools

Tool gateway



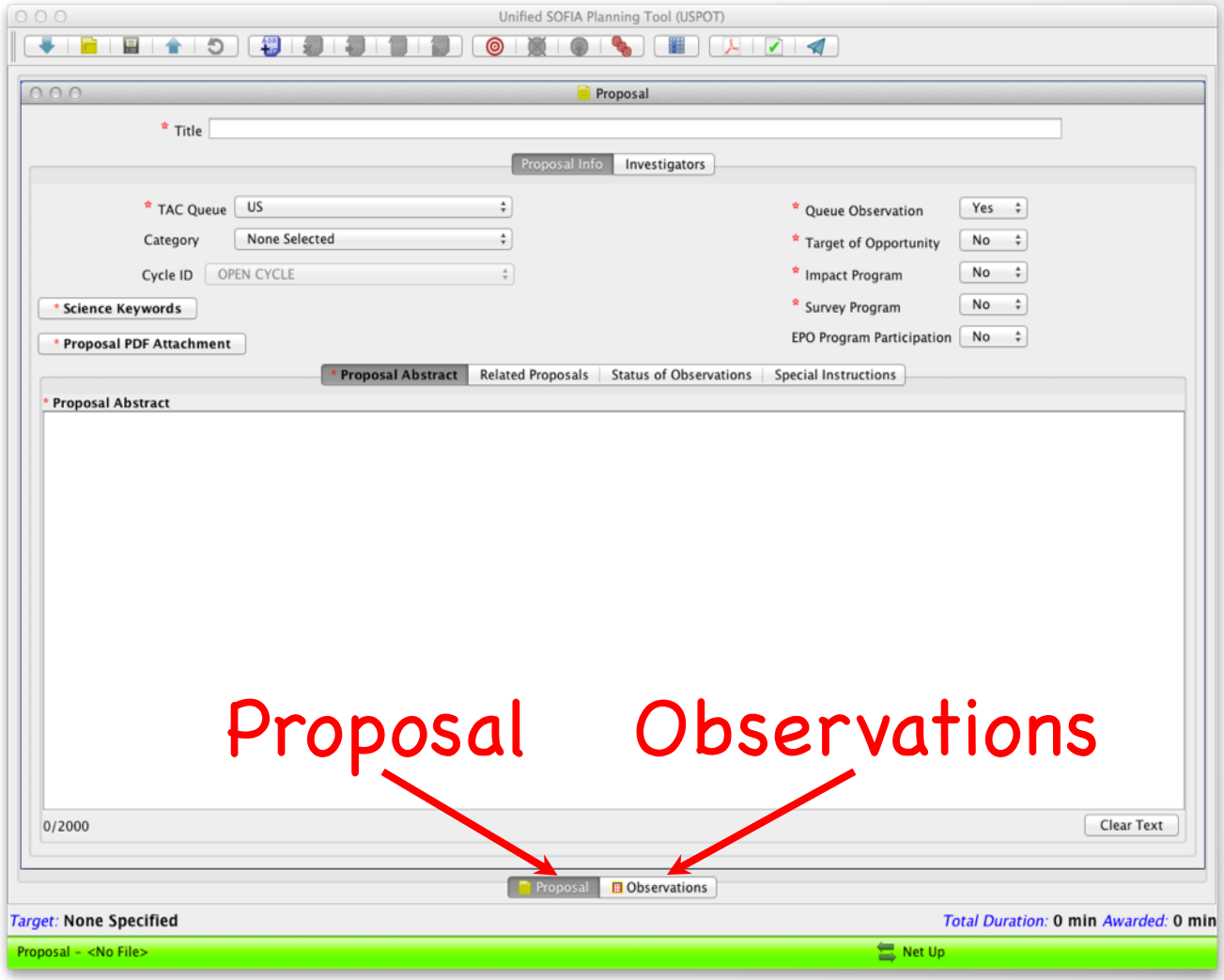
Most of the SOFIA tools are available at the SOFIA Data Cycle System site: https://dcs.arc.nasa.gov/

USPOT

The main tool for planning and submitting a proposal is USPOT, the Unified Sofia Proposal and Observation Tool.

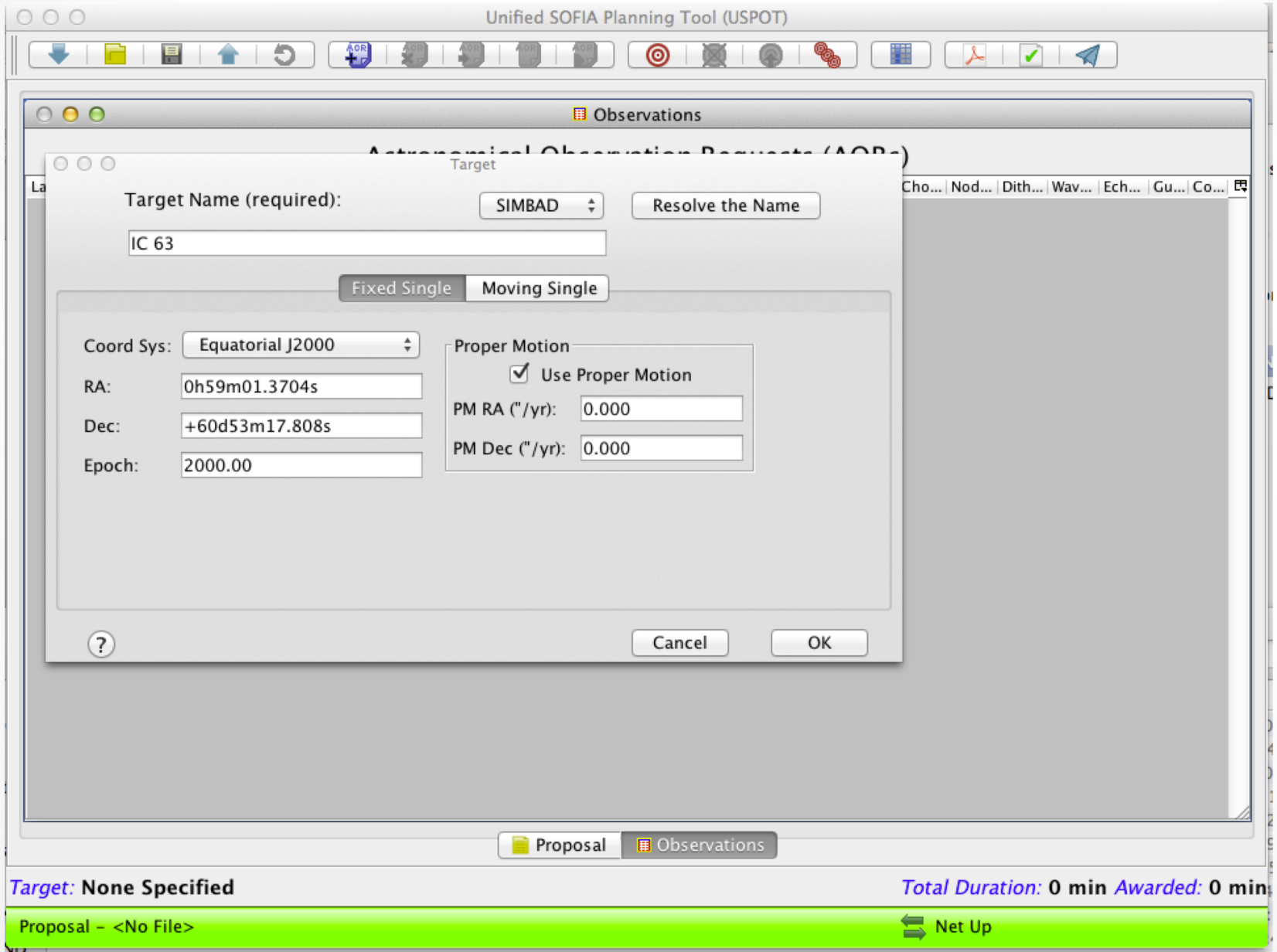
Through this tool it is possible to:

