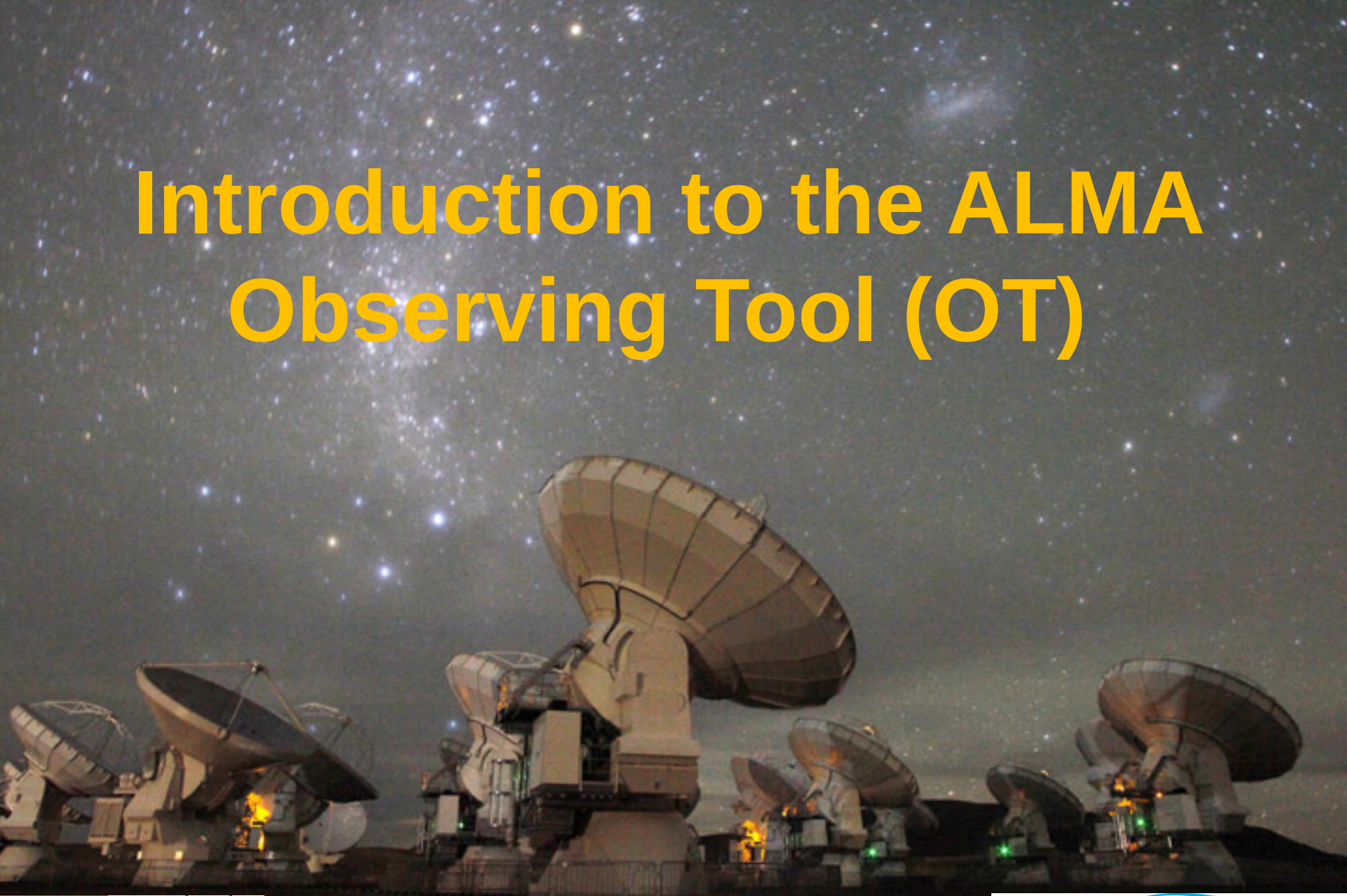
Introduction to the ALMA Observing Tool (OT)



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Argelander-Institut für Astronomie

EUROPEAN ARC
ALMA Regional Centre || Germany

The ALMA-OT

The ALMA Observing Tool (ALMA-OT):

- ✓ for **proposal preparation** (phase I)
  => Science Goals (SGs)
- ✓ for creation of the **observing program** (phase II)
  => Scheduling Blocks (SBs)

Scheduling Blocks are created from Science Goals!

- downloaded and run locally by **webstart** (recommended) **or tarballs** for Linux, Mac and Windows
- needs **Java 8** (javaws)! *IcedTea doesn't work*
- internet connection required to access **online databases** and catalogues
- **many tools** included (name resolver, visual editors, sensitivity calculator, spectral line picker, …)

Atacama Large Millimeter/submillimeter Array

In search of our Cosmic Origins

Log In

About | Science | Proposing | Observing | Data | Processing | Tools | Documentation | Help

Search Site

- Cycle 5 Call for Proposals
- Proposing Guidance
- Proposer's Guide
- Cycle 5 Capabilities
- Observing Tool
  - Troubleshooting
  - OT Video Tutorials
- Sensitivity Calculator
- Proposal Template
- Duplicate Observations
- ALMA Primer
- Technical Handbook
- DDT proposals

Observatory News

Additional Information for Cyc
Feb 01, 2018

New Science Verification data
for download
Jan 22, 2018

Announcement of intent to rel
installment of Science Verifica

More...

RC News

rcher position available at the Nordic ARC

018

an ARC-

European Radio Interferometry School

...

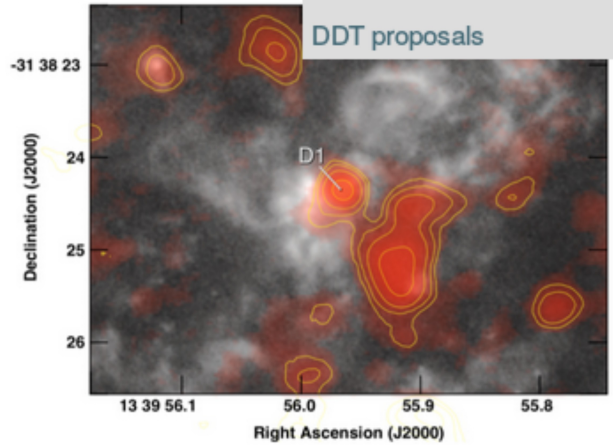
Status

ALMA Cycle 5 Config Schedule
Latest Cycle 6 Proposal News Item

Refereed publications: 969
Last observed source: IRAS_16293-2422
Current configuration: C43-5

More...

Science Highlights - M upernebula of the Dwarf Galaxy NGC 5253



One of the areas of extragalactic research which makes great use of ALMA's resolution and sensitivity is the study of the molecular gas properties of dwarf galaxies. In a recent study by Dr. Jean Turner and her collaborators, they make use of Band 7 ALMA observations to detect warm ^{12}CO(3-2) and ^{13}CO(3-2) emission (Cloud D1) from the core of a giant star-forming region, in the dwarf galaxy NGC 5253. This "supernebula" is the source of one-third of the galaxy's infrared luminosity and is in proximity to optical clusters with measured stellar ages of ~ 1 Myr. From radio recombination line analysis, the region is estimated to have 1400-1800 O stars..

Full Summary...

Observing Tool

The ALMA Observing Tool (OT) is a Java application used for the preparation and submission of ALMA Phase 1 (observing proposal) and Phase 2 (telescope runfiles for accepted proposals) materials. It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals. The current *Cycle 5* release of the OT is configured for the present capabilities of ALMA as described in the Cycle 5 Call For Proposals. Note that in order to submit proposals you will have to register with the ALMA Science Portal beforehand.

Note that preparation of Cycle 4 DDT proposals needs to be done using the Cycle 4 version of the Observing Tool. This version of the OT can be found in the DDT page, or the Phase 2 menu.

Download & Installation

The OT will run on most common operating systems, as long as a **64-bit version of Java 8** is installed (see the troubleshooting page if you are experiencing Java problems). The ALMA OT is available in two flavours: Web Start and tarball.

The **Web Start** application is the recommended way of using the OT. It has the advantage that the OT is automatically downloaded and installed on your computer and it will also automatically detect and install updates. There are some issues with Web Start, particularly that it does not work with the Open JDK versions of Java such as the "Iced Tea" flavour common on many modern Linux installations. The Oracle variant of Java should therefore be installed instead. If this is not possible, then the tarball installation of the OT is available.

The **tarball** version must be installed manually and will not automatically update itself, however there should be no installation issues. For Linux users, we also provide a download complete with a recommended version of the Java Runtime Environment. Please use this if you have any problems running the OT tarball with your default Java.

Webstart Tarball

button_webstart

Documentation

Extensive documentation is available to help you work with the OT and optimally prepare your proposal:

- If you are a novice OT user you should start with the OT Quickstart Guide, which takes you through the basic steps of ALMA proposal preparation.
- Audio-visual illustrations of different aspects of the OT can be found in the OT video tutorials. These are recommended for novices and advanced users alike.

