ALMA Observing Tool

Phase I: Observing Proposal

Yu-Nung Su

ALMA Novice-User Workshop
December 18, 2010

Introduction

- *What is Observing Tool (OT) ?*
  - *provides a comprehensive set of interfaces (form and tool) to*
    - ***define observing proposals at ALMA (Phase I)***
    - *prepare observing programs at ALMA (Phase II)*
- *a java based application*

The Current Status of OT

- *The OT is still under development*
- *The latest OT version is IP2, released in 2010 September*
  - *A new release is planned next week, for integrated test (IT3)*
  - *The IT3 version will also be used as a "restricted preview" for astronomers.*

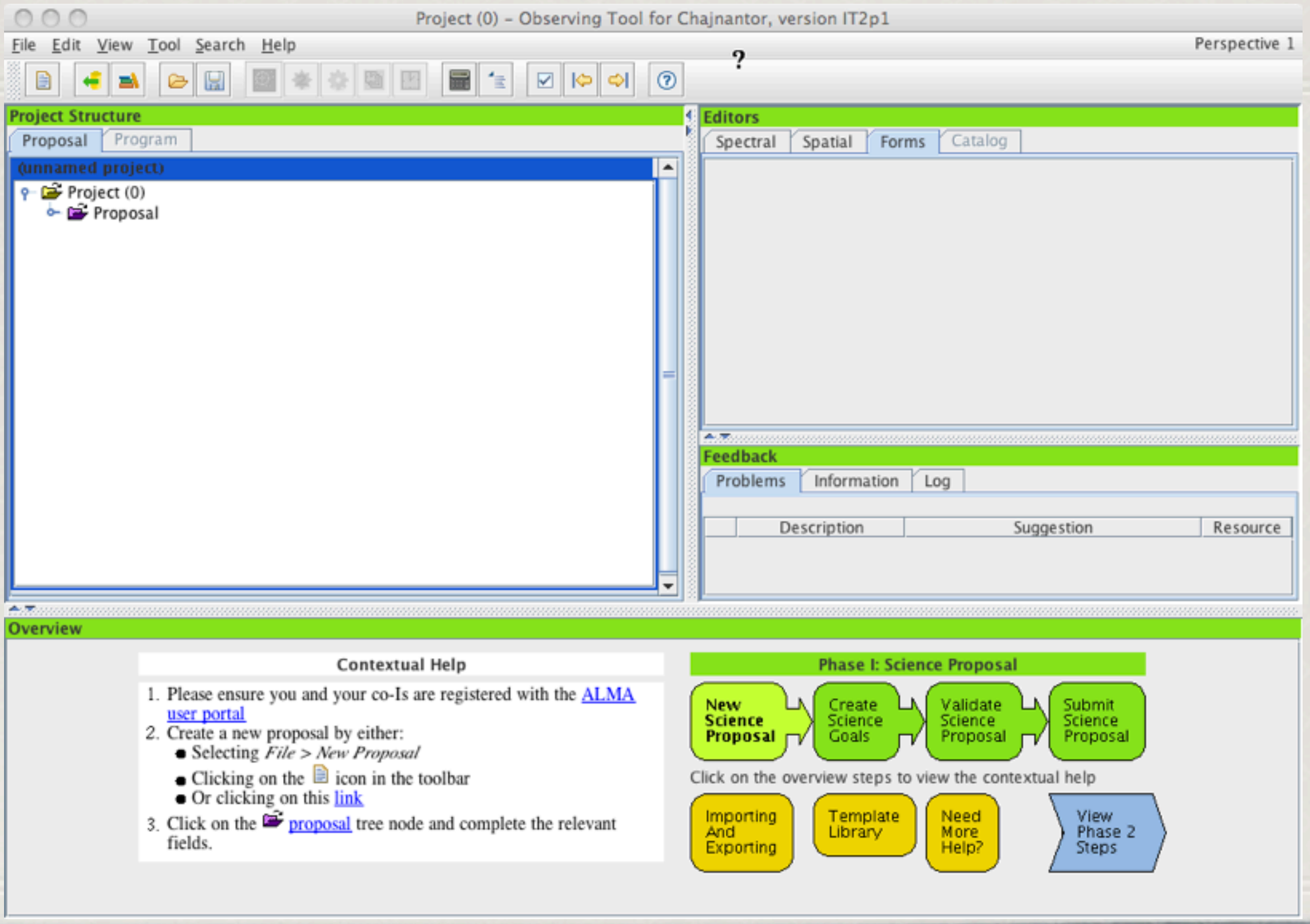
Supported Platforms

- *At present, ALMA officially supports the OT under*
  - *Sun/Solaris*
  - *RedHat 7, 9, and RedHat Enterprise*
  - *Linux Fedora and Scientific Linux*
  - *Suse Linux versions 7, 9 and 10*
  - *Windows XP and VISTA (Windows 7 ?)*
  - *MAC OSX 10.6 (Leopard and Snow Leopard)*
- *Installing correct Java software is also required*

Installation

- *To run OT, Java Virtual Machine(JVM) is required*
  - *java -version -> 1.6.x*
- *Webstart*
  - *The OT is installed and run automatically on your computer*
- *Tarball*
  - *Download and install the OT manually*

The OT Main GUI



Overview Steps

The Schematic Steps for Proposal and Observing Programs Preparation and Submission

Contextual Help

1. Please ensure you and your co-Is are registered with the ALMA user portal
2. Create a new proposal by either:
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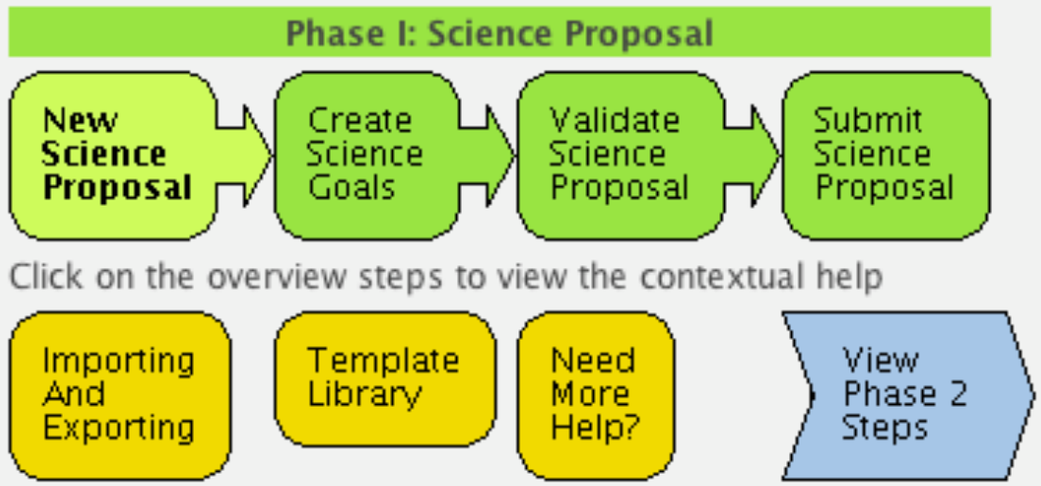

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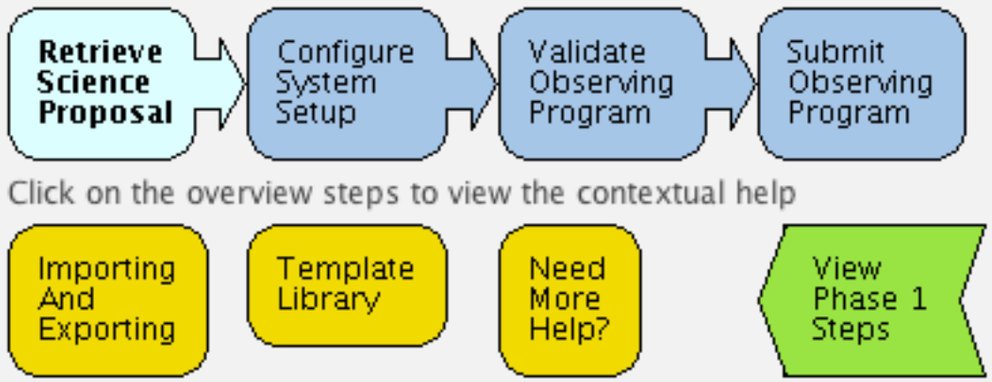
The Schematic Steps for Proposal and Observing Programs Preparation and Submission

Contextual Help

Retrieve your science proposal from the ALMA server by either:

- Selecting *File > Open Project > From ALMA Archive*
- Or clicking on this link

Phase II: Observing Program



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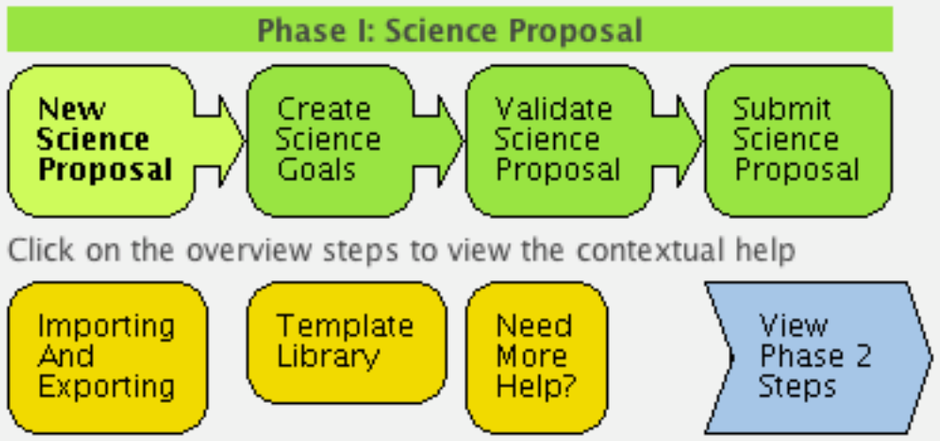