- Define targets
- Plan observations
- Overlay observations on images
- Submit a proposal



https://dcs.arc.nasa.gov/observationPlanning/installUSPOT/uspotDownload.jsp

USPOT: select a target



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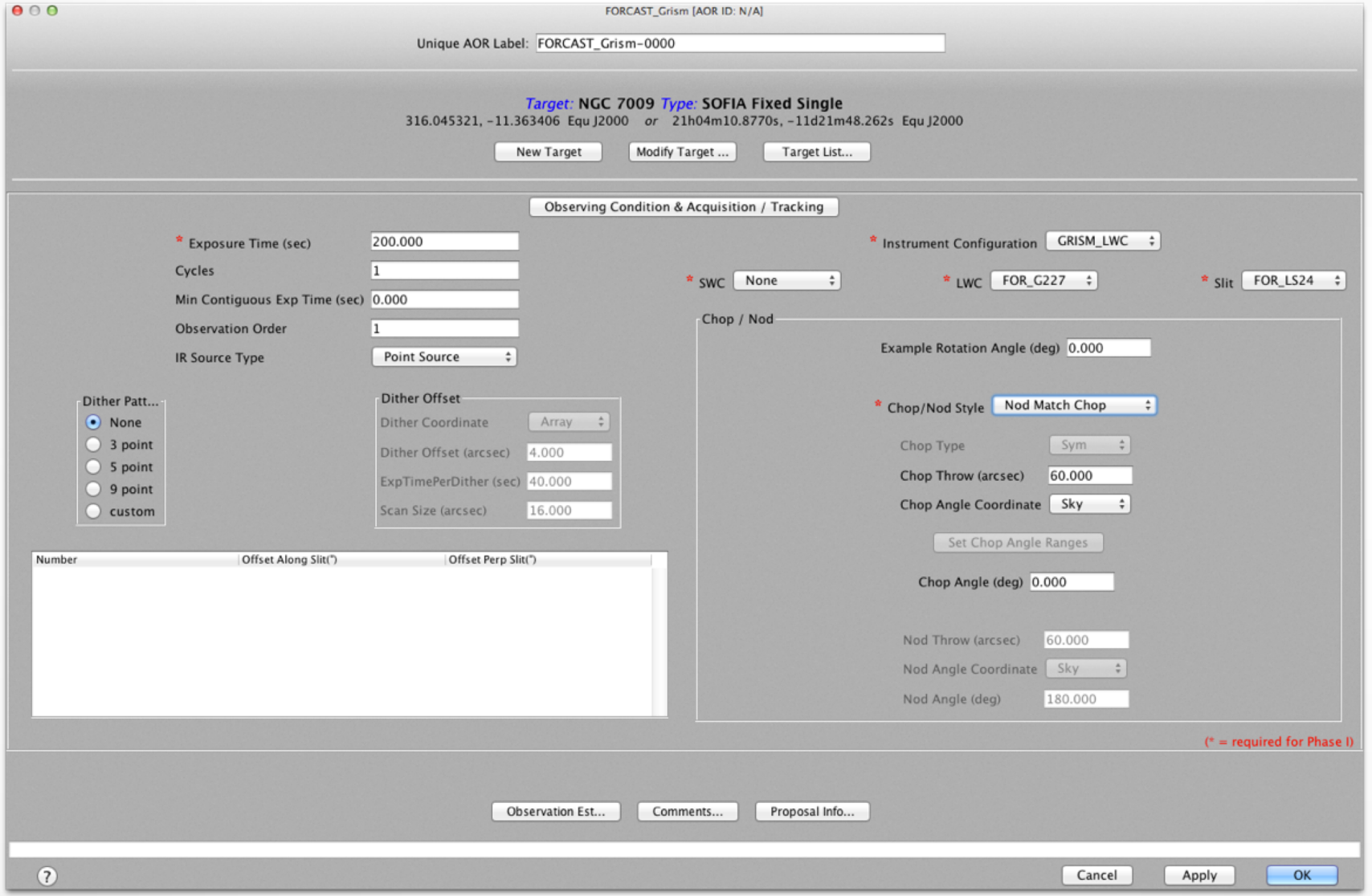
USPOT: plan an observation



