

ALMA OT
demo

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What needs to be done

- [download the OT](#)
 - directly on your computer via the tarball or webstart (*preferred method*)
- [fill in the project cover letter & proposal information](#)
 - add yourself as PI and add your CO-Is (*everybody need to be a registered member of the ALMA Science Portal*)
 - proposal type & science category
 - keywords (2 max)
- [attach your science case](#)
 - Note: it should not contain the technical justification, the latter should be captured by the dedicated section of your "Science Goal(s)"
- [create your <Science Goal\(s\)>](#)
 - making use of the in-build tools such as the <name resolver>, <sensitivity calculator>, <spectral line catalogue>
- [validate your proposal](#)
- [submit your proposal](#)

Demo

Band 7 line & continuum obs. towards TW Hya

- Coordinates: $RA_{J2000} = 11:01:51.90671$
 $DEC_{J2000} = -34:42:17.0323$
- Proper motion: $PM_{RA} : -66.19 \pm 1.85 \text{ mas/yr}$
 $PM_{Dec} : -13.90 \pm 1.47 \text{ mas/yr}$
- Parallax : $18.62 \pm 2.14 \text{ mas}$
- Radial Velocity: $V_{LSR} = 13.4 \text{ km/s}$
- Angular resolution requested: $0''.5$
- Largest size scale requested: $6''$
- Spectral line: CO ($V=0 \text{ J}=3-2$) @ 345 GHz with $dV=0.2 \text{ km/s}$ & Peak flux $\sim 2 \text{ Jy/beam}$
with a sensitivity of 20 mJy/beam
[CS ($V=0 \text{ J}=7-6$) can also be observed in the same sideband (SB) as a "bonus"]
- Continuum: in the other SB (which you can either put in the lower SB or the upper SB)

What needs to be done

- fill in the project cover letter & proposal information

The screenshot displays the ALMA OT demo software interface, which is divided into several panels. The top panel shows the 'Project Structure' tree on the left, with 'Project' and 'Proposal' folders highlighted. The main 'Editors' panel is split into 'Spectral', 'Spatial', and 'Project' tabs. The 'Project' tab is active, showing fields for 'Principal Investigator' (with a 'Select PI...' button) and 'Main Project Information' (with a 'Project Code' field). Below this, there are fields for 'Assigned Prior' and 'Project Code'. The 'Proposal' tab is also visible, showing an 'Abstract' field (max. 1200 characters), a 'Launch Editor' button, 'Proposal Type' (Standard or Target Of Opportunity), and 'Scientific Category' (Cosmology and the High Redshift Universe, Galaxies and Galactic Nuclei, ISM, star formation and astrochemistry, Circumstellar disks, exoplanets and the solar system, Stellar Evolution and the Sun). A 'Feedback' section at the bottom right includes 'Validation', 'Validation History', and 'Log' tabs, with a table for 'Description' and 'Suggestion'. At the bottom, an 'Overview' section provides 'Contextual Help' and a 'Phase I: Science Proposal' flowchart: New Science Proposal → Create Science Goals → Validate Science Proposal → Submit Science Proposal.

File Edit View Tool Search Help

Project Structure

Proposal Program

Unsubmitted Proposal

Project

Proposal

Editors

Spectral Spatial Project

Principal Investigator

Select PI...

Main Project Information

Project Assigned Prior Project Code

File Edit View Tool Search Help

Project Structure

Proposal Program

Unsubmitted Proposal

Project

Proposal

Editors

Spectral Spatial Proposal

Abstract (max. 1200 characters)

Launch Editor

Proposal Type

Standard Target Of Opportunity

Scientific Category

Cosmology and the High Redshift Universe Galaxies and Galactic Nuclei ISM, star formation and astrochemistry

Circumstellar disks, exoplanets and the solar system Stellar Evolution and the Sun

