SOFIA Observation Tools

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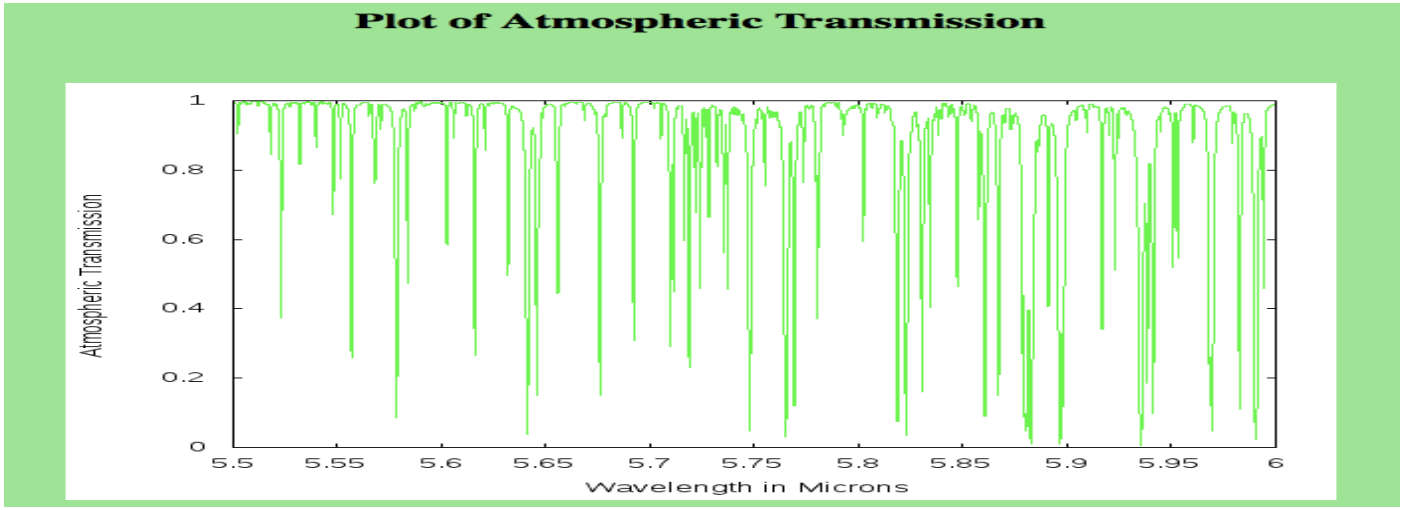
SOFIA/USRA, Support Scientist

[thanks to Ravi Sankrit, SOFIA User Support Lead]



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1. Generating the Science Ideas

Resources available on our Science webpages:

- Links to publications: https://www.sofia.usra.edu/Science/meetings-and-publications/sofia-publications
- SOFIA Community Teletalks archive: https://www.sofia.usra.edu/Science/meetings-and-publications/events (select past teletalks)
- Workshops, Splinter Sessions presentations: https://www.sofia.usra.edu/Science/meetings-and-publications/events (left column)
- The Science Vision document: https://www.sofia.usra.edu/sites/default/files/SofiaScienceVision051809-1.pdf
- Instrument flyers, accessible from each page at: https://www.sofia.usra.edu/Science/instruments

2. Two-Phase Process

Phase I:

- proposals contain scientific justification and feasibility analysis
- SPT submission tools requires minimal technical parameters
- proposals undergo technical and scientific review

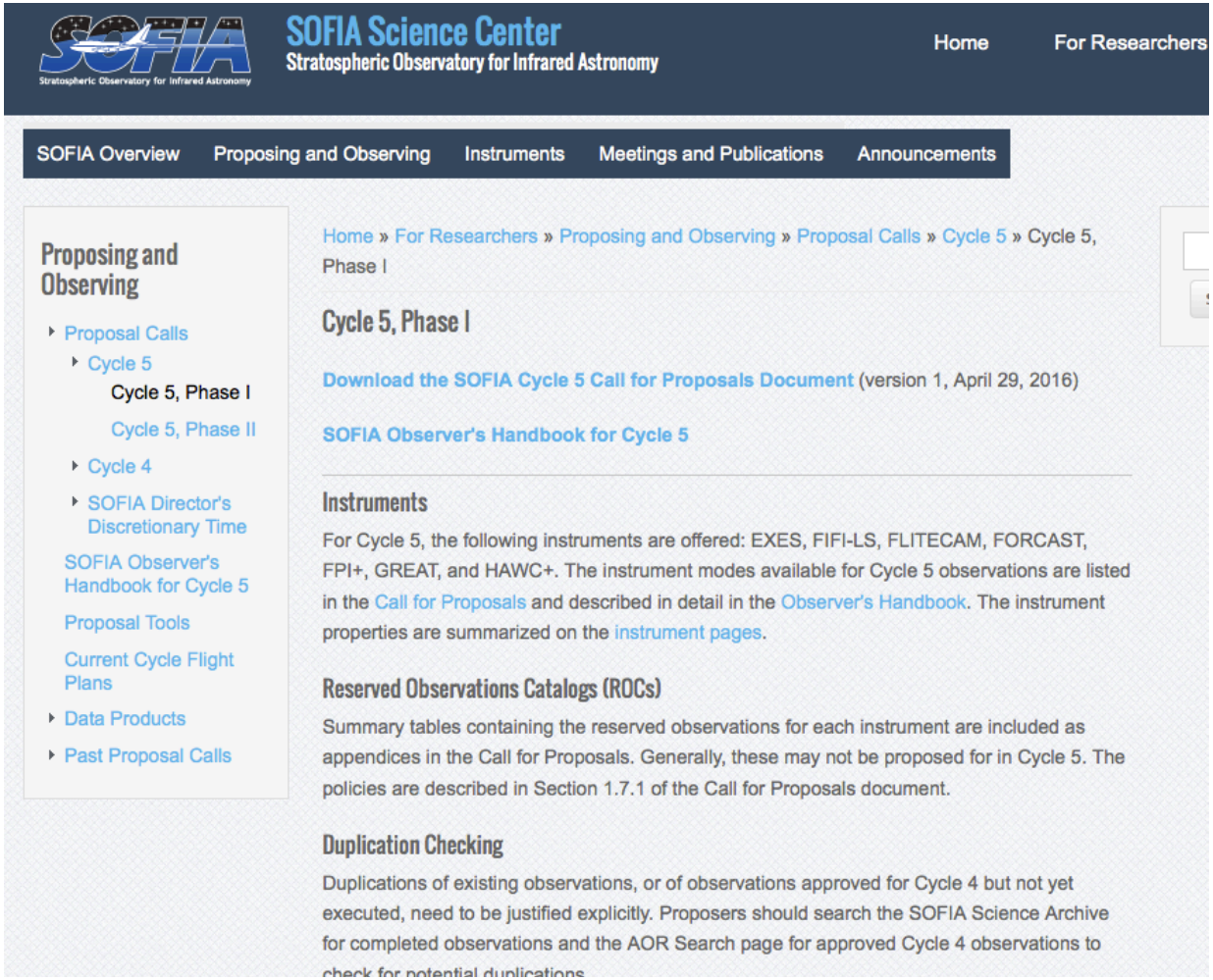
Phase II :

- Each successful proposal is assigned a support scientist, who helps the PI prepare the detailed observing set-up for each of the targets, using the SSPOT tool.
- Submission consists primarily of a set of "Astronomical Observation Requests" (AORs) that are planned and implemented.