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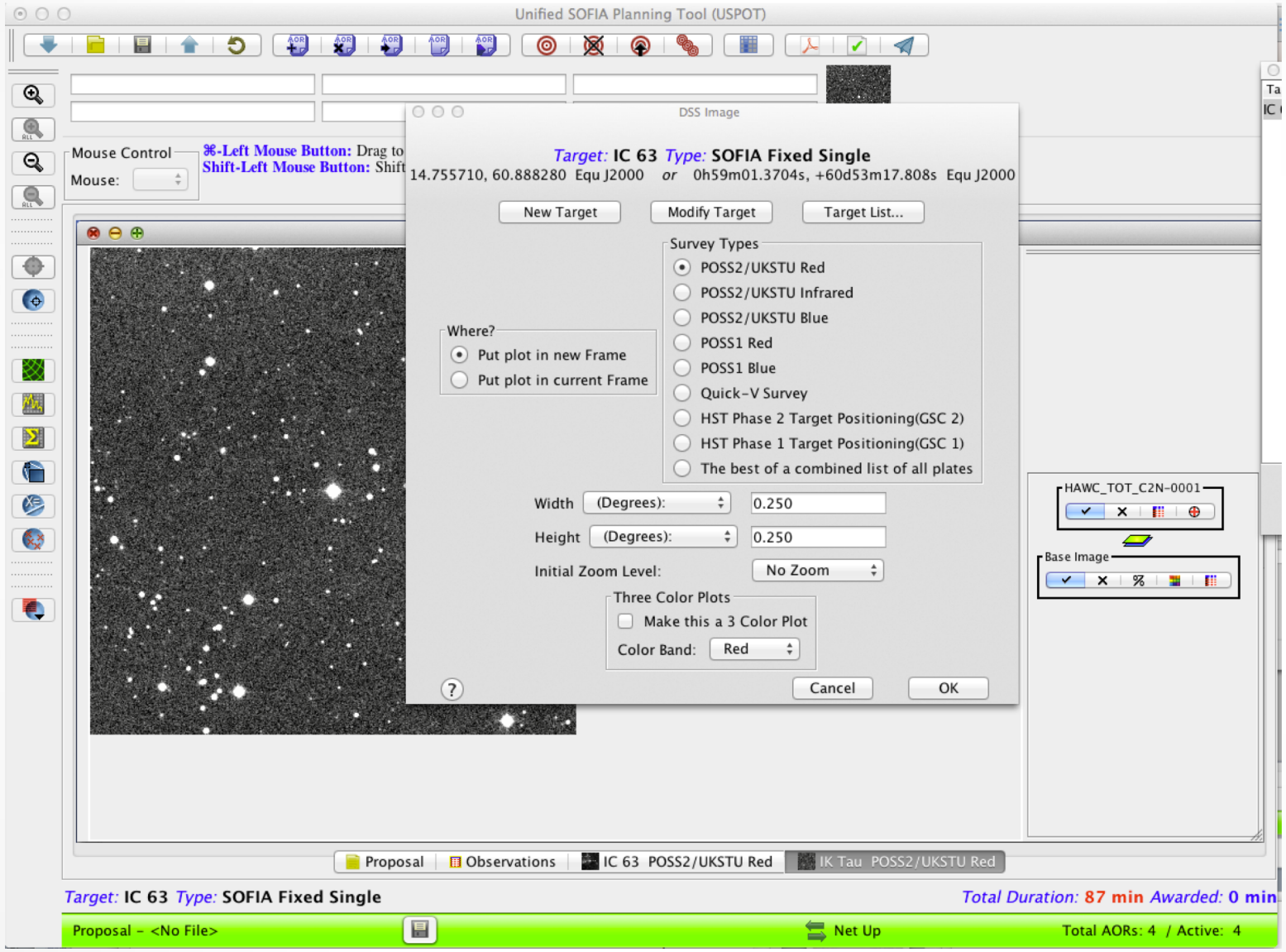
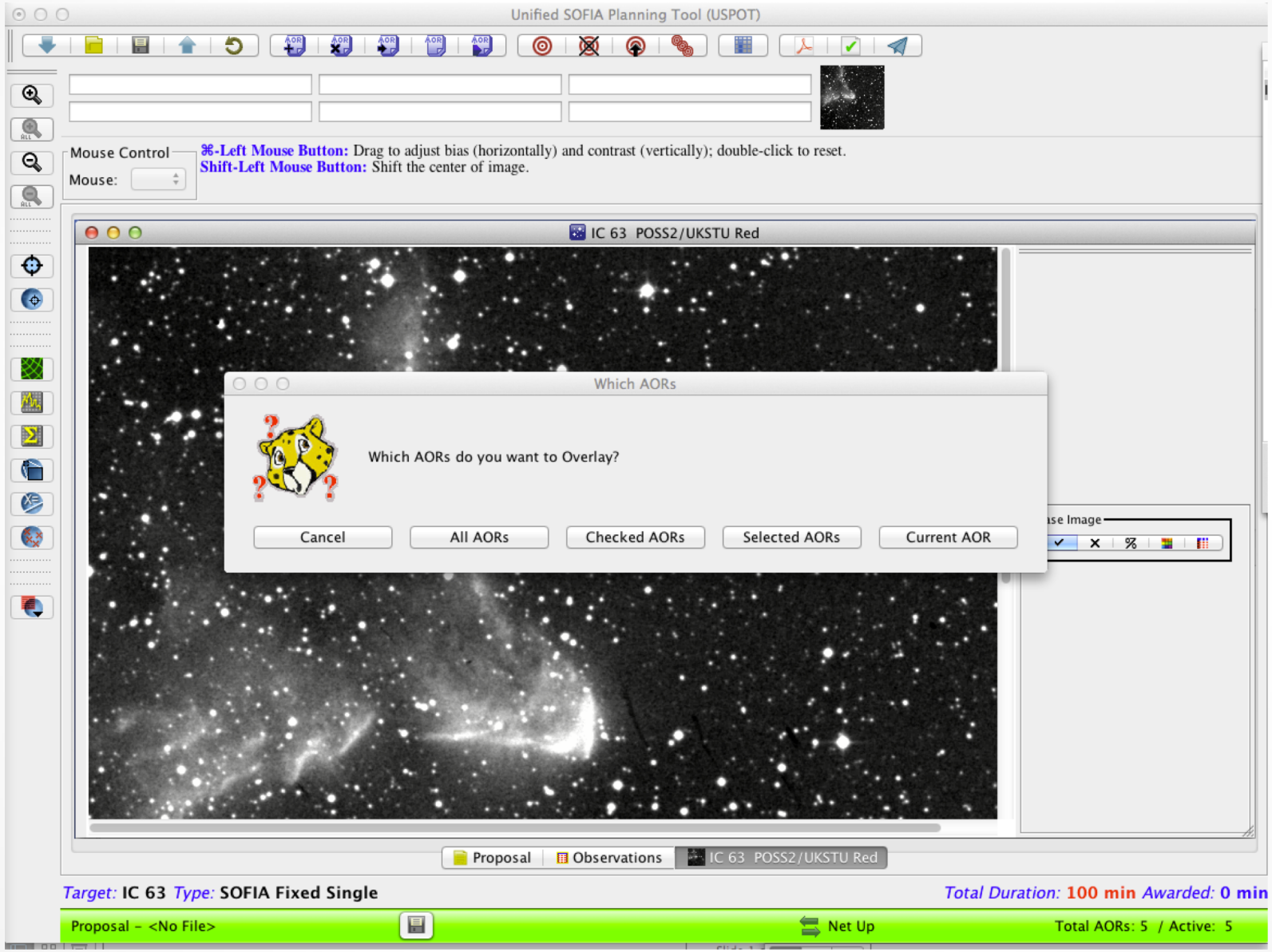
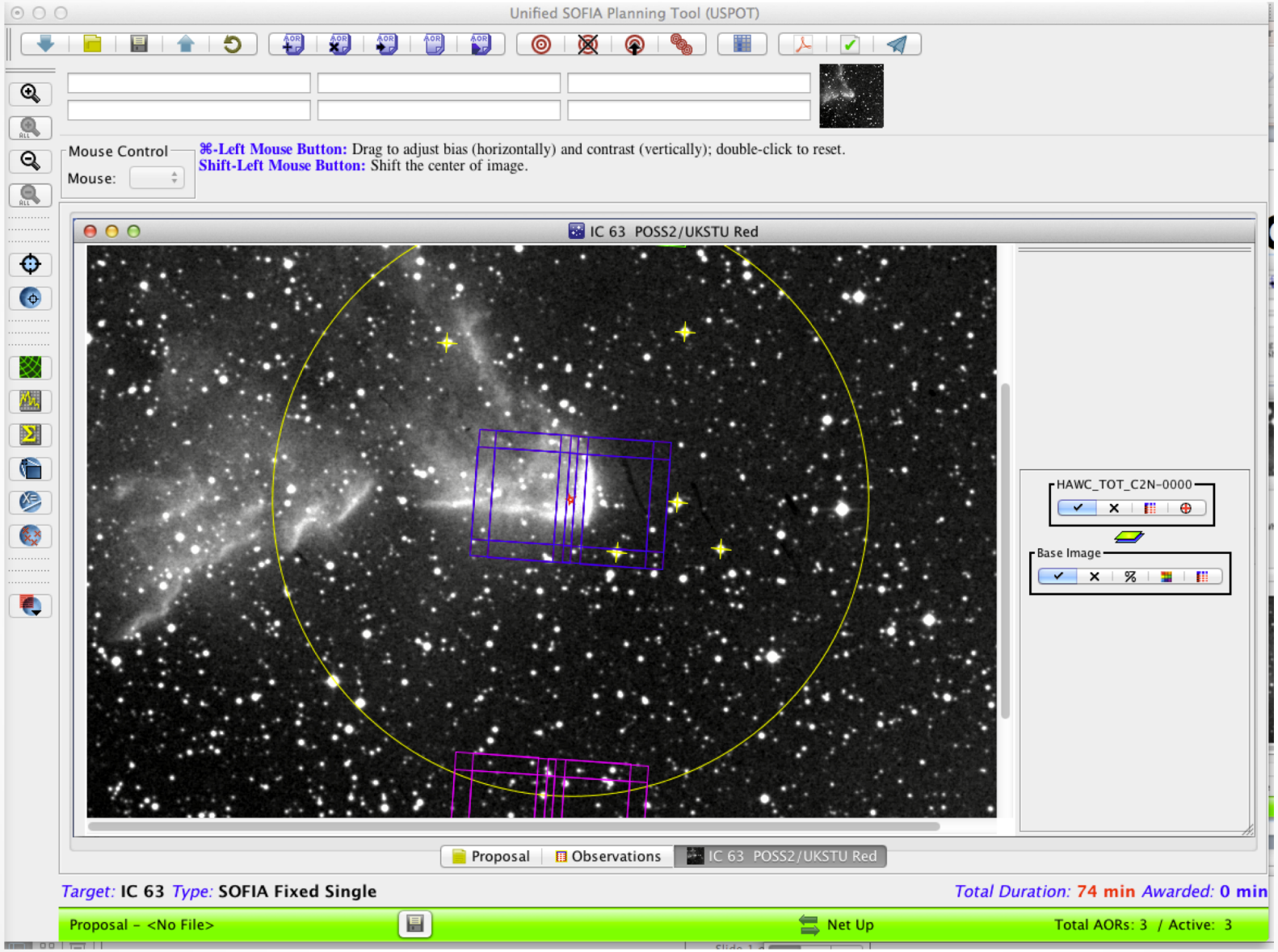
USPOT: download field from archive