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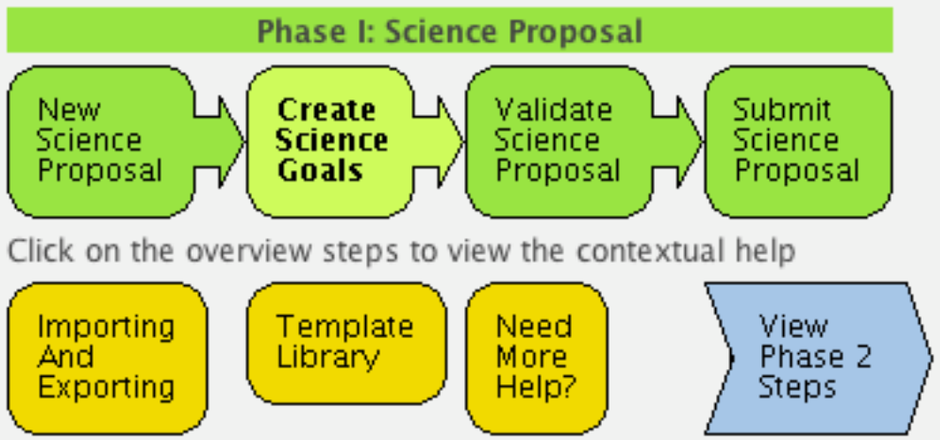

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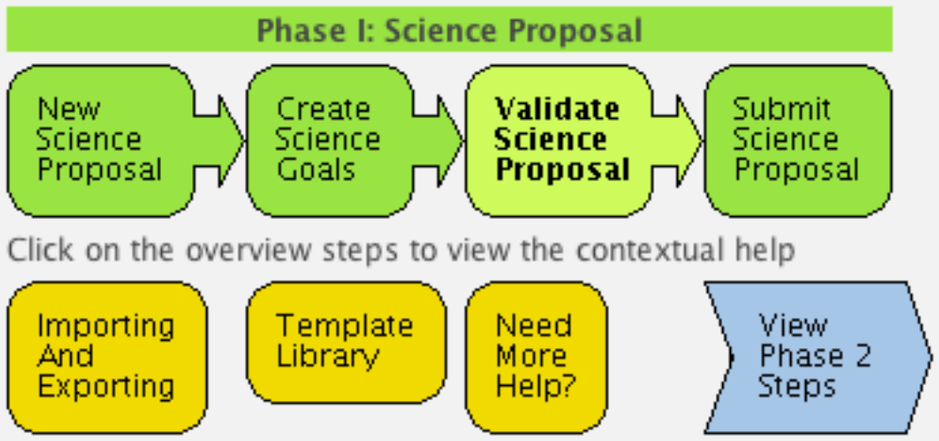

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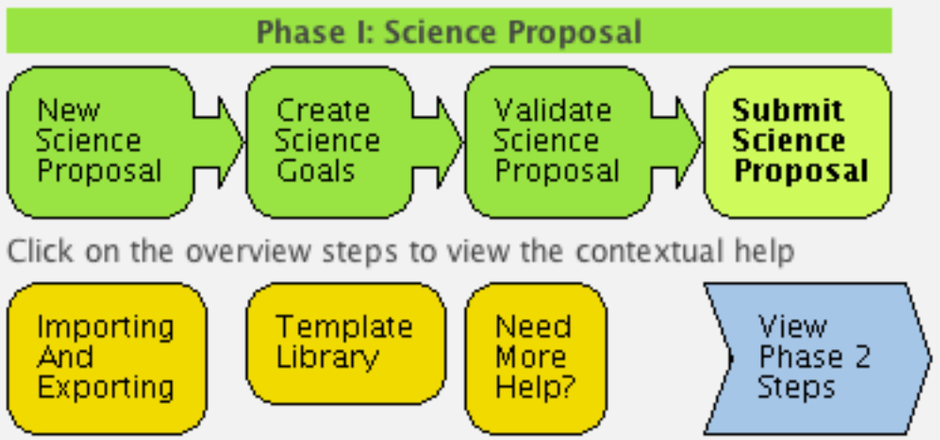
Submit your science proposal to the ALMA server by either:
- Selecting *File > Submit Project*
- Or clicking on this link



Tools and Simulators

- *The ALMA Template Library*
- *Calibrator Selection Tool*
- *Sensitivity Calculator*
- *ALMA LO Configuration Tool*
- *Spectral Line Selection Tool*
- *Visual Editors*
  - *TheVisual Spatial Editor*
  - *The Visual Spectral Line Editor*

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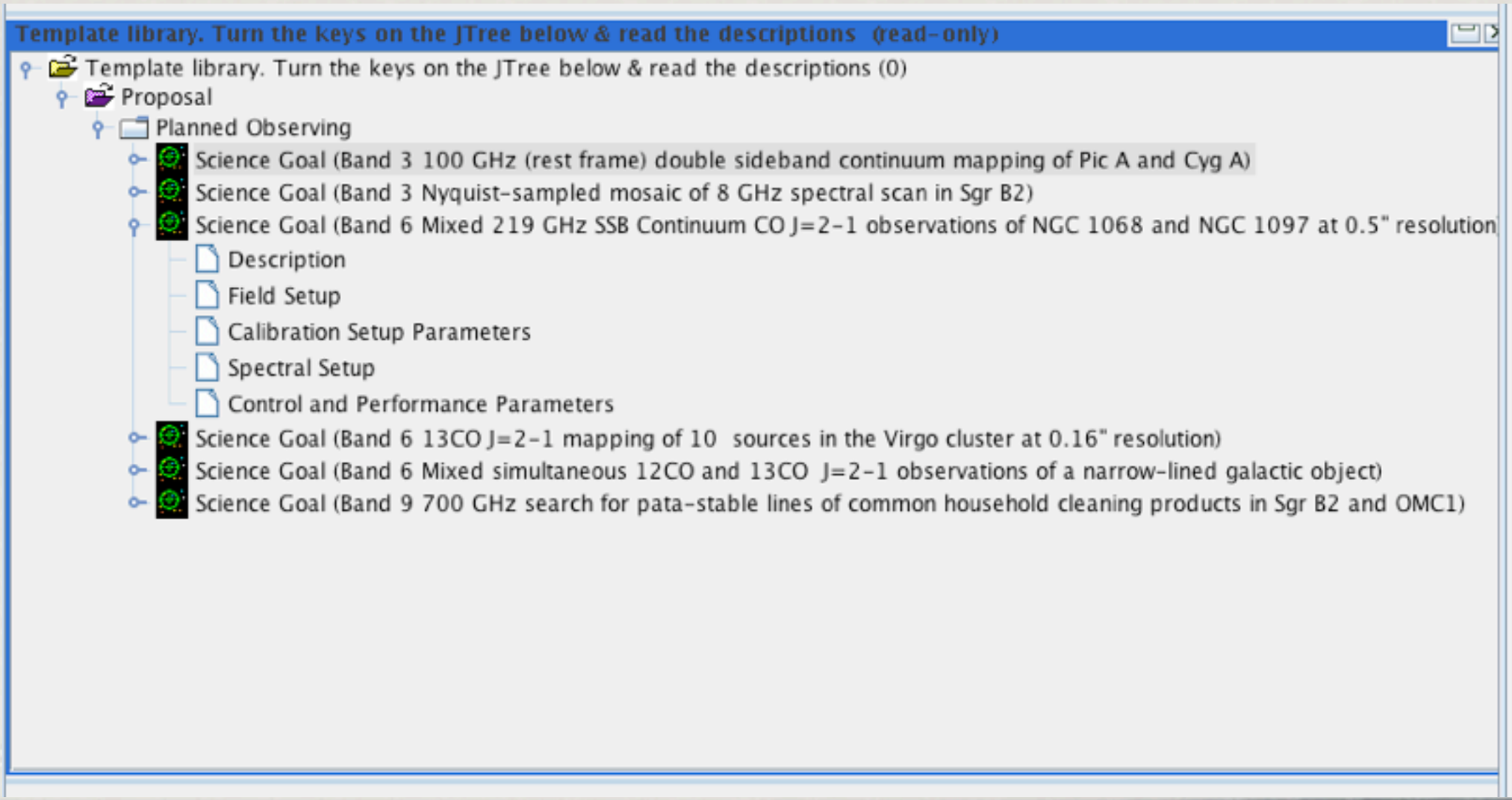
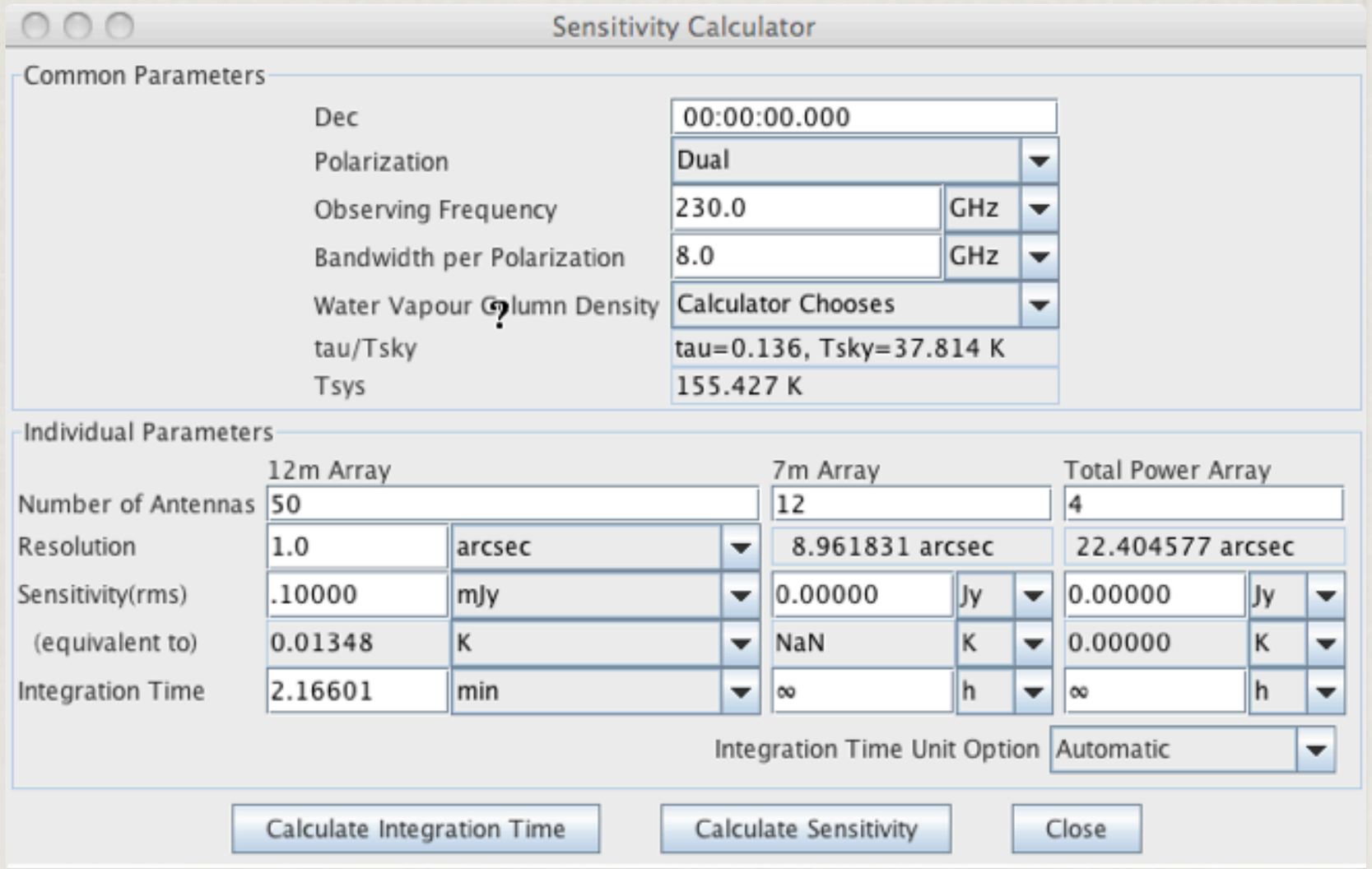