Keywords

Feedback

Validation Validation History Log

Description Suggestion

Overview

Contextual Help

Phase I: Science Proposal

New Science Proposal Create Science Goals Validate Science Proposal Submit Science Proposal

1. Please ensure you and your co-Is are registered with the [ALMA Science Portal](#)

2. Create a new proposal by either:

What needs to be done

- create your <Science Goal(s)>

The screenshot displays the ALMA Science Portal interface. At the top, there is a menu bar (File, Edit, View, Tool, Search, Help) and a toolbar with various icons. A red circle highlights a specific icon in the toolbar, and a red arrow points from it to a 'ScienceGoal (Sci...' entry in the 'Project Structure' tree on the left. The tree shows a hierarchy: Project > Proposal > Planned Observing > ScienceGoal (Sci...). The main window is titled 'New Phase 1 Science Goal' and has tabs for 'Spectral', 'Spatial', and 'Proposal'. The 'Proposal' tab is active, showing a form for 'Proposal Information'. Fields include 'Proposal Title', 'Proposal Cycle' (set to 2015.1), and 'Abstract (max. 1200 characters)'. A 'Launch Editor' button is below the abstract field. At the bottom of the form, there are radio buttons for 'Standard' and 'Target Of Opportunity'. Below the form is a 'Feedback' section with tabs for 'Validation', 'Validation History', and 'Log'. At the bottom of the screen, an 'Overview' section contains 'Contextual Help' with two numbered steps and a 'Phase I: Science Proposal' flowchart. The flowchart shows a sequence: 'New Science Proposal' -> 'Create Science Goals' -> 'Validate Science Proposal' -> 'Submit Science Proposal'.

File Edit View Tool Search Help Perspective 1

Project Structure

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Sci...)

General

Field Setup

Spectral Setup

Calibration Setup

Control and Perf

Technical Justific

New Phase 1 Science Goal

Spectral Spatial Proposal

Proposal Information

Proposal Title

Proposal Cycle 2015.1

Abstract (max. 1200 characters)

Launch Editor

Proposal Type

Standard Target Of Opportunity

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:

Phase I: Science Proposal

New Science Proposal Create Science Goals Validate Science Proposal Submit Science Proposal

What needs to be done

- create your <Science Goal(s)>

The screenshot displays the ALMA OT demo software interface. The 'Project Structure' pane on the left shows a tree view with 'ScienceGoal (TW Hya)' selected, and its sub-tab 'Field Setup' is highlighted with a red circle. The main 'Editors' pane is set to the 'Field Setup' tab. The 'Source' section contains the following fields:

- Source Name: TW_Hya (with a red dashed circle around the 'Resolve' button to its right)
- Choose a Solar System Object?: Name of object: Unspecified
- System: FK5 J2000 Sexagesimal display?:
- Parallax: 18.62000 mas
- Source Coordinates: RA: 11:01:51.9067 PM RA: -66.19000 mas/yr; Dec: -34:42:17.032 PM DEC: -13.90000 mas/yr
- Source Radial Velocity: 13.400 km/s hel z: 0.000044699 Doppler Type: RELATIVISTIC
- Target Type: Individual Pointing(s) 1 Rectangular Field
- Expected Source Properties (circled in red):
 - Peak Continuum Flux Density per Synthesized Beam: 20.00000 mJy
 - Continuum Polarization Percentage: 0.0 %
 - Peak Line Flux Density per Synthesized Beam: 2.00000 Jy
 - Line Width: 3.00000 km/s
 - Line Polarization Percentage: 0.0 %
- Field Center Coordinates (with a red dashed circle around the 'Resolve' button to its right)
- Custom Mosaic: PointingPattern: Offset

The 'Feedback' pane at the bottom contains 'Validation', 'Validation History', and 'Log' tabs.