USPOT: generate and overplot AOR



USPOT: footprint and guide starts

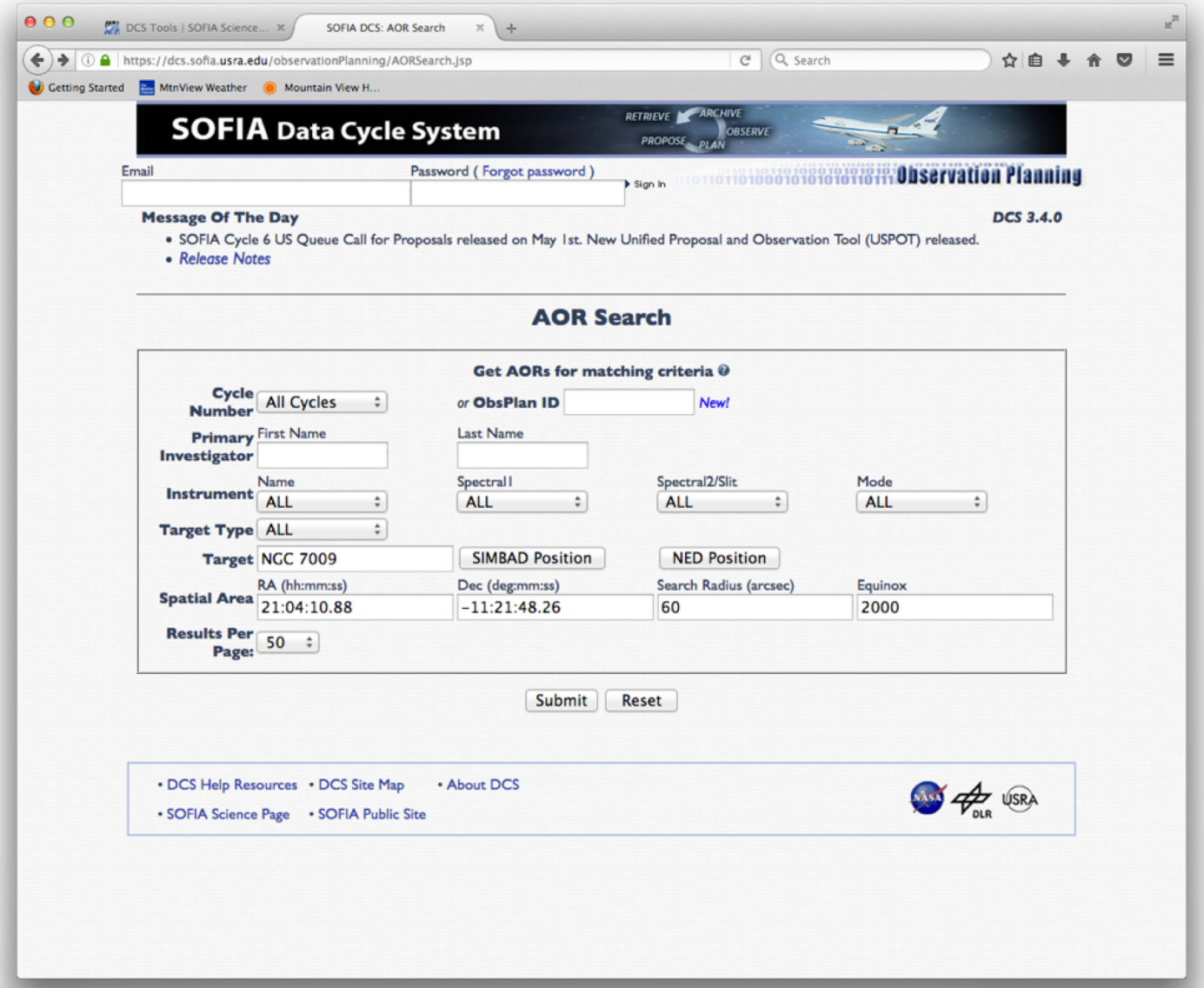


SOFIA archive

Duplication checking is done by exploring the previous SOFIA observations archived in the DCS.

To use the DCS one needs to register and sign-in.

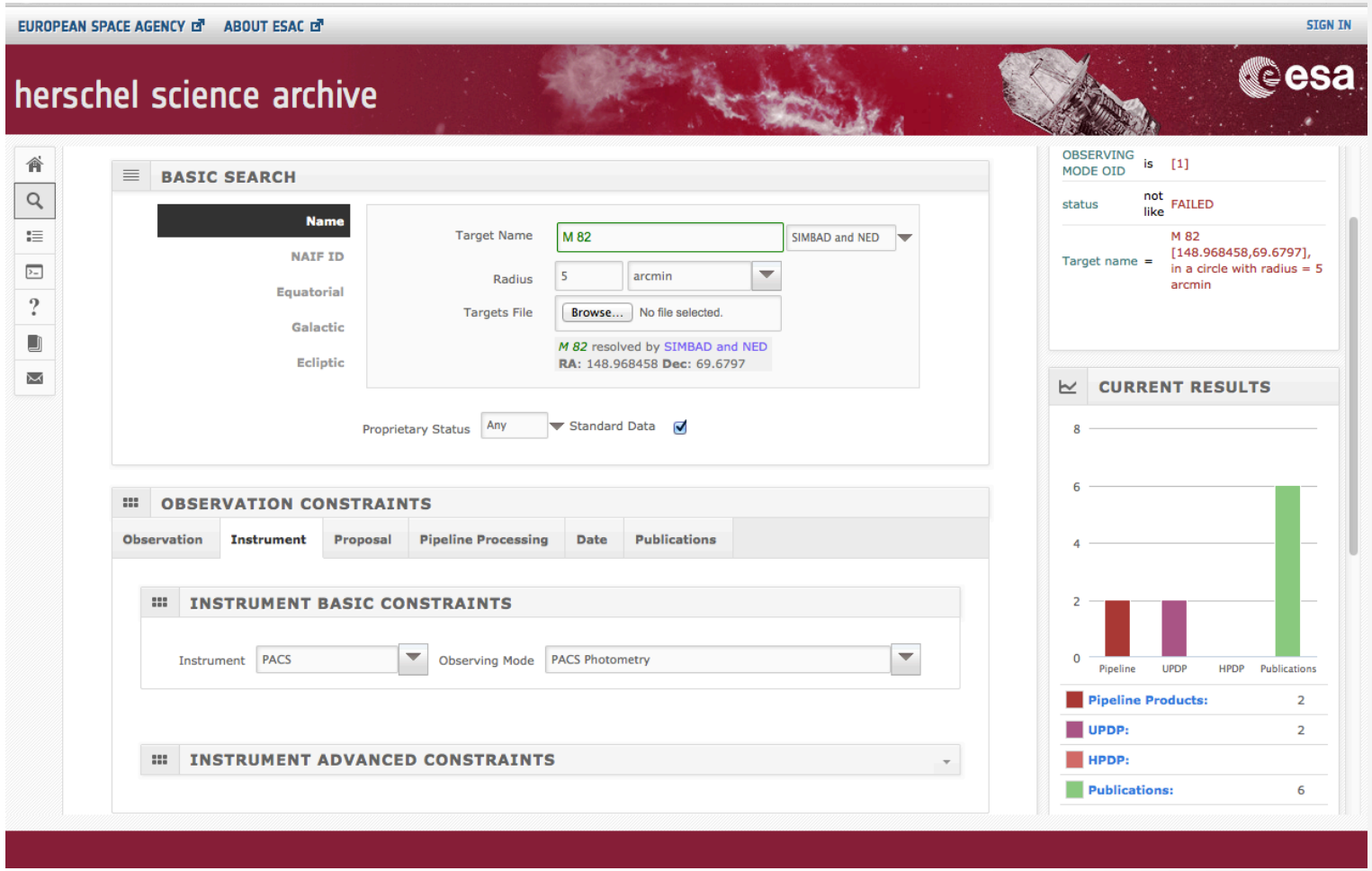
Also, the call for proposals contains a table of ROC targets (Reserved Observation Catalog).