This workshop focuses on the Phase I proposal preparation!

2. Two-Phase Process: Webpage

https://www.sofia.usra.edu/Science/proposing-and-observing/proposal-calls/cycle-5/cycle-5-phase-i



3. Checking Existing and Planned Observations

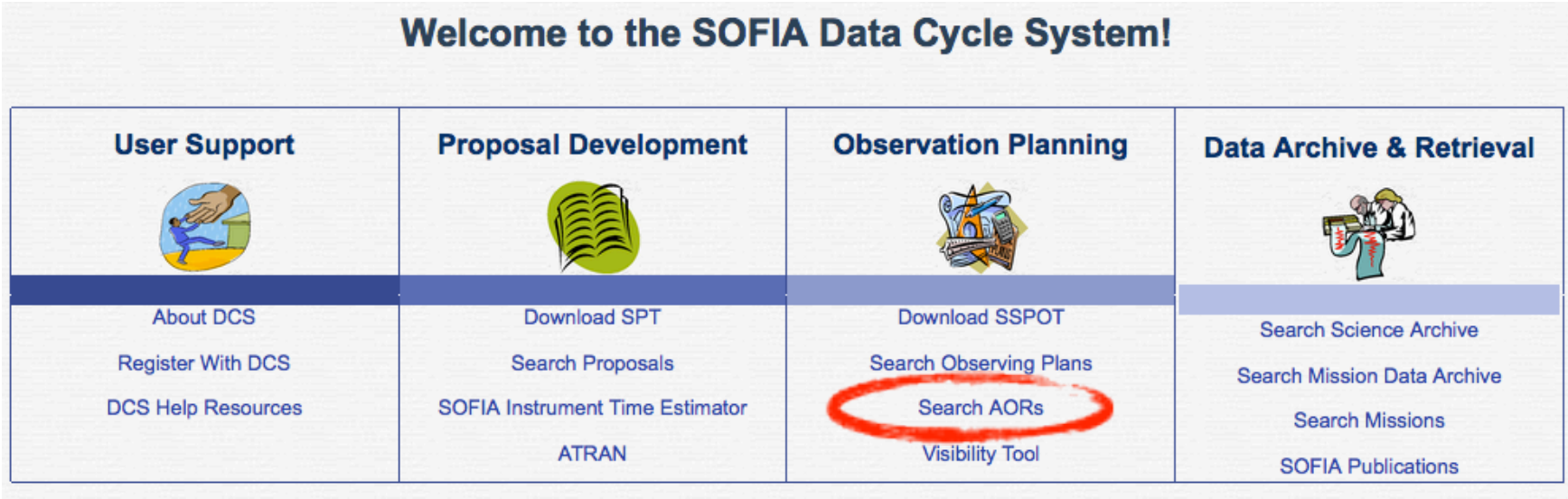
Reserved observations in Call for Proposals document: https://www.sofia.usra.edu/sites/default/files/SOFIA_Cy5_CfP.pdf

Appendix A1 - GREAT Cycle 5 Reserved Observations Catalog (ROC)

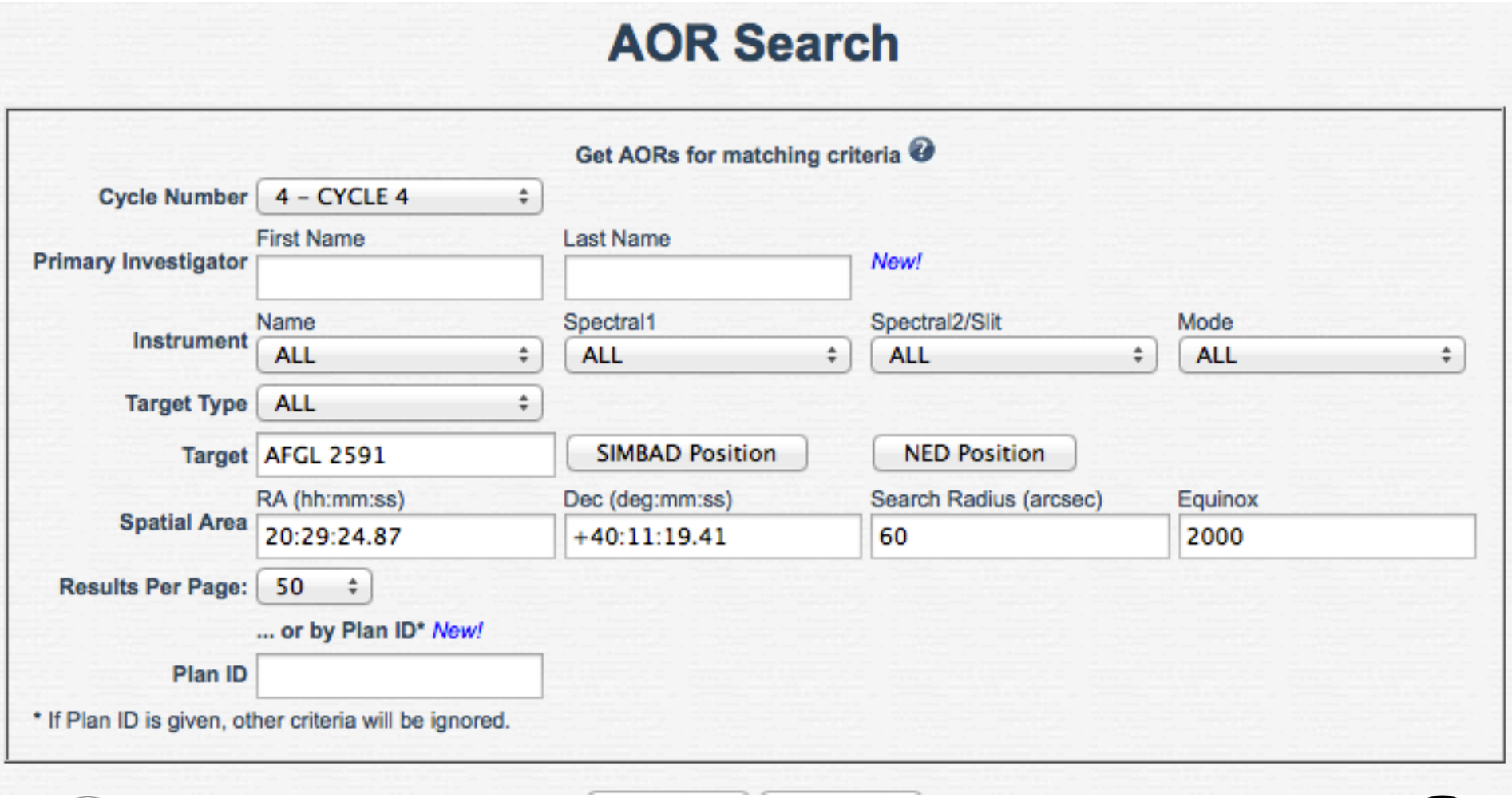
Science	Object Name	RA	DEC	ν_1	ν_2	ν_3	area	Time
		(2000)	(2000)	[THz]			arcmin	[hr]
PP disks	HD100546	11:33:25.4	-70:11:41.2	all lines			0.3	0.5
	HD50138	06:51:33.4	-06:57:59.5	all lines			0.3	0.5
	HD97048	11:08:03.3	-77:39:17.4	all lines			0.3	0.5
Star formation cores	SgrB2(M)(N)	17:47:20.4	-28:23:07.0	#1	#2	OI	2	2.0
	NGC2023	05:41:38.4	-02:15:32.5			OI	3	1.0
	NGC2024	05:41:45.2	-01:55:45.0			OI	2	1.0
	Orion-KL	05:35:15.1	-05:22:26.6	#1	#2	OI	2	1.5
	IRAS16172	16:21:02.0	-50:35:09.0	CO	CO/CII	OI	5	0.7
	IRAS16177	16:21:31.0	-50:25:48.0	CO	CO/CII	OI	5	0.7
	NGC6334I	17:20:53.3	-35:47:01.5	#1	#2	OI	5	3.0
	W33A	18:14:39.4	-17:52:00.0			OI	1	0.3
	G29.96	18:46:03.8	-02:39:22.0	#1	#2	OI	1	0.3
	G31.41	18:47:34.3	-01:12:46.0	#1	#2	OI	1	0.3
	G48.66	19:21:49.6	+13:49:31.2	CO	CO/CII	OI	2	1.0
	W51D	19:23:43.8	+14:30:26.0			OI	2	0.6
	W58N	19:59:59.9	+33:25:45	CO	CO/CII	OI	5	1.0