What needs to be done

- create your <Science Goal(s)>

The screenshot shows the ALMA OT demo software interface. The 'Project Structure' panel on the left shows a tree view with 'Spectral Setup' highlighted. The 'Editors' panel on the right shows the 'Spectral Setup' editor with four basebands. The 'Baseband-1' section is highlighted with a yellow circle. The 'Select Lines to Observe in Baseband-1...' button is highlighted with a red circle. The 'Representative Frequency' field is highlighted with a red dashed circle and has a tooltip explaining its use.

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)

Representative Frequency
The representative frequency is used in conjunction with the sensitivity entered on the 'Control and Performance' page to estimate the required observing time and to set the size of the antenna beam shown in the 'Spatial Visual' editor. If the transition you are most interested in does not fall in the centre of the chosen spectral window, its frequency can be changed here. The sky equivalents of the representative frequency are shown in the targets table below.

345.79599 GHz

- up to 4 <basebands> (of 2 GHz) are available.
- spectral windows (SPWs) can be placed anywhere within a baseband

What needs to be done

- create your <Science Goal(s)>

The screenshot shows the ALMA OT demo interface. On the left, there are filter controls for 'co*', including 'Include description', 'Frequency Filters' (ALMA Band, Sky Frequency), 'Receiver/Back End Configuration', 'Maximum Upper-state Energy', and 'Molecule Filter / Environment'. The main table displays a list of transitions for Carbon Monoxide and Carbon Monoxide Ion. A red arrow points from the 'CO v=0 3-2' transition in the main table to the 'Selected transitions' table below.

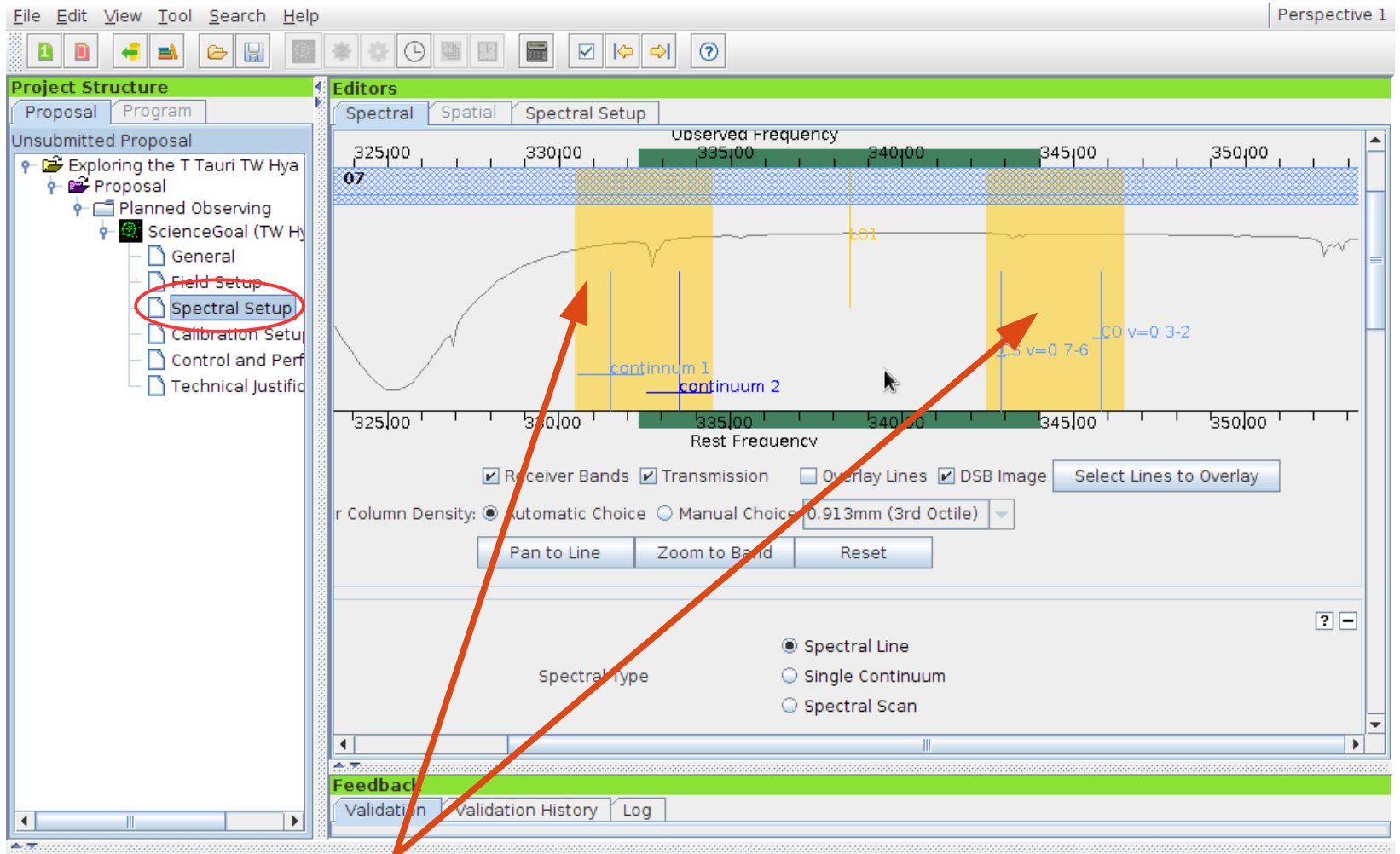
Transition	Description	Rest Frequency	Sky Frequency	Upper-state Energy	Lovas Intensity	S
CO v=2 3-2	Carbon Monoxide	339.5 GHz	339.5 GHz	6161.831 K		0.034
CO v=1 3-2	Carbon Monoxide	342.648 GHz	342.648 GHz	3116.561 K	0.71	0.034
CO v=0 3-2	Carbon Monoxide	345.796 GHz	345.796 GHz	33.192 K	70	0.034
CO+ J=3-2, F=5/2-3/2	Carbon Monoxide Ion	353.741 GHz	353.741 GHz		0.1	1.2 D
CO+ J=3-2, F=7/2-5/2	Carbon Monoxide Ion	354.014 GHz	354.014 GHz		0.18	1.71