https://dcs.arc.nasa.gov/dataRetrieval/SearchScienceArchiveInfo.jsp

Herschel archive

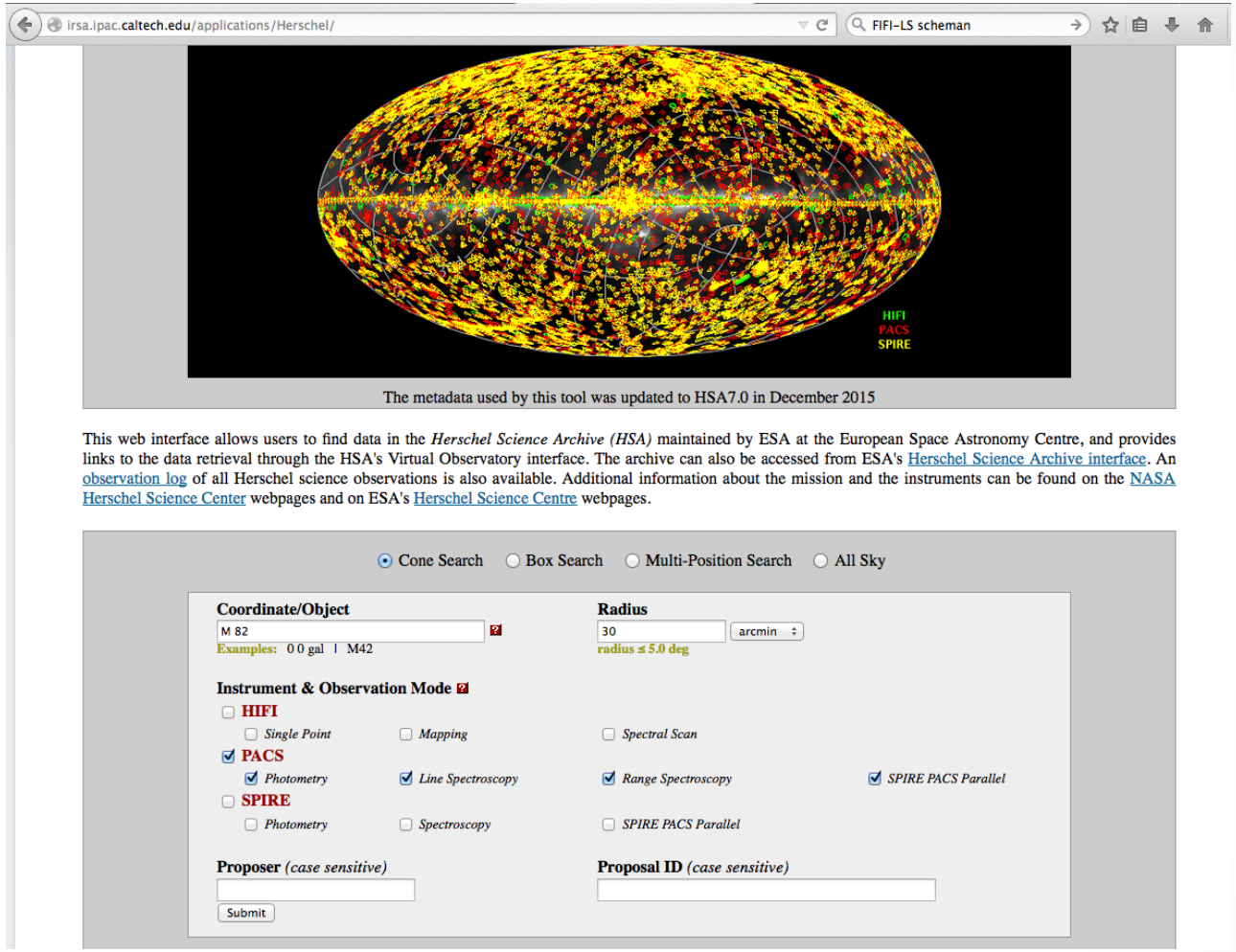
During observation planning have a look at existing Herschel observations to avoid duplications and/or obtain flux estimates.



http://archives.esac.esa.int/hsa/whsa/ - search

Herschel archive through IRSA

The Herschel archive is also available through the IRSA site.



http://irsa.ipac.caltech.edu/applications/Herschel/

ETC

- Online Exposure time calculators are available for each instrument:

Exposure Time Estimation

EXES - exposure times should be obtained from the on-line calculator for EXES observations, maintained by the Instrument PI, Matthew Richter (UC Davis).

FIFI-LS on-line time estimator.

FLITECAM imaging - on-line calculator, SITE.

FLITECAM grism observation calculator.

FORCAST imaging - on-line calculator, SITE.

FORCAST grism observation calculator.

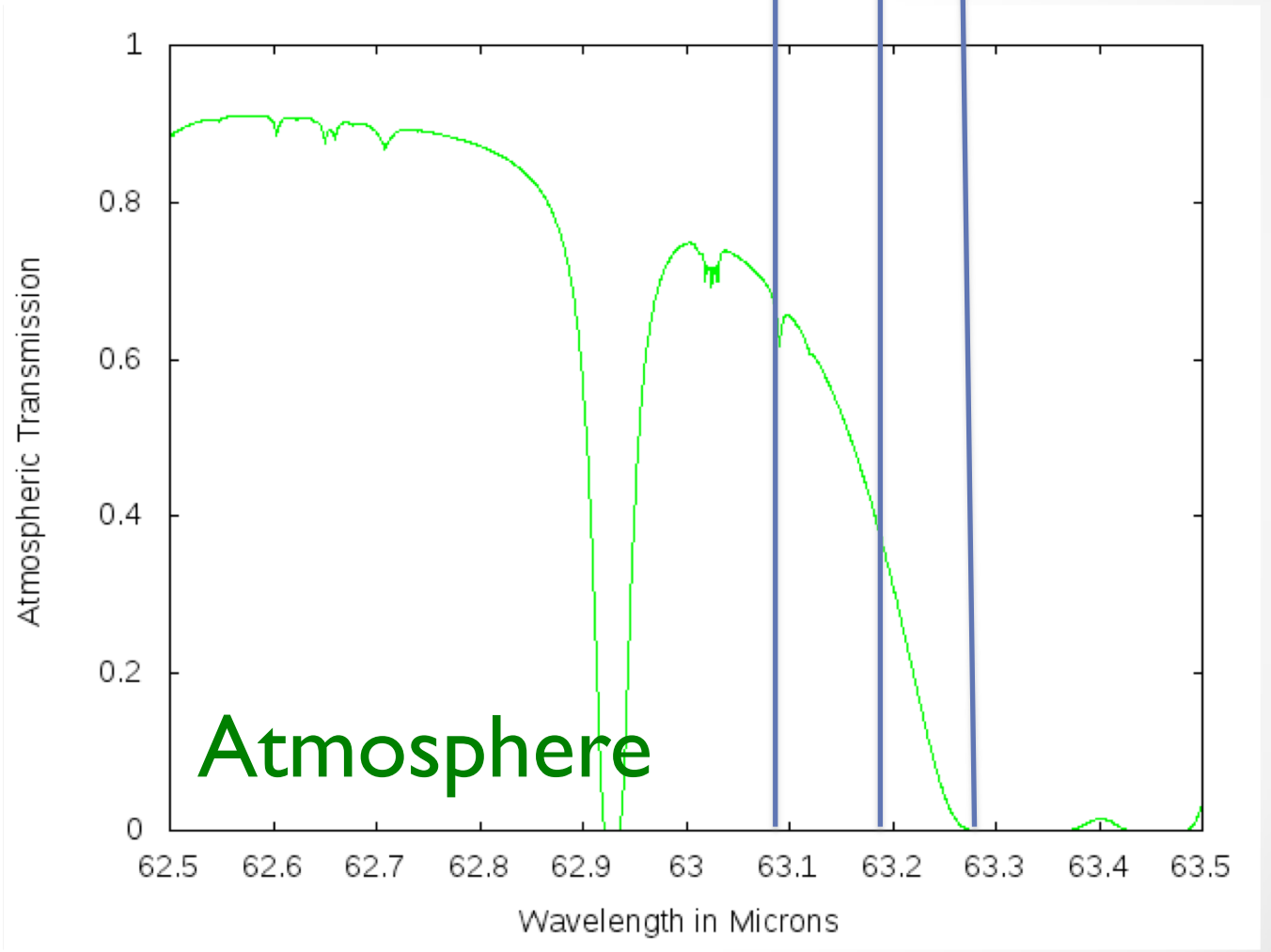
FPI+ - on-line calculator, SITE.

