EUROPEAN ARC
ALMA Regional Centre

The ALMA Observing Tool (OT)

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Bordeaux University / IRAM

Spanish ALMA Days 18-20 February 2025, La laguna, Spain

The ALMA OT

- **Observing Tool** used to prepare and submit ALMA proposal
- At ALMA you need to **define precisely the observations setup at the time of proposal submission**
  - Scientific target(s) precise coordinates
  - Spectral setup (receiver bands and correlator configuration and mode)
  - Antenna configuration(s), 12m ? ACA ?
  - Sensitivity goal
  - Time constrains

    Limited changed might be possible after acceptance, under well reasoned request, with no guaranty to be accepted

The ALMA OT

- Tool used to prepare and submit ALMA proposal
- Tool to be **download** from the ALMA science portal (pc/mac, with or without java)

The ALMA OT

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

Observing Tool

The ALMA Observing Tool (OT) is a Java desktop application used for the preparation and submission of ALMA Phase 1 proposals and, for those which are accepted, Phase 2 materials (Scheduling Blocks). It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals and Supplemental Call (ACA stand-alone) proposals. The current *Cycle 11* release of the OT is configured for the present capabilities of ALMA as described in the Proposer's Guide. Note that in order to submit proposals you will have to register with the ALMA Science Portal beforehand.

Download & Installation

The OT should run on all common operating systems and depends on a version of Java being available. The Cycle 11 version of the OT will come with its own version of Java 17 and thus the users need no longer worry about their local Java installation. Unfortunately, as Java 17 does not include Web Start, this version of the OT is no longer available. The Cycle 11 OT can be installed in two different ways, either with a modern installer or manually with a tarball distribution.

It is recommended that the OT be installed using the ALMA **OT Installer**. This uses a modern graphical interface to report the progress of the installation and allows the user to change various settings from their defaults, including the amount of memory the OT may use. The installation will produce an executable file that can be used to start the OT. If problems are encountered with the installer, then the tarball must be used.

The **tarball** version must be installed manually and the instructions for doing this have not changed.

Installer Tarball

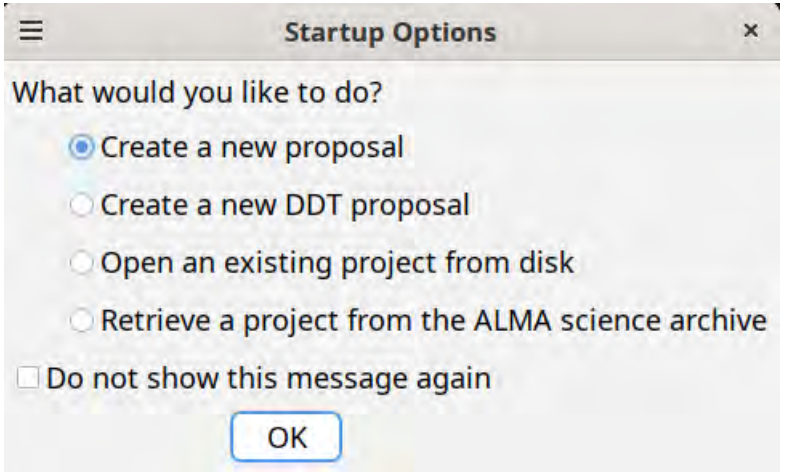
The ALMA OT

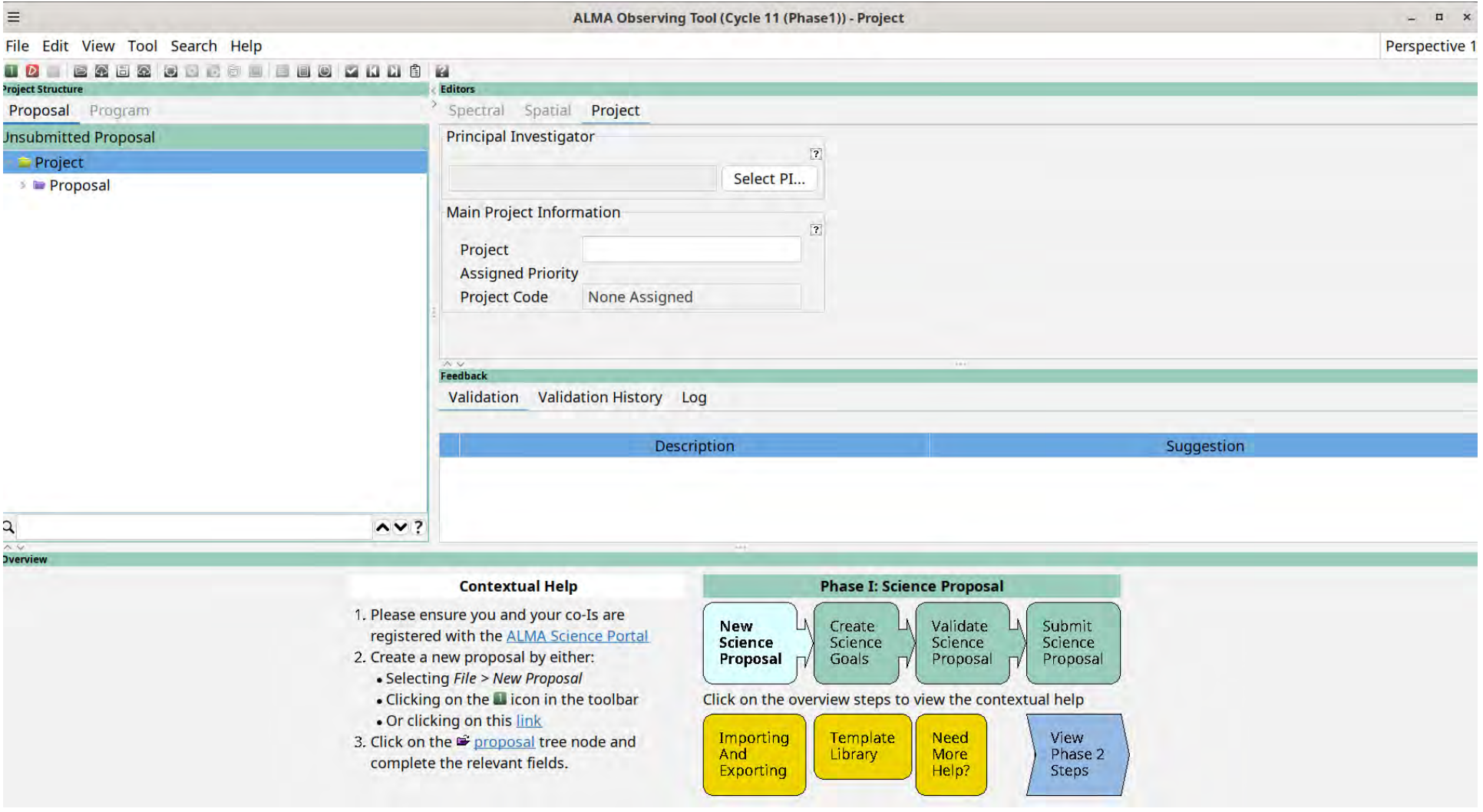
- Tool used to prepare and submit ALMA proposal
- Tool to be **download** from the ALMA science portal (pc/mac, with or without java)
- **Updated each** cycle
  - New capabilities (i.e. new band, polarization mode…)
  - Antenna configuration schedule
    - ► **Need the new version** even for proposal resubmission
    - ►Do not wait for the very last moment to enter your proposal in the OT

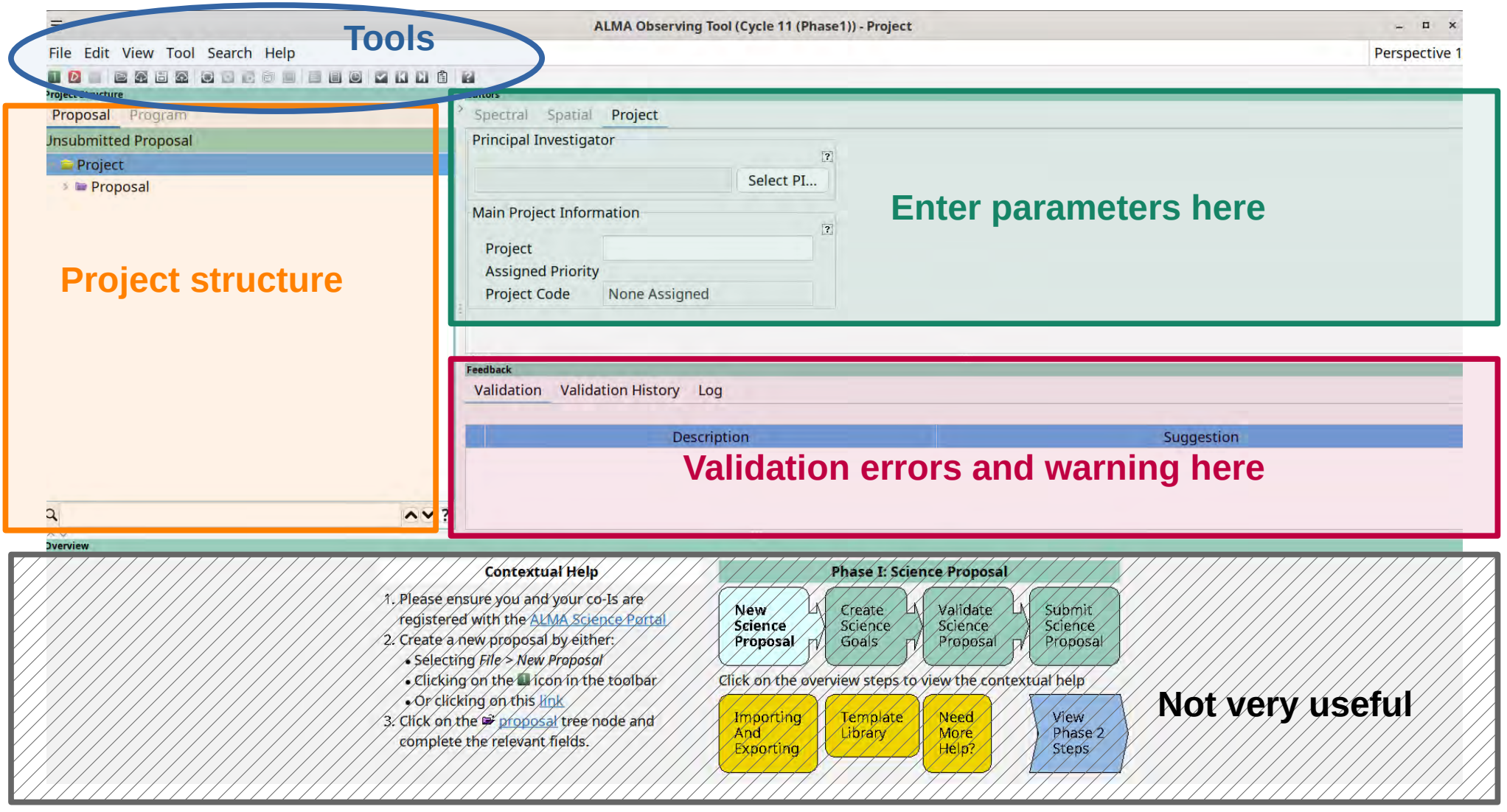
The ALMA OT

- At start, a popup window

  choice between
  - Create a blank new proposal
  - Create a DDT proposal
  - Open a file on the local disk
  - Open a project from the ALMA science archive
  - You need to have access to the project
  - Could be a rejected project from a previous cycle




ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File Edit View Tool Search Help
Perspective 1
Project Structure
Proposal Program
Unsubmitted Proposal
Project
Proposal
Editors
Spectral Spatial Project
Principal Investigator
Select PI...
Main Project Information
Project
Assigned Priority
Project Code
None Assigned
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


Tools
ALMA Observing Tool (Cycle 11 (Phase1)) - Project
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Perspective 1
Proposal Program
Unsubmitted Proposal
Project
Proposal
Project structure
Spectral Spatial Project
Principal Investigator
Select PI...
Main Project Information
Project
Assigned Priority
Project Code
None Assigned
Enter parameters here
Feedback
Validation Validation History Log
Description
Suggestion
Validation errors and warning here
Overview
Contextual Help
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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
Not very useful