Selected transitions

Transition	Description	Rest Frequency	Sky Frequency
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What needs to be done

- create your <Science Goal(s)>



- there are 2 <sidebands> (the lower and upper sidebands) having a fixed separation of 8 GHz. ⚠ It is not possible to place three basebands in one sideband and one in the other bands 3, 4, 6, 7 and 8 (cf. The ALMA OT Quick Start Guide)

What needs to be done

- create your <Science Goal(s)>

The screenshot shows the ALMA LO Configuration Tool interface. The 'Tool' menu is open, with 'Sensitivity Calculator...' highlighted. The tool's main window displays the following parameters:

Common Parameters

- Dec: -34:00:00.000
- Polarization: Dual
- Observing Frequency: 345.00000 GHz
- Bandwidth per Polarization: 0.20000 km/s
- Water Vapour Column Density: Automatic Choice Manual Choice
- tau/Tsky: tau0=0.158, Tsky=37.260
- Tsys: 152.677 K

Individual Parameters

	12m Array		7m Array		Total Power Array	
Number of Antennas	36		10		2	
Resolution	1.00000	arcsec	5.97455393852278		17.923661815568337	
Sensitivity (rms)	20.00000	mJy	0.00000	uJy	0.00000	uJy
(equivalent to)	0.20545	K	0.00000	K	0.00000	K
Integration Time	3.50090	min	Infinity	d	Infinity	d

Integration Time Unit Option: Automatic
Sensitivity Unit Option: Automatic

Buttons: Calculate Integration Time, Calculate Sensitivity, Close

Feedback: Calculate integration time against the sensitivity provided

What needs to be done

- create your <Science Goal(s)>

The screenshot displays the ALMA OT demo software interface. On the left, the 'Project Structure' pane shows a tree view under 'Unsubmitted Proposal' with a sub-entry 'ScienceGoal (TW Hy)' containing several sub-items, including 'Control and Perf' which is circled in red. The main window is titled 'Perspective 1' and contains a 'Note' about time requirements, an 'Input Parameters' table, a 'Time required for largest 12-m array' table, a 'Calibration Breakdown per SB execution' table, and an 'Estimated total time for science goal 29.18 min'.