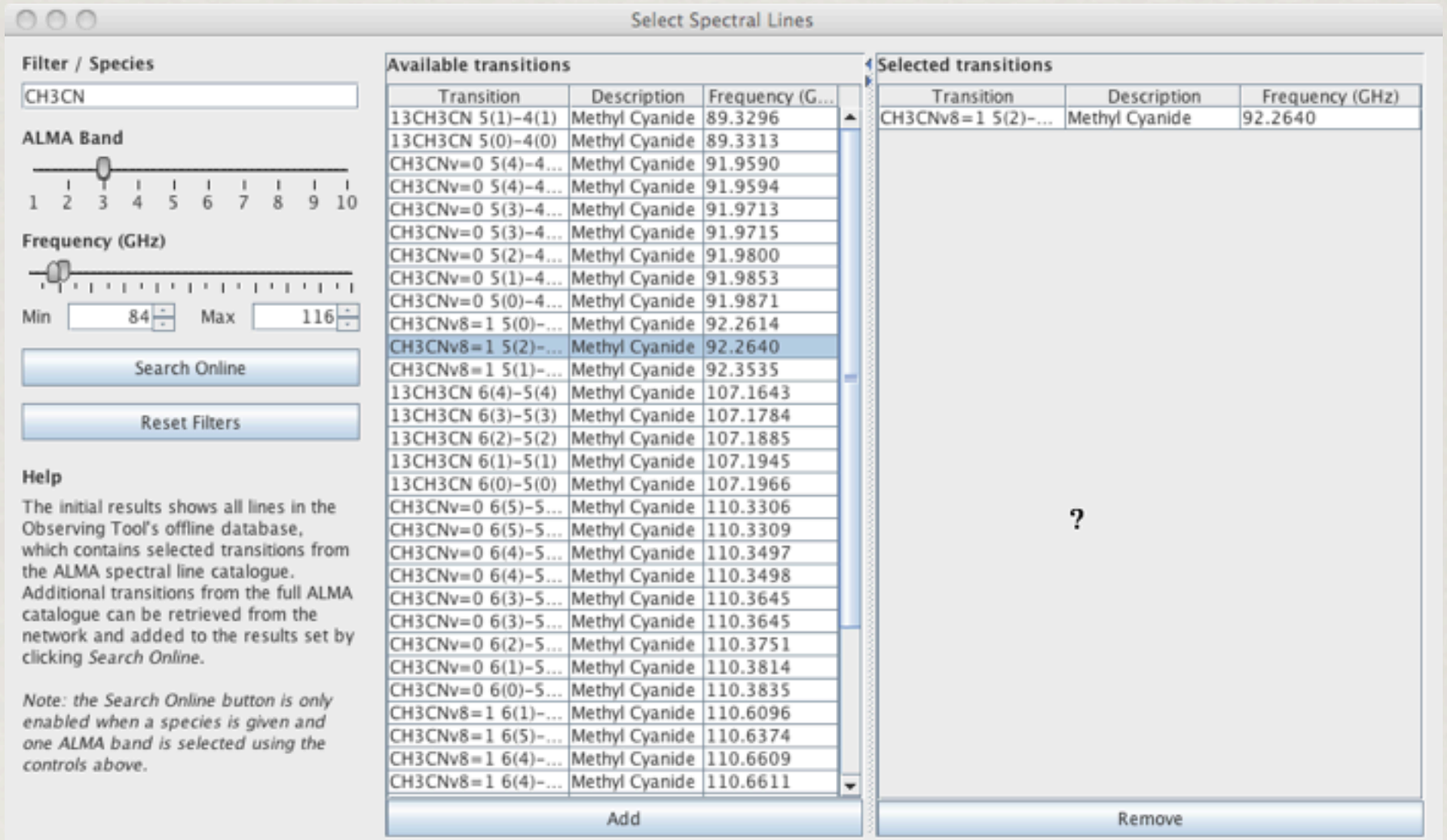
Tools and Simulators

Sensitivity Calculator



Tools and Simulators

Spectral Line Selection Tool

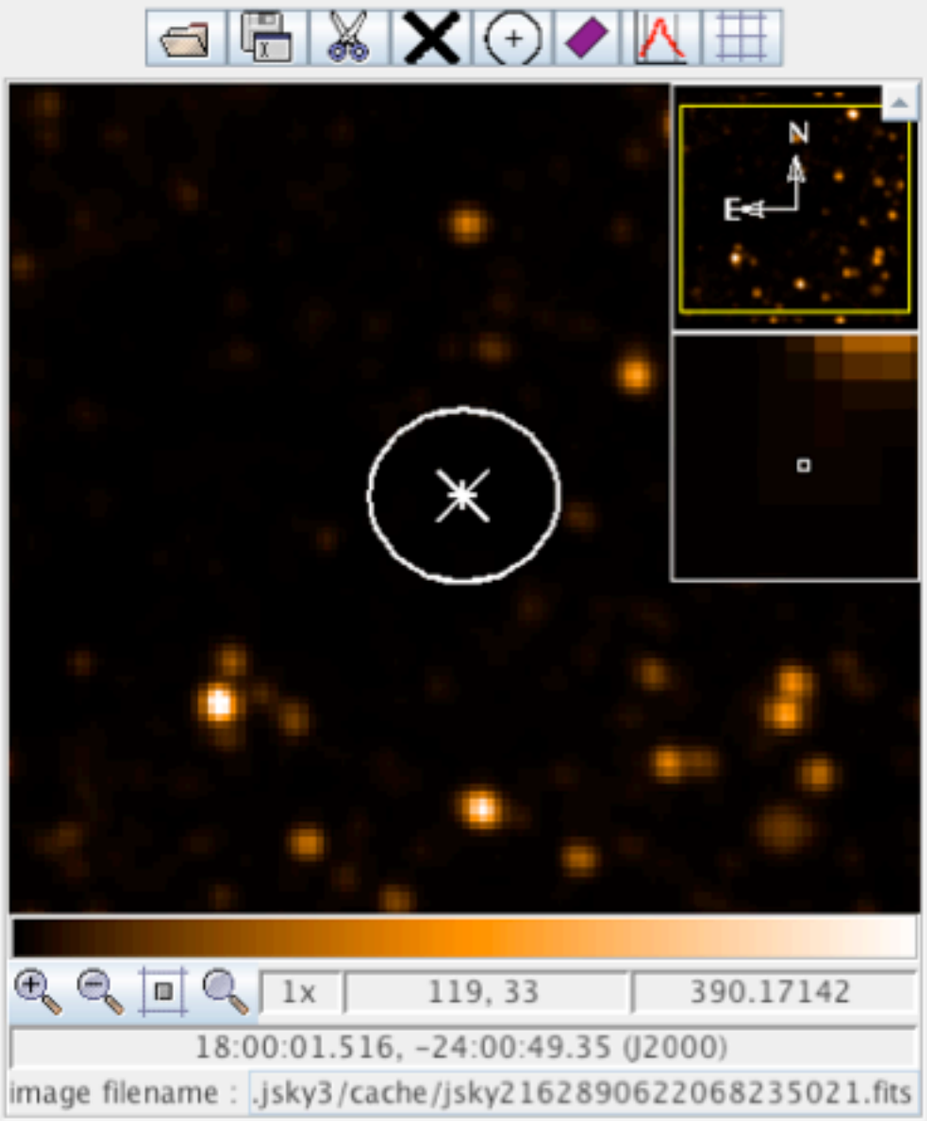


Tools and Simulators

- ***The Visual Spatial Editor***
  - *A graphic interference for helping observers to setup target parameters*
  - *loading images from*
    - *data archives (2mass, digitized sky, CO via skyview etc)*
    - *local fits files*

Editors

Spectral | Spatial | Field Setup | Catalog



1x | 119, 33 | 390.17142

18:00:01.516, -24:00:49.35 (J2000)

image filename : .jsky3/cache/jsky2162890622068235021.fits

FOV Parameters

Frequency used 230.00000 GHz Refresh

(taken from)

Antenna Diameter 12m 7m

Main beam size 22.4 arcsec

Show FOV(circle)