Web Start Download Page

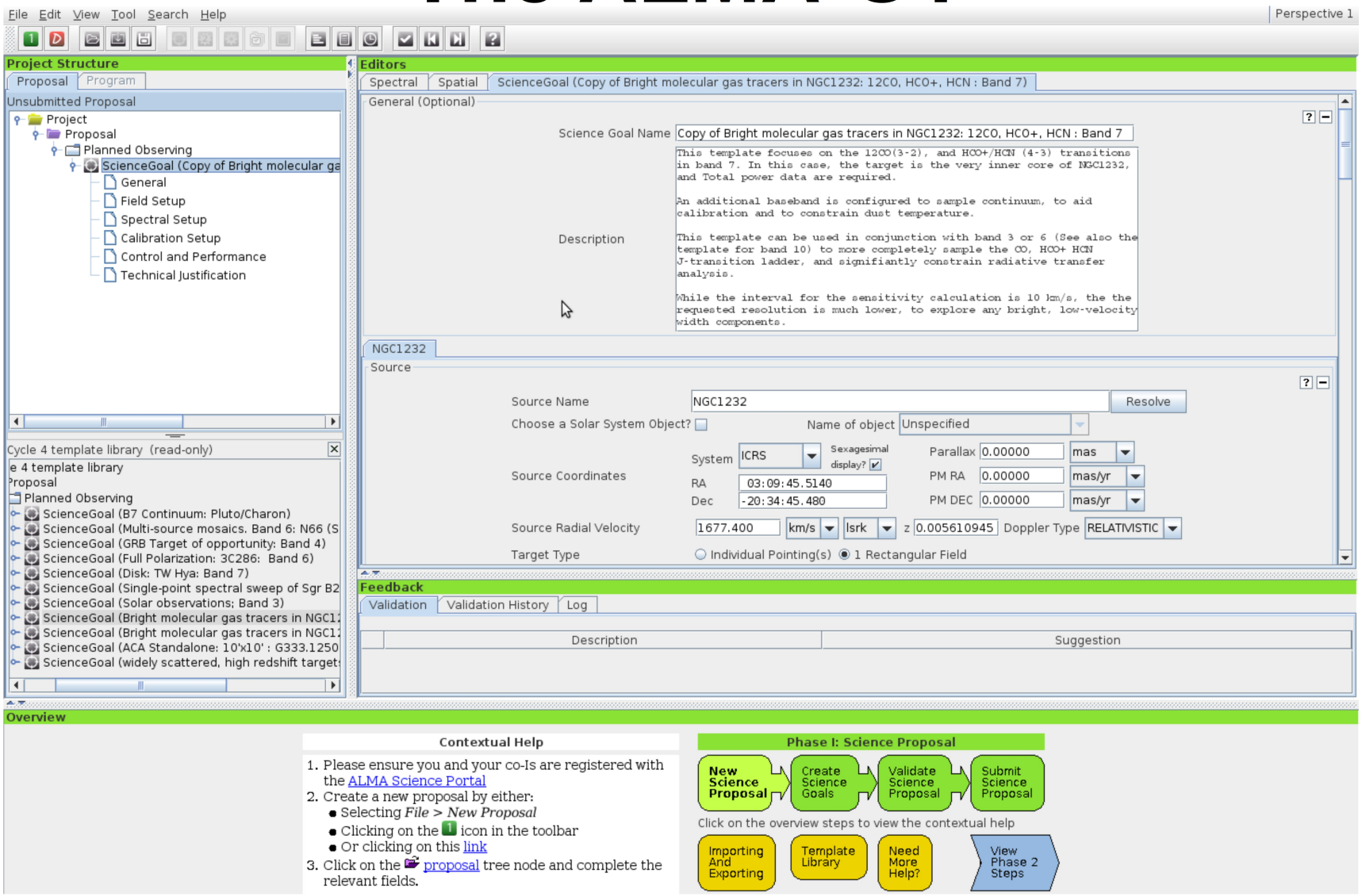
Click logo to start.

Click the OT Logo to start the OT. If the OT has not been downloaded before, or if an update has been released, a download window will appear. For first-time users, after the download has completed, you may (depending on your operating system) be given the option to create a shortcut, or one will be created automatically for you, usually on the desktop. Future use of the OT can then most conveniently be started by double-clicking the shortcut. Even if a shortcut is not created, the OT will have been downloaded into the Web Start cache and can be started from the Java Cache Viewer (accessible using 'javaws -viewer' or from Java Preferences on a Mac).

USEFUL TO KNOW

- The Web Start will automatically detect if an update to the installed version of the OT has been released and will automatically download it.
- If a network connection is not available, the Web Start version will still work, but will obviously not be able to update itself or use the OT's external services such as the user database, online spectral line search, etc.

The ALMA-OT


File Edit View Tool Search Help
Perspective 1
Project Structure
Proposal Program
Unsubmitted Proposal
Project
Proposal
Planned Observing
ScienceGoal (Copy of Bright molecular ga
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
Cycle 4 template library (read-only)
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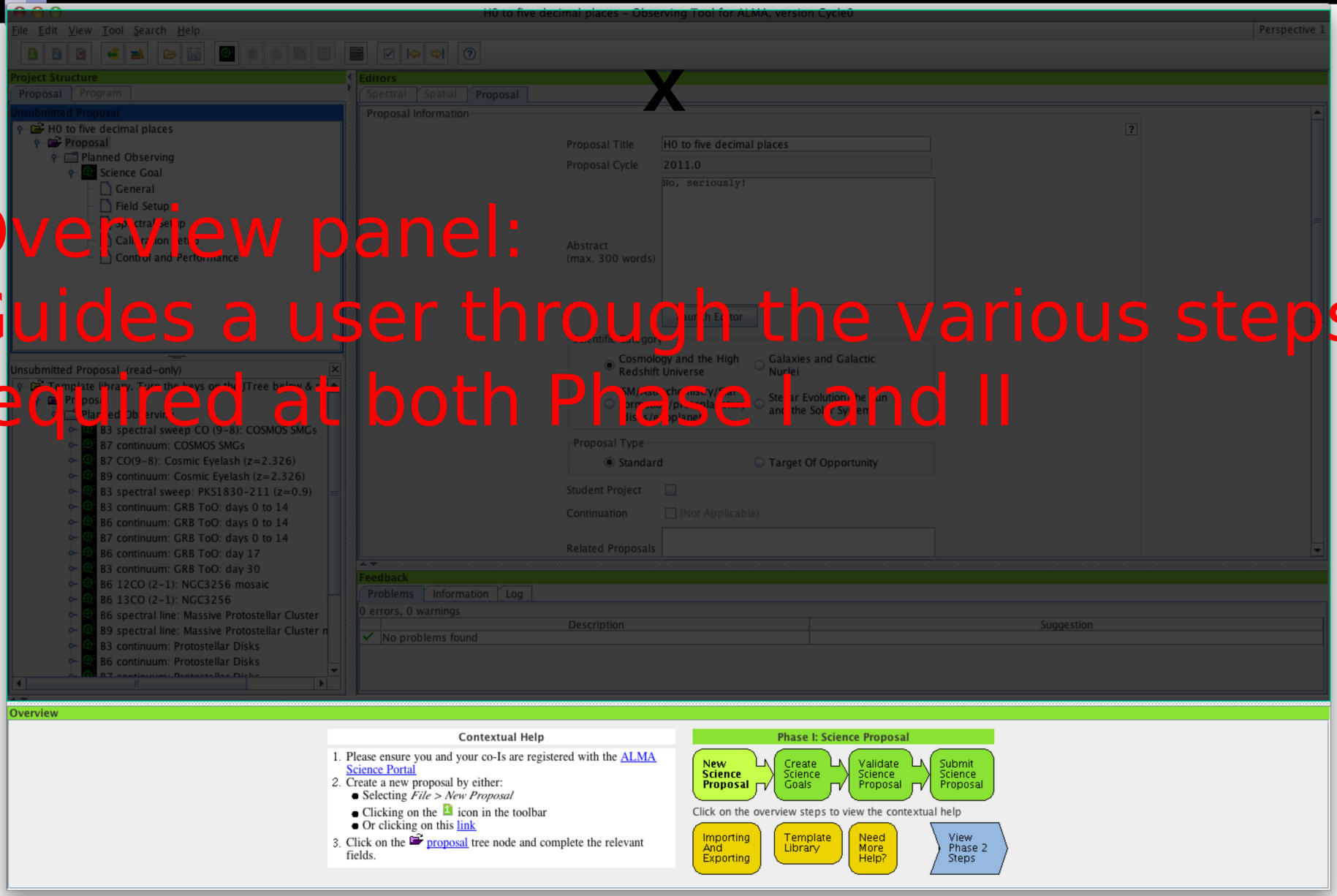
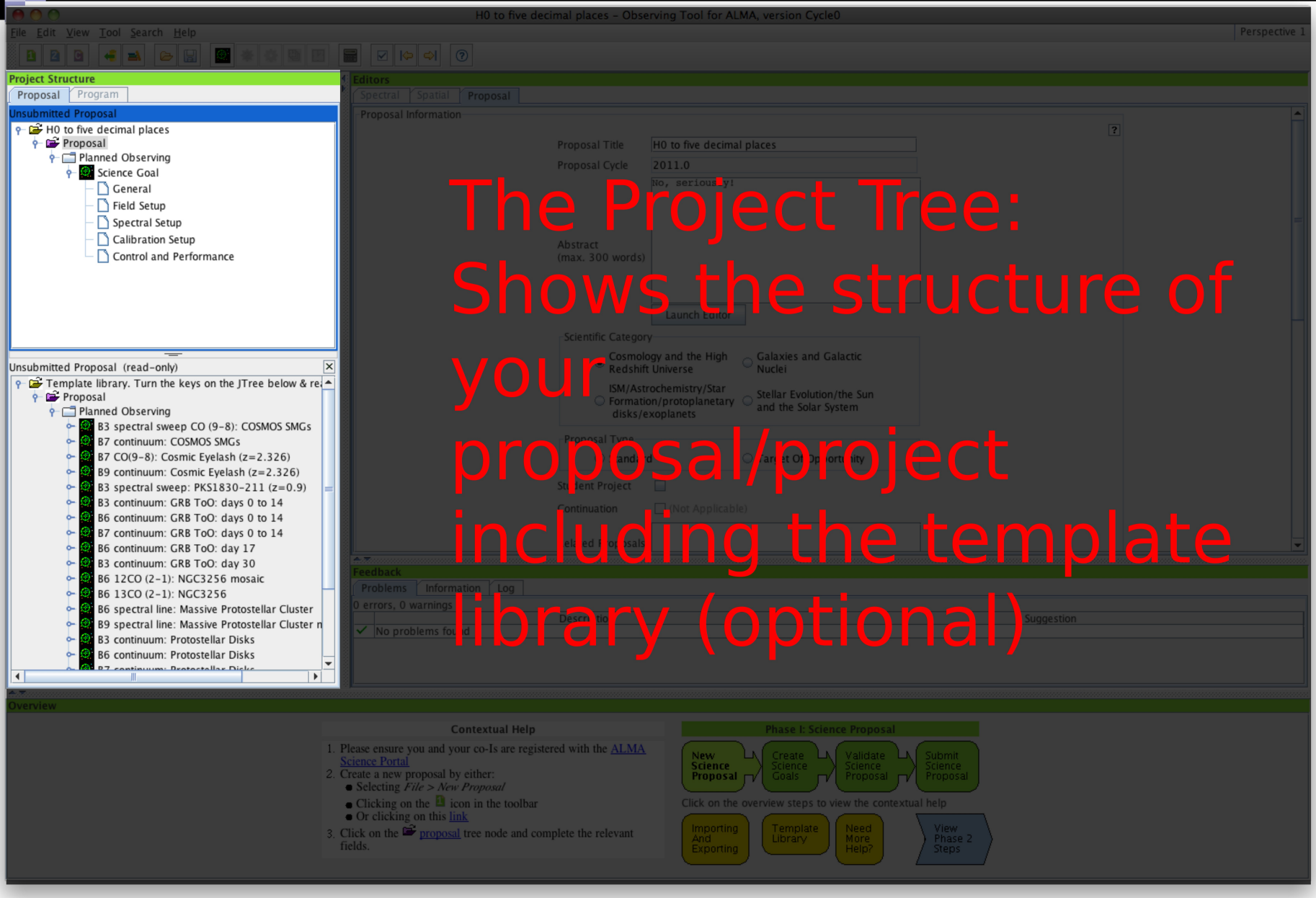
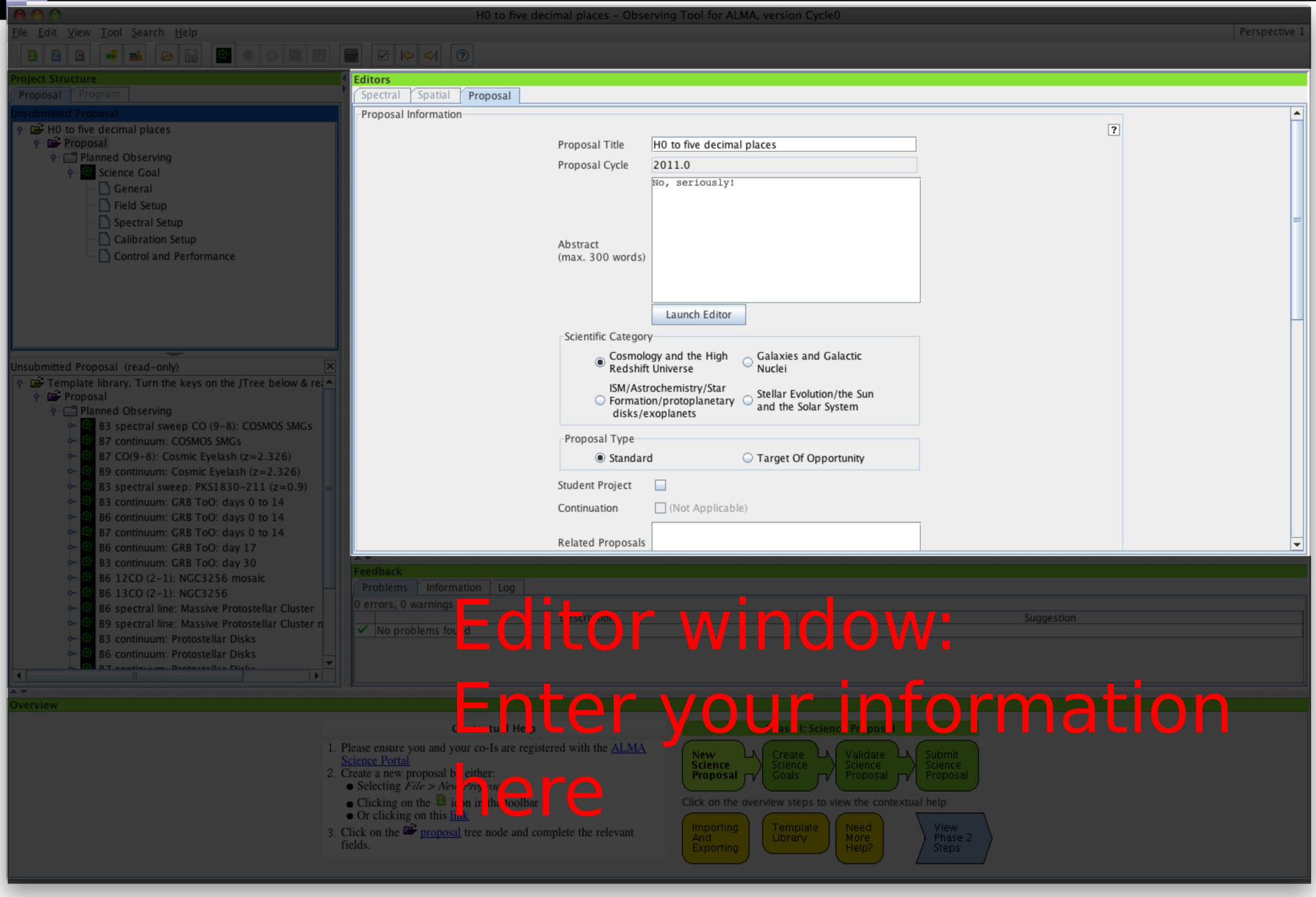
roposal
Planned Observing
ScienceGoal (B7 Continuum: Pluto/Charon)
ScienceGoal (Multi-source mosaics. Band 6: N66 (S
ScienceGoal (GRB Target of opportunity: Band 4)
ScienceGoal (Full Polarization: 3C286: Band 6)
ScienceGoal (Disk: TW Hya: Band 7)
ScienceGoal (Single-point spectral sweep of Sgr B2
ScienceGoal (Solar observations; Band 3)
ScienceGoal (Bright molecular gas tracers in NGC1
ScienceGoal (Bright molecular gas tracers in NGC1
ScienceGoal (ACA Standalone: 10'x10' : G333.1250
ScienceGoal (widely scattered, high redshift target
Editors
Spectral Spatial ScienceGoal (Copy of Bright molecular gas tracers in NGC1232: 12CO, HCO+, HCN : Band 7)
General (Optional)
Science Goal Name Copy of Bright molecular gas tracers in NGC1232: 12CO, HCO+, HCN : Band 7
Description
This template focuses on the 12CO(3-2), and HCO+/HCN (4-3) transitions in band 7. In this case, the target is the very inner core of NGC1232, and Total power data are required.
An additional baseband is configured to sample continuum, to aid calibration and to constrain dust temperature.
This template can be used in conjunction with band 3 or 6 (See also the template for band 10) to more completely sample the CO, HCO+ HCN J-transition ladder, and signifiantly constrain radiative transfer analysis.
While the interval for the sensitivity calculation is 10 km/s, the the requested resolution is much lower, to explore any bright, low-velocity width components.
NGC1232
Source
Source Name NGC1232 Resolve
Choose a Solar System Object?
Name of object Unspecified
Source Coordinates
System ICRS
Sexagesimal display?
RA 03:09:45.5140
Dec -20:34:45.480
Parallax 0.00000 mas
PM RA 0.00000 mas/yr
PM DEC 0.00000 mas/yr
Source Radial Velocity 1677.400 km/s lsrk z 0.005610945 Doppler Type RELATIVISTIC
Target Type
Individual Pointing(s)
1 Rectangular Field
Feedback
Validation Validation History Log
Description
Suggestion
Overview
Contextual Help
1. Please ensure you and your co-Is are registered with the ALMA Science Portal
2. Create a new proposal by either:
Selecting File > New Proposal
Clicking on the icon in the toolbar
Or clicking on this link
3. Click on the proposal tree node and complete the relevant fields.
Phase I: Science Proposal
New Science Proposal
Create Science Goals
Validate Science Proposal
Submit Science Proposal
Click on the overview steps to view the contextual help
Importing And Exporting
Template Library
Need More Help?
View Phase 2 Steps