File Edit View Tool Search Help

Perspective

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
  - Proposal

Editors

Spectral Spatial Proposal

Please select one or two keywords

Student project

Joint Proposals

Is this a Joint Proposal? Yes No

Investigators

Type	Full name	Email	Affiliation	ALMA ID	Executive	Revie...
PI	Not set	Not set	Not set	Not set	Non-ALMA	☑

Select PI | Add CoPI | Add CoI | Remove Collaborator | Add from Proposal

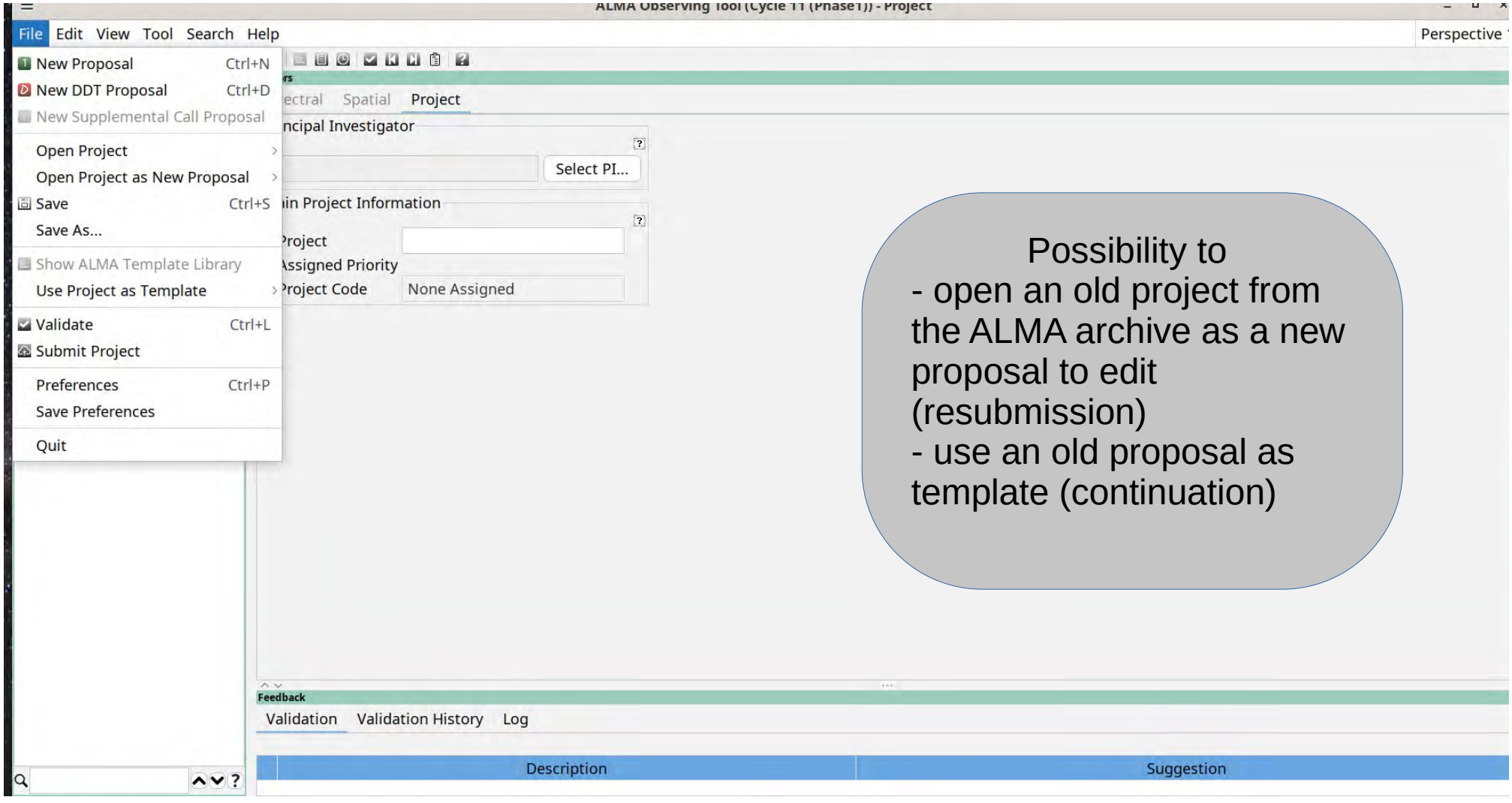
Reviewer Information

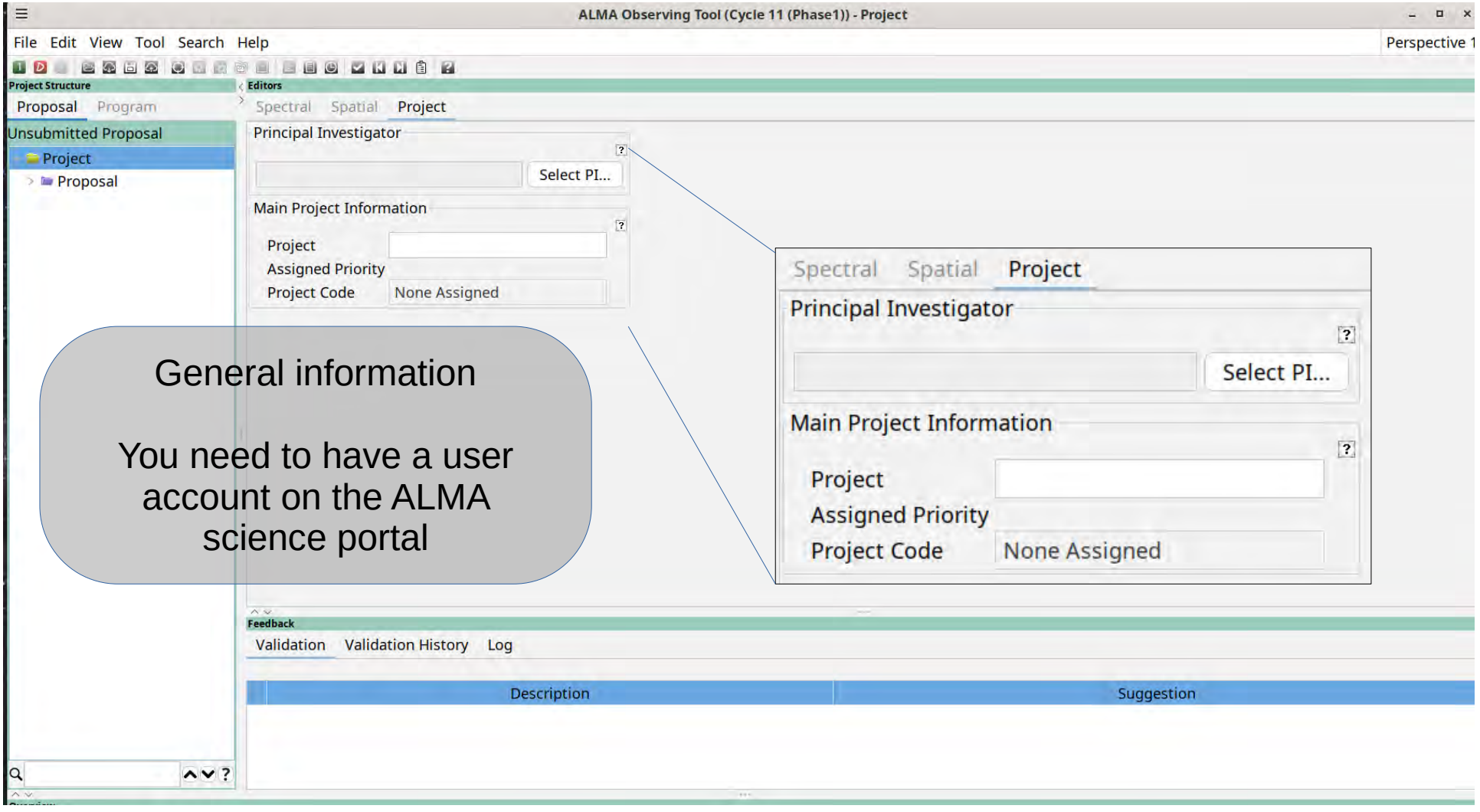
Please designate a reviewer who will participate in the distributed review process. The reviewer may be the PI of the proposal or one of the other investigators.
A student (without a PhD) may serve as the reviewer only if they are the PI of the proposal and a mentor (with a PhD) is identified.
The mentor does not need to be an investigator on the proposal.

Feedback

Validation Validation History Log

Description	Suggestion


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File
Edit
View
Tool
Search
Help
Perspective
New Proposal Ctrl+N
New DDT Proposal Ctrl+D
New Supplemental Call Proposal
Open Project
Open Project as New Proposal
Save Ctrl+S
Save As...
Show ALMA Template Library
Use Project as Template
Validate Ctrl+L
Submit Project
Preferences Ctrl+P
Save Preferences
Quit
ectral
Spatial
Project
ncipal Investigator
Select PI...
in Project Information
roject
ssigned Priority
roject Code
None Assigned
Possibility to
- open an old project from the ALMA archive as a new proposal to edit (resubmission)
- use an old proposal as template (continuation)
Feedback
Validation
Validation History
Log
Description
Suggestion


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File Edit View Tool Search Help
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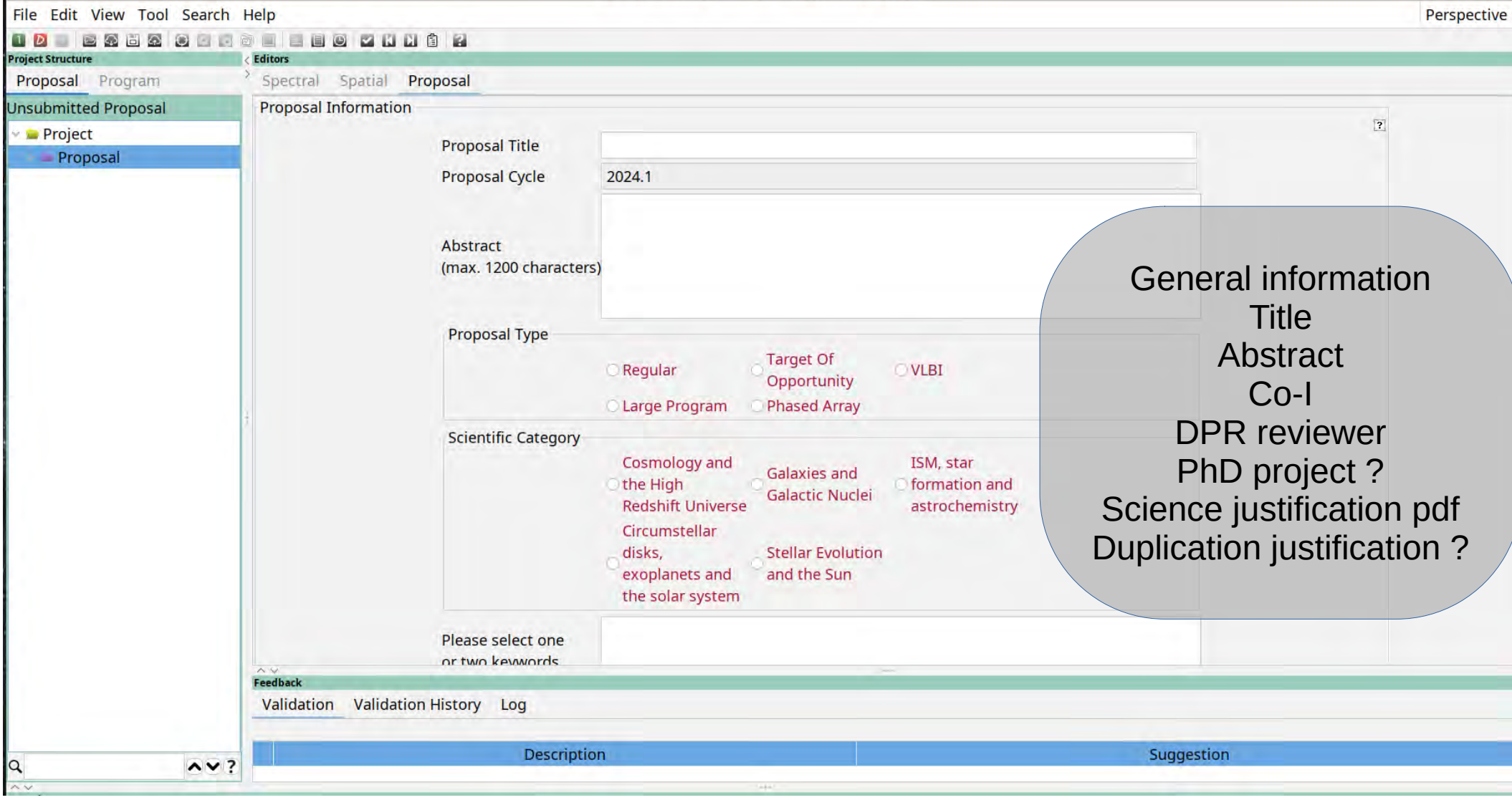
Project Structure
Proposal Program
Unsubmitted Proposal
Project
Proposal
Editors
Spectral Spatial Project
Principal Investigator
Select PI...
Main Project Information
Project
Assigned Priority
Project Code
None Assigned
General information
You need to have a user account on the ALMA science portal
Spectral Spatial Project
Principal Investigator
Select PI...
Main Project Information
Project
Assigned Priority
Project Code
None Assigned
Feedback
Validation Validation History Log
Description
Suggestion


File Edit View Tool Search Help
Perspective
Project Structure
Editors
Proposal Program
Spectral Spatial Proposal
Unsubmitted Proposal
Project
Proposal
Proposal Information
Proposal Title
Proposal Cycle
2024.1
Abstract
(max. 1200 characters)
Proposal Type
Regular
Target Of Opportunity
VLBI
Large Program
Phased Array
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
Please select one or two keywords
Feedback
Validation Validation History Log
Description
Suggestion
General information
Title
Abstract
Co-I
DPR reviewer
PhD project ?
Science justification pdf
Duplication justification ?