3. Checking Existing and Planned Observations: AORs

https://dcs.sofia.usra.edu



3. Checking Existing and Planned Observations: AORs



3. Checking Existing and Planned Observations: AORs

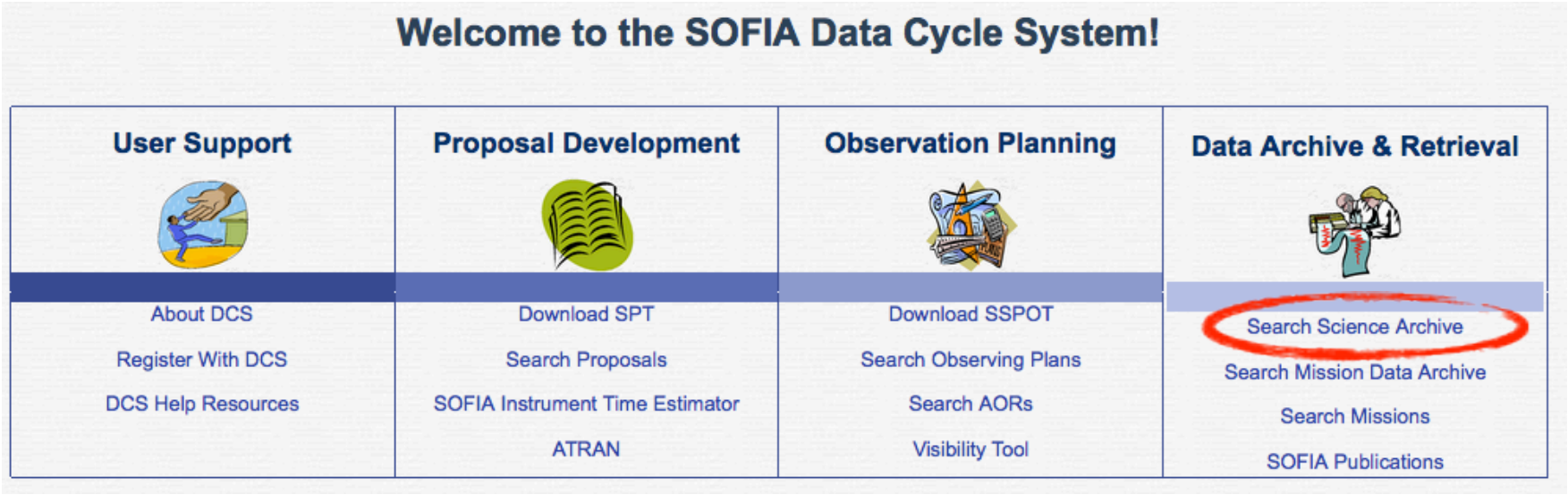
data available

Save As CSV File

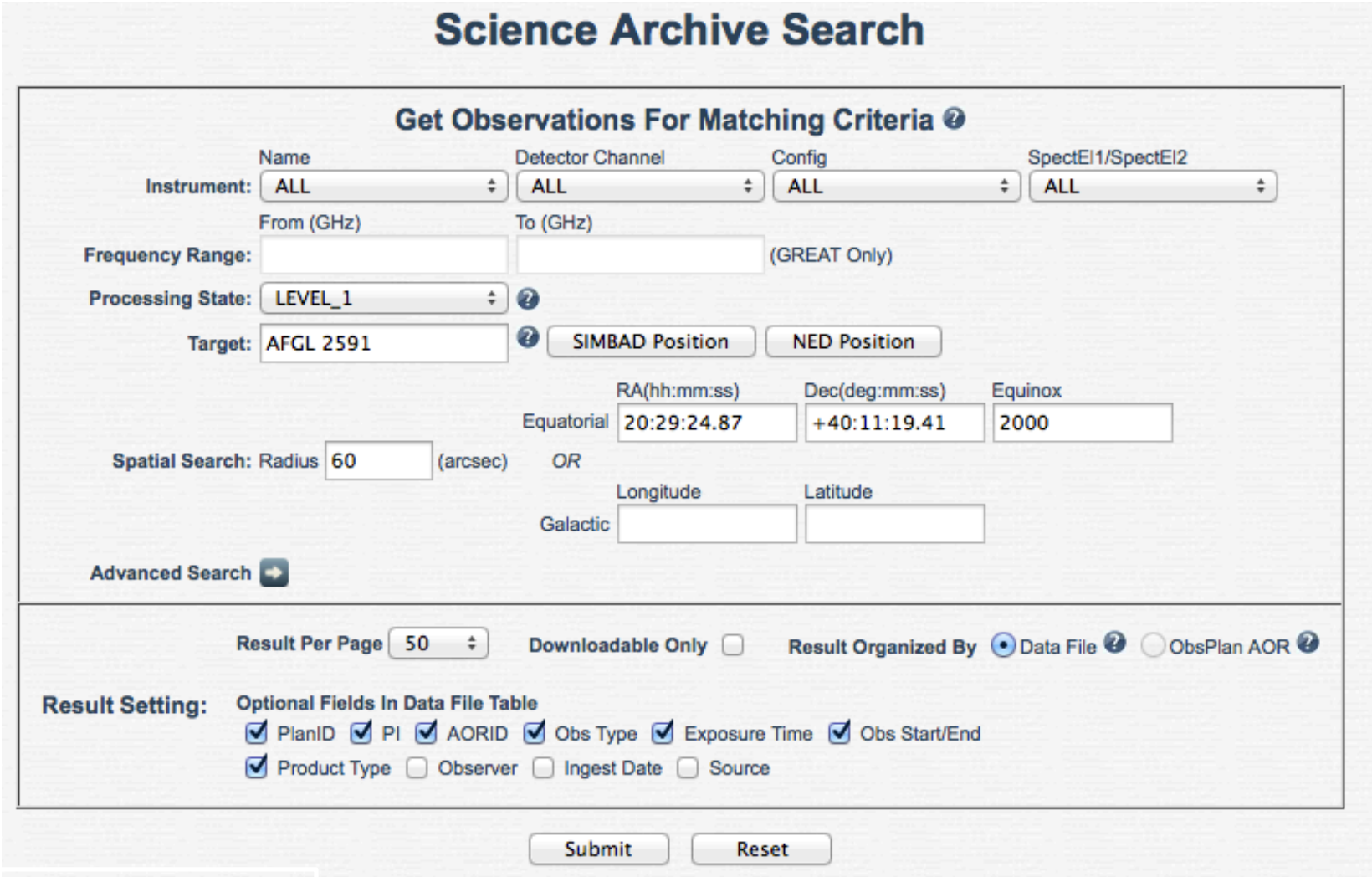
AORID	Target	RA(J2000)	Dec(J2000)	NAIF_ID	Instrument	InstConfig	Spectral1	Spectral2	Slit	Wavelength	Wavelength2	Freq1	Freq2	ObsMode	Exposure	Processing	LastArchived (UTC)	MissionIDs	QAComments
04_0089_4	CRL 2591-1	20:29:24.87	+40:11:19.41		EXES	HIGH_MED	EXE_ELON	EXE_ECHL	EXE_S24	5.296				NOD_ON_SLIT	02:05:00				
04_0120_4	AFGL 2591	20:29:24.87	+40:11:19.41		EXES	HIGH_MED	EXE_ELON	EXE_ECHL	EXE_S19	5.72				NOD_OFF_SLIT	00:18:00	LEVEL_1 LEVEL_2 LEVEL_3	2016-04-18 2016-04-27 2016-04-27	2016-03-24_EX_F291	
04_0120_5	AFGL 2591	20:29:24.87	+40:11:19.41		EXES	HIGH_MED	EXE_ELON	EXE_ECHL	EXE_S19	6.73				NOD_OFF_SLIT	00:28:40	LEVEL_0 LEVEL_1 LEVEL_2 LEVEL_3	2016-04-18 2016-04-18 2016-04-27 2016-04-27	2016-03-24_EX_F291	
04_0141_1	AFGL 2591-cen	20:29:24.6	+40:11:19.8		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_2	AFGL 2591-R1	20:29:25.5	+40:11:19.1		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_3	AFGL 2591-R2	20:29:24.9	+40:11:11.6		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_4	AFGL 2591-R3	20:29:24.0	+40:11:9.6		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_5	AFGL 2591-B1	20:29:24.4	+40:11:27.9		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_6	AFGL 2591-B2	20:29:25.3	+40:11:27.2		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				
04_0141_7	AFGL 2591-B3	20:29:23.8	+40:11:17.7		GREAT	DUAL-CHANNEL	GRE_H	GRE_L2				4744.777	1837.8168	BSW	00:00:53				