Image Query

Image Server 2MASS-K via SkyView @ NASA/GSFC

Image Size(arcmin) 2 Query

Target

G5.89-0.39

Source

Source Name G5.89-0.39 Resolve

Choose a Solar System Object? Name of object Mercury

Source Coordinates System J2000 Sexagesimal display? Parallax 0.00000 mas

RA 18:00:00.000 PM RA 0.00000 mas/yr

Dec -24:00:00.000 PM DEC 0.00000 mas/yr

Source Velocity 0.000 km/s lsr RADIO z 0.000000

Target Type Single Point Field 1 rectangular field

Field Center Coordinates

Coords Type ABSOLUTE RELATIVE

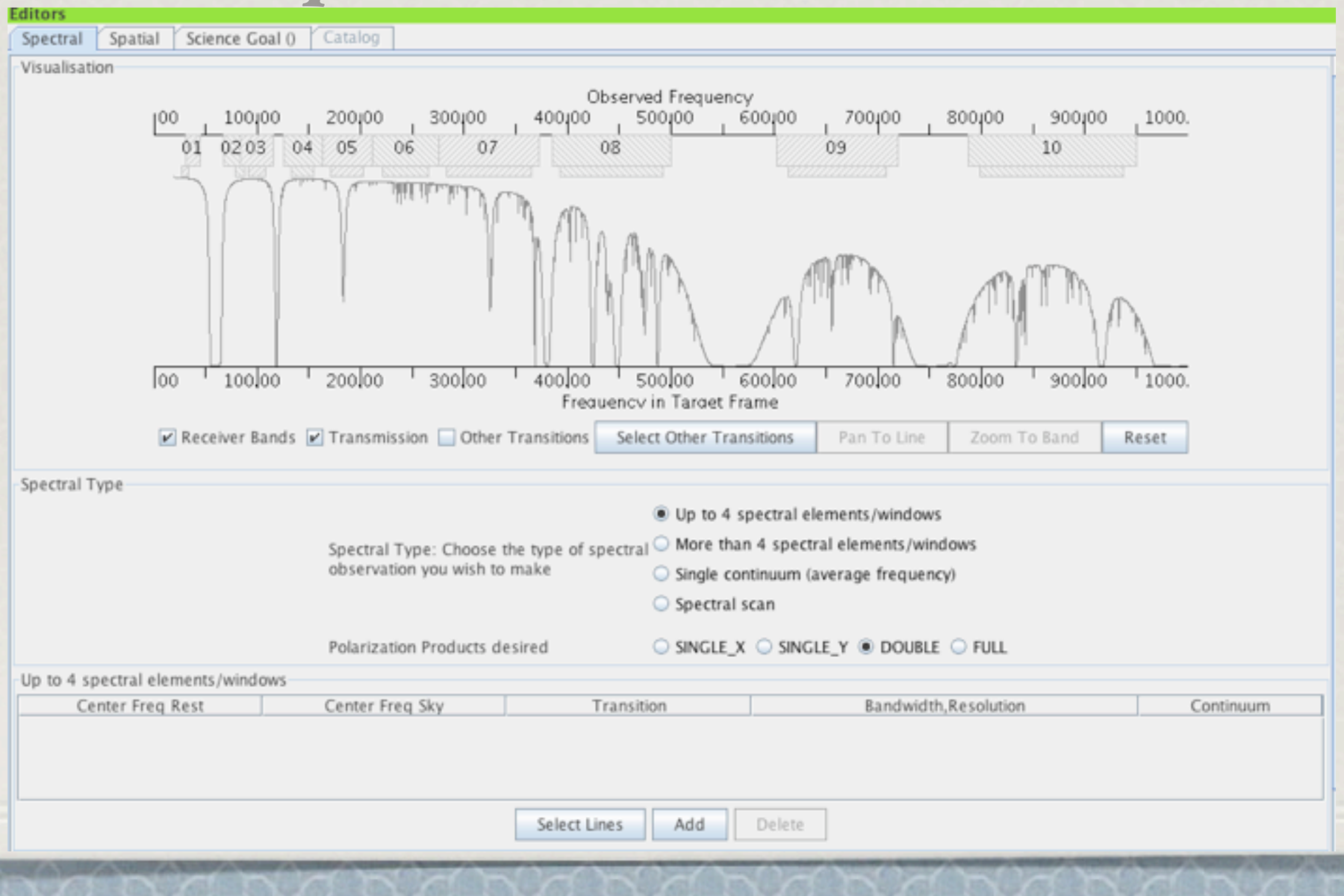
Offset(Longitude) 0.00000 arcsec

Offset(Latitude) 0.0 arcsec

Add Target | Delete Target | Load Target List

Tools and Simulators

- ***The Visual Spectral Line Editor***



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  - *New Science Proposal*
  - *Create Science Goals*
  - *Verify Science Proposal*
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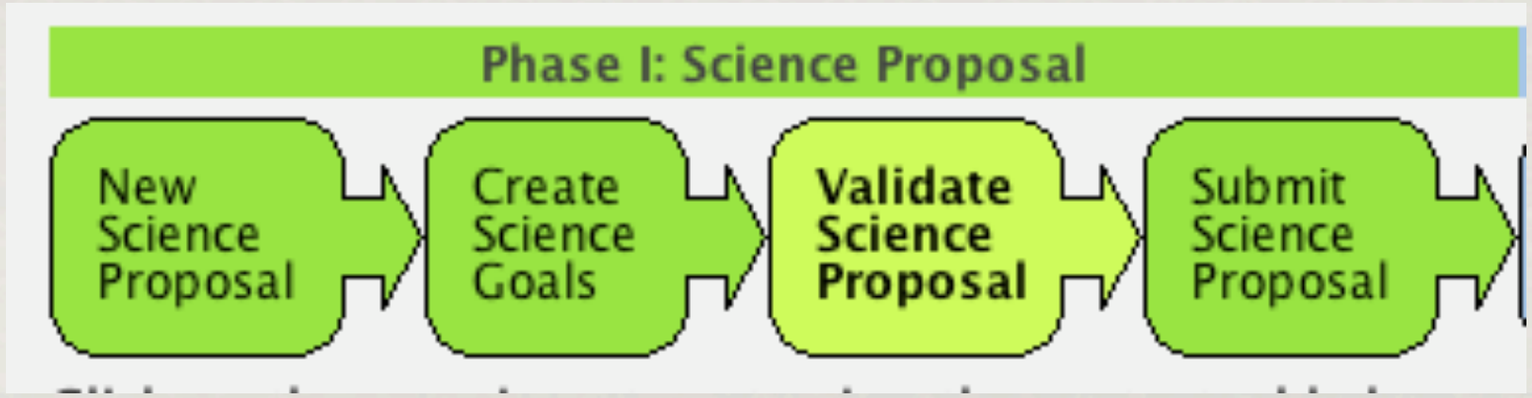

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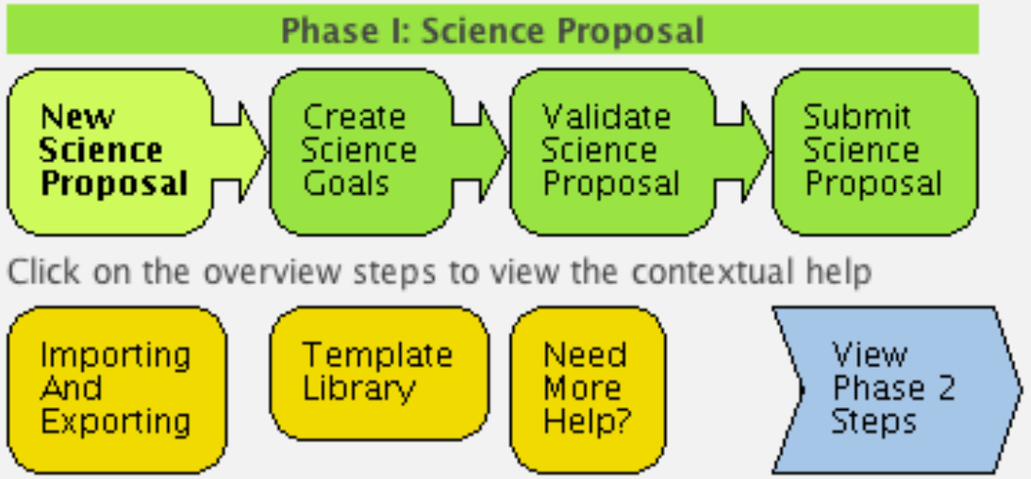

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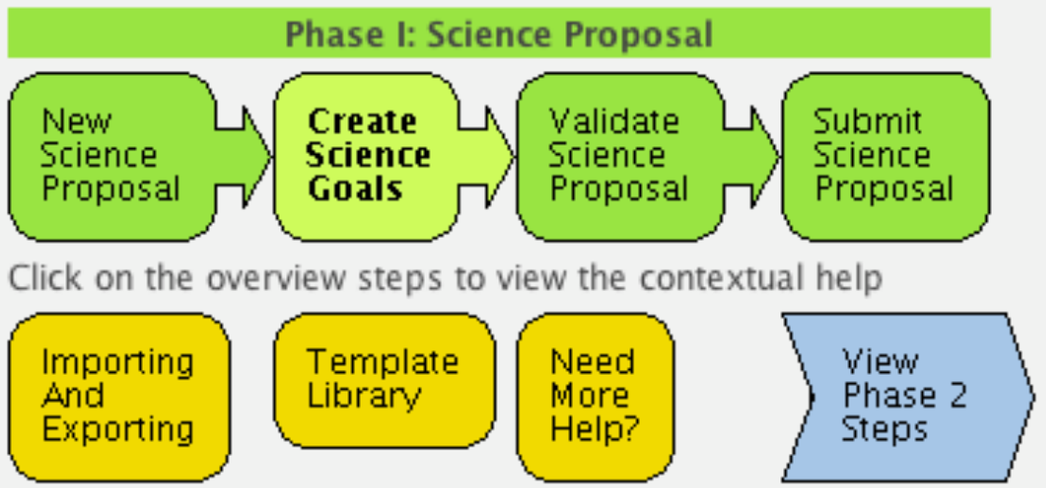

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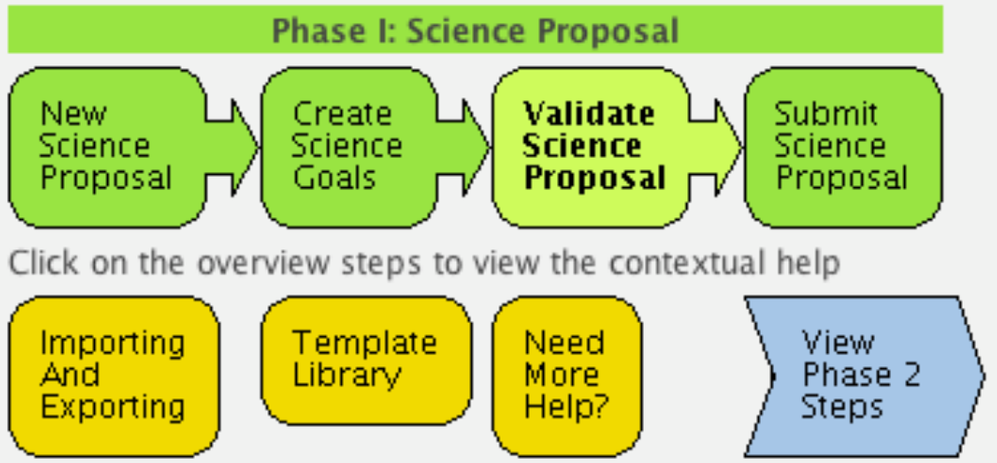