Note: The time in brackets is that required to reach the sensitivity. Operational requirements often mean that the actual observed time is longer, especially for mosaics. Please see the User Manual for more details.

Input Parameters	
Requested sensitivity	20.00 mJy
Bandwidth used for sensitivity	0.244 MHz
Representative frequency (sky, first source)	345.78 GHz
Precipitable water vapour (all sources)	0.913mm (3rd Octile)

Time required for largest 12-m array	
Time on source per pointing (first source)	3.53 min [3.33 min]
Total number of pointings (all sources)	1
Number of tunings	1
Total time on source	3.53 min [3.33 min]
Total calibration time	20.48 min
Other overheads	5.18 min
Total time for 1 SB execution	29.18 min
Number of SB executions	1
Total time to complete SB	29.18 min

Calibration Breakdown per SB execution	
3 x Pointing	36.00 s
1 x SidebandRatio	1.58 min
1 x Amplitude	2.50 min
1 x Bandpass	10.00 min
1 x Phase	30.00 s
1 x Phase reference check source	30.00 s
3 x Atmospheric	2.00 min
Calibration overheads	2.80 min

Estimated total time for science goal 29.18 min

On the right side of the interface, there are several input fields and buttons. A 'Time Estimate' button is circled in red. Below it, a tooltip reads 'Display a detailed breakdown of the time calculation'. Other buttons include 'Suggest' and 'OK'.

What needs to be done

- create your <Science Goal(s)>

The screenshot displays the ALMA OT demo software interface. The 'Project Structure' pane on the left shows a tree view with 'Technical Justification' selected and circled in red. The 'Editors' pane on the right shows the 'Technical Justification' editor with the following content:

Enter a Technical Justification for this Science Goal, paying special attention to the parameters reproduced below.

Sensitivity

Requested RMS over 211.670 m/s is 20.00 mJy For a peak flux density of 2.00 Jy, the S/N

Achieved RMS over the total 4.453 GHz bandwidth is 144.00 uJy For a continuum flux density of 20.00 mJy,

For a peak line flux of 2.00 Jy, the achieved S/N over 1/3 of the source line width (3.00 km/s / 3 = 1.00 km/s) is

Line width / bandwidth used for sensitivity (3.00 km/s / 211.67 m/s) = 14.17

Spectral Dynamic Range (continuum flux / line rms): 1.03

Justify your requested RMS and resulting S/N for the spectral line and/or continuum observations.

For line observations also justify the bandwidth used for the sensitivity calculation.

Justification of the RMS and S/N requested for the spectral line & continuum obs.

...