File Edit View Tool Search Help

Perspective

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
  - Proposal

Editors

Spectral Spatial Proposal

the solar system

Please select one or two keywords

Student project

Joint Proposals

Is this a Joint Proposal? Yes No

Investigators

Type	Full name	Email	Affiliation	ALMA ID	Executive	Revie...
PI	Not set	Not set	Not set	Not set	Non-ALMA	☑

Select PI | Add CoPI | Add CoI | Remove Collaborator | Add from Proposal

Reviewer Information

Please designate a reviewer who will participate in the distributed review process. The reviewer may be the PI of the proposal or one of the other investigators.
A student (without a PhD) may serve as the reviewer only if they are the PI of the proposal and a mentor (with a PhD) is identified.
The mentor does not need to be an investigator on the proposal.

Reviewers are requested to:

- Abide by the maximum number of Proposal Sets that are to be assigned for review to any individual (refer to the Proposer's Guide for more information).

File Edit View Tool Search Help

Perspective

Project Structure

Proposal Program

Unsubmitted Proposal

Project

Proposal

Editors

Spectral Spatial Proposal

Reviewers are requested to:

- Abide by the maximum number of Proposal Sets that are to be assigned for review to any individual (refer to the Proposer's Guide for more information).
- Update their user profiles with combinations of scientific categories and keywords which describe their area(s) of expertise using the new 'Expertise' tab in the link below. Available expertise information will be used in the distribution of proposal assignments.

https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp

Reviewer has a PhD? No Yes

Select Mentor

Mentor name

Mentor has a PhD? No Yes

Science Case

Please ensure that your science case is properly anonymized following instructions on the Science Portal

Science Case (Mandatory, PDF, 4 pages max.) Attach Detach View

Duplicate observations

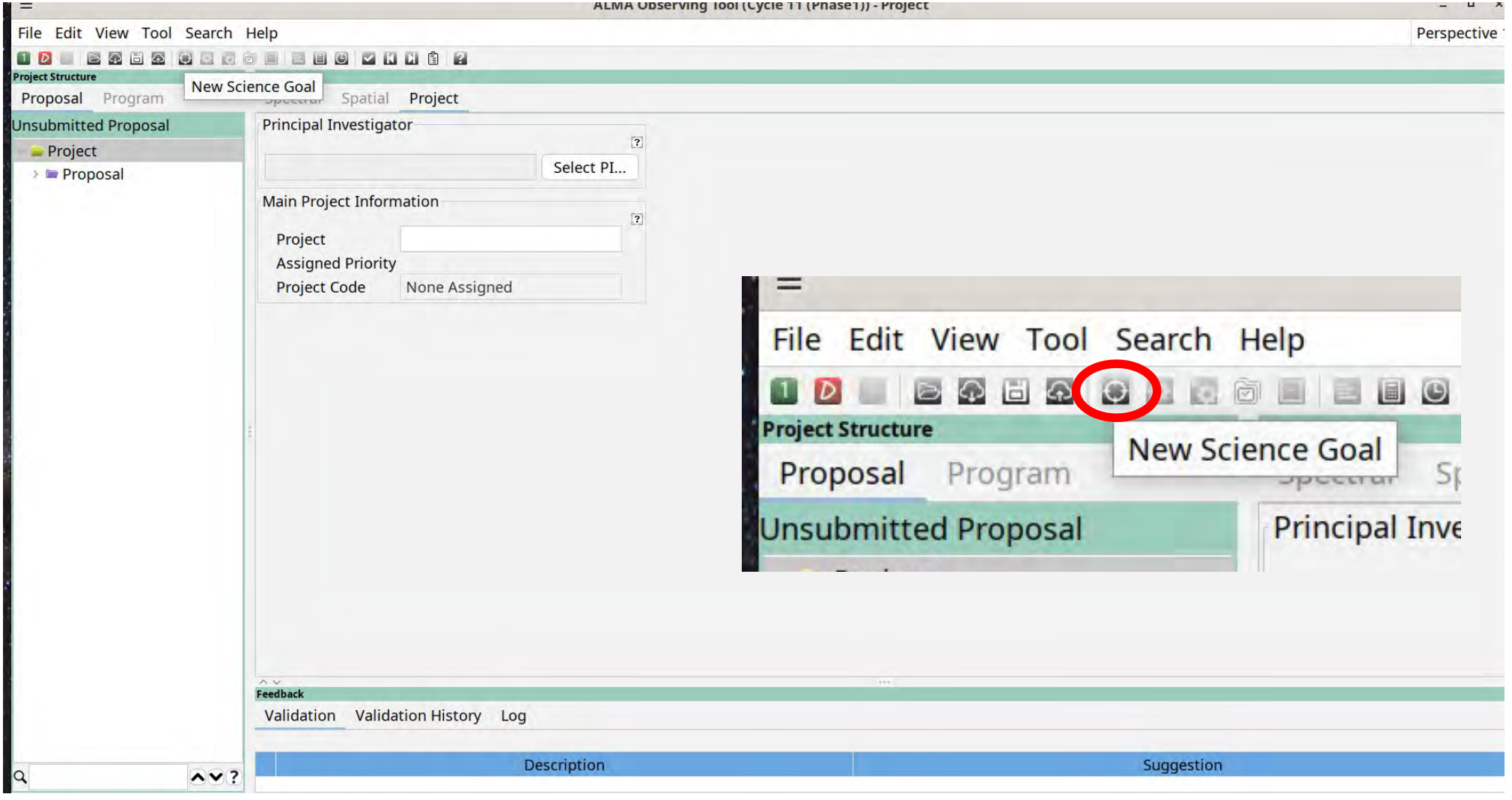
Briefly justify any new observations that duplicate archival data or accepted programs.
Information regarding the ALMA Duplication Policy and how to search archival data and accepted programs can be found at:

https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp

Feedback

Validation Validation History Log

Description	Suggestion


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File Edit View Tool Search Help
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Project Structure
New Science Goal
Proposal Program Spatial Project
Unsubmitted Proposal
Project
Proposal
Principal Investigator
Select PI...
Main Project Information
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Assigned Priority
Project Code
None Assigned
Feedback
Validation Validation History Log
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Suggestion
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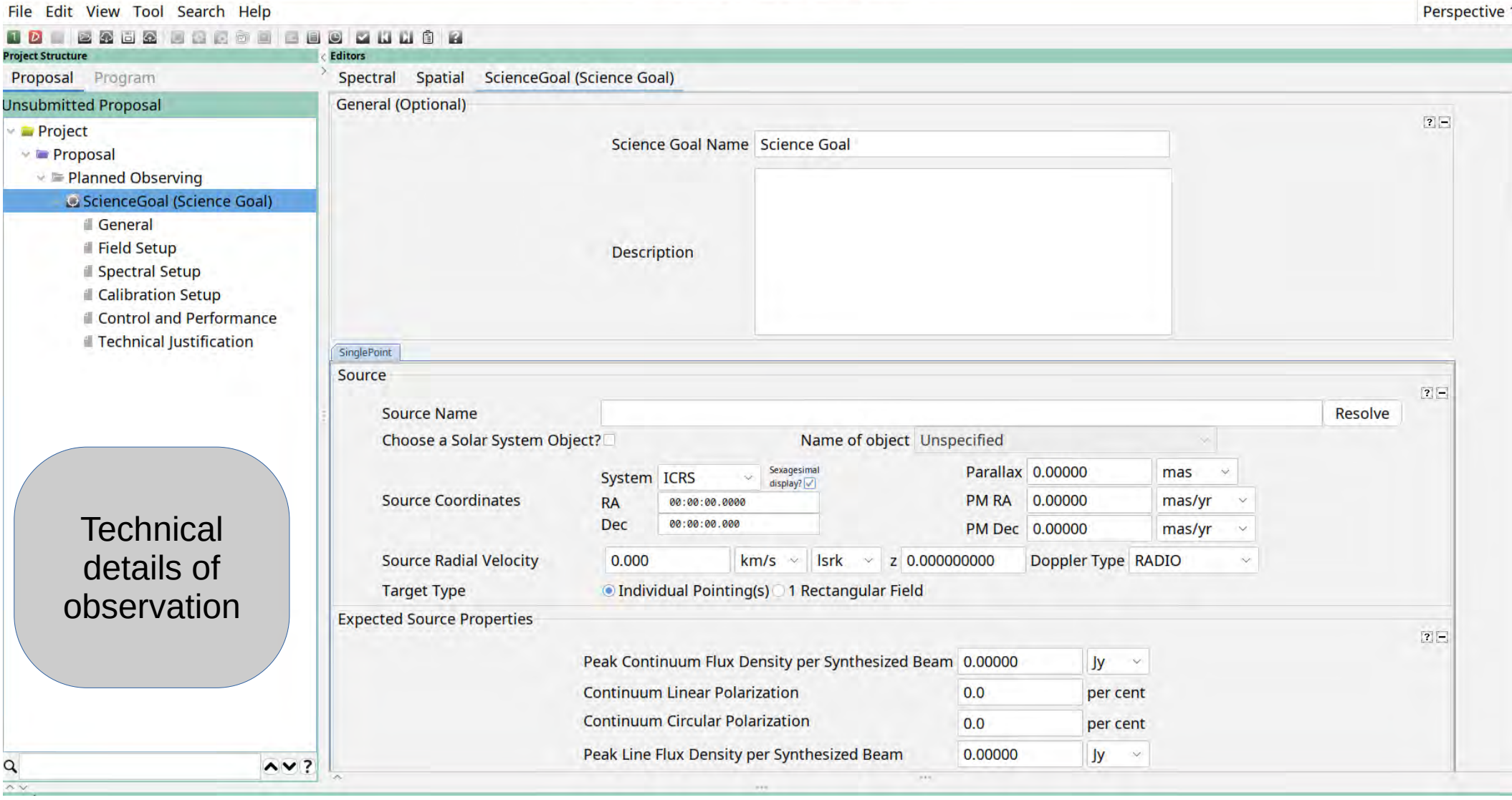
New Science Goal
Proposal Program
Unsubmitted Proposal
Principal Inve