3. Checking Existing Observations: Science Archive

https://dcs.sofia.usra.edu



3. Checking Existing Observations: Science Archive



3. Checking Existing Observations: Science Archive

Page 1 of 3 (1 - 50 of 114) **Results Organized By Data File**

Get Selected Data In Current Page | Get Downloadable Data In All Pages | There is a ***30GB*** download limit.

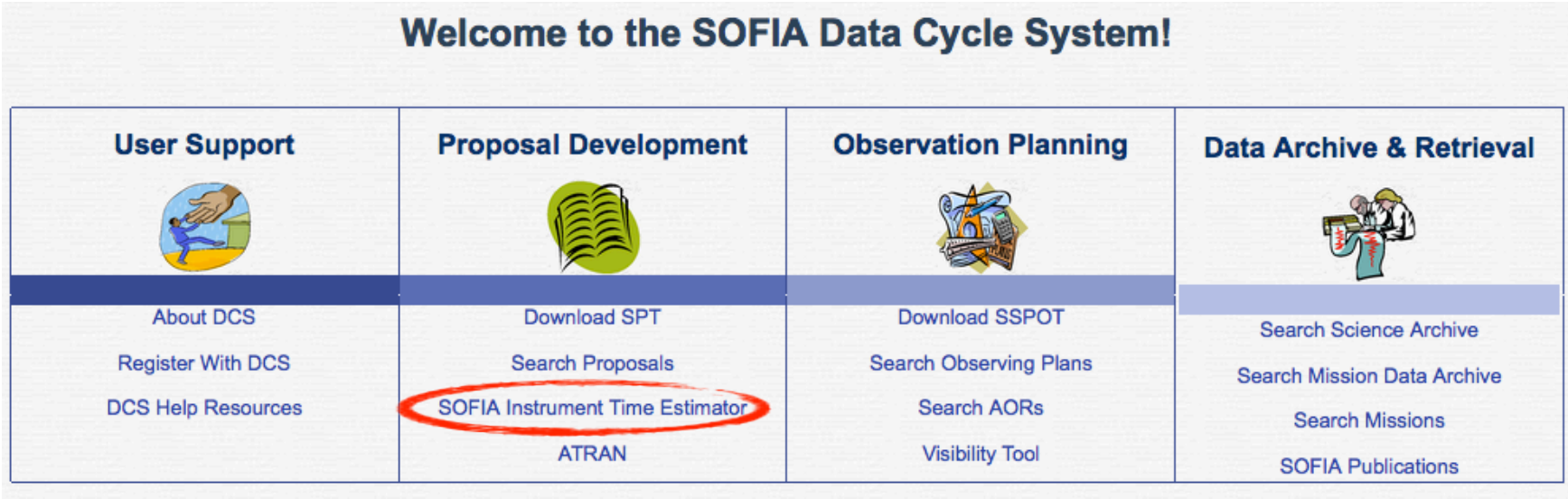
ObservationID	MissionID	PlanID	PI	AORID	Instrument	Detector Channel	Config	Frequency (GHz)	SpectEl1	SpectEl2	Slit	Target	ObsType	Processing	ProductType	RAJ2000 Longitude (Galactic) (Ecliptic)	DecJ2000 Latitude (Galactic) (Ecliptic)	Exposure (Sec)	ObsStart (UTC)	ObsEnd (UTC)	Release (UTC)
2016-03-24_EX_F29140060	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_1	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2136	FLAT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	128.0	2016-03-24 09:30:09.859	2016-03-24 09:32:37.593	2016-04-18 16:21:17.0
2016-03-24_EX_F29140059	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_4	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	OBJECT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	192.0	2016-03-24 09:14:52.343	2016-03-24 09:21:58.89	2017-04-18 16:21:13.0
2016-03-24_EX_F29140058	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_4	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	OBJECT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	128.0	2016-03-24 09:08:29.843	2016-03-24 09:14:17.78	2017-04-18 16:21:17.0
2016-03-24_EX_F29140057	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_4	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	OBJECT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	128.0	2016-03-24 09:02:15.39	2016-03-24 09:07:54.203	2017-04-18 16:21:20.0
2016-03-24_EX_F29140056	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_4	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	OBJECT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	128.0	2016-03-24 08:55:59.39	2016-03-24 09:01:36.656	2017-04-18 16:21:18.0
2016-03-24_EX_F29140055	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_4	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	FLAT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	128.0	2016-03-24 08:52:54.468	2016-03-24 08:55:24.75	2016-04-18 16:21:18.0
2016-03-24_EX_F29140054	2016-03-24_EX_F291	04_0120	Indriolo, Nick	04_0120_5	EXES		HIGH_MED		EXE_ELON	EXE_ECHL	EXE_S19	AFGL 2591	OBJECT	LEVEL_1		20:29:24.87 78.887(G) 327.048(E)	+40:11:19.41 0.709(G) 56.471(E)	192.0	2016-03-24 08:42:51.312	2016-03-24 08:51:16.656	2017-04-18 16:21:16.0