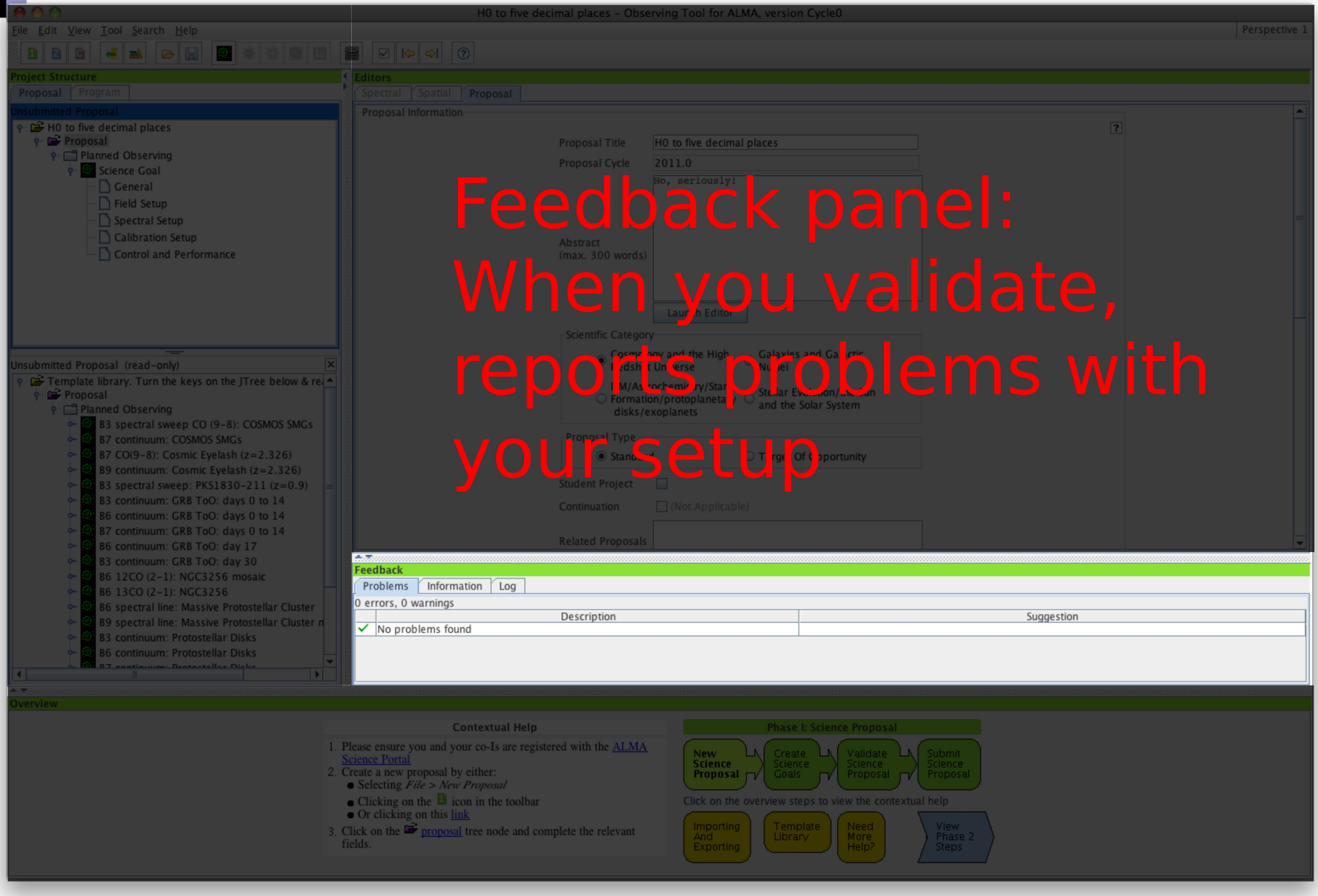
Overview panel:
Guides a user through the various steps required at both Phase I and II