File Edit View Tool Search Help
Perspective
Project Structure
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Proposal Program
Spectral Spatial ScienceGoal (Science Goal)
Unsubmitted Proposal
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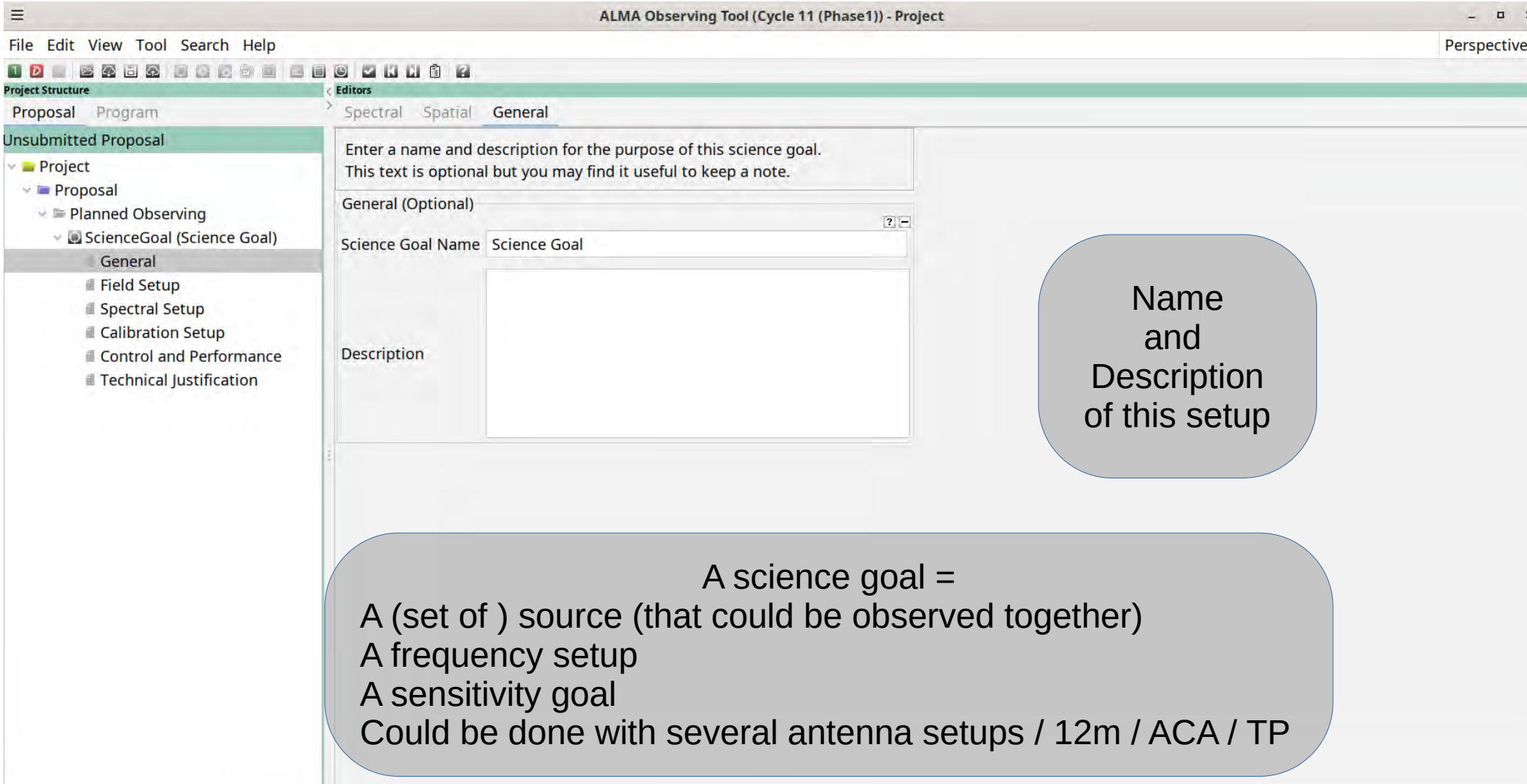
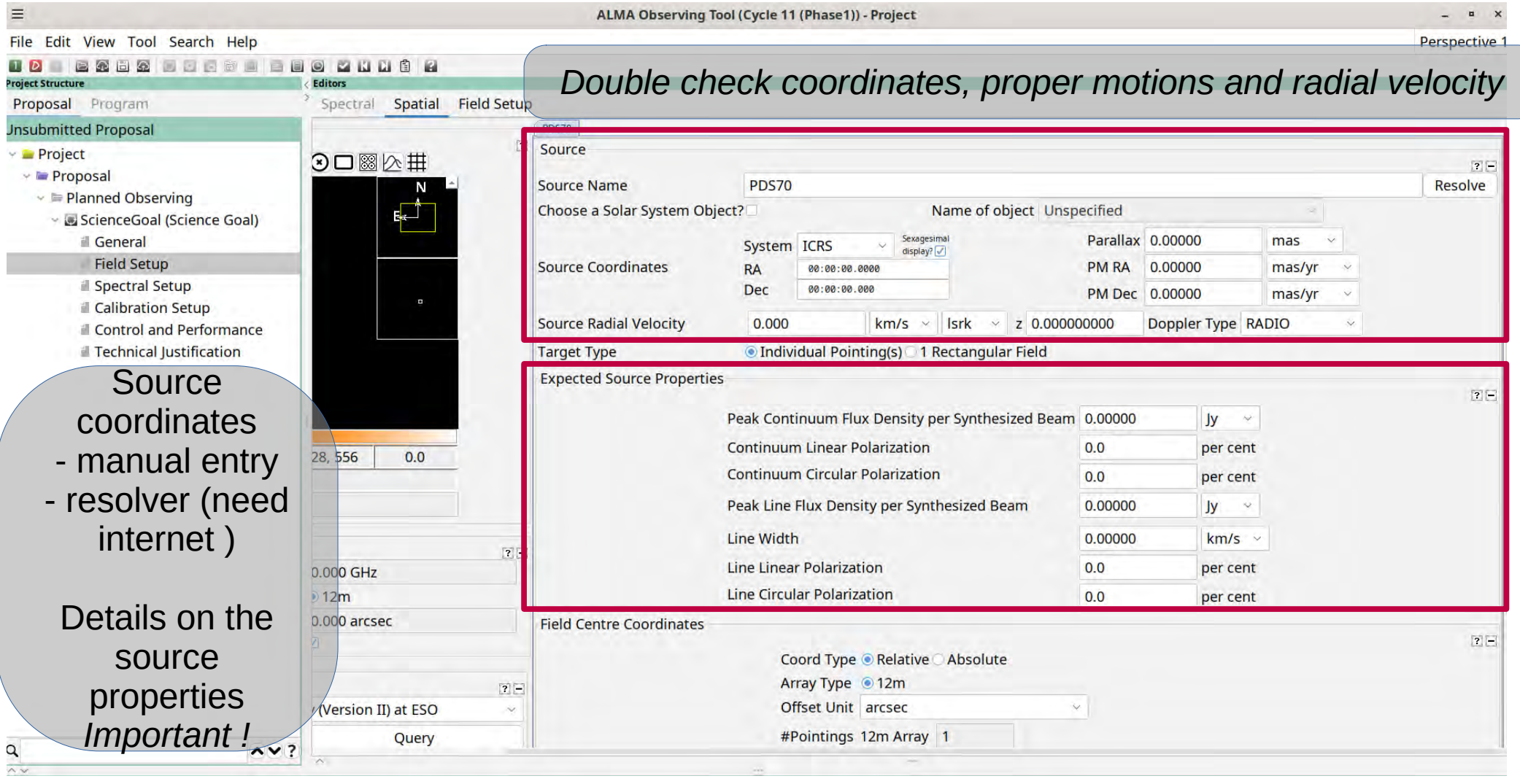
Proposal
Planned Observing
ScienceGoal (Science Goal)
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
General (Optional)
Science Goal Name
Science Goal
Description
SinglePoint
Source
Source Name
Resolve
Choose a Solar System Object?
Name of object
Unspecified
Source Coordinates
System
ICRS
Sexagesimal display?
RA
00:00:00.0000
Dec
00:00:00.000
Parallax
0.00000
mas
PM RA
0.00000
mas/yr
PM Dec
0.00000
mas/yr
Source Radial Velocity
0.000
km/s
lsrk
z
0.000000000
Doppler Type
RADIO
Target Type
Individual Pointing(s)
1 Rectangular Field
Expected Source Properties
Peak Continuum Flux Density per Synthesized Beam
0.00000
Jy
Continuum Linear Polarization
0.0
per cent
Continuum Circular Polarization
0.0
per cent
Peak Line Flux Density per Synthesized Beam
0.00000
Jy
Technical details of observation

Science goal



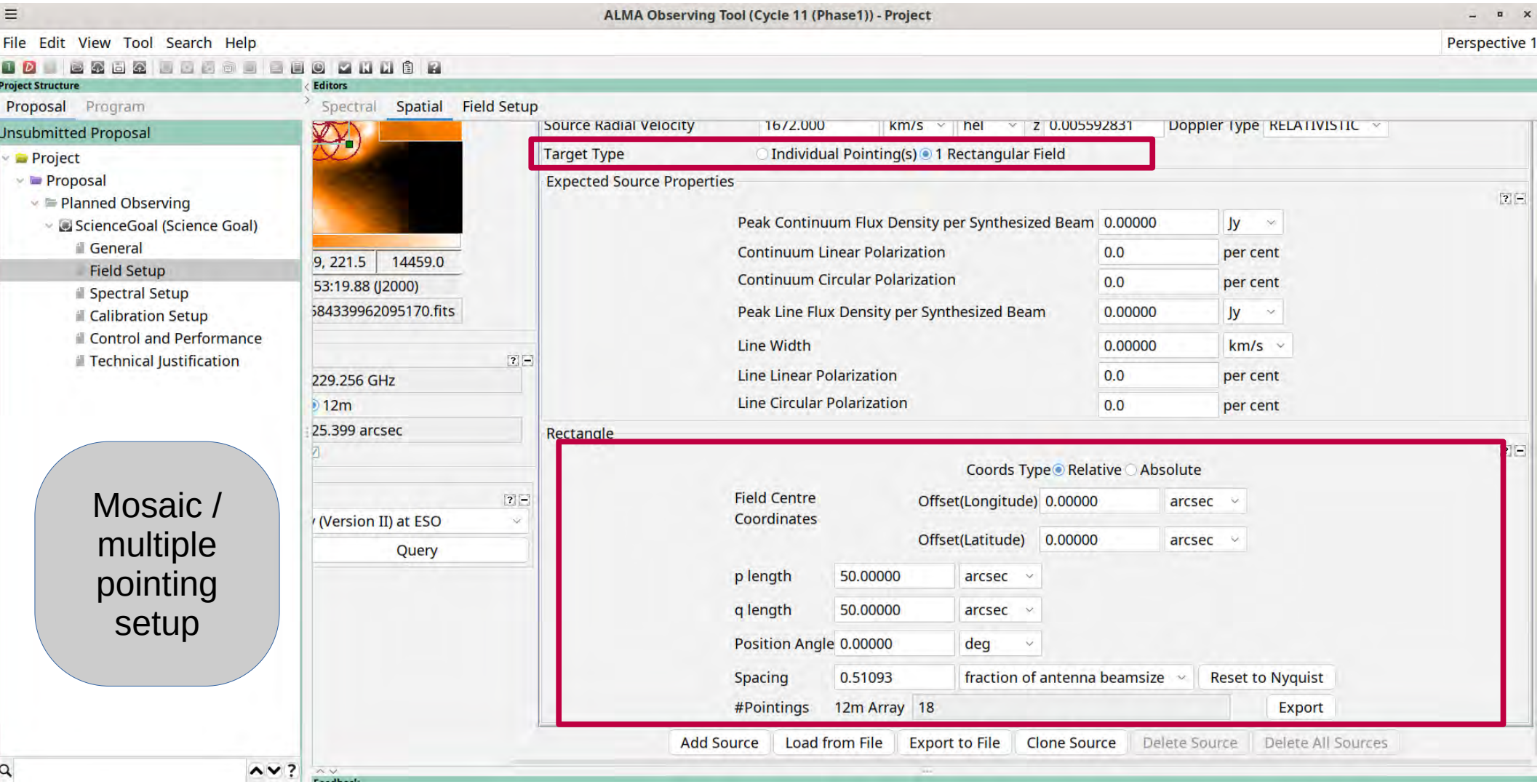
Source setup



Double check coordinates, proper motions and radial velocity

Source coordinates
- manual entry
- resolver (need internet)

Details on the source properties
Important !