To get more detailed information about data in the archive:

- data may have to be downloaded.
- if not public, or in doubt, contact the SOFIA helpdesk at sofia_help@sofia.usra.edu

4. Feasibility Analysis: Exposure Times (SITE)

https://dcs.sofia.usra.edu



4. Feasibility Analysis: Atmospheric Transmission (ATRAN)

Submit Form | Clear Form

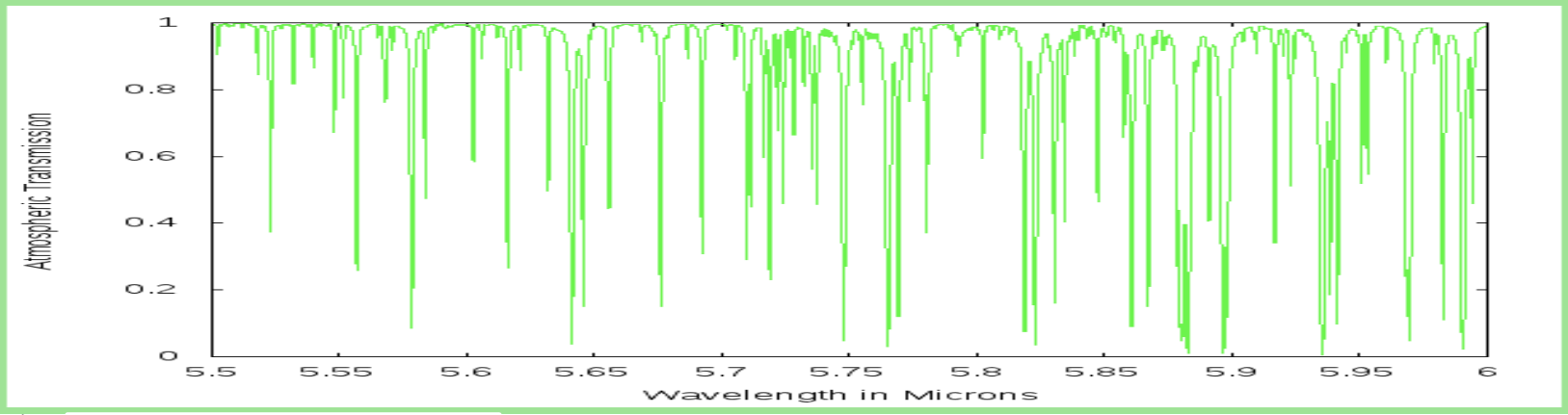
Input Parameters

Give the **Observatory Altitude** (in feet; < 60000 ft):	41000
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):	45
Give the desired **Wavelength Range** (min and max in microns; min > 0.85):	5.5 - 6.0
Give the **Resolution R** for Smoothing (0 = No Smoothing):	10000
Comments for the plot :	example

Checking atmospheric transmission essential:

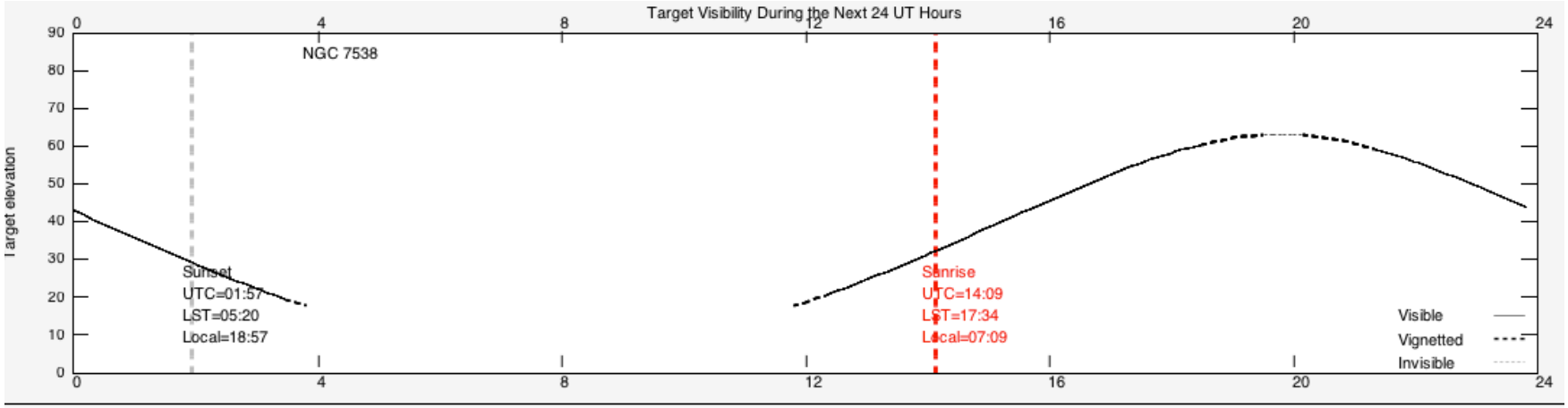
- Can observations be done from the ground?
- Feasible from the stratosphere?
- Velocity shift needed?