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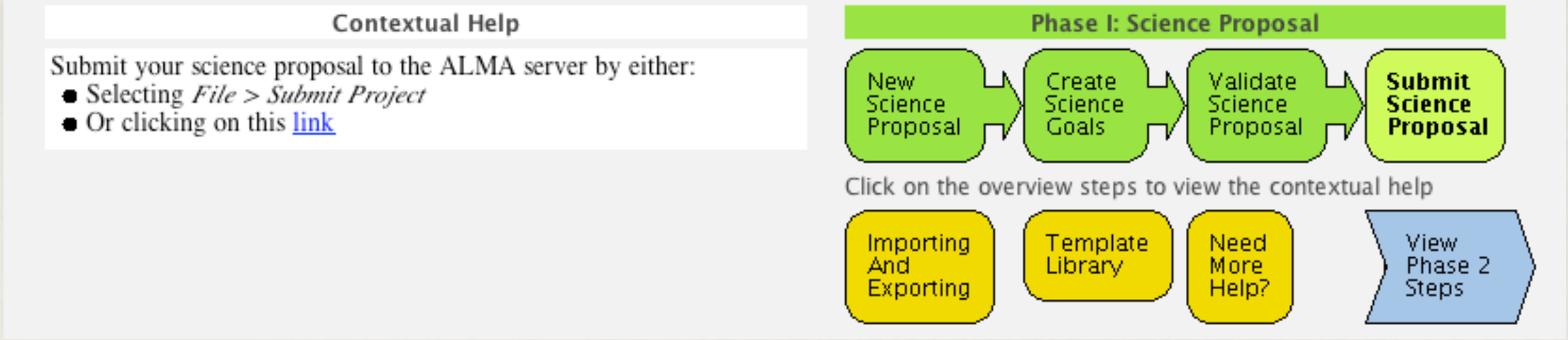
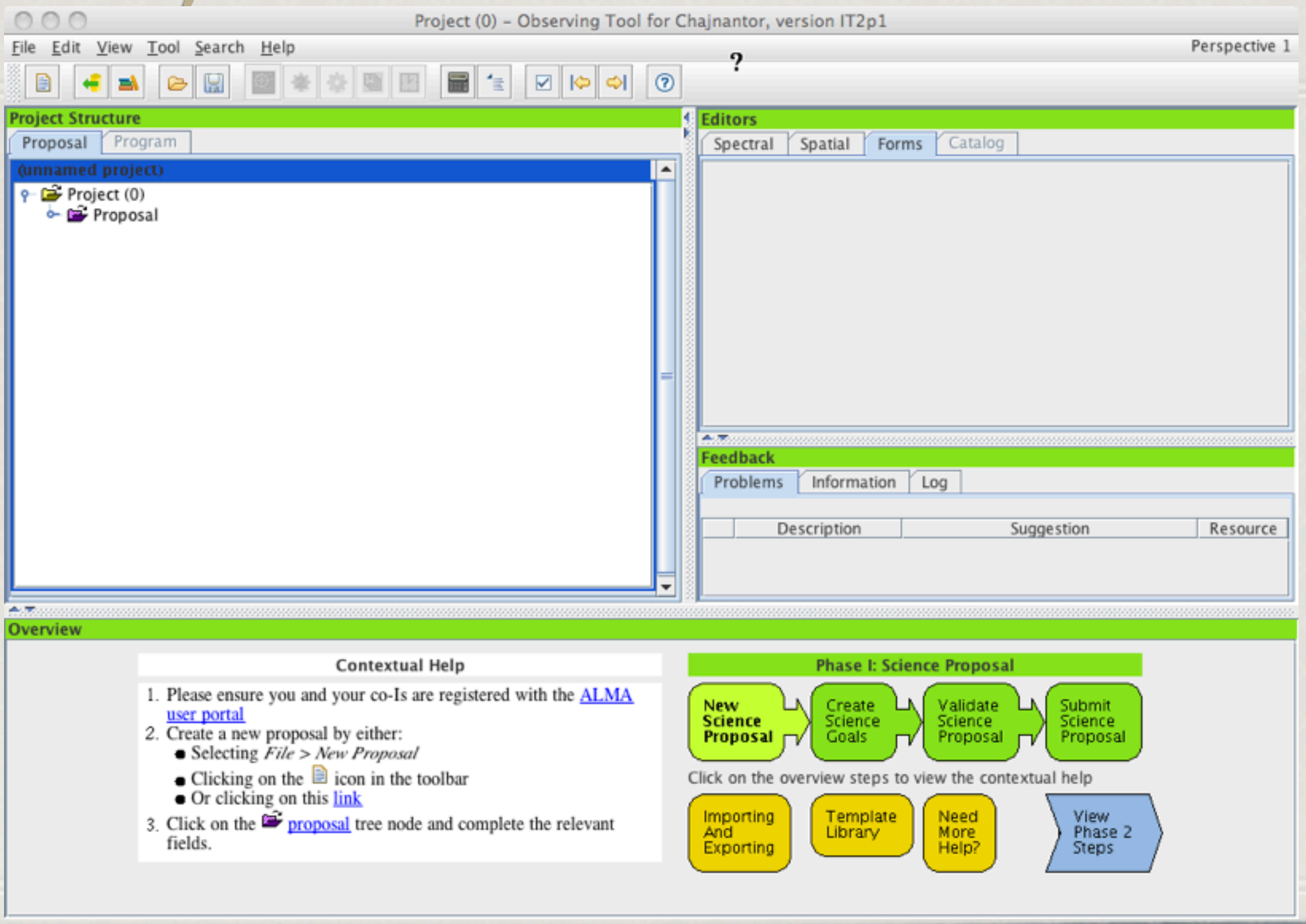


Project Structure (Phase I)



Project Structure (Phase I)

- *Project (Main Project Information)*
  - *Proposal (Proposal Information)*
    - *Planned Observing*
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        - *Description*
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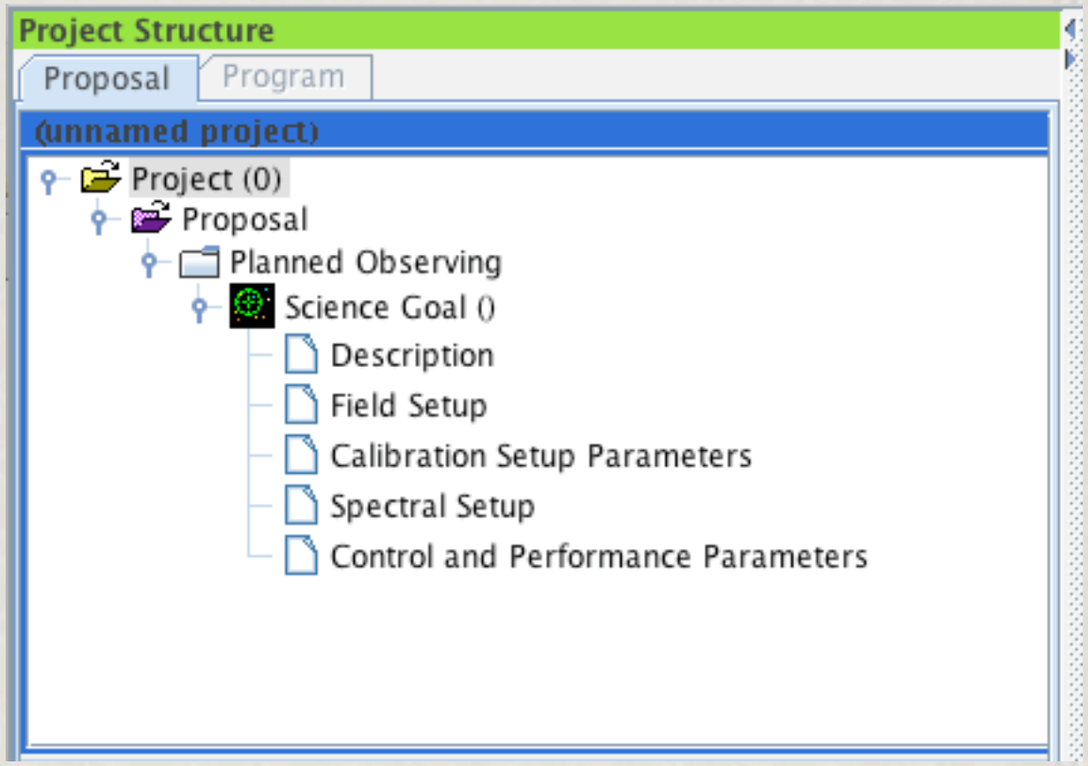

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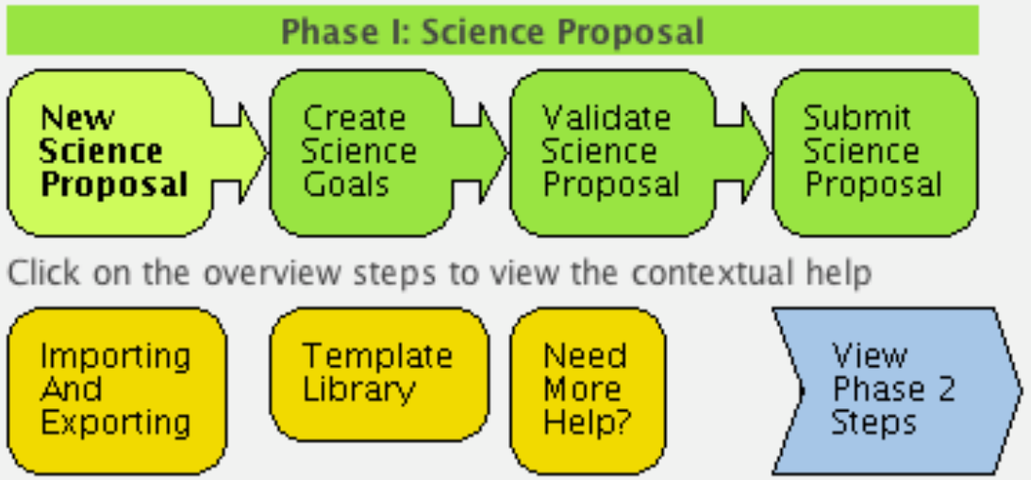