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
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Spectral Spatial Field Setup
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Project
Proposal
Planned Observing
ScienceGoal (Science Goal)
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Field Setup
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Calibration Setup
Control and Performance
Technical Justification
Source Radial Velocity 1672.000 km/s hel z 0.005592831 Doppler Type RELATIVISTIC
Target Type Individual Pointing(s) 1 Rectangular Field
Expected Source Properties
Peak Continuum Flux Density per Synthesized Beam 0.00000 Jy
Continuum Linear Polarization 0.0 per cent
Continuum Circular Polarization 0.0 per cent
Peak Line Flux Density per Synthesized Beam 0.00000 Jy
Line Width 0.00000 km/s
Line Linear Polarization 0.0 per cent
Line Circular Polarization 0.0 per cent
Rectangle
Coords Type Relative Absolute
Field Centre Coordinates
Offset(Longitude) 0.00000 arcsec
Offset(Latitude) 0.00000 arcsec
p length 50.00000 arcsec
q length 50.00000 arcsec
Position Angle 0.00000 deg
Spacing 0.51093 fraction of antenna beamsize
Reset to Nyquist
#Pointings 12m Array 18
Export
Add Source
Load from File
Export to File
Clone Source
Delete Source
Delete All Sources
9, 221.5 14459.0
53:19.88 (J2000)
584339962095170.fits
229.256 GHz
12m
25.399 arcsec
(Version II) at ESO
Query
Mosaic / multiple pointing setup

ALMA Observing Tool (Cycle 11 (Phase1)) - Project

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

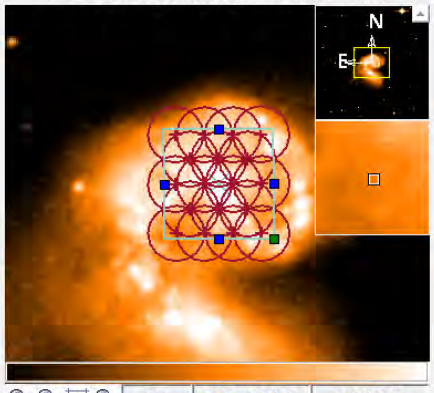
Unsubmitted Proposal

- Project
  - Proposal
    - Planned Observing
      - ScienceGoal (Science Goal)
        - General
        - Field Setup
        - Spectral Setup
        - Calibration Setup
        - Control and Performance
        - Technical Justification

Editors

Spectral Spatial Field Setup

Spatial Image



2x | 269, 221.5 | 14459.0

12:01:55.097, -18:53:19.88 (J2000)

Image Filename I7060584339962095170.fits

FOV Parameters

Representative Frequency (Sky) 229.256 GHz

Array Type 12m

Antenna Beamsize (HPBW) 25.399 arcsec

Show Antenna Beamsize

Image Query

Image Server Digitized Sky (Version II) at ESO

Image Size(arcmin) 10.0 Query

NGC4038

Source

Source Name NGC4038

Choose a Solar System Object?

Name of object Unspecified

Source Coordinates

System ICRS Sexagesimal display?

RA 12:01:53.0020

Dec -18:52:03.320

Parallax 0.00000

PM RA 0.00000

PM Dec 0.00000

Source Radial Velocity 1672.000 km/s hel z 0.005592831 Doppler Type RELA

Target Type Individual Pointing(s) 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Synthesized Beam	0.00000	Jy
Continuum Linear Polarization	0.0	per cent
Continuum Circular Polarization	0.0	per cent
Peak Line Flux Density per Synthesized Beam	0.00000	Jy
Line Width	0.00000	km/s
Line Linear Polarization	0.0	per cent
Line Circular Polarization	0.0	per cent

Rectangle

Coords Type Relative Absolute

Field Centre Coordinates

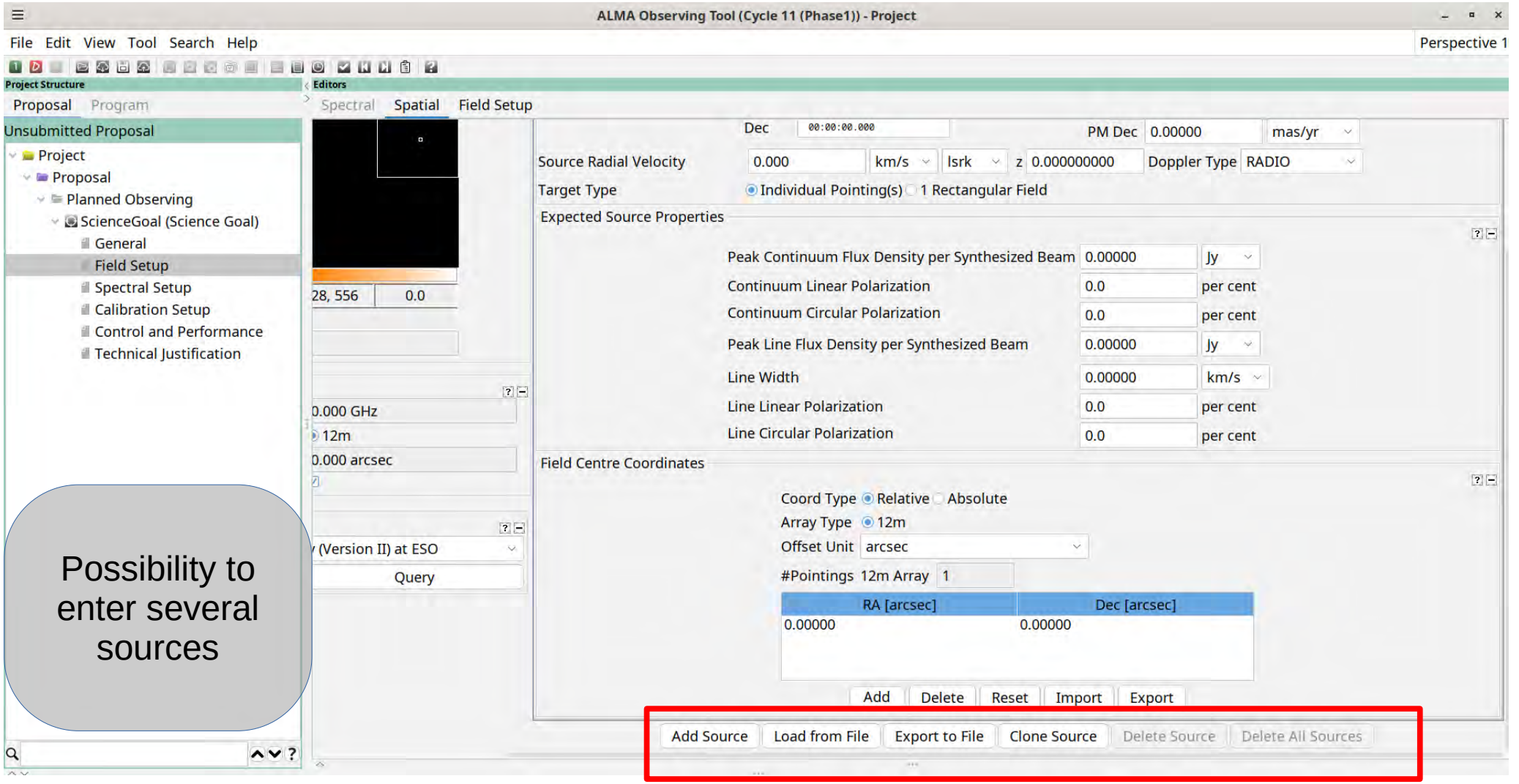
Offset(Longitude) 0.00000 arcsec

Offset(Latitude) 0.00000 arcsec

Feedback

Visualization

Mosaic / multiple pointing setup


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
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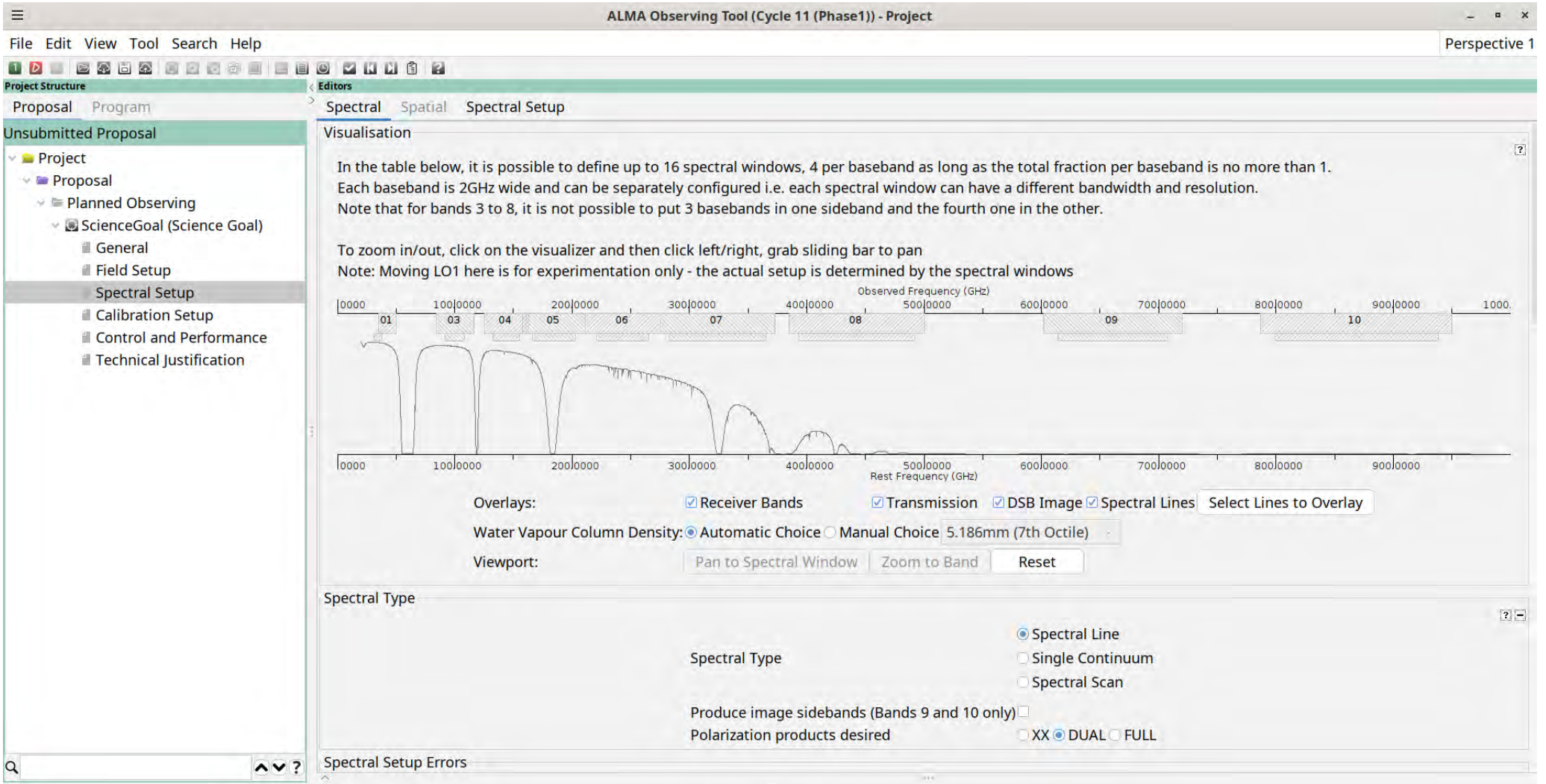
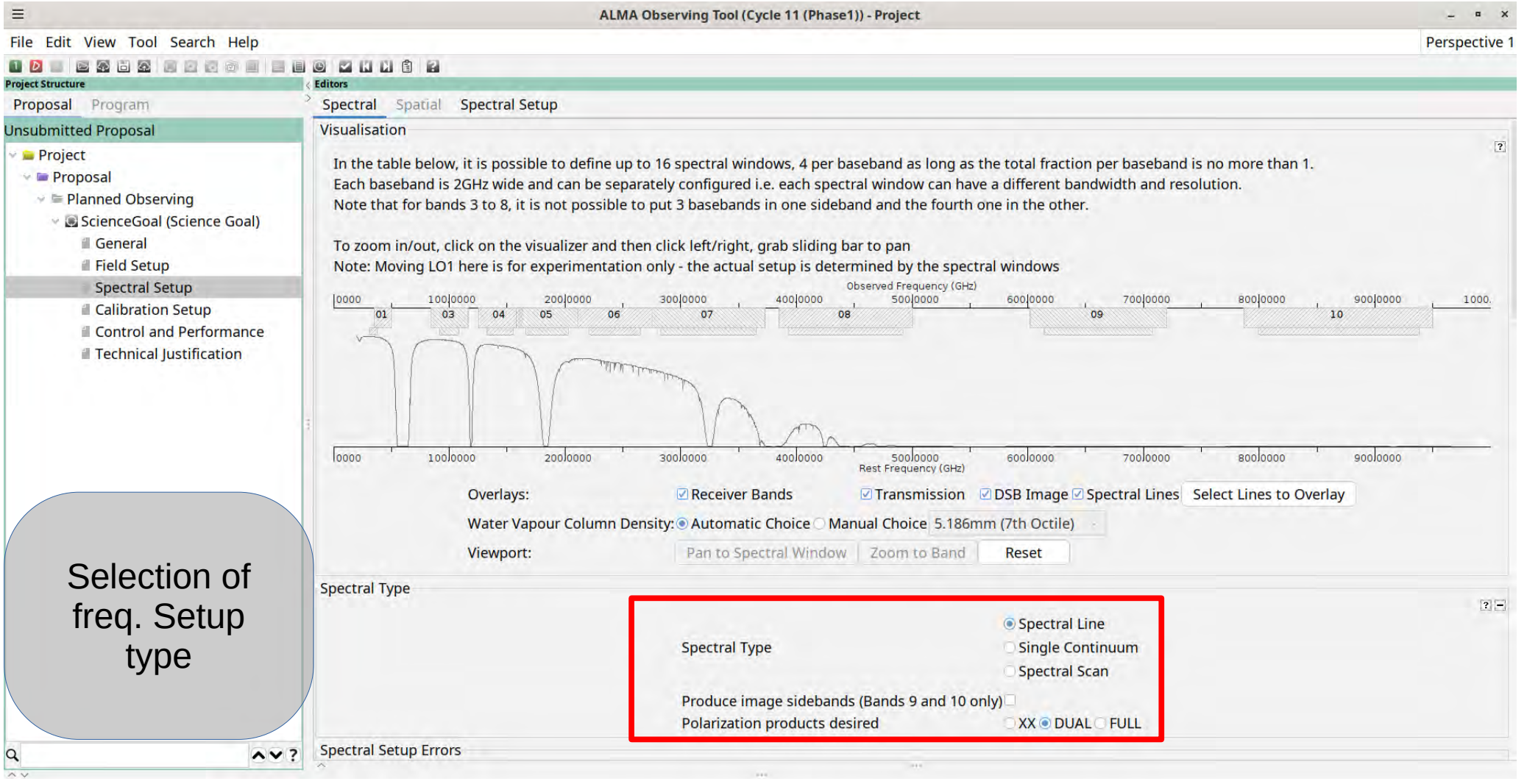
Calibration Setup
Control and Performance
Technical Justification
Dec 00:00:00.000
PM Dec 0.00000 mas/yr
Source Radial Velocity 0.000 km/s lsrk z 0.000000000 Doppler Type RADIO
Target Type Individual Pointing(s) 1 Rectangular Field
Expected Source Properties
Peak Continuum Flux Density per Synthesized Beam 0.00000 Jy
Continuum Linear Polarization 0.0 per cent
Continuum Circular Polarization 0.0 per cent
Peak Line Flux Density per Synthesized Beam 0.00000 Jy
Line Width 0.00000 km/s
Line Linear Polarization 0.0 per cent
Line Circular Polarization 0.0 per cent
Field Centre Coordinates
Coord Type Relative Absolute
Array Type 12m
Offset Unit arcsec
#Pointings 12m Array 1
RA [arcsec]
Dec [arcsec]
0.00000
0.00000
Add Delete Reset Import Export
Add Source Load from File Export to File Clone Source Delete Source Delete All Sources
28, 556
0.0
0.000 GHz
12m
0.000 arcsec
(Version II) at ESO
Query
Possibility to enter several sources