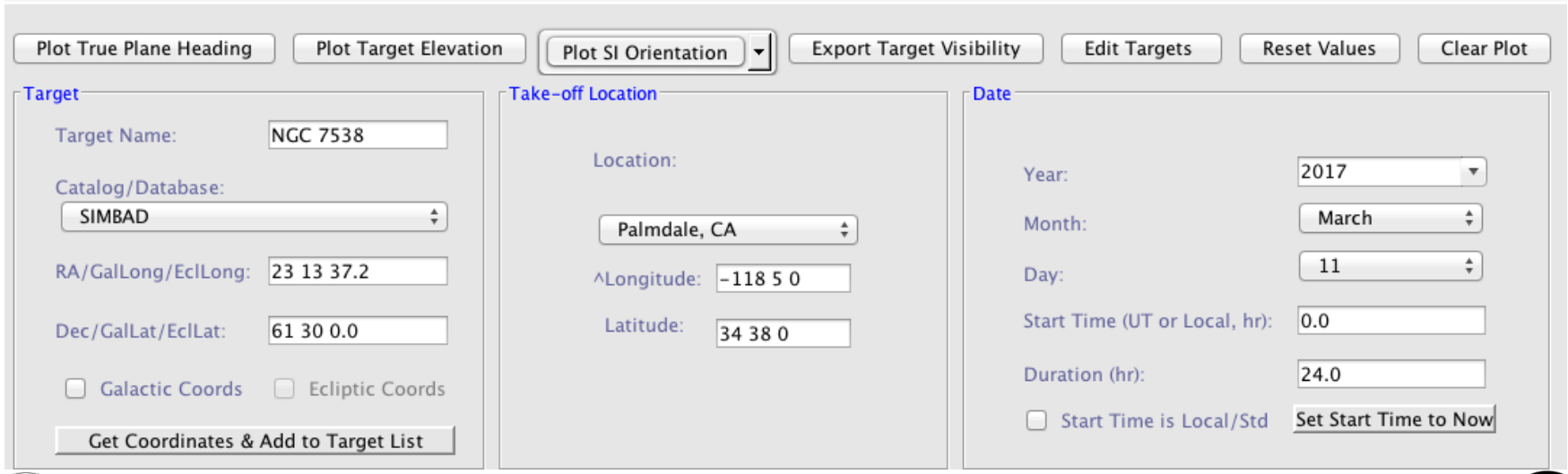
Plot of Atmospheric Transmission



4. Feasibility Analysis: VT

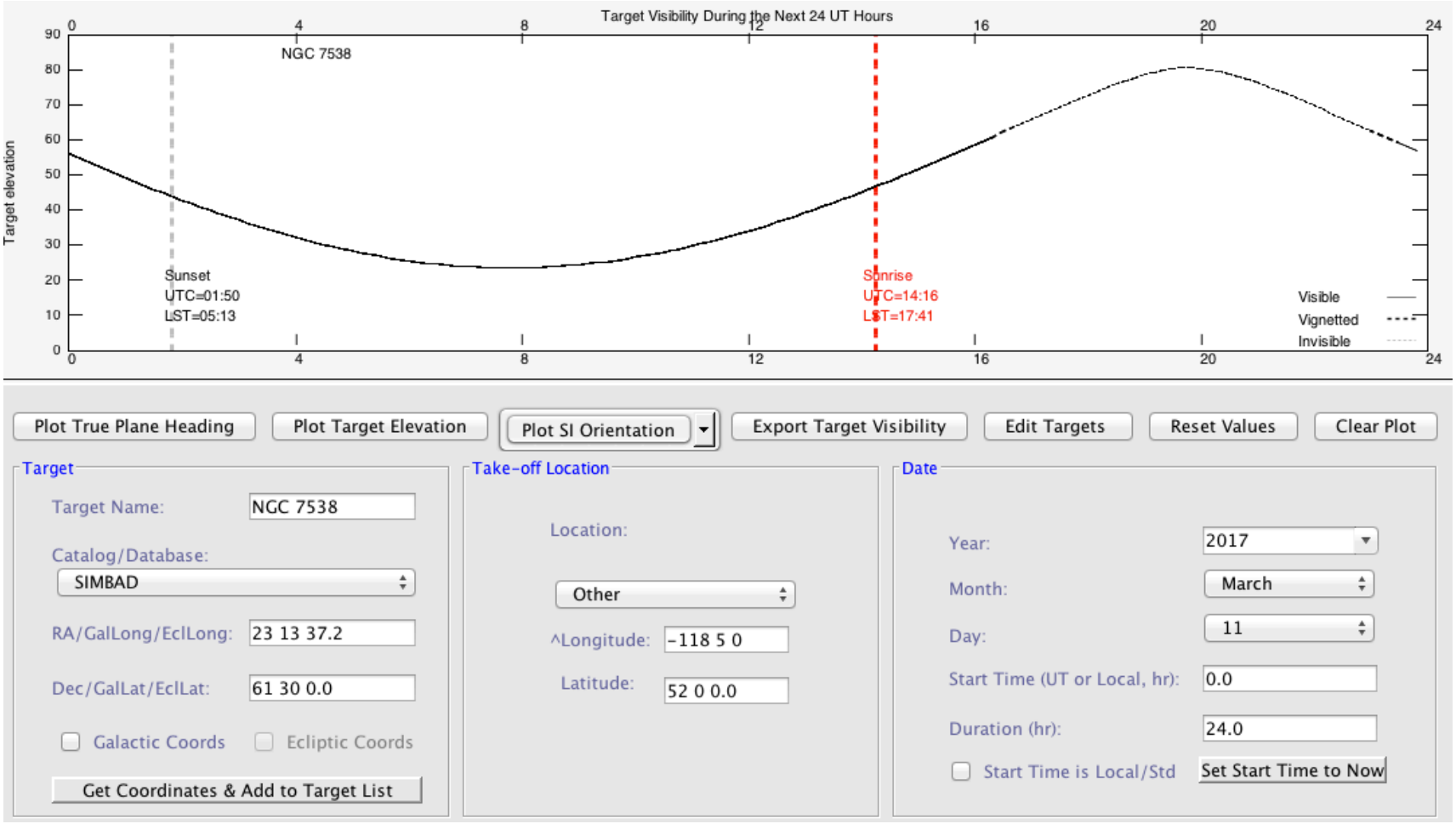
Is NGC 7538 visible, i.e., between elevations 25-65 degrees on March 11 from Palmdale?





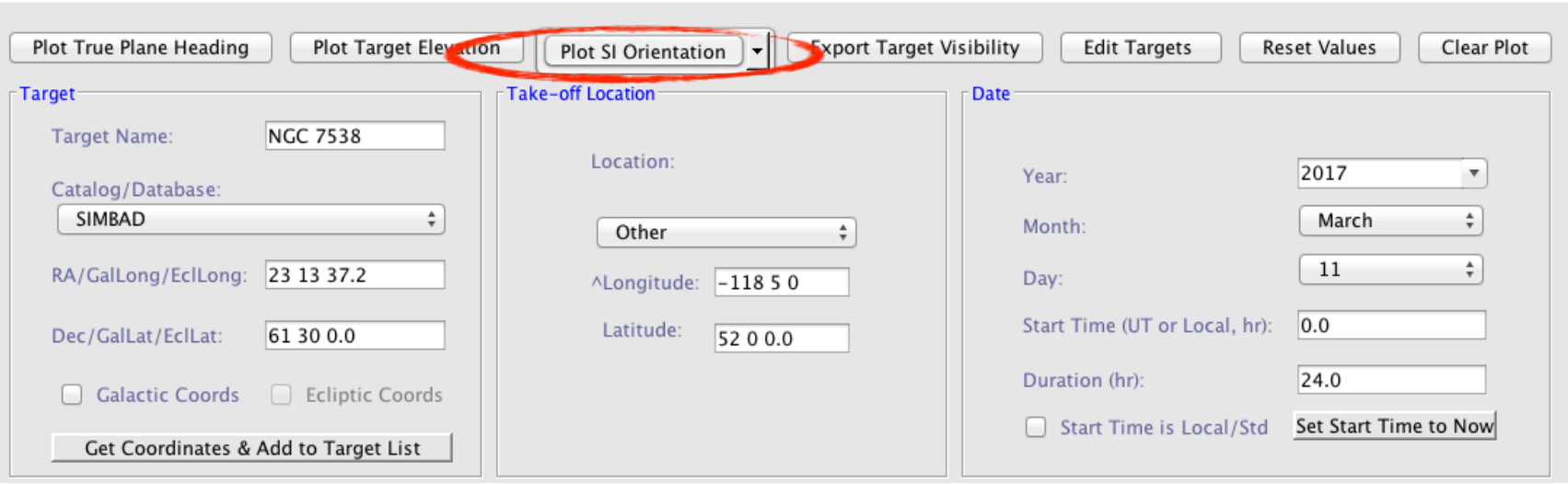
4. Feasibility Analysis: VT

How about from Canada (say, latitude 52 degrees)?