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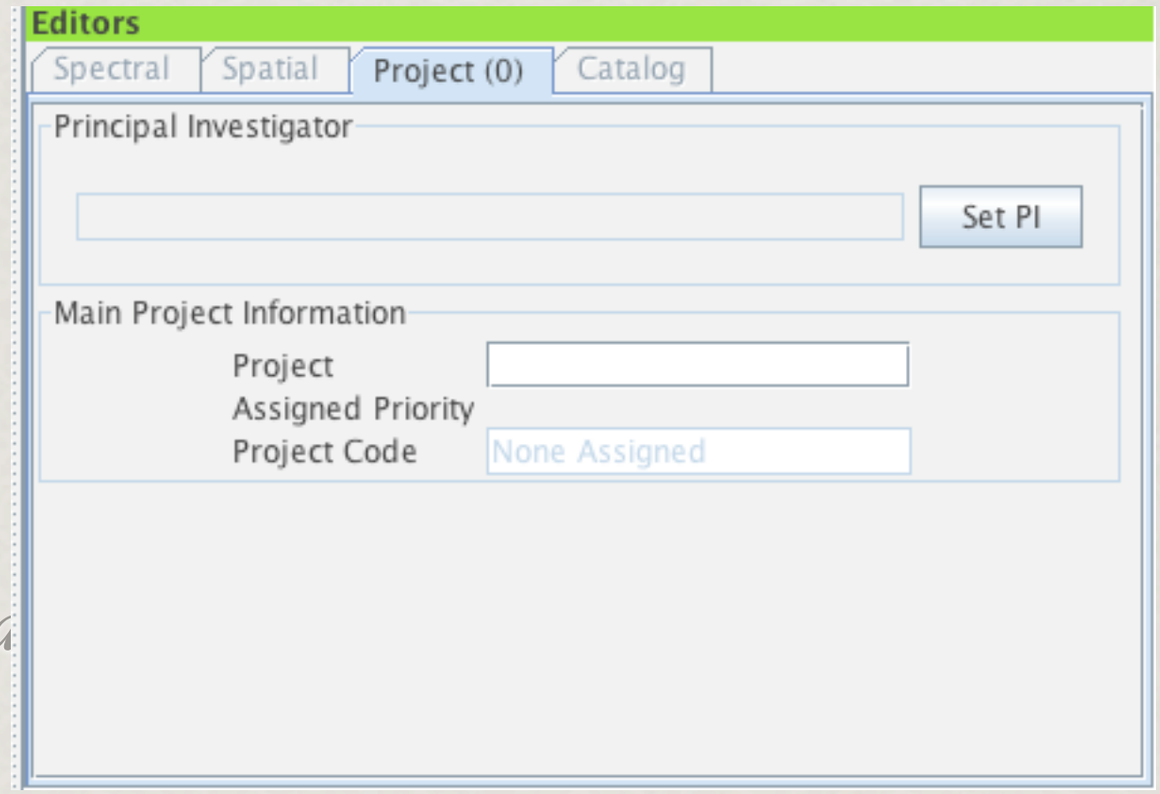

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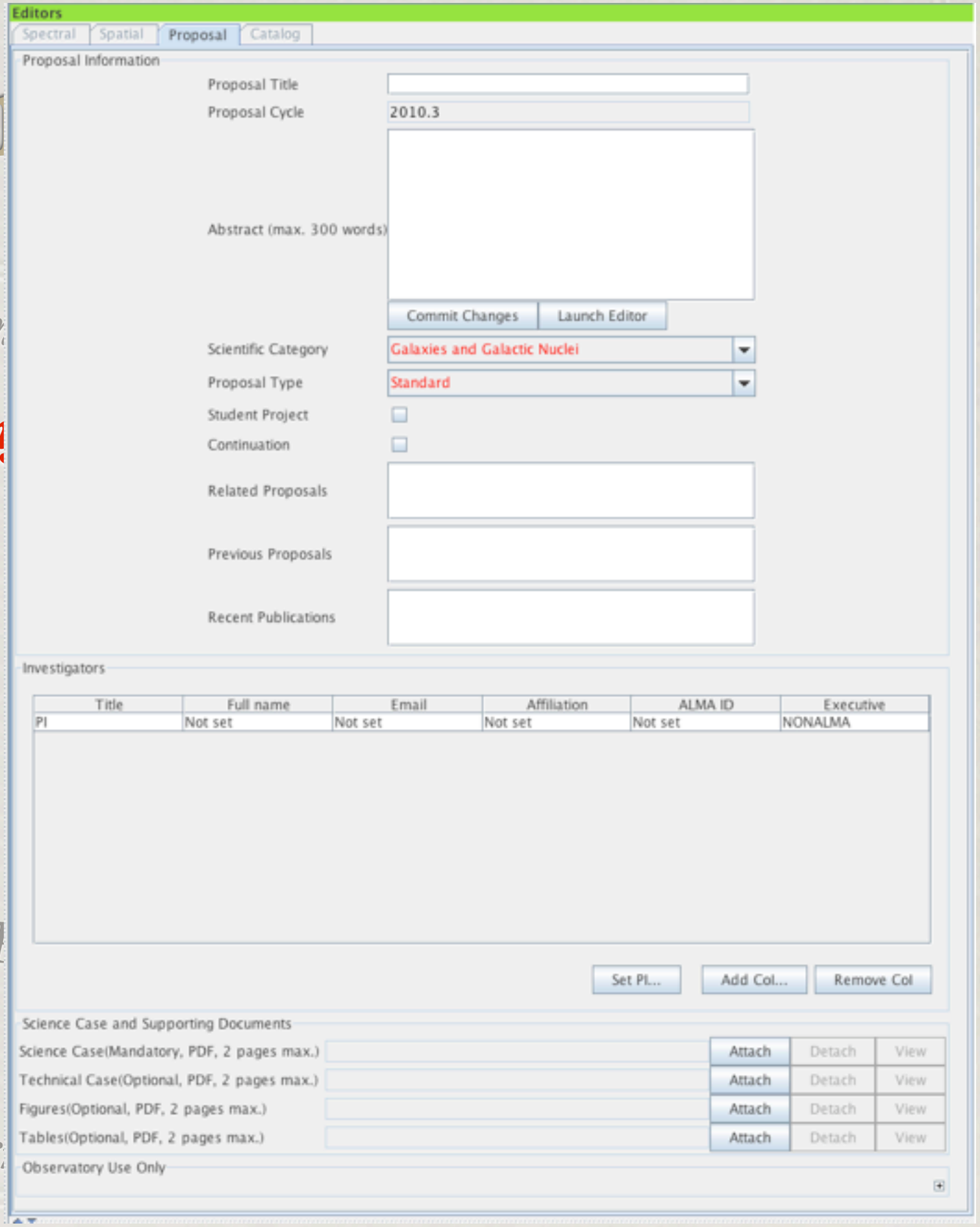

Science Goals

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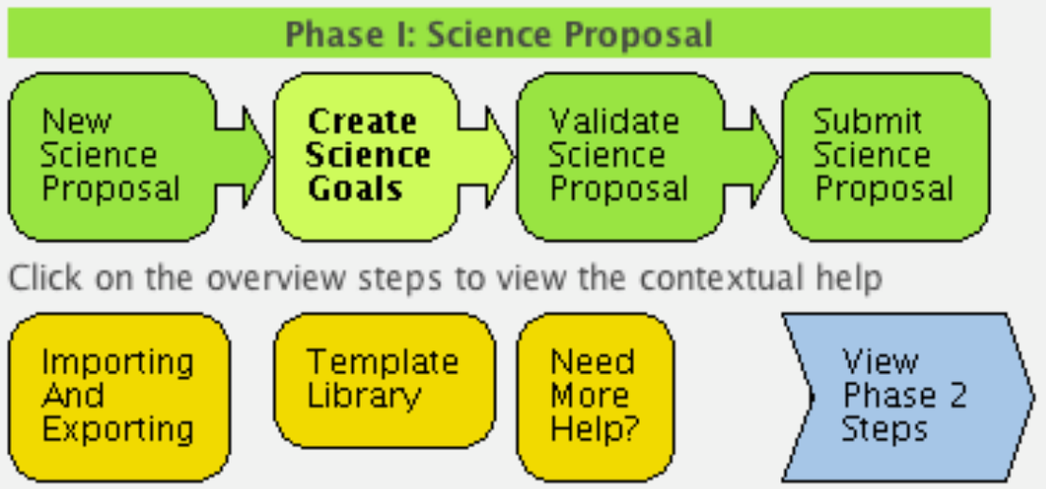

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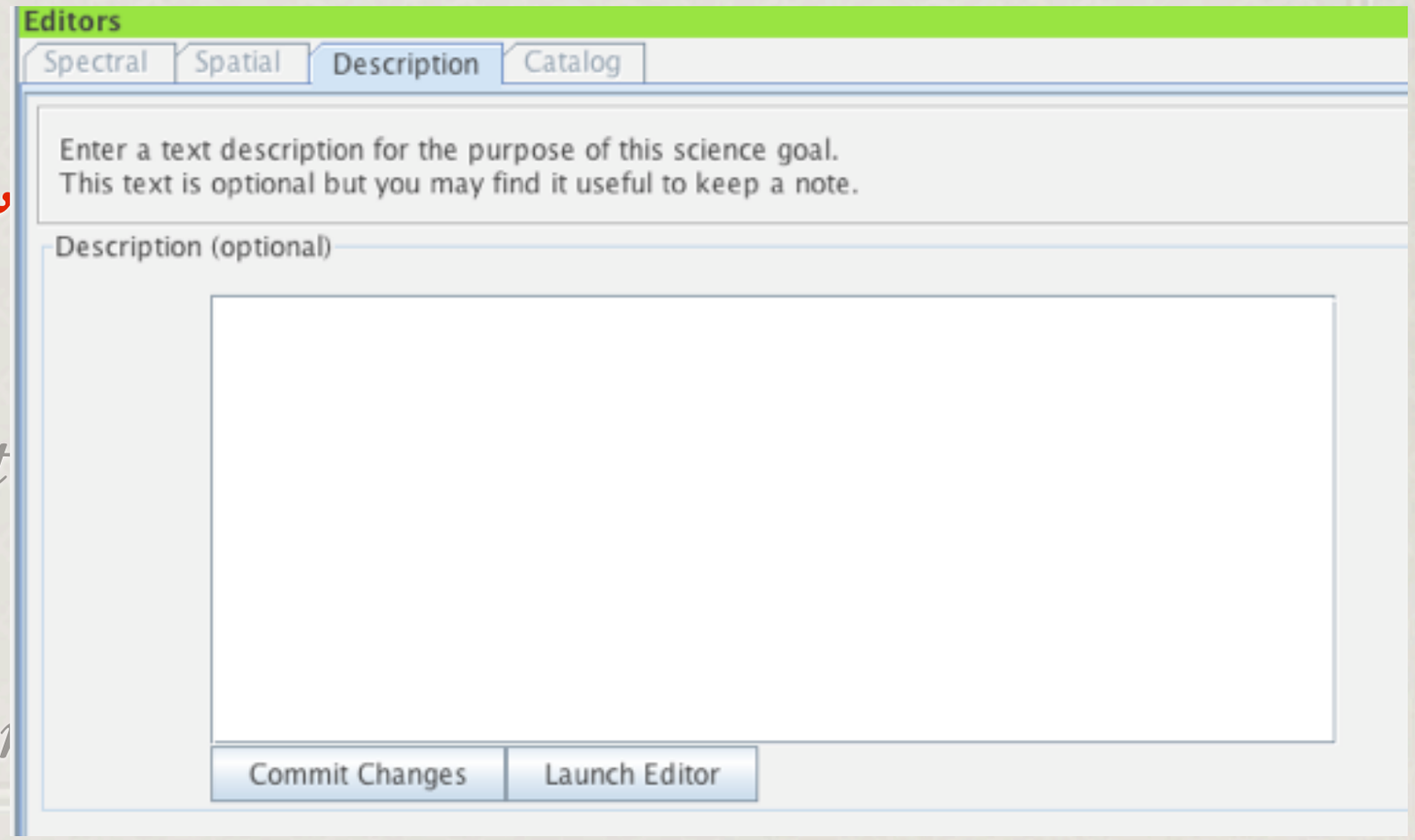


- *Project (Main Pro*
  - *Proposal (Prop*
    - *Planned Obs*
      - ***Science C***
        - *Descrip*
        - ***Field S***
        - *Calibra*
        - *Spectral*
        - *Control*

Editors

Spectral | Spatial | Field Setup | Catalog

Input the source you wish to look at and your mapping specification.
Alternatively you may define this with the Visual Editor – select the spatial tab.