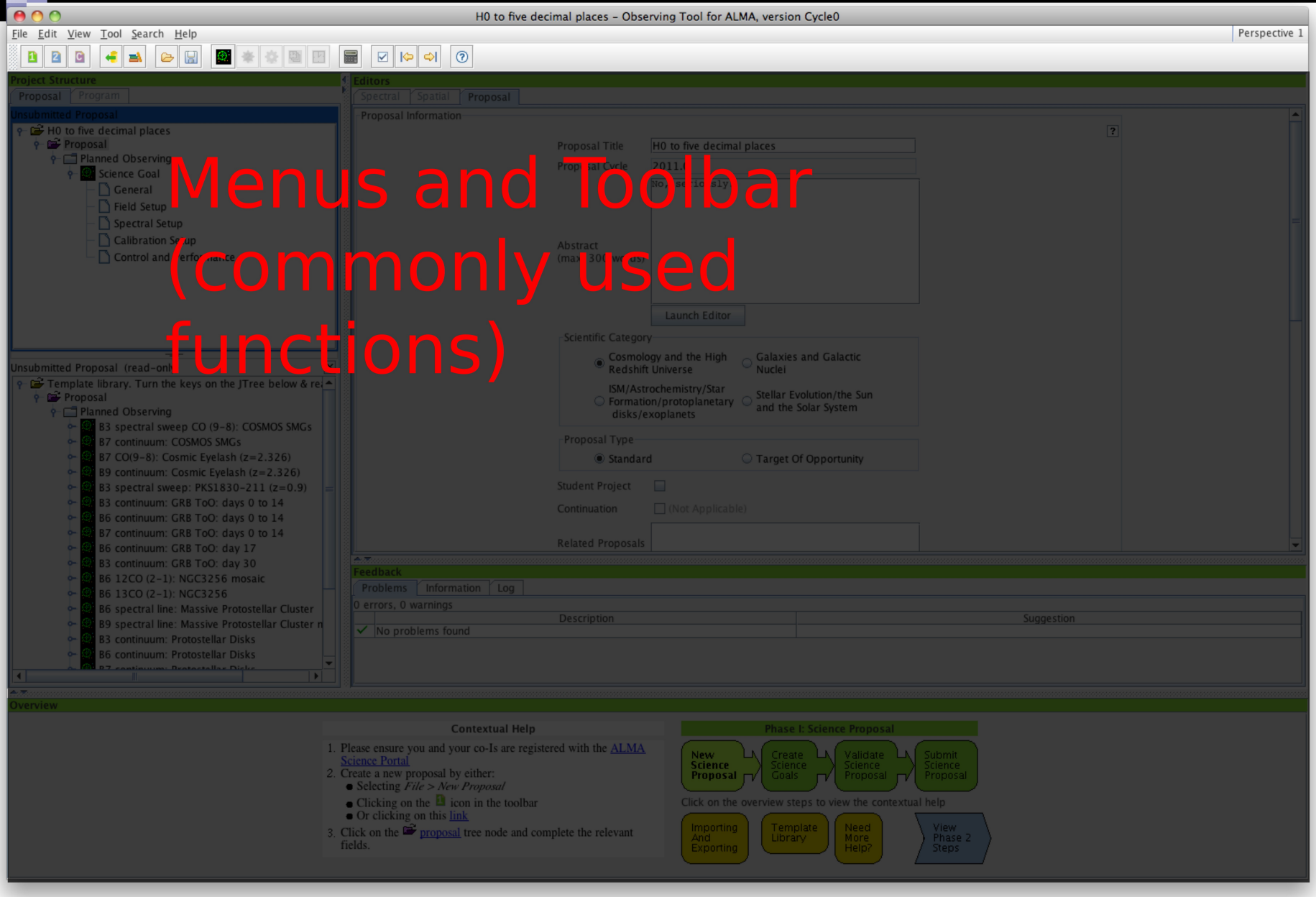
The Project Tree: Shows the structure of your proposal/project including the template library (optional)



Editor window:
Enter your information here



Feedback panel:
When you validate, reports problems with your setup

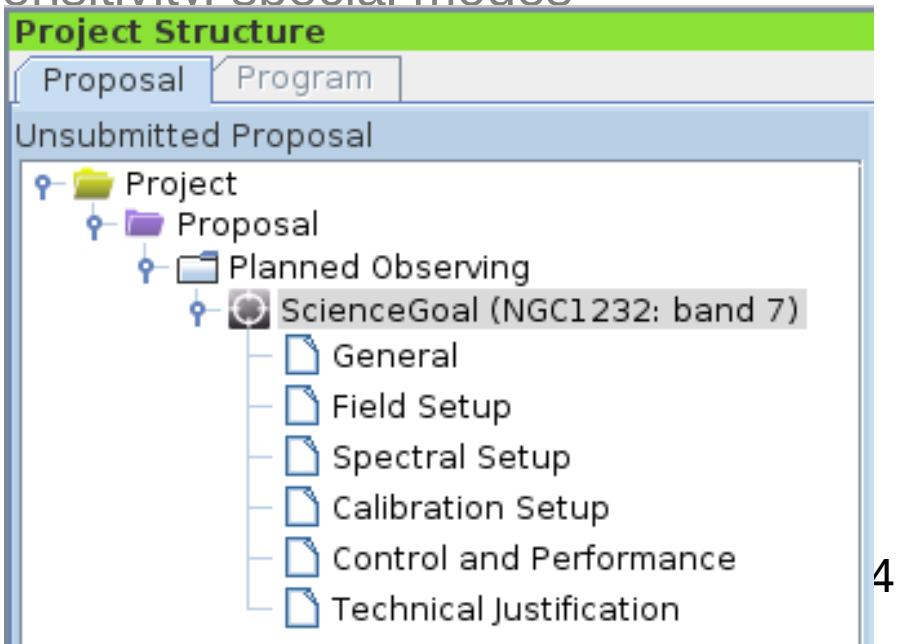


Menus and Toolbar (commonly used functions)

The ALMA-OT

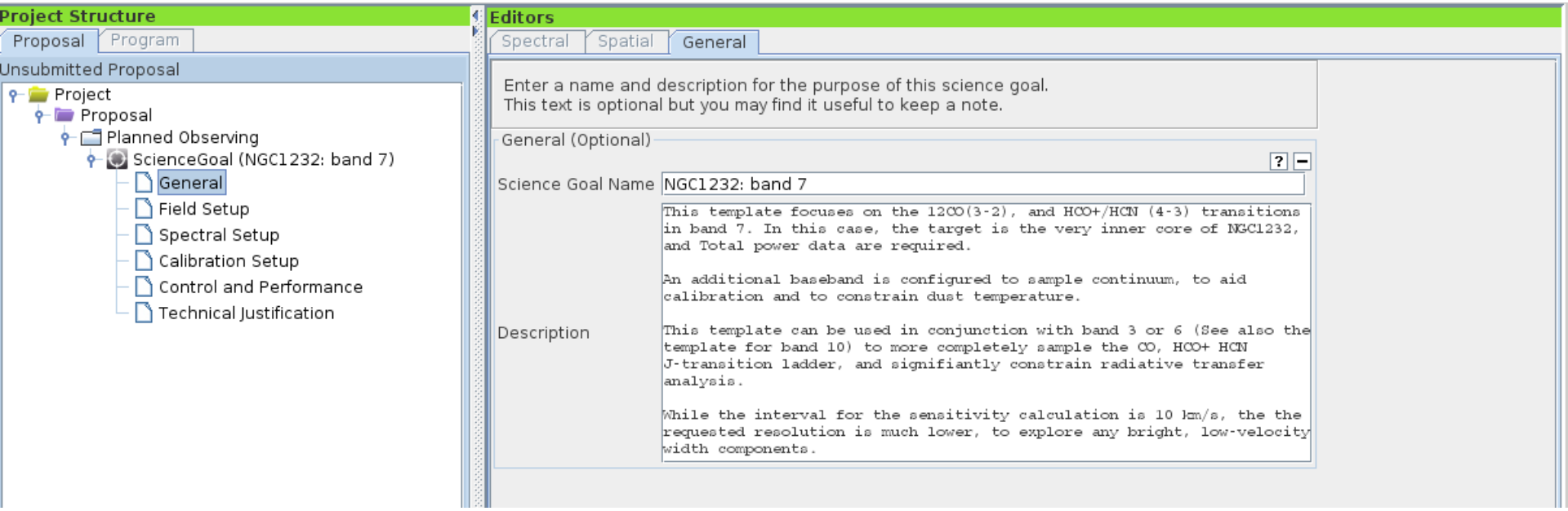
A **Science Goal** consists of:

1) (a basic description)
2) basic source information: coordinates, velocity, flux density, field
3) spectral setup: lines or continuum, frequency, correlator modes
4) calibration setup: choose “system-defined”
5) control and performance parameters: angular resolution, largest angular structure, required sensitivity, special modes
6) technical justification (text)