GREAT - exposure times should be calculated using the GREAT on-line time estimator. The calculations are based on the "Guide to observation planning with GREAT", which also contains detailed information about the instrument.

HAWC+ - on-line calculator, SITE.

ETC: sky transmission

- For spectroscopic observations, it is critical to check the atmosphere's transmission at the ***observing*** wavelength.
- For EXES, FIFI-LS, and GREAT the Earth's orbital velocity may be important and is included in the time estimators.



ATRAN

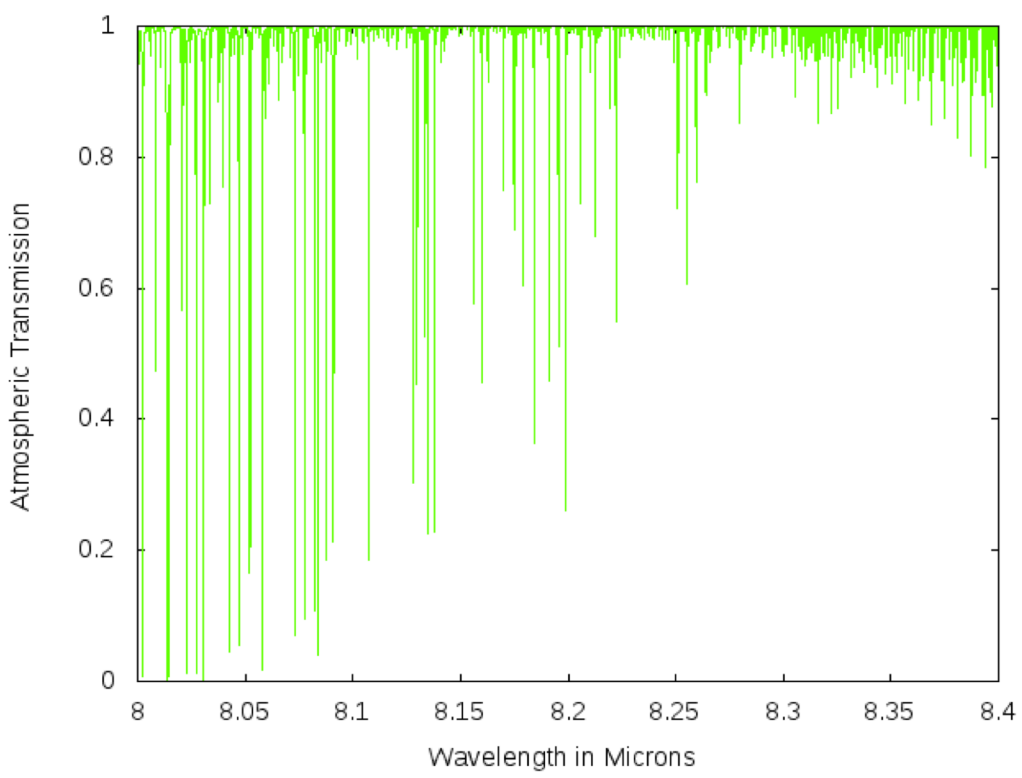
https://atran.arc.nasa.gov/cgi-bin/atran/atran.cgi

- The atmospheric transmission as a function of wavelength may be obtained using the on-line tool ATRAN developed and kindly provided to the SOFIA program by Steve Lord: mailto:sdlord2007@gmail.com
- The use of ATRAN is ***necessary*** for planning SOFIA high-resolution spectroscopic observations.
- Also for medium resolution spectroscopy – e.g. FIFI-LS observations of [O I], the Doppler shift of atmospheric lines can have significant impacts on the sensitivity
- For spectral regions clear also from the ground (e.g. l=10-13mm), very strong motivation must be provided for using e.g. SOFIA/EXES instead of Gemini/TEXES