4. Feasibility Analysis: VT

Note: requests specific instrument orientations not supported



Hence, specific slit position angles on the sky cannot be requested for EXES, FORCAST and FLITECAM

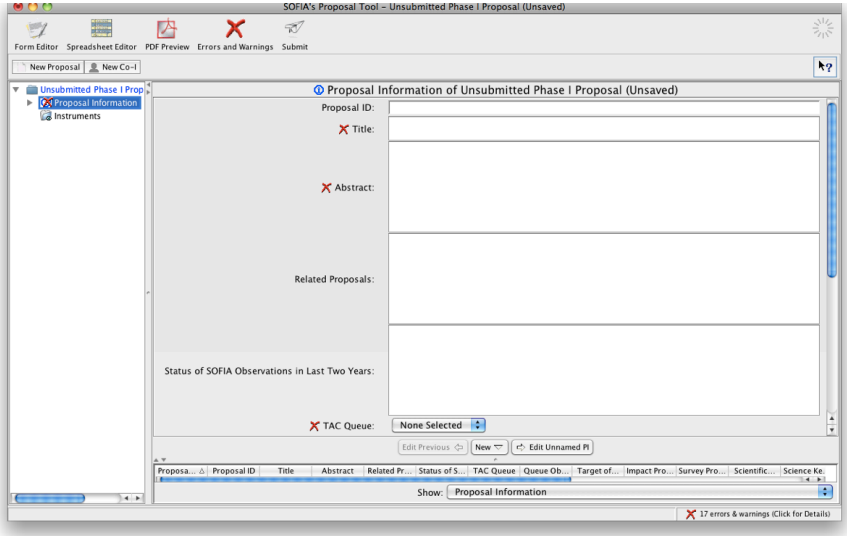
5. Proposal Preparation and Submission: SPT

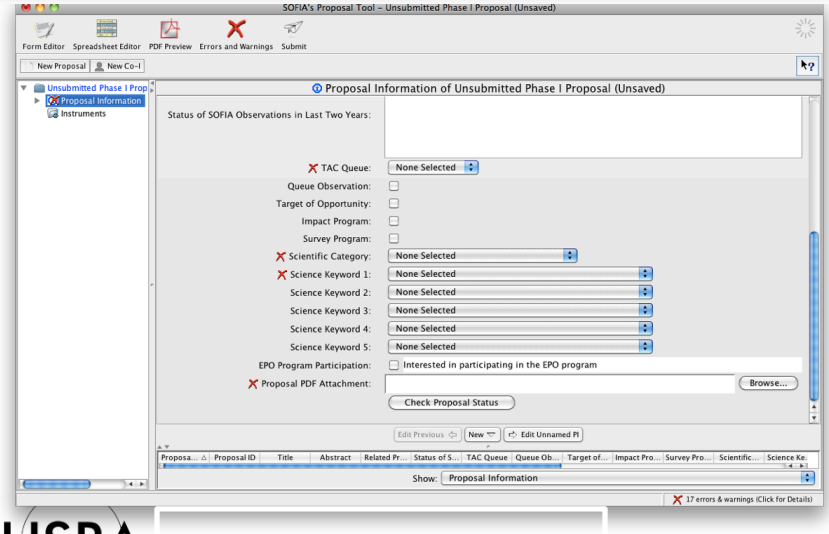
Phase I proposals must be prepared and submitted using the SOFIA Proposal Tool (SPT).

SPT is based on the Astronomer's Proposal Tool (APT) developed and used for Hubble Space Telescope proposals.

The most recent version, SPT v3.1.0, has to be used for Cycle 5 proposals.

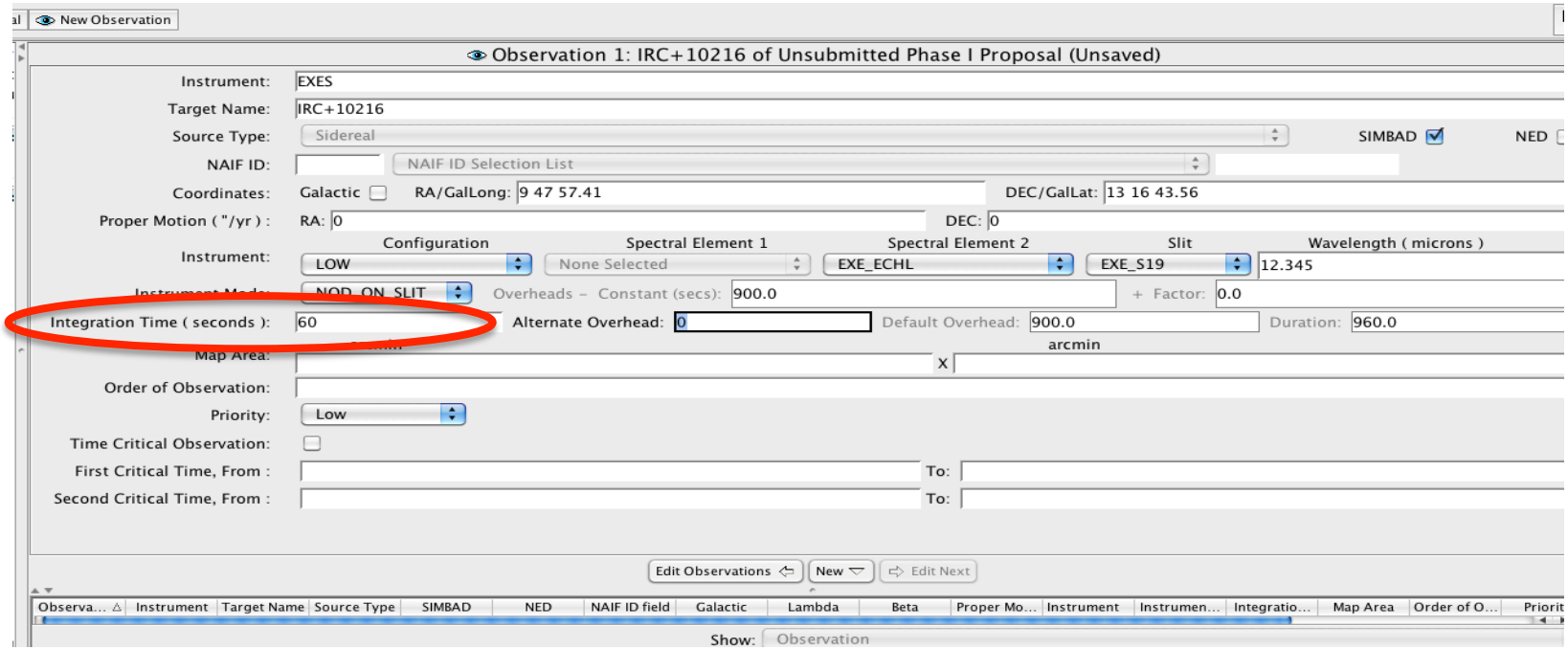
5. Proposal Preparation and Submission: SPT





- Enter title and abstract in SPT
- Prepare science and technical justification in favorite editor and upload pdf.
- Update as often as needed until deadline
- PI needs to register with 'DCS': https://dcs.sofia.usra.edu

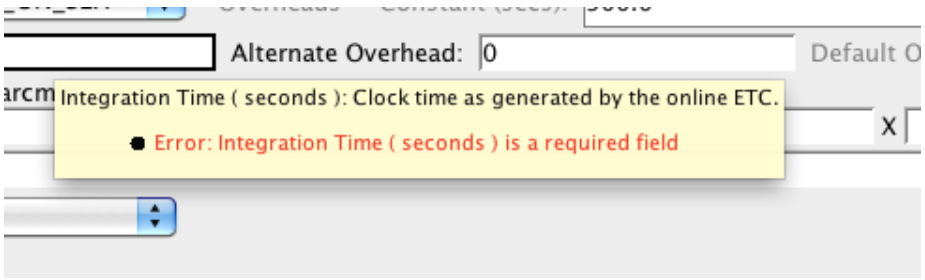
5. Proposal Preparation and Submission: SPT



SPT Example EXES.