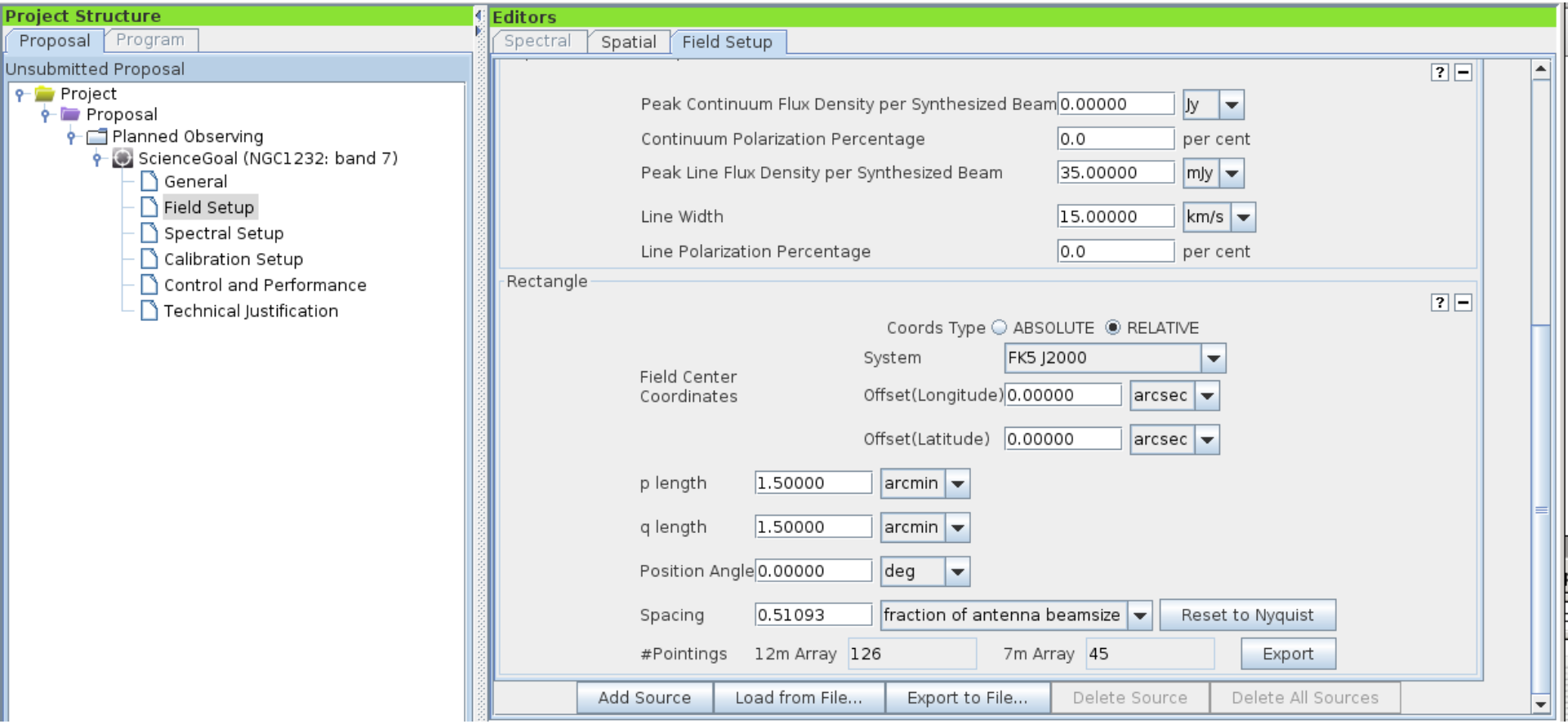


Science Goal: General

enter a name and description of the science goal (optional)

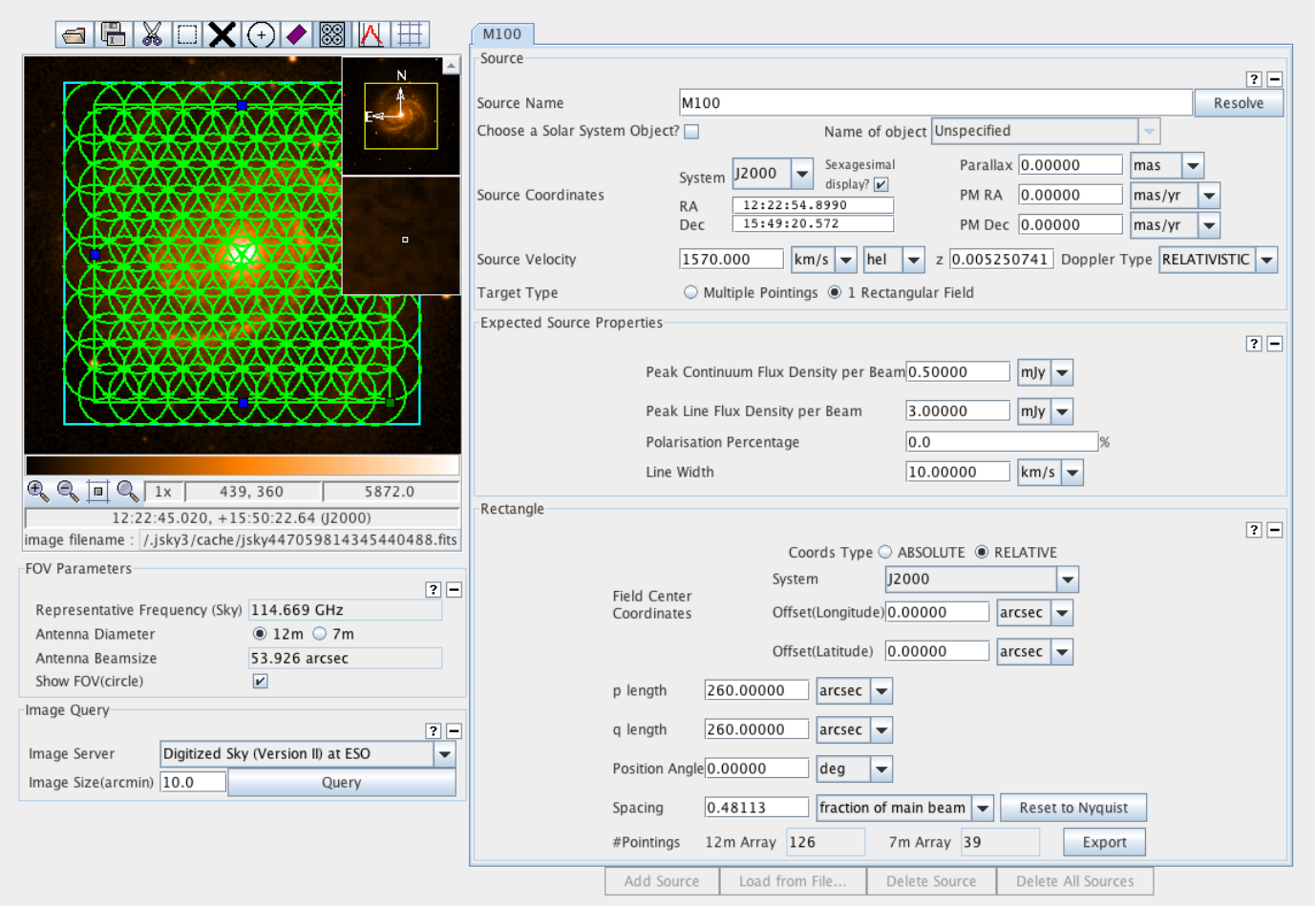


Science Goal: Spatial Setup



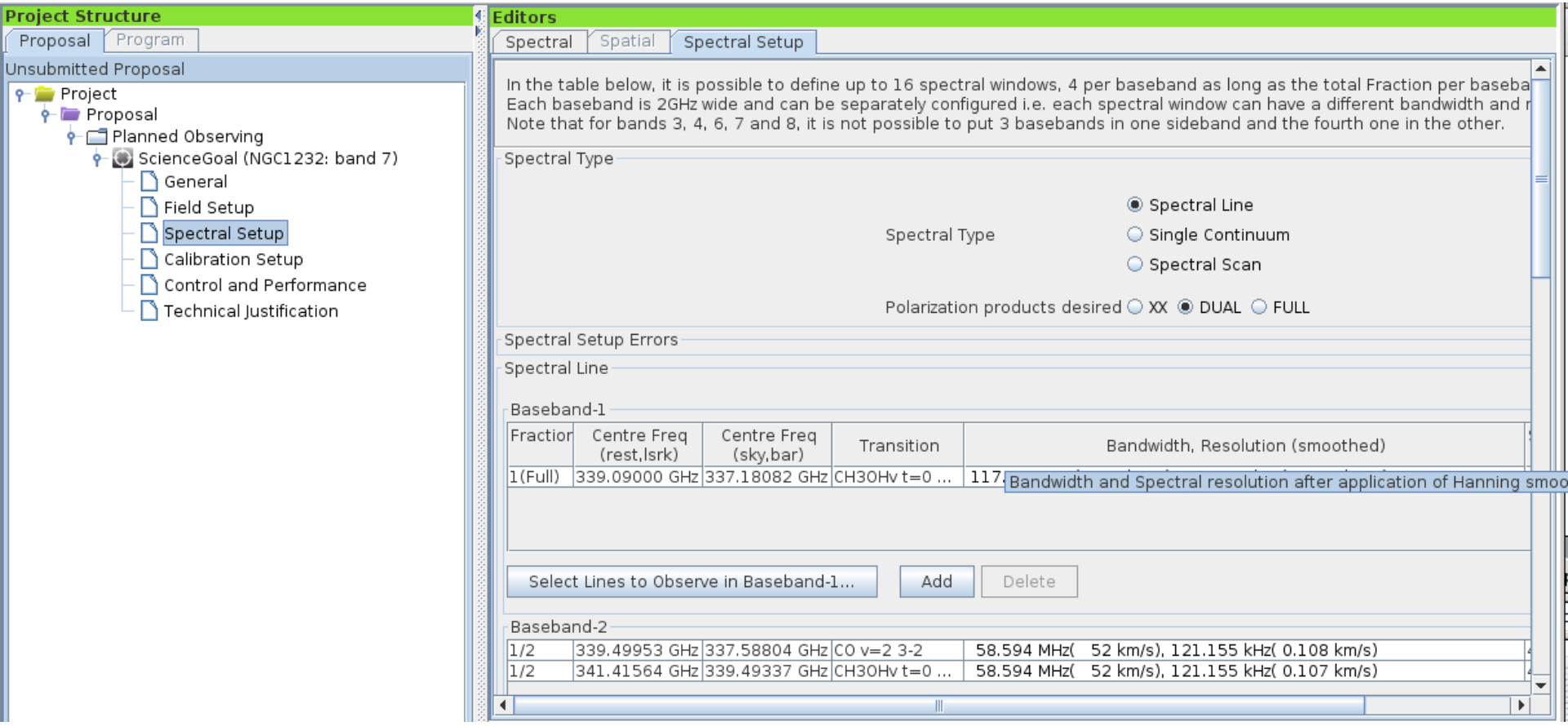
basic source information: coordinates, velocity, strength, line width, pointings/map area, …

Science Goal: Spatial Setup

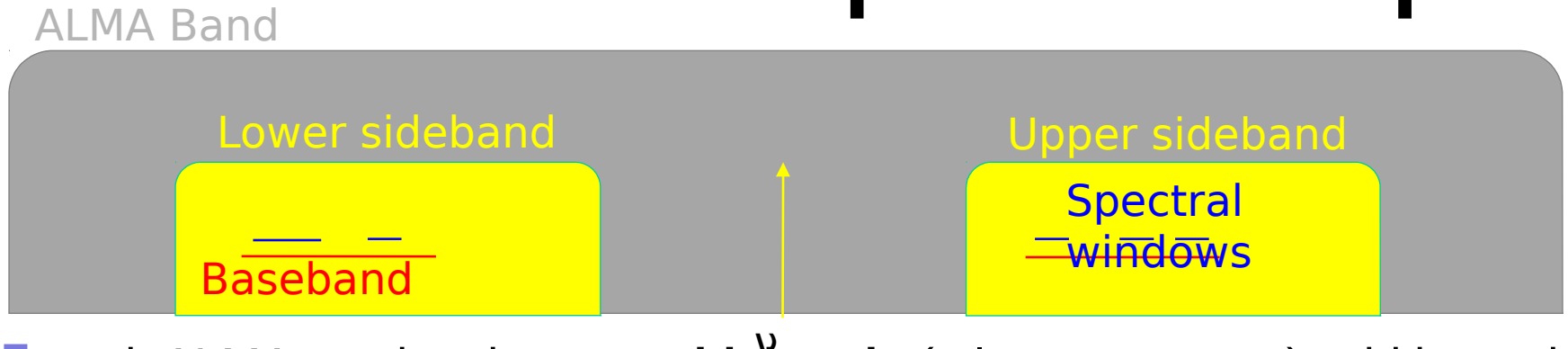


Spatial Visual Editor: show ALMA and ACA pointings and beam widths overlaid on FITS images (define rep. freq. first!)