ATRAN

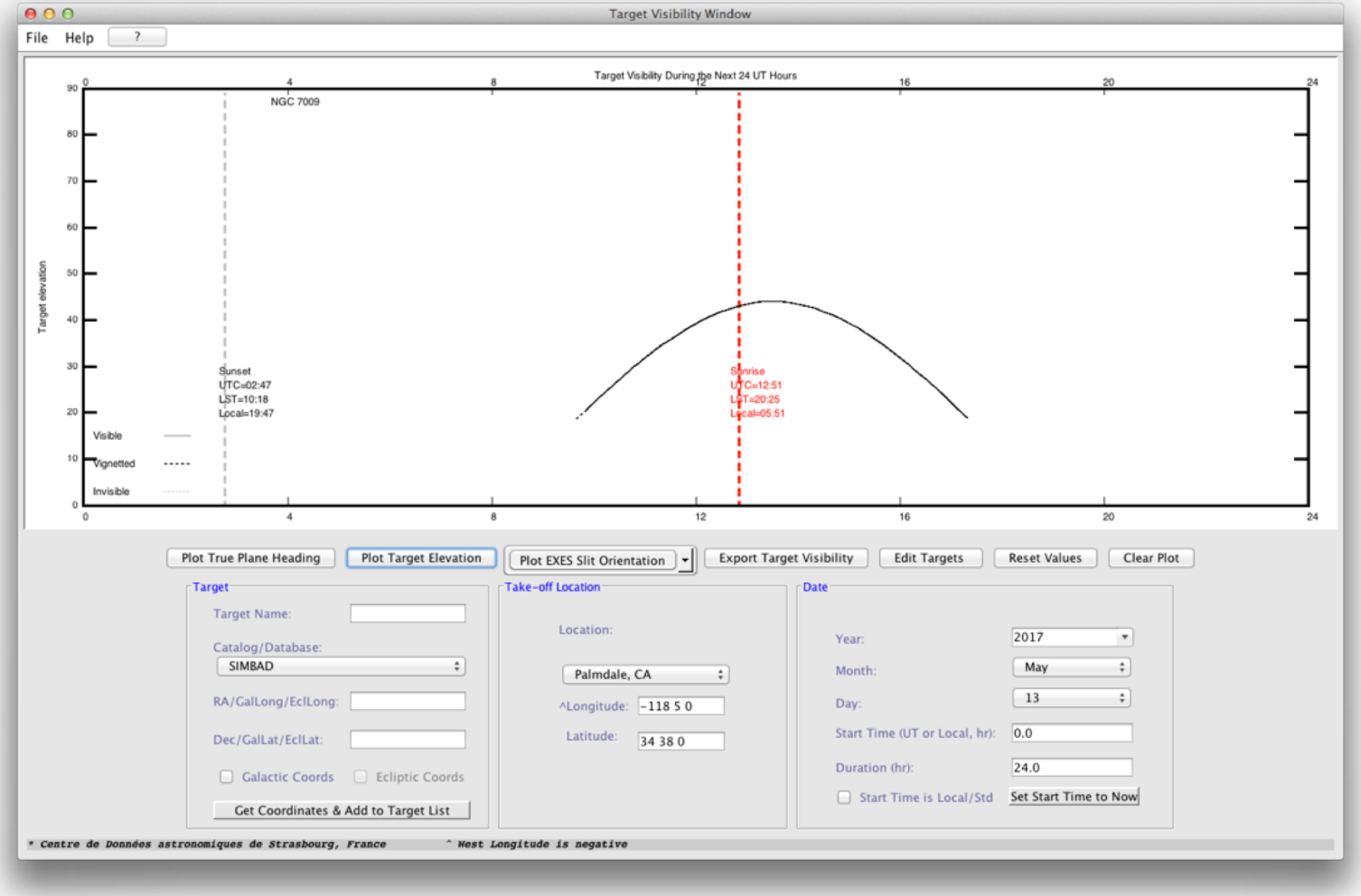
Input Parameters

Give the **Observatory Altitude** (in feet; < 60000 ft): 43000
Choose the closest value of the **Observatory Latitude**: 39 deg
Give the desired **Water Vapor Overburden** (in microns; 0 if unknown): 0
Choose the **Number of Atmospheric Layers** (usually 2): 2
Give the **Zenith Angle** of Observations (between 0 and 90 deg):
Give the desired **Wavelength Range** (min and max in microns; min > 0.85): 8.0 - 8.4
Give the **Resolution R** for Smoothing (0 = No Smoothing):
Comments for the plot :



Model of the atmosphere can be obtained by specifying the altitude, the zenith angle of observation, the water vapor burden, and the instrumental resolution.

VT (visibility tool)



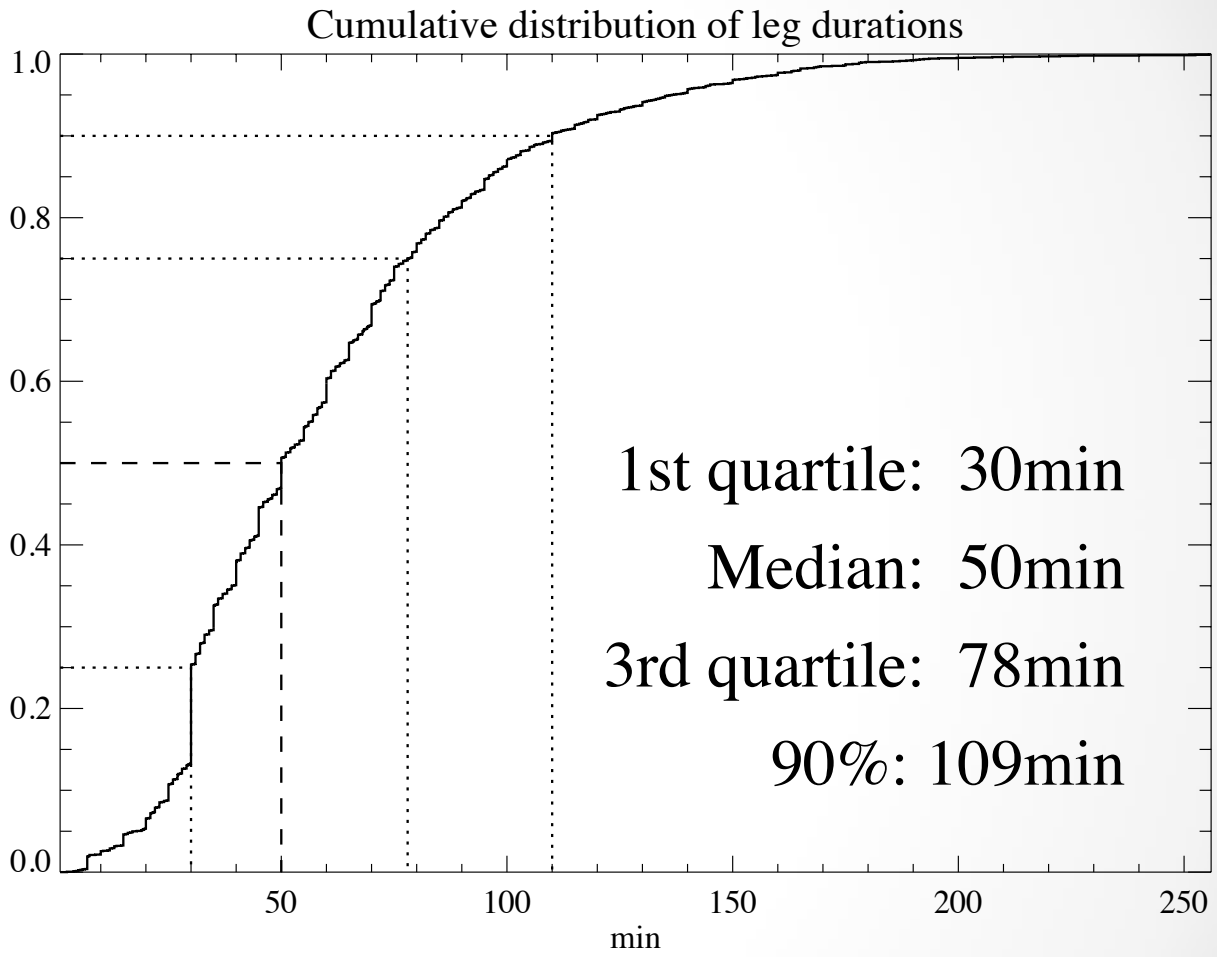
Target visibility, as well as the direction of the plane to observe the target, can be checked through the visibility tool: https://dcs.arc.nasa.gov/observationPlanning/installVT/

Tips & tricks: leg duration

When planning an observation it is good to know that it will be performed in legs.