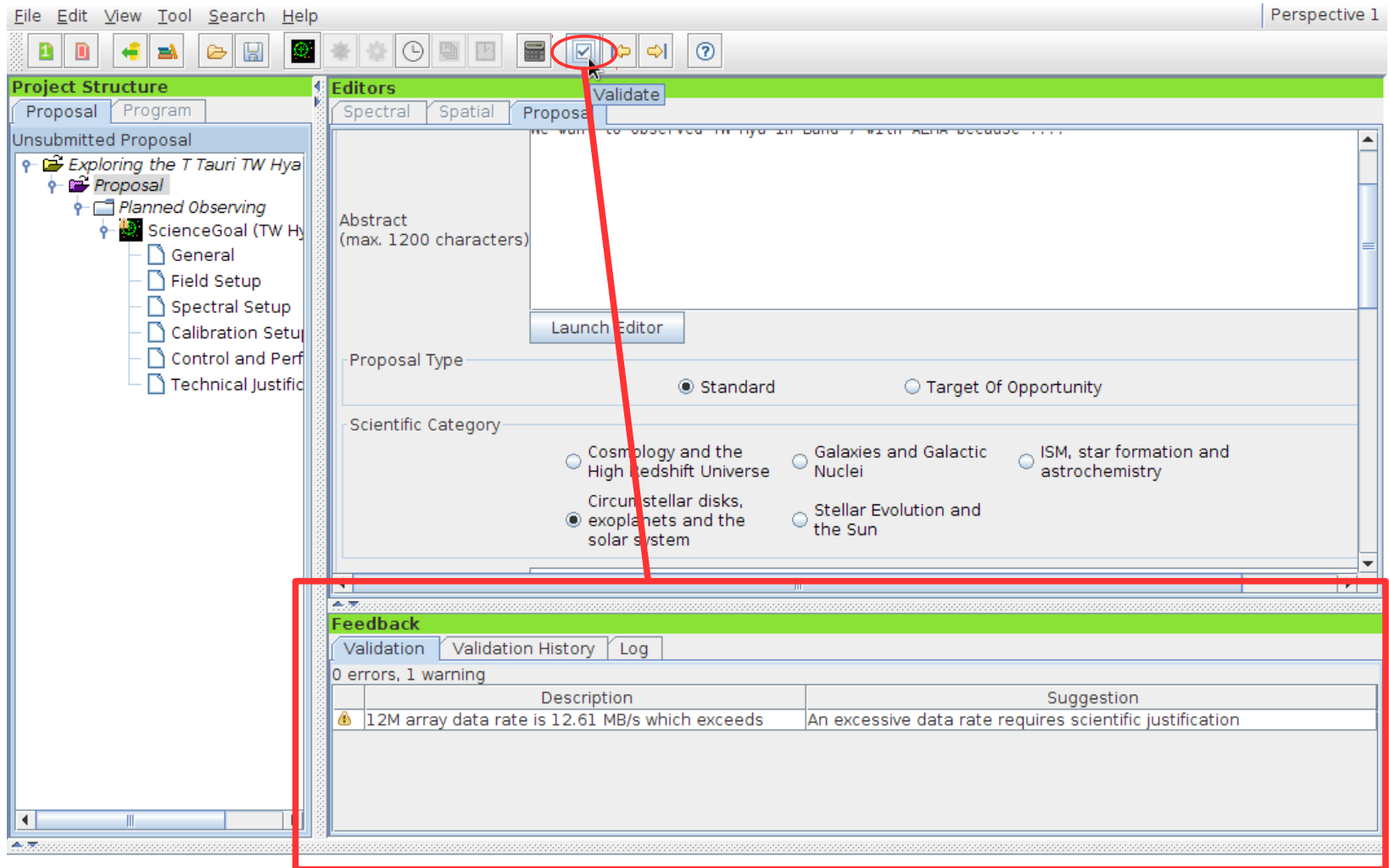
Imaging

Feedback

Validation Validation History Log

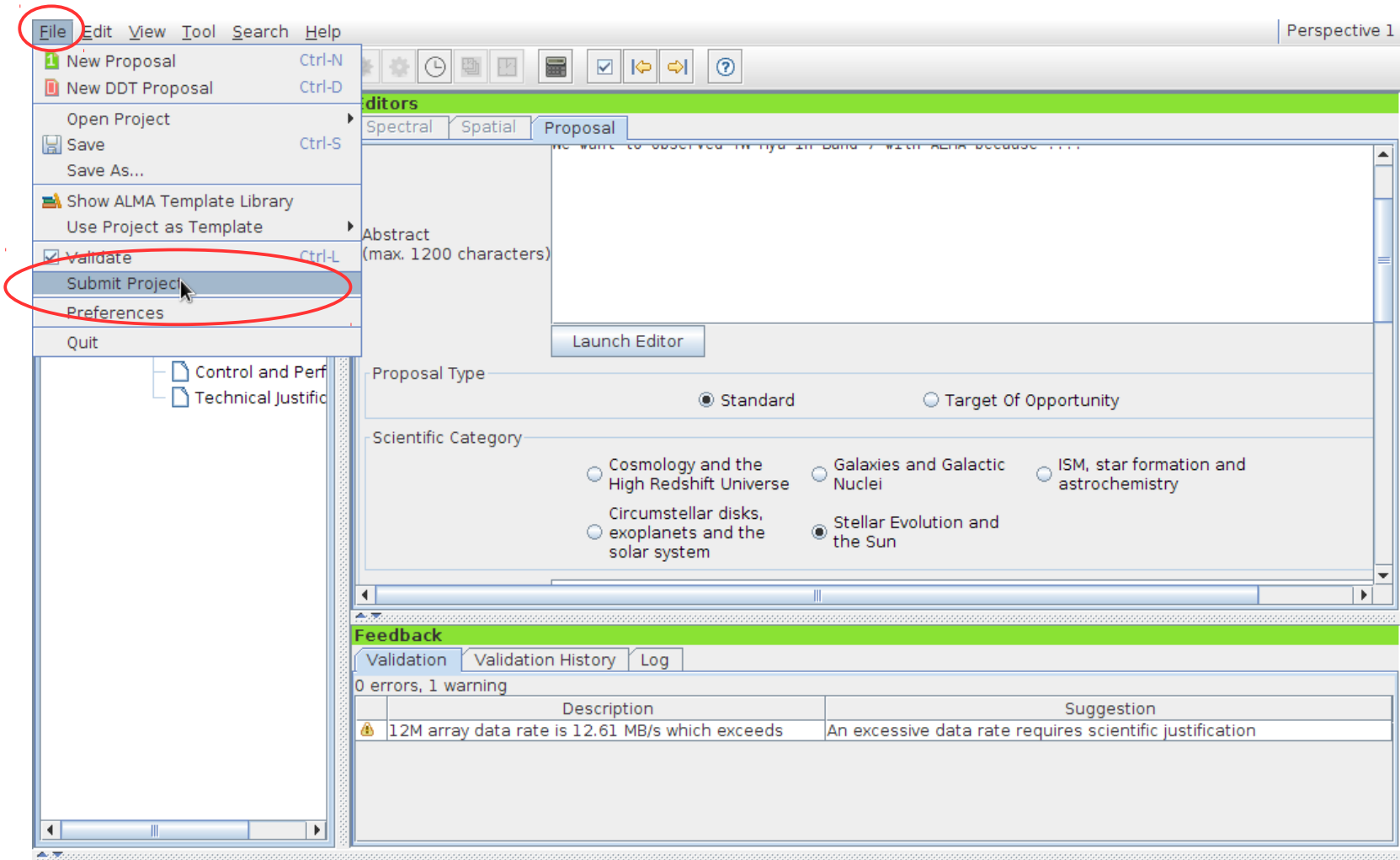
What needs to be done

- validate your proposal



What needs to be done

- submit your proposal



Useful info

- **Documentation & Troubleshooting**

- <https://almascience.eso.org/proposing/observing-tool>

- **ALMA OT Quick Start Guide**

- <https://almascience.eso.org/documents-and-tools/cycle3/alma-ot-quickstart>

- **OT video tutorials**

- <https://almascience.eso.org/proposing/observing-tool/video-tutorials>

- **Troubleshooting**

In case of OT installation-related problems -> check:

- <https://almascience.eso.org/documents-and-tools/cycle3/known-issues>

which lists the common problems encountered with the OT.

Another source of more in-depth FAQ resource:

- <https://help.almascience.org/index.php?/Knowledgebase/List/Index/1/alma-observing-tool-ot>

And if these 2 pages do not solve your problem -> put a request via the

"Helpdesk Ticket" system:

- <https://help.almascience.org/cas-login.php>