Science Goal: Spectral Setup

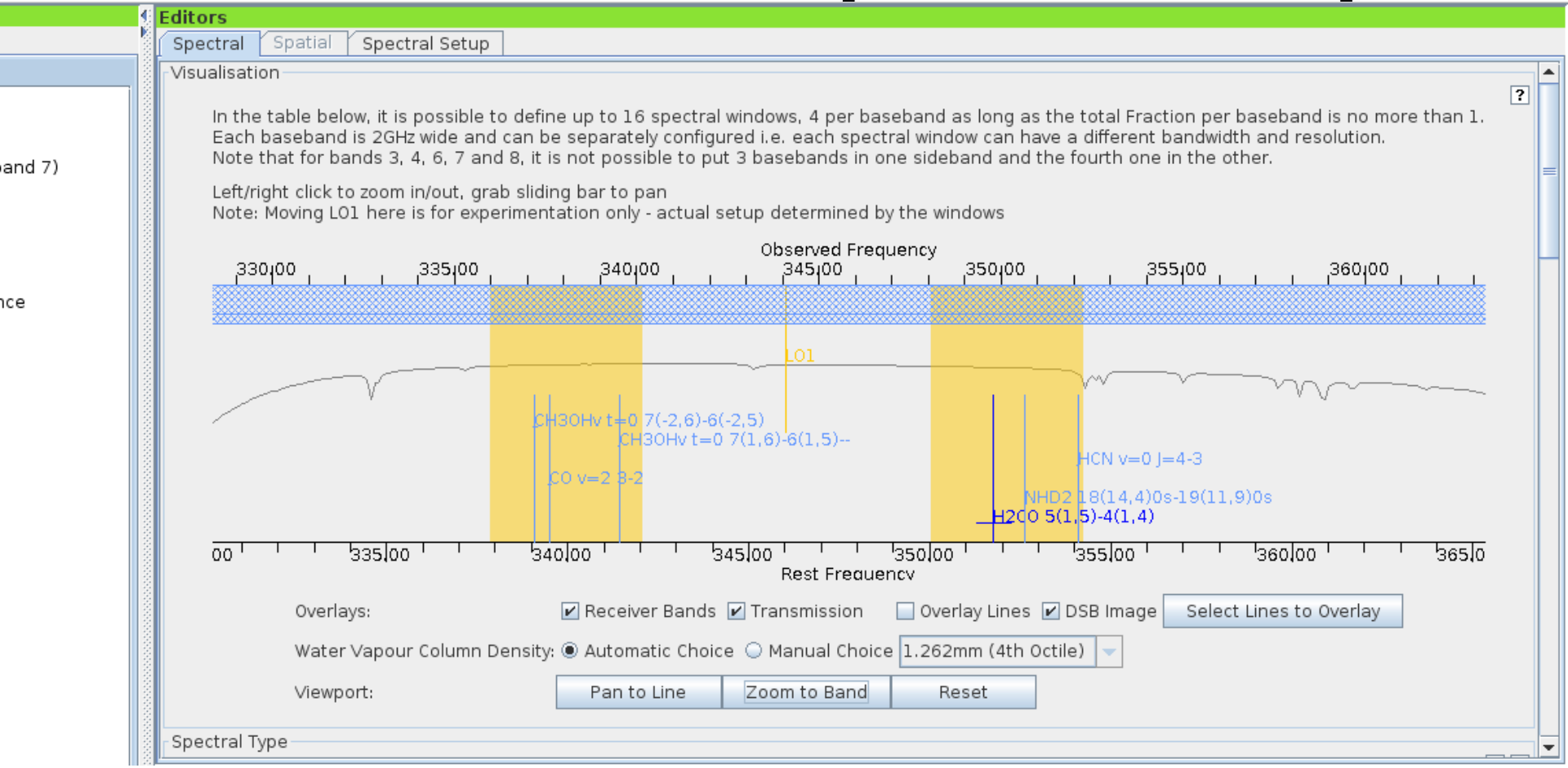


Science Goal: Spectral Setup



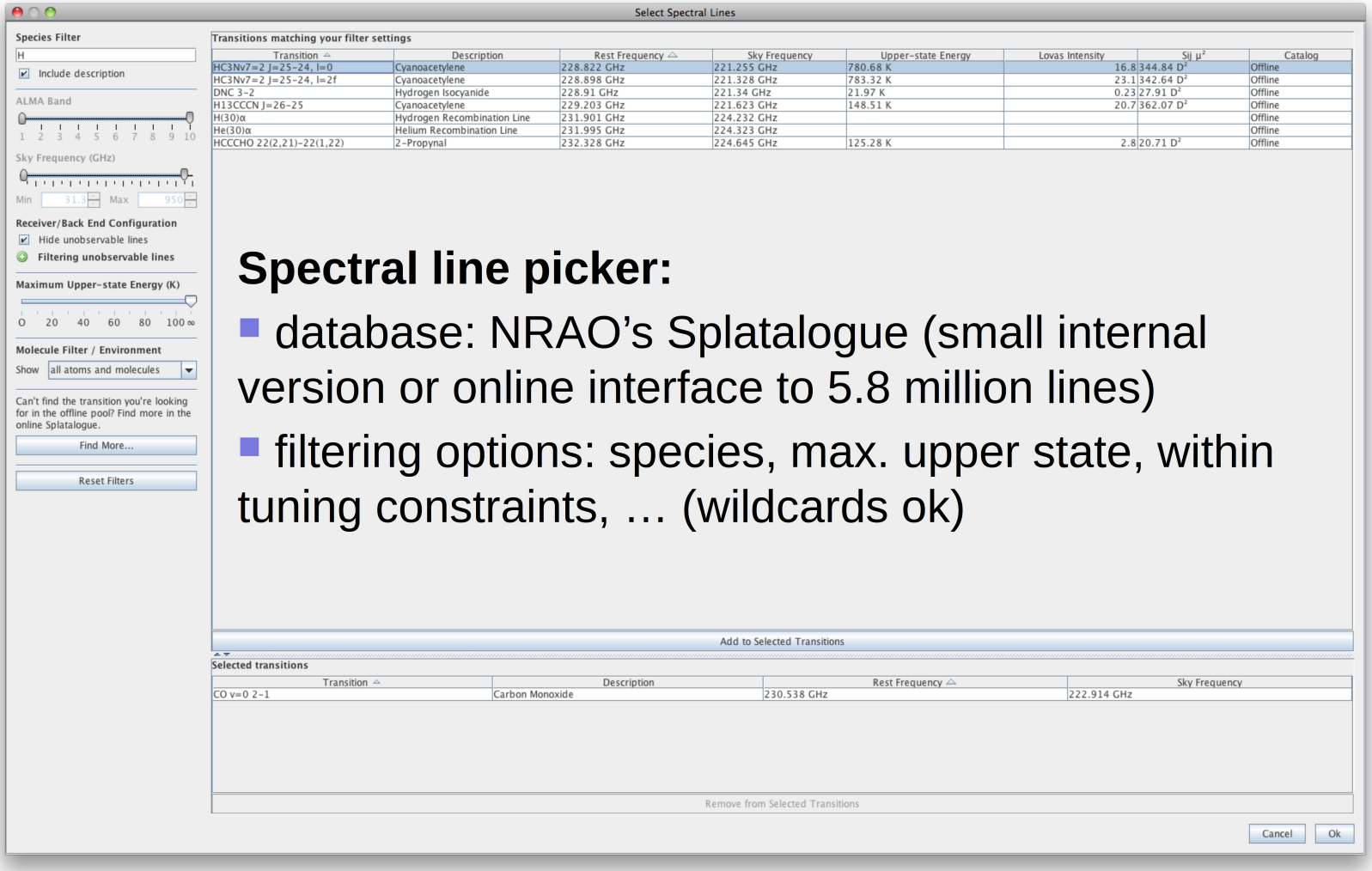
- each ALMA receiver has two **sidebands** (telescope output); widths and separations are band-dependent
- up to 4 **basebands** sample the sideband signals, each 2-GHz wide, two polarizations (X and Y)
- **spectral windows** sample the baseband signals
- possible to define up to 4 spectral windows per baseband
  - different high-resolution and low-resolution correlator modes possible within the same frequency tuning (limiting factor: correlator channels)
- one correlator setup, one set of calibration and control parameters and up to 5 frequency tunings per Science Goal

Science Goal: Spectral Setup



displays sidebands, spectral windows, LO1, atmospheric transmission, spectral lines…