SinglePoint

Source

Source Name [ ] Resolve

Choose a Solar System Object? ☐ Name of object Mercury

Source Coordinates
System J2000 Sexagesimal display? ☑
RA 00:00:00.000
Dec 00:00:00.000
Parallax 0.00000 mas
PM RA 0.00000 mas/yr
PM DEC 0.00000 mas/yr

Source Velocity 0.000 km/s lsr RADIO z 0.000000

Target Type ◉ Single Point Field ○ 1 rectangular field

Field Center Coordinates

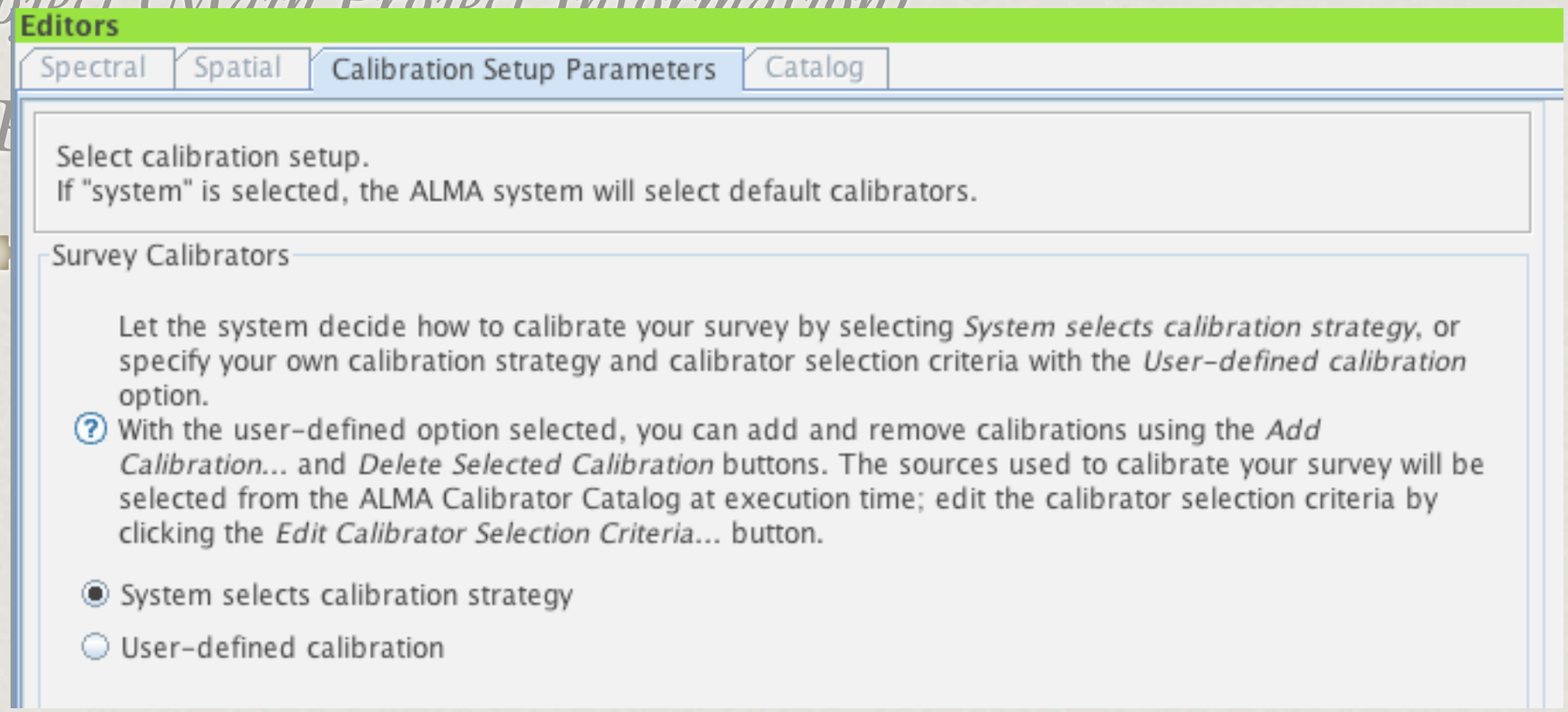
Coords Type ◉ ABSOLUTE ○ RELATIVE

System J2000 Sexagesimal display? ☑
RA 00:00:00.000
Dec 00:00:00.000

Add Target | Delete Target | Load Target List

Science Goals

- *Project (Main Project Information)*
- *Proposal Info*
- *Source*



- ***Calibration Setup Parameters***
- *Spectral Setup*
- *Control and Performance Parameters*

Science Goals

- Proje
- Pr
-
-

Editors

Spectral | Spatial | Spectral Setup | Catalog

You can set up spectral elements (windows) to be observed.
Up to 4 can be observed at the highest frequency resolution depending on the bandwidths you specify.
If you want to setup more than 4, you need to arrange them into 4 or fewer sets of spectral elements/windows.
Those sets are called "Basebands", and the width of a baseband is 2GHz.

Spectral Type

Spectral Type: Choose the type of spectral observation you wish to make

- (•) Up to 4 spectral elements/windows
- ( ) More than 4 spectral elements/windows
- ( ) Single continuum (average frequency)
- ( ) Spectral scan

Polarization Products desired: ( ) SINGLE_X ( ) SINGLE_Y (•) DOUBLE ( ) FULL

Up to 4 spectral elements/windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth,Resolution	Continuum

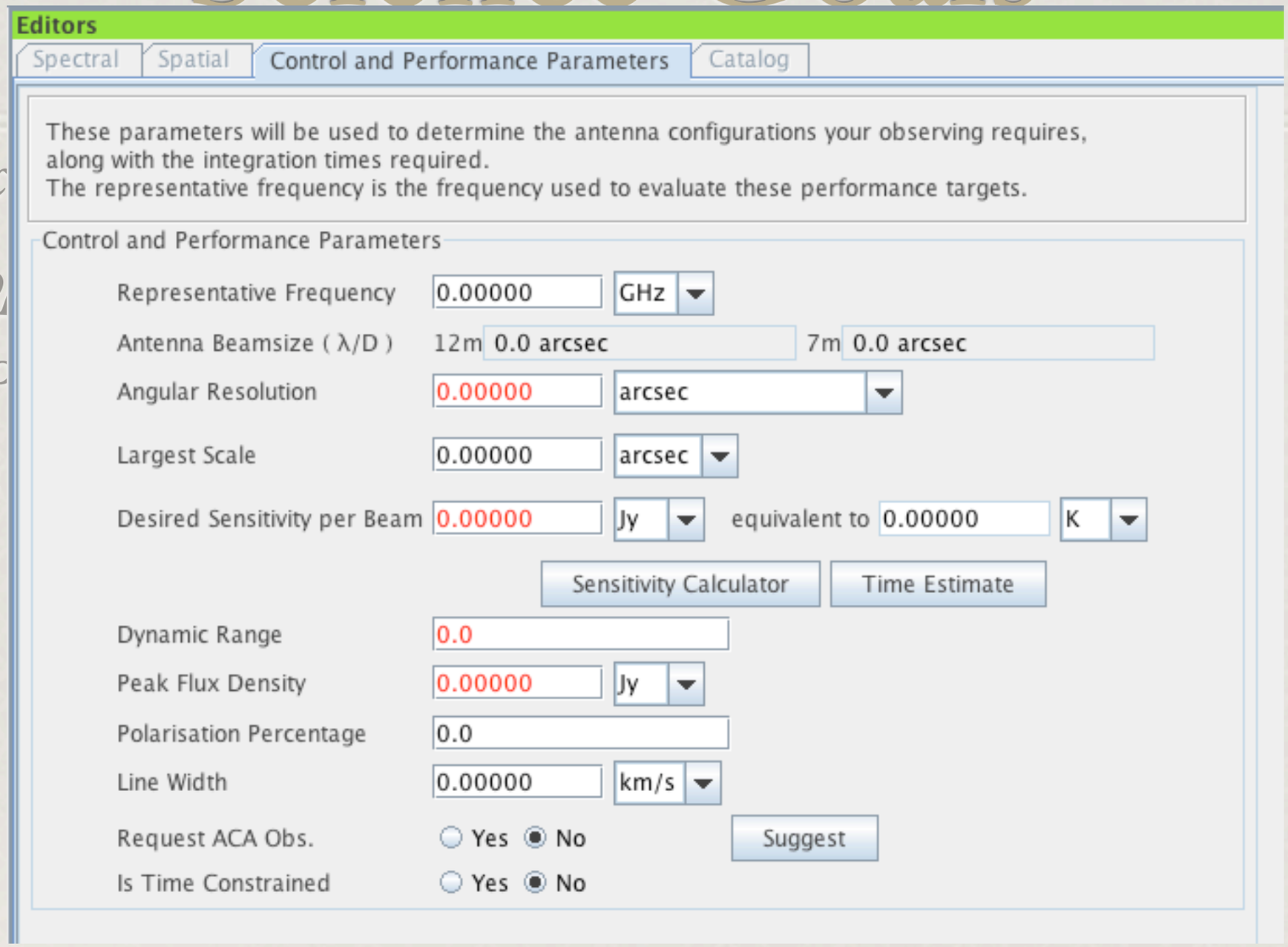
Select Lines | Add | Delete

Feedback

- ***Spectral Setup***
- *Control and Performance Parameters*

Science Goals

- *Projec*
- *Pro*
- *P*



- ***Control and Performance Parameters***

Science Goals

- *All the spectral elements defined a science goal should lie within a spectral range which can be observed at a time by a receiver band*