Note “Integration Time”:

- ‘clock time’ for EXES
- ‘ON+OFF’ for (up)GREAT
- ‘ON’ for other instruments



6. Detailed Observation Preparation: SSPOT

SSPOT not needed for proposal submission. It might be handy for map visualization, however.

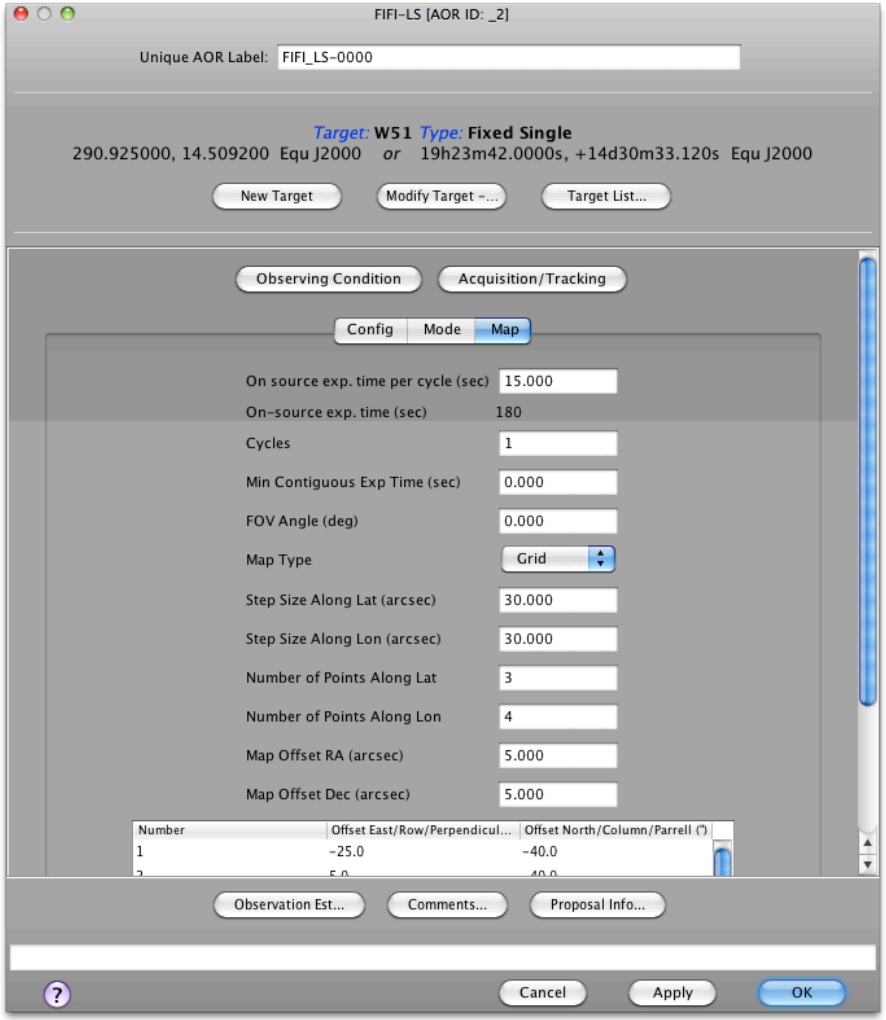
FIFI-LS AOR: Instrument configuration

6. Detailed Observation Preparation: SSPOT

FIFI-LS AOR: Instrument "mode" (chop/nod parameters)

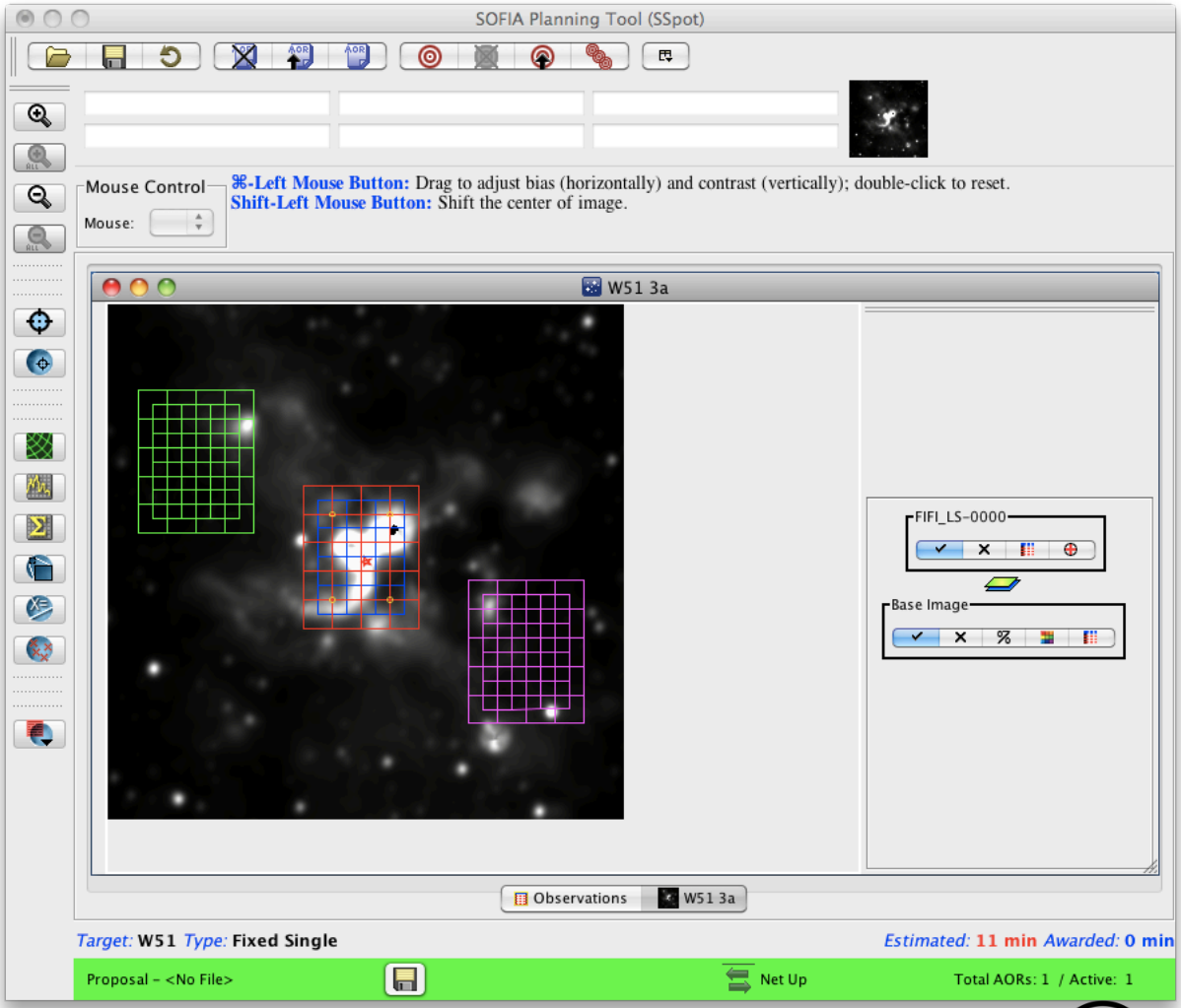
6. Detailed Observation Preparation: SSPOT

FIFI-LS AOR: map parameters



6. Detailed Observation Preparation: SSPOT

FIFI-LS: AOR Overlay



Backup Slides