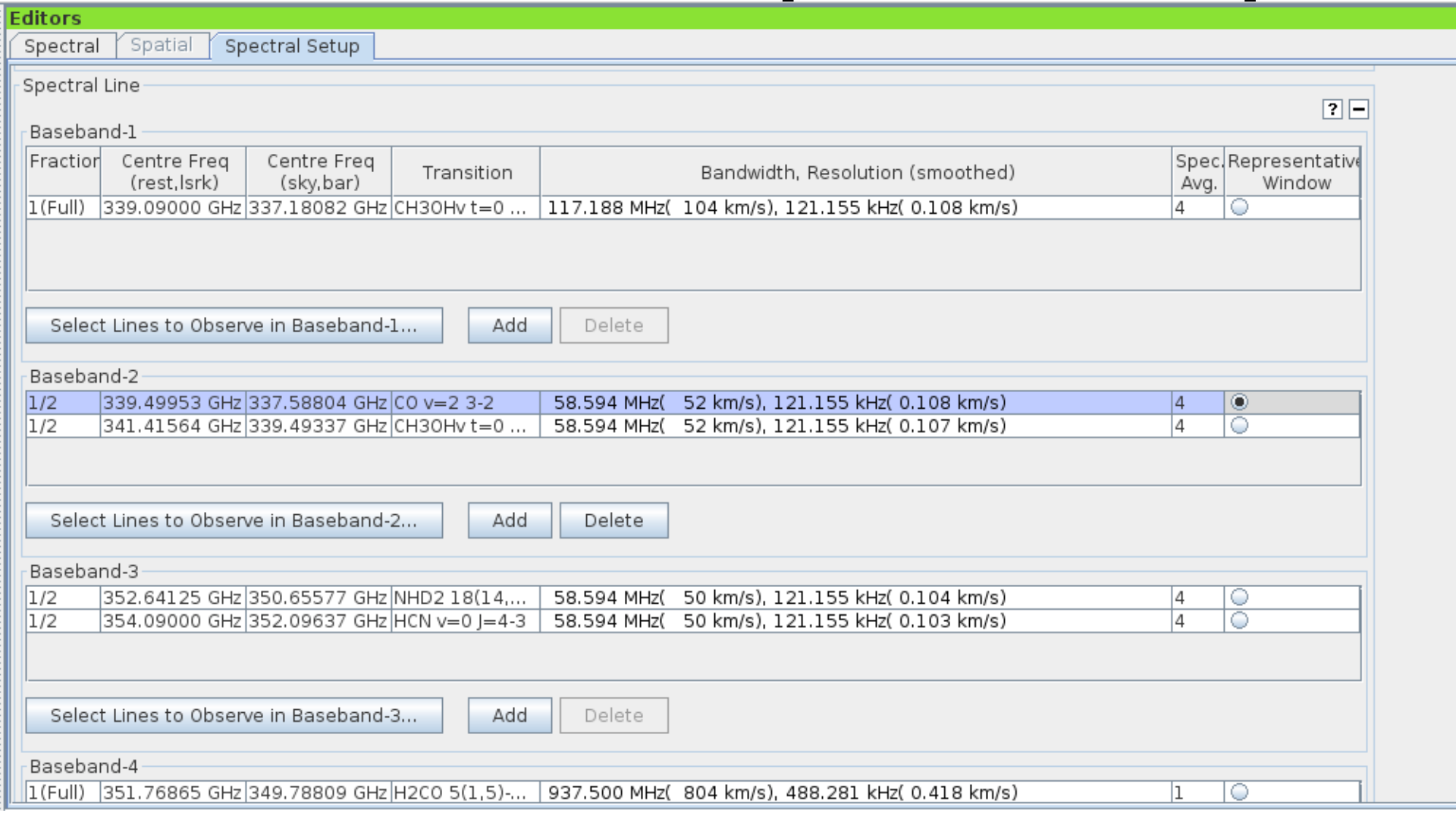
Science Goal: Spectral Setup



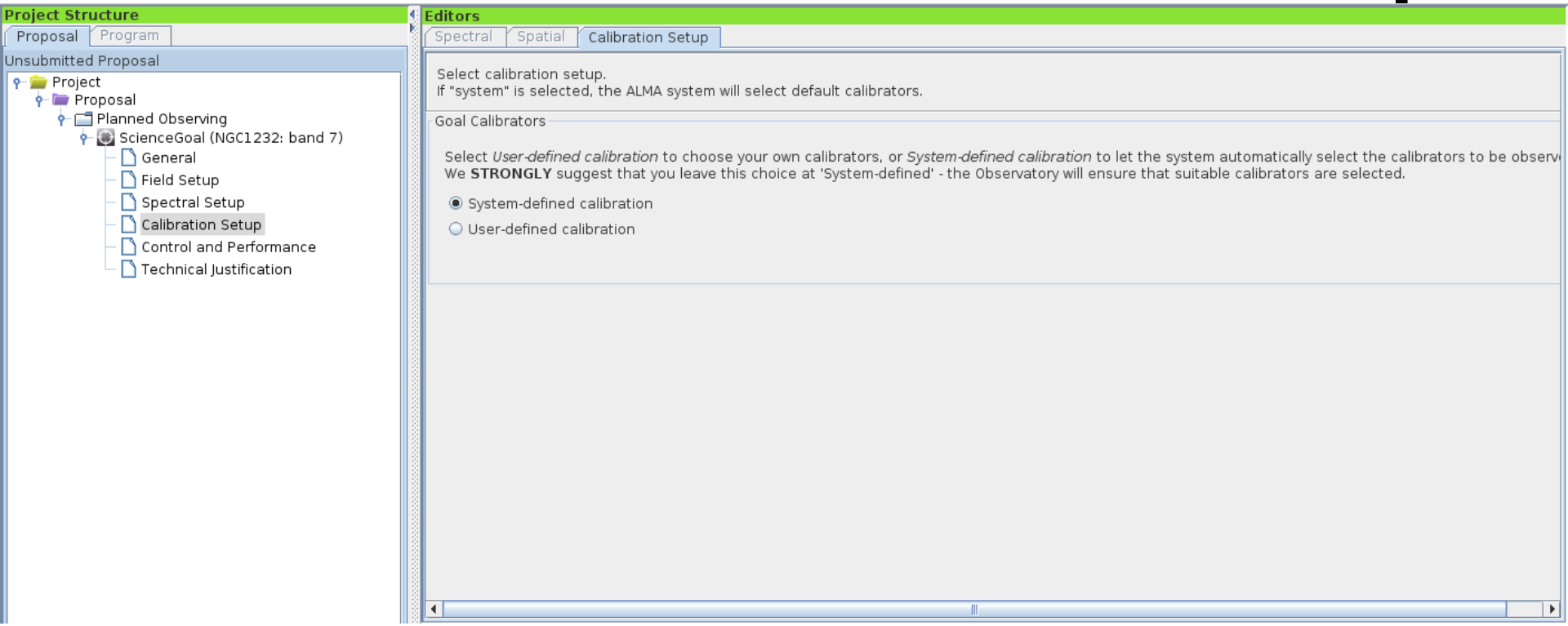
Spectral line picker:

- database: NRAO's Splatalogue (small internal version or online interface to 5.8 million lines)
- filtering options: species, max. upper state, within tuning constraints, … (wildcards ok)

Science Goal: Spectral Setup

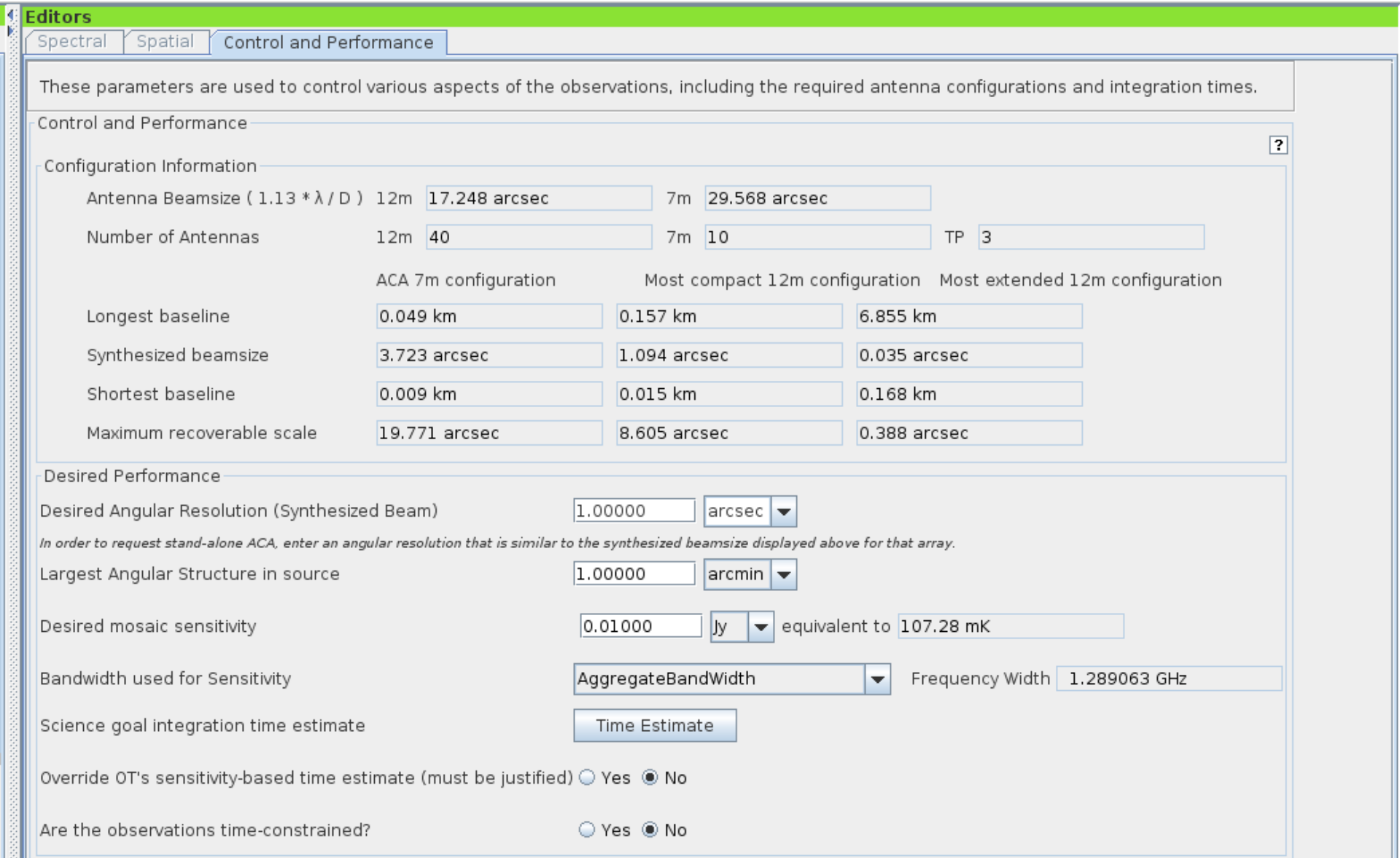


Science Goal: Calibration Setup



- in almost all cases, “system-defined calibration” is fine
- if “user-defined calibration” is requested, one needs to justify that in the scientific justification