- *If you request observations required more than one frequency/receiver setups, you have to define a science goal for each setup.*

Validating Proposal

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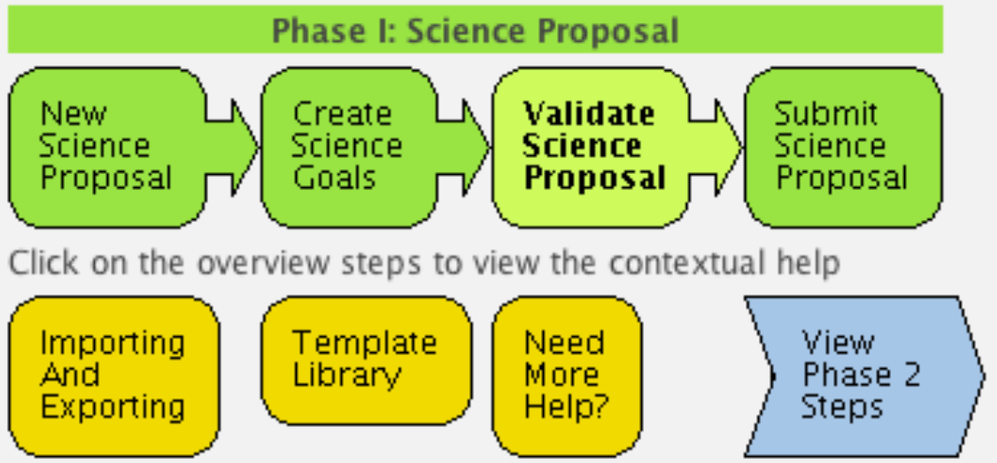

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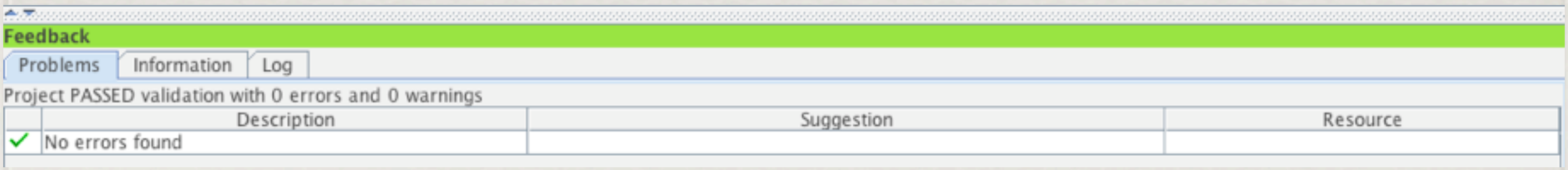

Submitting Proposal

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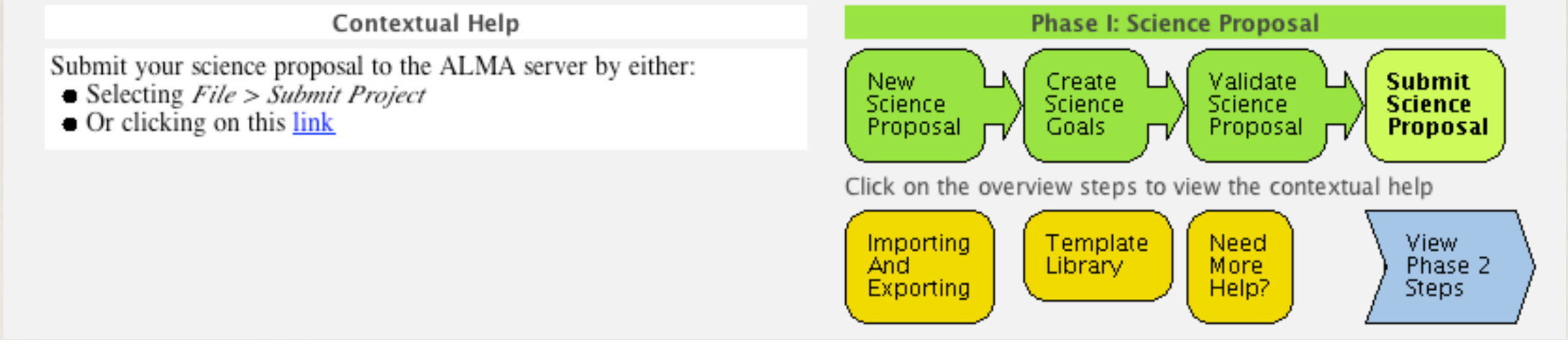

Summary Information

- *Printable Summary of proposal Summary Information*
  - *proposal information*
  - *science goals*
- *Generating a pdf of whole proposal*

Summary Information

- *Printable Summary*
- ***proposal infor***
- *science goals*
- *Generating a pdf of*

Summary Information : Project

Panel# : -1 ProposalID : entityId_-1133214557

2010.3

Title : REAL: Imaging the High-Velocity Outflow associated with the Massive Young Star G5.89-0.39

Astronomical Category : Galaxies and Galactic Nuclei

Date Submitted : ---

PI Name : Yu-Nung Su ARC : EA Institution : ASIAA Contact : , ynsu@asiaa.sinica.edu.tw

--Select A Proposal Type-- Standard Large Target Of Opportunity

Continuation Resubmission Related Proposals : Student/PhD

Stringency : PEL : Atmos.Quality Needed : A B C No grade SB's Done

Abstract

The bulk of the molecular outflow detected in low-J CO lines is thought to mainly comprise of swept-up ambient molecular gas
entrained by high-velocity primary wind/jet from the central young
star. The composition of the primary jet, however, is poorly understood. Direct imaging of the primary jet is not easy, while an alternative strategy is to
investigate the interactions between the primary jet and its entrained ambient gas. High-velocity outflowing gas often exhibits distinct behaviors with its low-velocity counterpart, and likely has ?
close connection to the primary jet. In such a case, the characteristics of high-velocity gas should better reflect the physical conditions of the primary jet. Here we propose to carry out
ALMA observations in CO and SiO to study the physical properties of the high-velocity outflow from G5.89-0.39, a high-mass young star. We will explore the
physical properties of the high-velocity outflowing gas using the large velocity gradient calculations.

#Science Goals : 2

Total Time : 4.8 h

Band 1 ... Band 2 ... Band 3 ... Band 4 ... Band 5 ...

Band 6 ... 0.3h Band 7 ... 4.5h Band 8 ... Band 9 ... Band 10 ...

12m Array Max Data Rate : 70.1 MB/s Data Volume : 1.1 TB

Joint Synthesis +Mosaic OTF-SD SubArray

Line +polarization Continuum +polarization

<Not Available Yet>

ACA 7m Array Max Data Rate : 0.0 MB/s Data Volume : 0.0 GB

Joint Synthesis +Mosaic OTF-SD SubArray

Line +polarization Continuum +polarization

<Not Available Yet>

ACA Total Power Max Data Rate : 0.0 MB/s Data Volume : 0.0 GB

Joint Synthesis +Mosaic OTF-SD SubArray

Line +polarization Continuum +polarization

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Summa

- *Printable Summary of*
  - *proposal information*
  - ***science goals***
- *Generating a pdf of wh*

Summary Information : Project

TA's ID : ProposalID :

2010.3

SG : 1 of 2 Science Goal (ScienceGoal) has 1 Target

ALMA Band 06 General Properties : 211 - 275 GHz (2SB)

IF GHz	Trx	50% Tsys	50% zen. opacity	1MHz	1mJy@1"
5.0-10.0	83-83K	*0-0K*	*0.00-0.00*	1.2 km/s	0.018-0.030K

HPBW 12m	HPBW 7m	resolution 12m Array	resolution 7m Array
19-24"	32-42"	*0.000-0.0"*	*0-0"*

Science Goal Control Parameters

Resolution	Largest Str...	Rms mJy	Dynamic R...	Linewidth	Source Flux	Polarization
0.5"	5"	4.4 mJy	0	200.00 k...	10.0 Jy	*0%*

Use of 12m Array 50 antennas(information not available in *italic* font and blank cells)

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Data Rate
Synthesis	0.3 h	*0" x 0"*	1	*0" x 0"*	*no*	69.9 GB	70.1 MB/s
OTF-TP							

<Not Yet Available>Use of ACA 7m Array 12 antennas

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Data Rate
Synthesis							
OTF-TP							

<Not Yet Available>Use of ACA TP Array 4 antennas

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Data Rate
OTF-TP							

Target list for Science Goal 01

Target	Ra,Dec(J2000)	l,b	Motion	V,def,frame --OR--z	Linewidth	Source Flux	Pol'n
1-G5.89-0.39	18:00:30, -24:04:01	*0.000, 0.000*	Sidereal	10km/s,lsr,RADIO	*0 km/s*	*0.000 Jy*	*0%*

Frequency/correlator/specral Info

Set-0 - setup

Frequency GHz	Line ID	# Stokes (1,2,4)	# Channels per stokes	Bandwidth	Chan Spacing	Polarized %
217.104984	SiOv=0 5-4	2	4096	2000.0 MHz, 2761.8 km/s	488.28 kHz, 0.674 km/s	*1%*

Set-0 - rms

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA12m OTF-TP
217.104984	*0-0K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*

Set 1 - setup

Frequency GHz	Line ID	# Stokes (1,2,4)	# Channels per stokes	Bandwidth	Chan Spacing	Polarized %
230.538000	COv=0 2-1	2	4096	2000.0 MHz, 2600.9 km/s	488.28 kHz, 0.635 km/s	*1%*

Set 1 - rms

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA12m OTF-TP
230.538000	*0-0K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*	*0.0 m/y, 0.0 K*

Set 2 - setup

Frequency GHz	Line ID	# Stokes (1,2,4)	# Channels per stokes	Bandwidth	Chan Spacing	Polarized %

Set 2 - rms

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA12m OTF-TP

Set 3 - setup

Frequency GHz	Line ID	# Stokes (1,2,4)	# Channels per stokes	Bandwidth	Chan Spacing	Polarized %

Set 3 - rms

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA12m OTF-TP

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