Frequency setup




ALMA Observing Tool (Cycle 11 (Phase1)) - Project
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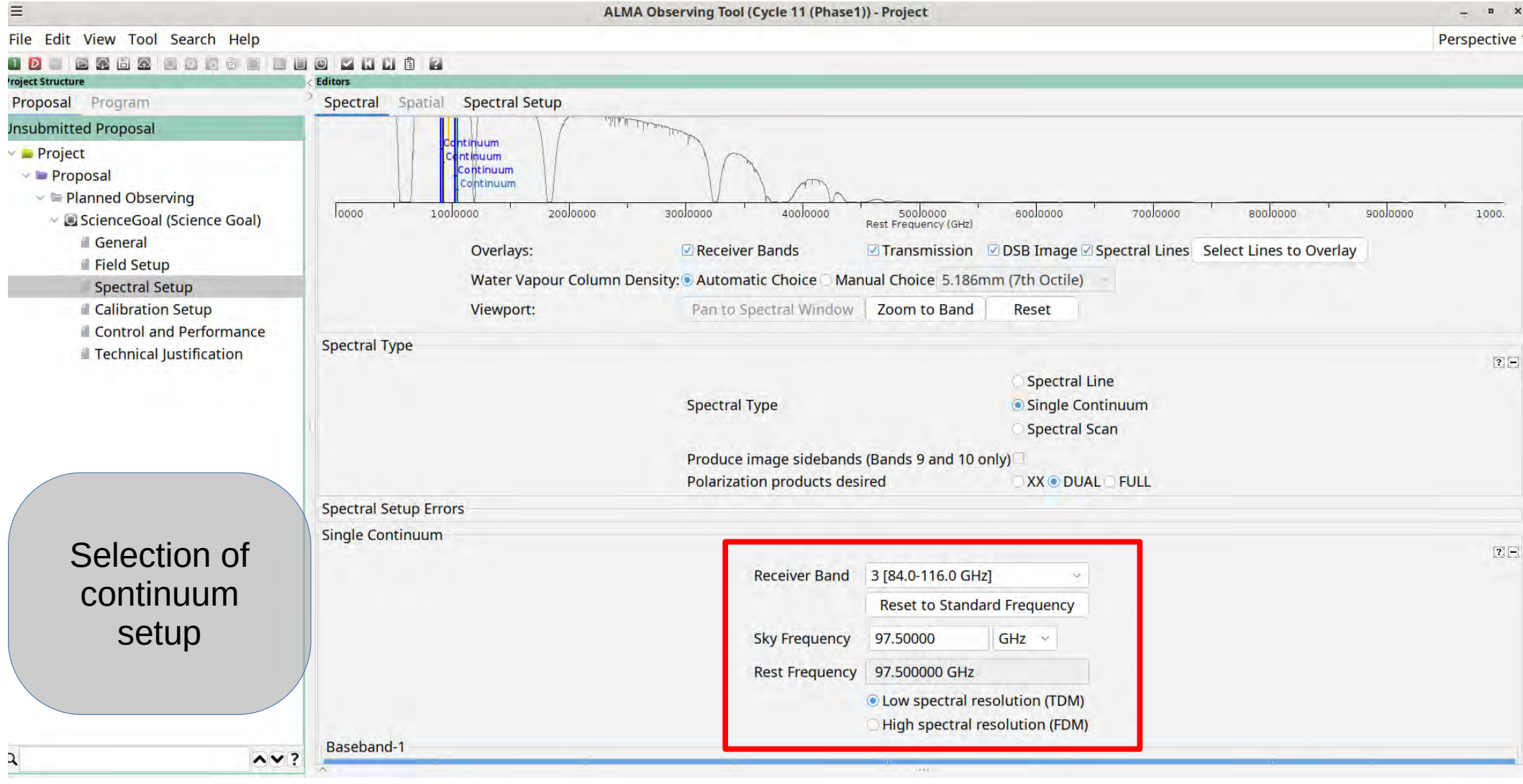
Spectral Spatial Spectral Setup
Visualisation
In the table below, it is possible to define up to 16 spectral windows, 4 per baseband as long as the total fraction per baseband is no more than 1.
Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution.
Note that for bands 3 to 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.
To zoom in/out, click on the visualizer and then click left/right, grab sliding bar to pan
Note: Moving LO1 here is for experimentation only - the actual setup is determined by the spectral windows
Observed Frequency (GHz)
0000 100|0000 200|0000 300|0000 400|0000 500|0000 600|0000 700|0000 800|0000 900|0000 1000
01 03 04 05 06 07 08 09 10
0000 100|0000 200|0000 300|0000 400|0000 500|0000 600|0000 700|0000 800|0000 900|0000
Rest Frequency (GHz)
Overlays: Receiver Bands Transmission DSB Image Spectral Lines Select Lines to Overlay
Water Vapour Column Density: Automatic Choice Manual Choice 5.186mm (7th Octile)
Viewport: Pan to Spectral Window Zoom to Band Reset
Spectral Type
Spectral Type
Spectral Line
Single Continuum
Spectral Scan
Produce image sidebands (Bands 9 and 10 only)
Polarization products desired XX DUAL FULL
Spectral Setup Errors
Selection of freq. Setup type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Field Setup
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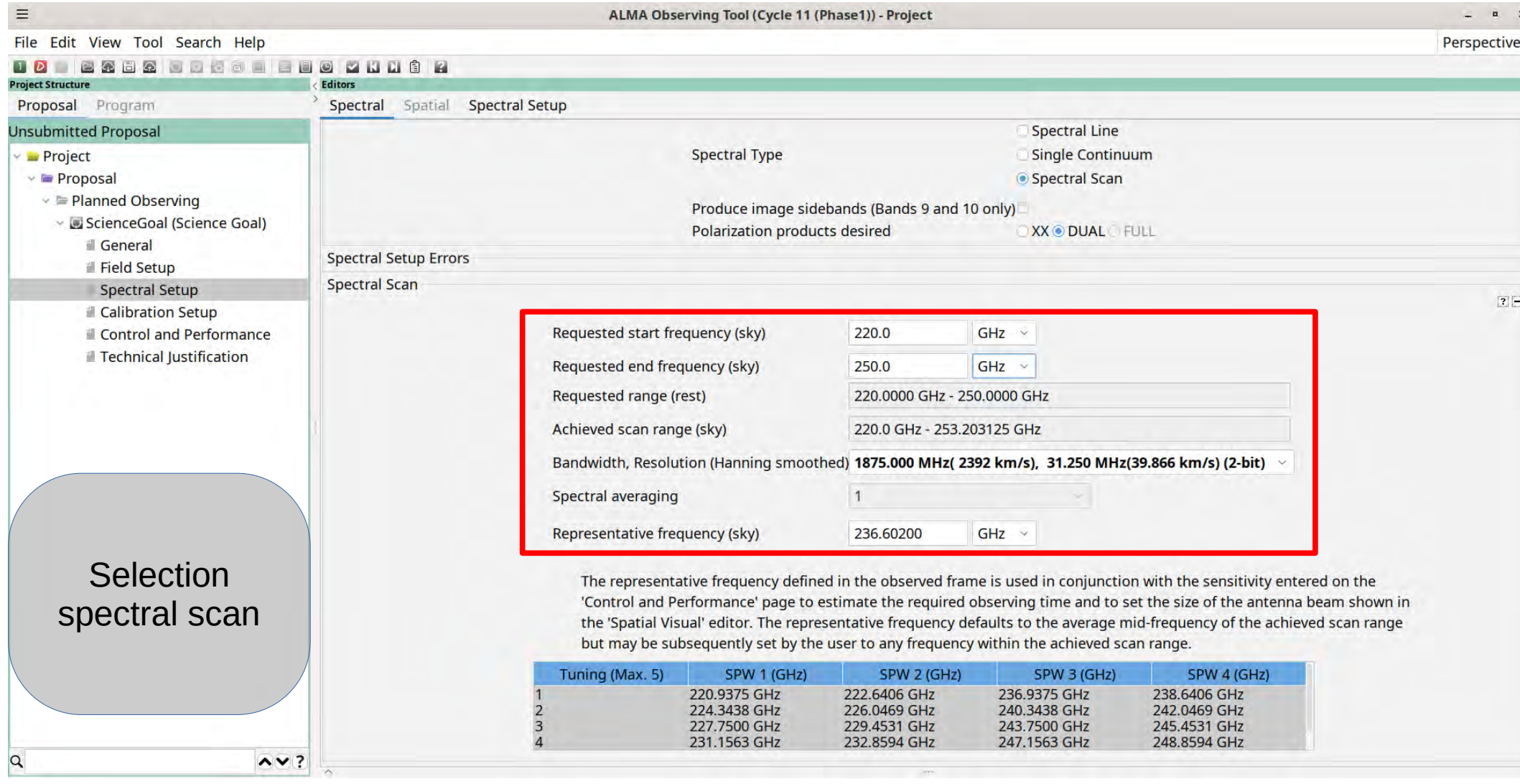
Calibration Setup
Control and Performance
Technical Justification
Continuum
Continuum
Continuum
Continuum
Rest Frequency (GHz)
Overlays:
Receiver Bands
Transmission
DSB Image
Spectral Lines
Select Lines to Overlay
Water Vapour Column Density:
Automatic Choice
Manual Choice
5.186mm (7th Octile)
Viewport:
Pan to Spectral Window
Zoom to Band
Reset
Spectral Type
Spectral Type
Spectral Line
Single Continuum
Spectral Scan
Produce image sidebands (Bands 9 and 10 only)
Polarization products desired
XX
DUAL
FULL
Spectral Setup Errors
Single Continuum
Receiver Band
3 [84.0-116.0 GHz]
Reset to Standard Frequency
Sky Frequency
97.50000
GHz
Rest Frequency
97.500000 GHz
Low spectral resolution (TDM)
High spectral resolution (FDM)
Baseband-1
Selection of continuum setup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Calibration Setup
Control and Performance
Technical Justification
Editors
Spectral Spatial Spectral Setup
Spectral Type
Spectral Line
Single Continuum
Spectral Scan
Produce image sidebands (Bands 9 and 10 only)
Polarization products desired
XX DUAL FULL
Spectral Setup Errors
Spectral Scan
Requested start frequency (sky) 220.0 GHz
Requested end frequency (sky) 250.0 GHz
Requested range (rest) 220.0000 GHz - 250.0000 GHz
Achieved scan range (sky) 220.0 GHz - 253.203125 GHz
Bandwidth, Resolution (Hanning smoothed) 1875.000 MHz(2392 km/s), 31.250 MHz(39.866 km/s) (2-bit)
Spectral averaging 1
Representative frequency (sky) 236.60200 GHz
The representative frequency defined in the observed frame 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. The representative frequency defaults to the average mid-frequency of the achieved scan range but may be subsequently set by the user to any frequency within the achieved scan range.
Tuning (Max. 5) SPW 1 (GHz) SPW 2 (GHz) SPW 3 (GHz) SPW 4 (GHz)
1 220.9375 GHz 222.6406 GHz 236.9375 GHz 238.6406 GHz
2 224.3438 GHz 226.0469 GHz 240.3438 GHz 242.0469 GHz
3 227.7500 GHz 229.4531 GHz 243.7500 GHz 245.4531 GHz
4 231.1563 GHz 232.8594 GHz 247.1563 GHz 248.8594 GHz
Selection spectral scan