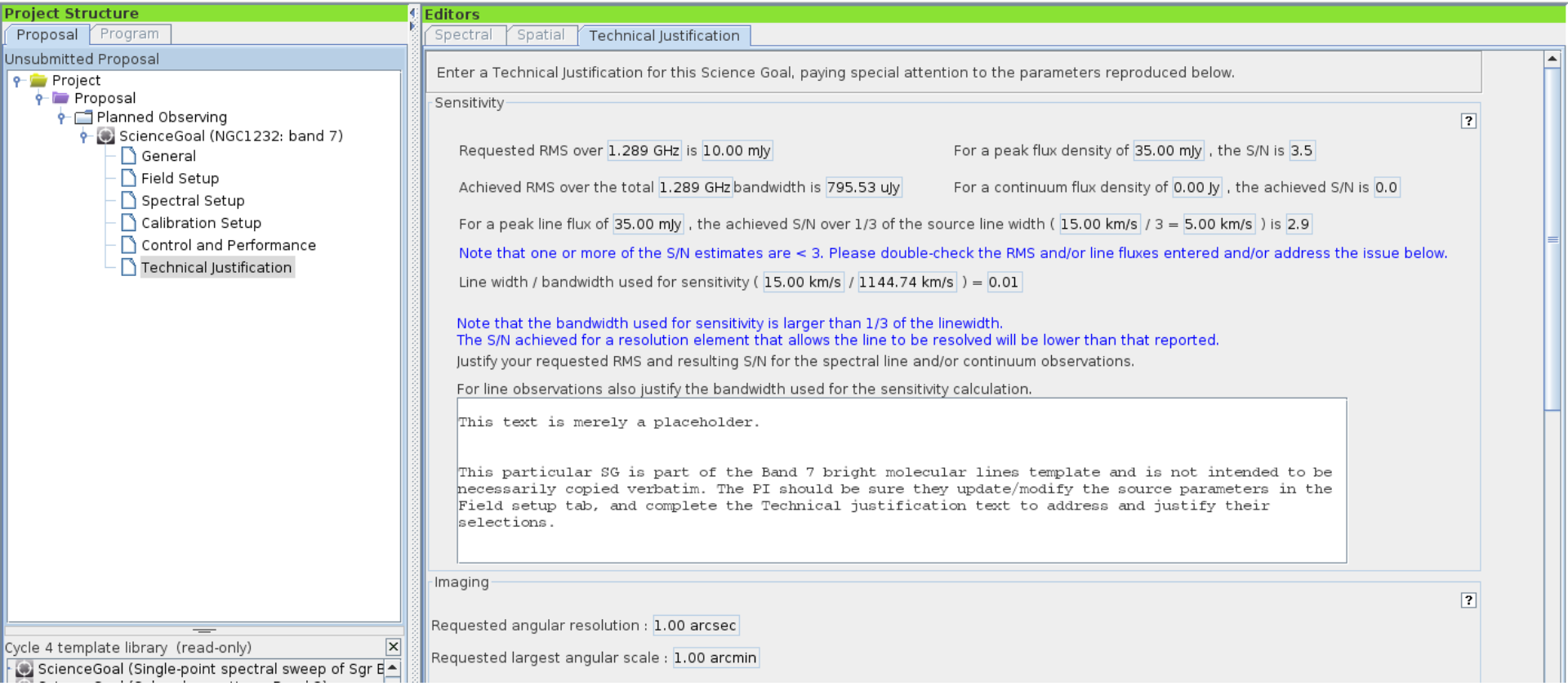
Science Goal: Control/Performance



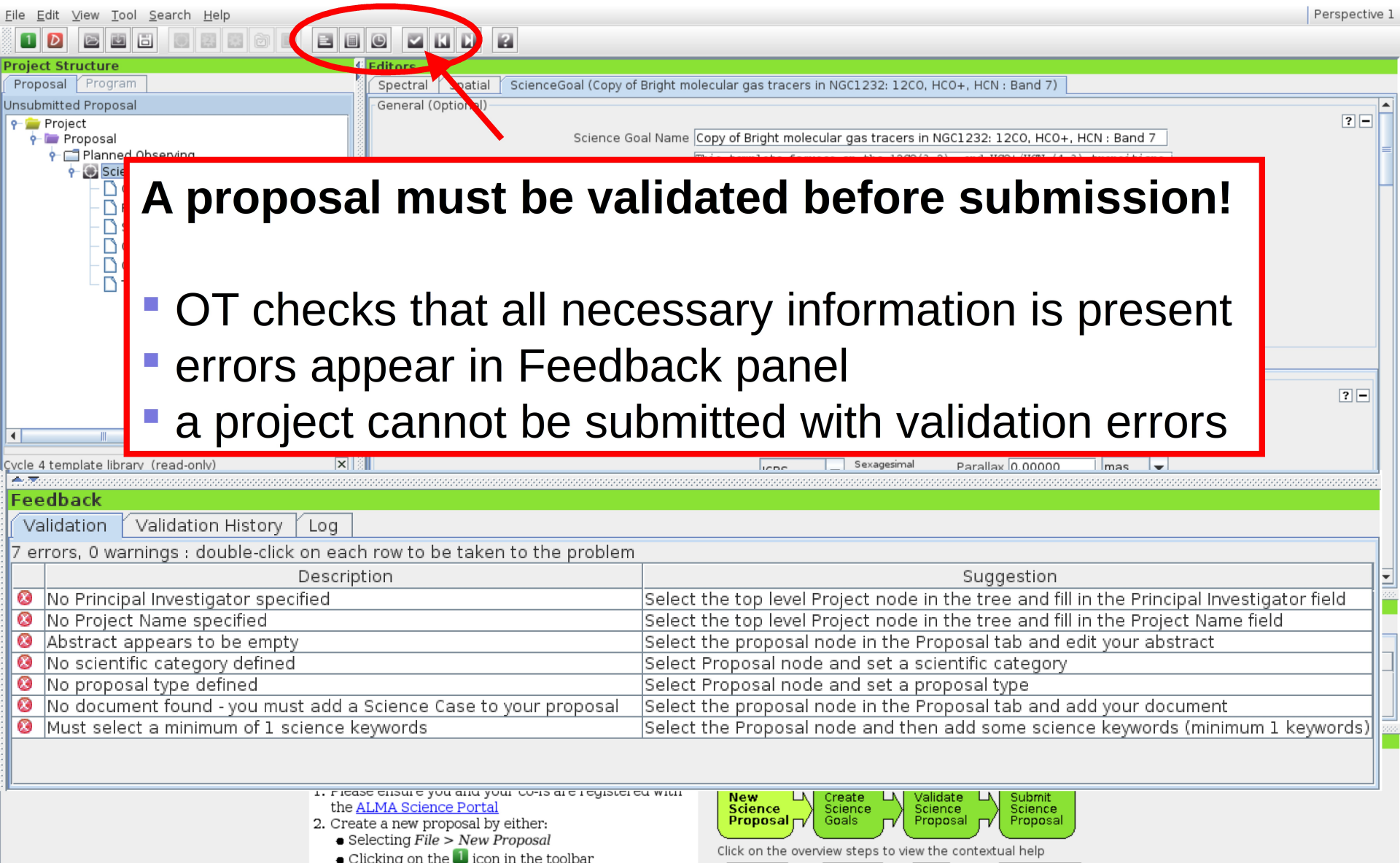
Science Goal: Technical Justification

enter brief explanations for the chosen parameters:

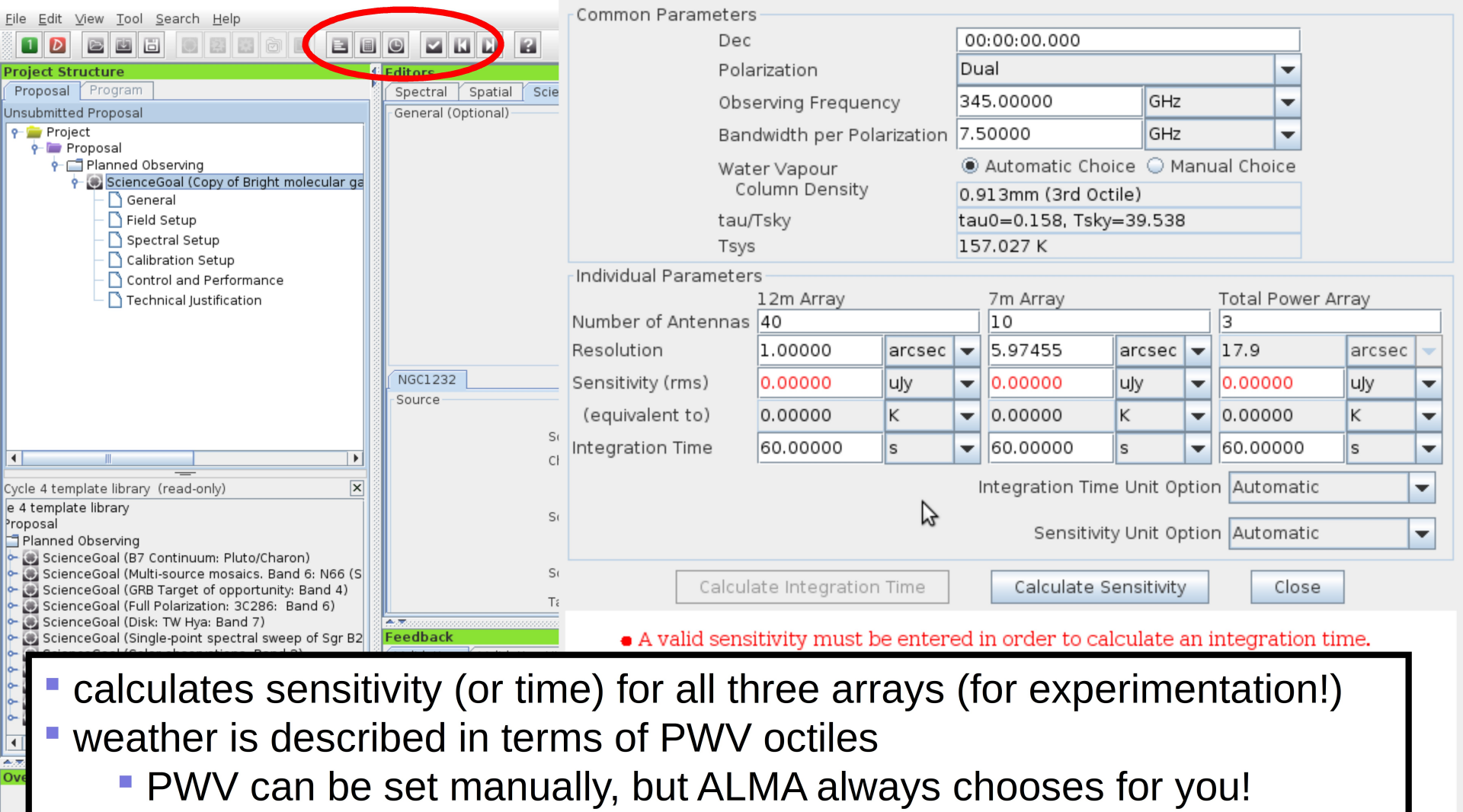
Sensitivity, Imaging, Correlator configuration, other choices to be justified



Tools: Validation



Tools: Sensitivity Calculator



- calculates sensitivity (or time) for all three arrays (for experimentation!)
- weather is described in terms of PWV octiles
  - PWV can be set manually, but ALMA always chooses for you!
- version in OT is independent from SG inputs

The ALMA-OT

Other tools and help:

- **Sensitivity Calculator** also available via Science Portal
- **ALMA simulator** (in CASA or online tool)
- lots of **documents**, manuals, guides, **video tutorials** available on the ALMA Science Portal, updated before each deadline
- **German ALMA Community Day** ~2-4 weeks before the deadline, this year: 05 April 2018