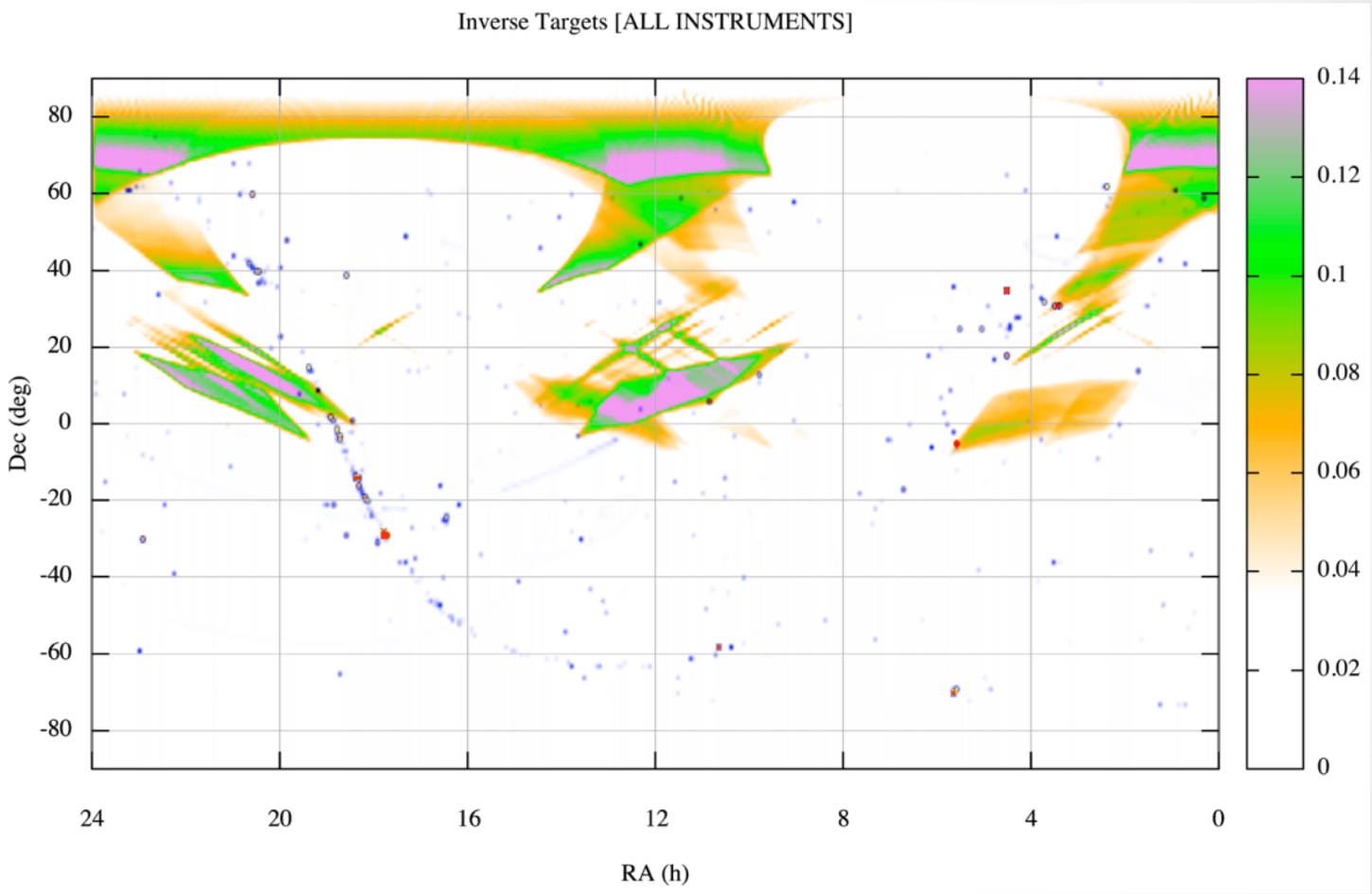
- 75% of scheduled legs are <80 min.

Requiring a very long leg complicates flight planning/scheduling and reduces the probability of the target being observed.



Tips & tricks: complementary sky positions

- Because some sky positions are more popular, there is a need for targets in ***complementary positions*** in order to maximize observing time during a flight.
- A map of the sky showing the most desired complementary positions is available on the SOFIA site.
- ***These targets will have a high probability of being scheduled even if graded with priority 3.***



https://www.sofia.usra.edu/science/proposing-and-observing/proposal-calls/cycle-6/complementary-sky-positions-cycle-6

SOSPEX - cube visualization

To display archival spectral cubes from FIFI-LS, GREAT, and PACS it is possible to use a new user-friendly Python GUI:

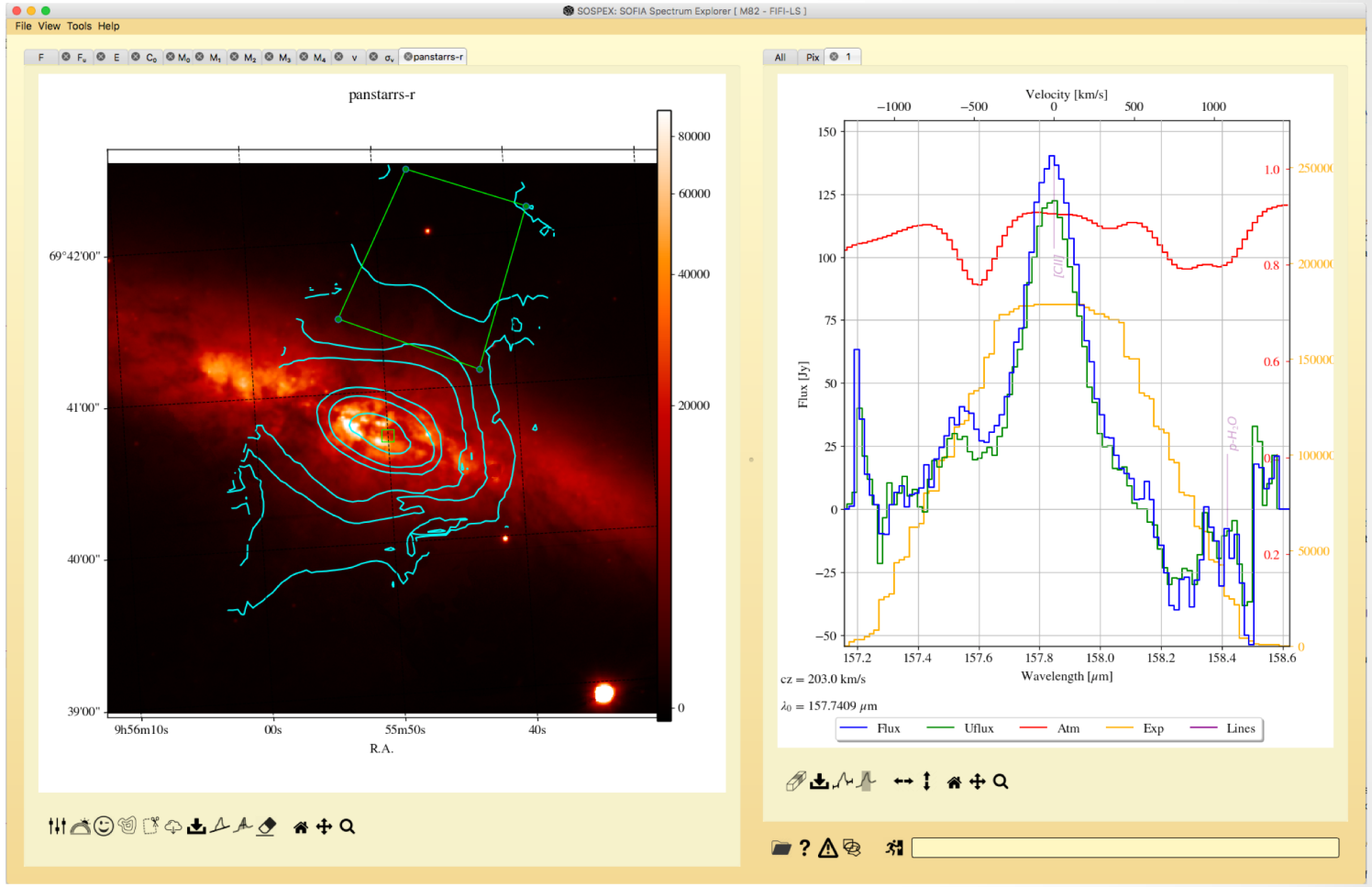
SOfia SPectral Explorer

The software can be installed via the anaconda installer:

```
conda install –c darioflute sospex
```

Capabilities:

- Navigate cube planes and spectra through tabs
- Allow cube manipulations (cut/crop)
- Compute continuum and moments across cubes
- Extract flux in custom apertures
- Export/import defined apertures
- Download images from web archives
- Overlap contours on other images



M82 outflow observed with FIFI-LS overplotted on optical image

https://github.com/darioflute/sospex/blob/master/README.md

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