ALMA Observing Tool (Cycle 11 (Phase1)) - Project

File Edit View Tool Search Help

Perspective

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
  - Proposal
    - Planned Observing
      - ScienceGoal (Science Goal)
        - General
        - Field Setup
        - Spectral Setup
        - Calibration Setup
        - Control and Performance
        - Technical Justification

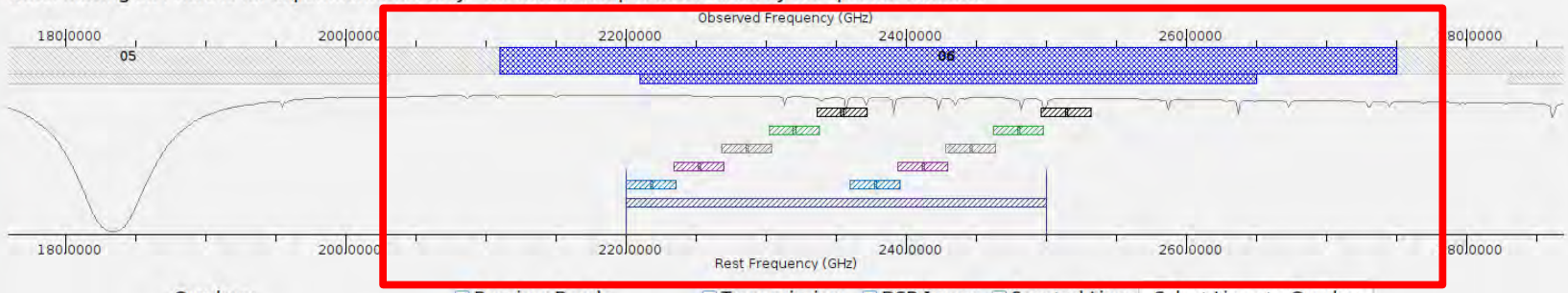
Visualization

Editors

Spectral Spatial Spectral Setup

Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution.
Note that for bands 3 to 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

To zoom in/out, click on the visualizer and then click left/right, grab sliding bar to pan
Note: Moving LO1 here is for experimentation only - the actual setup is determined by the spectral windows



Overlays: Receiver Bands | Transmission | DSB Image | Spectral Lines | Select Lines to Overlay

Spectral Scan: Requested Scan | Tuning 1 | Tuning 2 | Tuning 3 | Tuning 4 | Tuning 5

Water Vapour Column Density: Automatic Choice | Manual Choice | 1.796mm (5th Octile)

Viewport: Pan to Spectral Window | Zoom to Band | Reset

Spectral Type

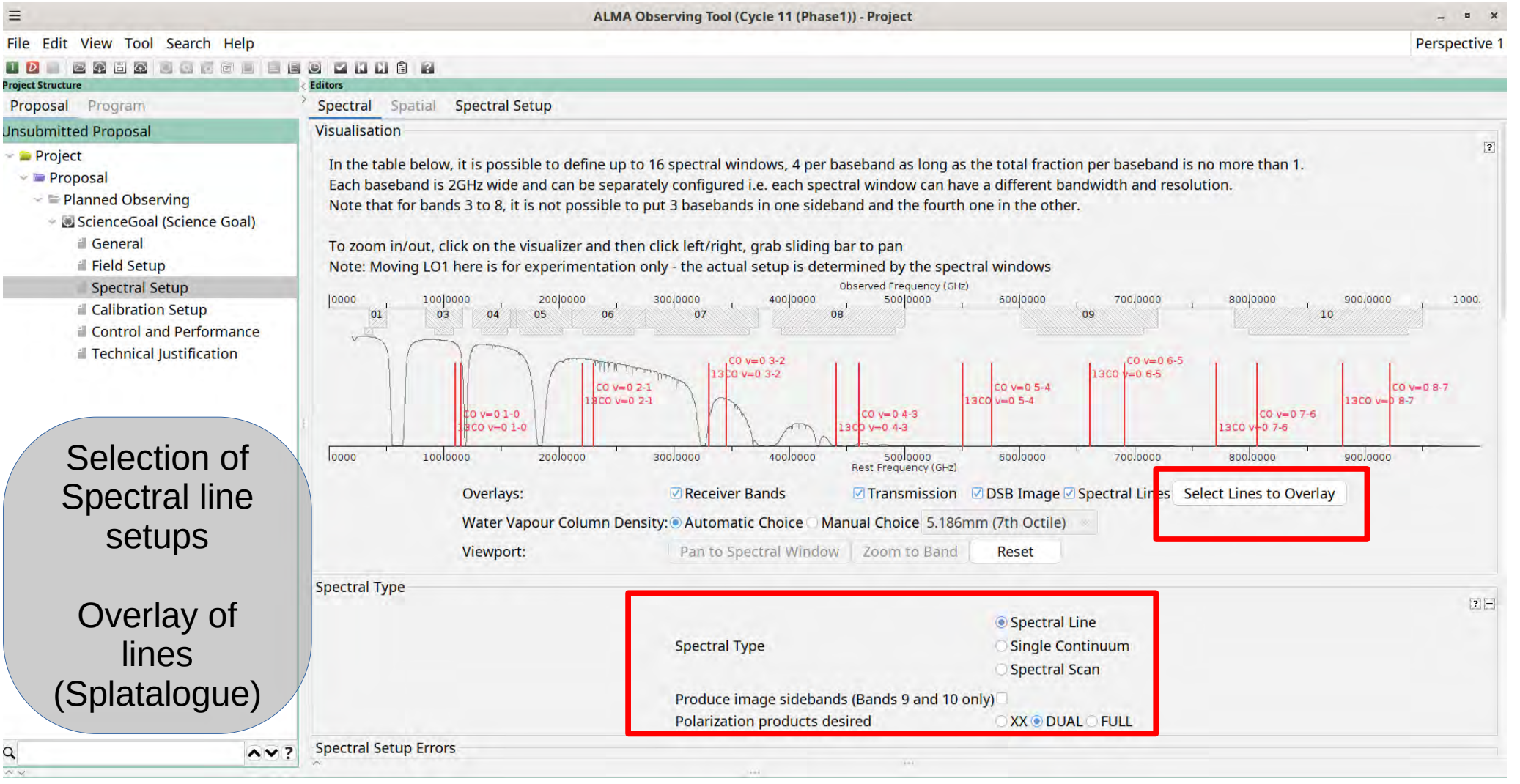
Spectral Type: Spectral Line | Single Continuum | Spectral Scan

Produce image sidebands (Bands 9 and 10 only)

Polarization products desired: XX | DUAL | FULL

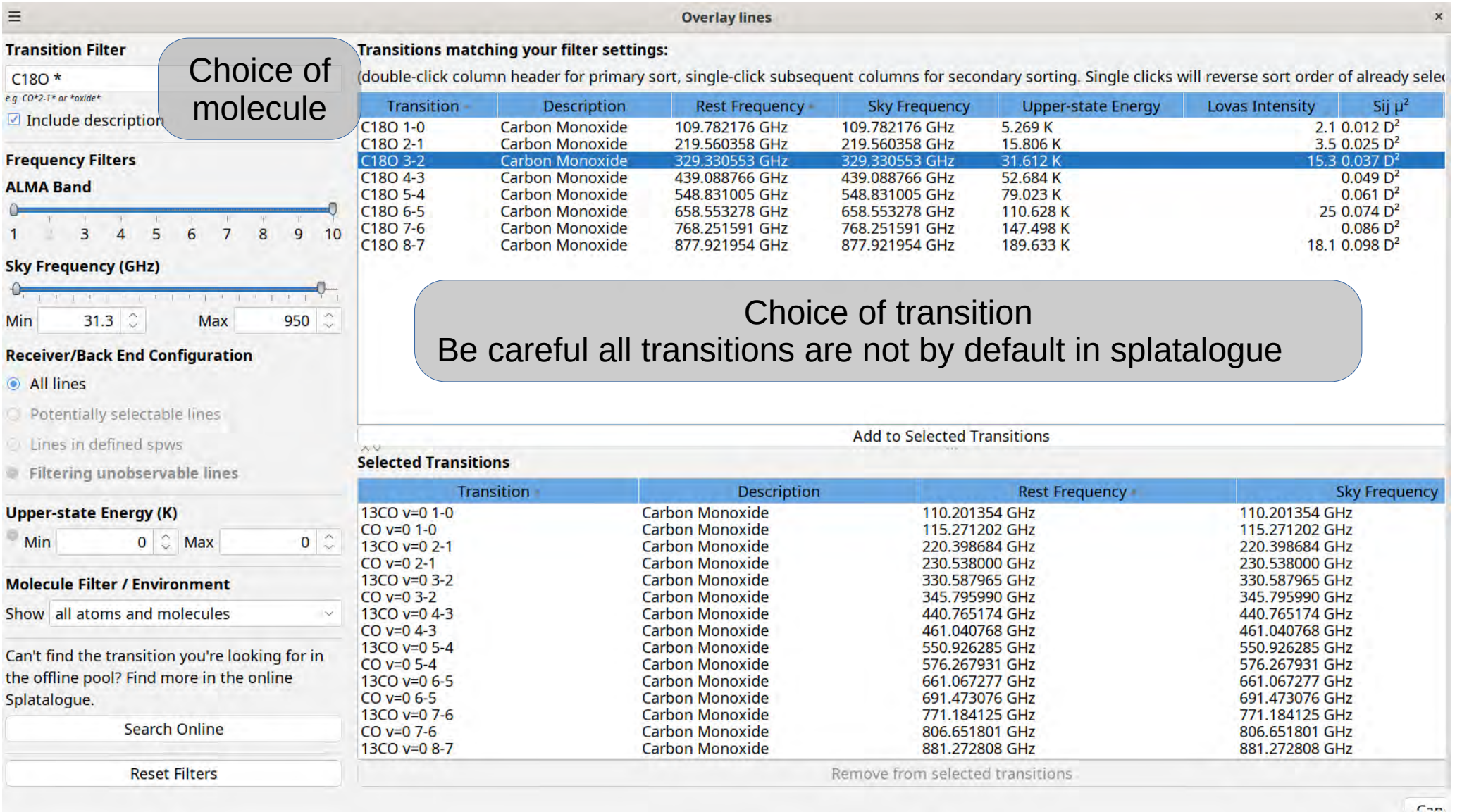
Spectral Setup Errors

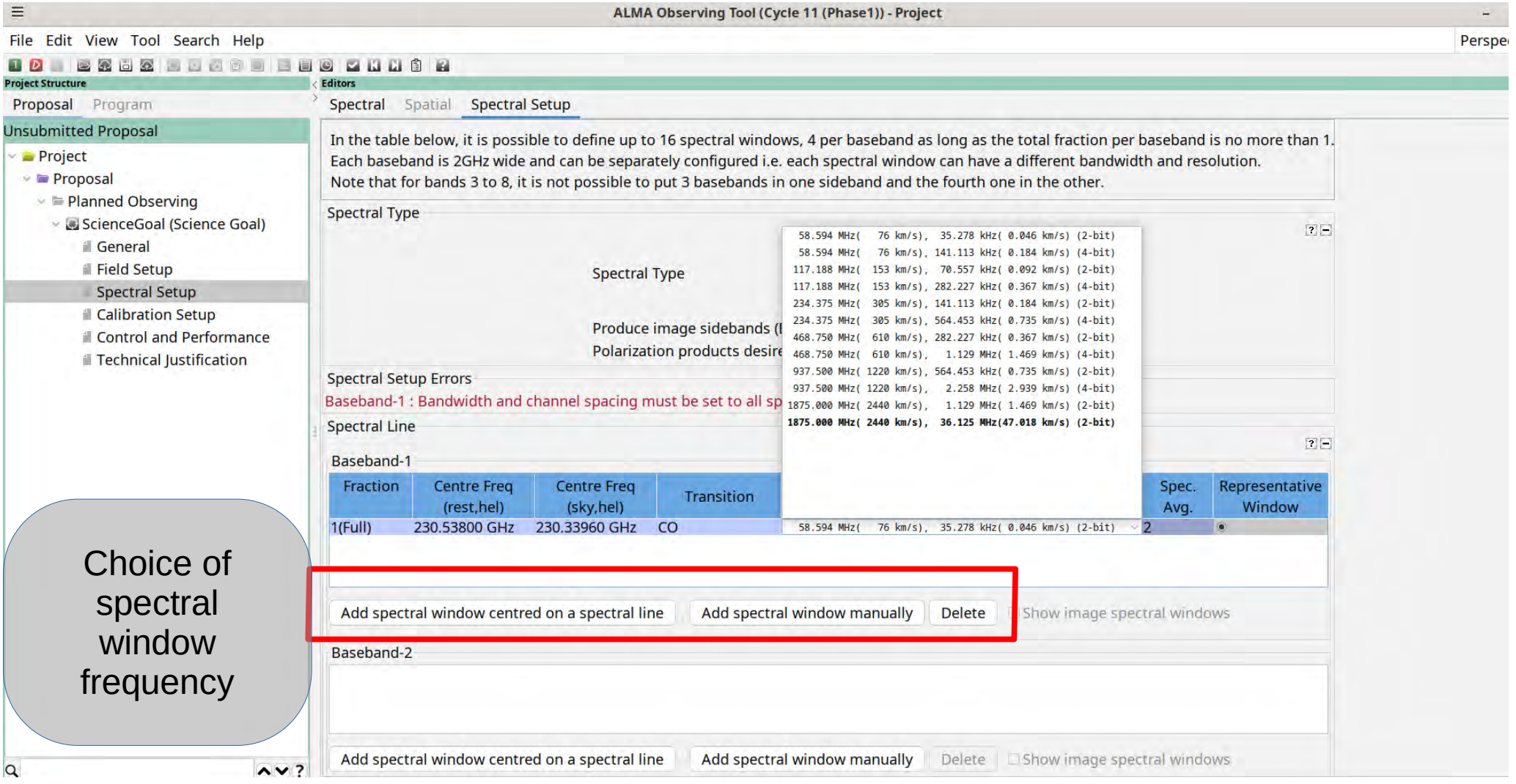
Spectral Scan



Selection of Spectral line setups

Overlay of lines (Splatalogue)


Overlay lines
Transition Filter
C18O *
e.g. CO*2-1* or *oxide*
Include description
Choice of molecule
Frequency Filters
ALMA Band
1 3 4 5 6 7 8 9 10
Sky Frequency (GHz)
Min 31.3
Max 950
Receiver/Back End Configuration
All lines
Potentially selectable lines
Lines in defined spws
Filtering unobservable lines
Upper-state Energy (K)
Min 0
Max 0
Molecule Filter / Environment
Show all atoms and molecules
Can't find the transition you're looking for in the offline pool? Find more in the online Splatalogue.
Search Online
Reset Filters
Transitions matching your filter settings:
(double-click column header for primary sort, single-click subsequent columns for secondary sorting. Single clicks will reverse sort order of already sele
Transition | Description | Rest Frequency | Sky Frequency | Upper-state Energy | Lovas Intensity | Sij μ²
C18O 1-0 | Carbon Monoxide | 109.782176 GHz | 109.782176 GHz | 5.269 K | 2.1 | 0.012 D²
C18O 2-1 | Carbon Monoxide | 219.560358 GHz | 219.560358 GHz | 15.806 K | 3.5 | 0.025 D²
C18O 3-2 | Carbon Monoxide | 329.330553 GHz | 329.330553 GHz | 31.612 K | 15.3 | 0.037 D²
C18O 4-3 | Carbon Monoxide | 439.088766 GHz | 439.088766 GHz | 52.684 K | | 0.049 D²
C18O 5-4 | Carbon Monoxide | 548.831005 GHz | 548.831005 GHz | 79.023 K | | 0.061 D²
C18O 6-5 | Carbon Monoxide | 658.553278 GHz | 658.553278 GHz | 110.628 K | 25 | 0.074 D²
C18O 7-6 | Carbon Monoxide | 768.251591 GHz | 768.251591 GHz | 147.498 K | | 0.086 D²
C18O 8-7 | Carbon Monoxide | 877.921954 GHz | 877.921954 GHz | 189.633 K | 18.1 | 0.098 D²
Choice of transition
Be careful all transitions are not by default in splatalogue
Add to Selected Transitions
Selected Transitions
Transition | Description | Rest Frequency | Sky Frequency
13CO v=0 1-0 | Carbon Monoxide | 110.201354 GHz | 110.201354 GHz
CO v=0 1-0 | Carbon Monoxide | 115.271202 GHz | 115.271202 GHz
13CO v=0 2-1 | Carbon Monoxide | 220.398684 GHz | 220.398684 GHz
CO v=0 2-1 | Carbon Monoxide | 230.538000 GHz | 230.538000 GHz
13CO v=0 3-2 | Carbon Monoxide | 330.587965 GHz | 330.587965 GHz
CO v=0 3-2 | Carbon Monoxide | 345.795990 GHz | 345.795990 GHz
13CO v=0 4-3 | Carbon Monoxide | 440.765174 GHz | 440.765174 GHz
CO v=0 4-3 | Carbon Monoxide | 461.040768 GHz | 461.040768 GHz
13CO v=0 5-4 | Carbon Monoxide | 550.926285 GHz | 550.926285 GHz
CO v=0 5-4 | Carbon Monoxide | 576.267931 GHz | 576.267931 GHz
13CO v=0 6-5 | Carbon Monoxide | 661.067277 GHz | 661.067277 GHz
CO v=0 6-5 | Carbon Monoxide | 691.473076 GHz | 691.473076 GHz
13CO v=0 7-6 | Carbon Monoxide | 771.184125 GHz | 771.184125 GHz
CO v=0 7-6 | Carbon Monoxide | 806.651801 GHz | 806.651801 GHz
13CO v=0 8-7 | Carbon Monoxide | 881.272808 GHz | 881.272808 GHz
Remove from selected transitions


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File Edit View Tool Search Help
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Editors
Proposal Program
Spectral Spatial Spectral Setup
Unsubmitted Proposal
Project
Proposal
Planned Observing
ScienceGoal (Science Goal)
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
In the table below, it is possible to define up to 16 spectral windows, 4 per baseband as long as the total fraction per baseband is no more than 1.
Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution.
Note that for bands 3 to 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.
Spectral Type
Spectral Type
Produce image sidebands (
Polarization products desire
58.594 MHz(76 km/s), 35.278 kHz(0.046 km/s) (2-bit)
58.594 MHz(76 km/s), 141.113 kHz(0.184 km/s) (4-bit)
117.188 MHz(153 km/s), 70.557 kHz(0.092 km/s) (2-bit)
117.188 MHz(153 km/s), 282.227 kHz(0.367 km/s) (4-bit)
234.375 MHz(305 km/s), 141.113 kHz(0.184 km/s) (2-bit)
234.375 MHz(305 km/s), 564.453 kHz(0.735 km/s) (4-bit)
468.750 MHz(610 km/s), 282.227 kHz(0.367 km/s) (2-bit)
468.750 MHz(610 km/s), 1.129 MHz(1.469 km/s) (4-bit)
937.500 MHz(1220 km/s), 564.453 kHz(0.735 km/s) (2-bit)
937.500 MHz(1220 km/s), 2.258 MHz(2.939 km/s) (4-bit)
1875.000 MHz(2440 km/s), 1.129 MHz(1.469 km/s) (2-bit)
1875.000 MHz(2440 km/s), 36.125 MHz(47.018 km/s) (2-bit)
Spectral Setup Errors
Baseband-1 : Bandwidth and channel spacing must be set to all sp
Spectral Line
Baseband-1
Fraction
Centre Freq (rest,hel)
Centre Freq (sky,hel)
Transition
Spec. Avg.
Representative Window
1(Full)
230.53800 GHz
230.33960 GHz
CO
58.594 MHz(76 km/s), 35.278 kHz(0.046 km/s) (2-bit)
2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Baseband-2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Choice of spectral window frequency

e.g. CO*2-1* or *oxide*

Include description

Frequency Filters

ALMA Band

1 2 3 4 5 6 7 8 9 10

Sky Frequency (GHz)

Min 31.3 Max 950

Receiver/Back End Configuration

- All lines
- Potentially selectable lines
- Lines in defined spws
- **Filtering unobservable lines**

Upper-state Energy (K)

Min 0 Max 300

Molecule Filter / Environment

Show all atoms and molecules

Can't find the transition you're looking for in the offline pool? Find more in the online Splatalogue.

Search Online

Reset Filters

Transition	Description	Rest Frequency	Sky Frequency	Upper-state Energy	Lovas Intensity	Sij μ^2
AlF v=0 J=7-6, F...	Aluminum Monofluor...	230.793890 GHz	230.595270 GHz	44.309 K	7.2	10.083 D^2
AlF v=0 J=7-6, F...	Aluminum Monofluor...	230.793890 GHz	230.595270 GHz	44.309 K	7.2	0.818 D^2
U-230879	UNIDENTIFIED	230.879000 GHz	230.680307 GHz		3.2	
U-230894	UNIDENTIFIED	230.894000 GHz	230.695294 GHz		3.2	
t-CH3CH2OH 16...	trans-Ethanol	230.953778 GHz	230.755020 GHz	145.778 K	4.3	16.337 D^2
t-CH3CH2OH 14...	trans-Ethanol	230.991374 GHz	230.792584 GHz	85.526 K	4.4	13.893 D^2
OCS v=0 19-18	Carbonyl Sulfide	231.060993 GHz	230.862143 GHz	110.899 K	0.8	9.719 D^2
13CS v=0 5-4	Carbon Monosulfide	231.220686 GHz	231.021699 GHz	33.291 K	0.7	19.169 D^2
H213CO 11(2,9)-...	Formaldehyde	231.245964 GHz	231.046955 GHz	273.974 K		0.058 D^2
U-231266	UNIDENTIFIED	231.266000 GHz	231.066974 GHz		1.2	
CH3OH v t=0 10...	Methanol	231.281100 GHz	231.082061 GHz	165.347 K	0.4	2.673 D^2
CH3CH2CN v=0 ...	Ethyl Cyanide	231.310420 GHz	231.111355 GHz	153.421 K		383.109 D^2
CH3CH2CN v=0 ...	Ethyl Cyanide	231.312300 GHz	231.113234 GHz	157.705 K	0.9	35.06 D^2
CH3CH2CN v=0 ...	Ethyl Cyanide	231.313241 GHz	231.114174 GHz	132.429 K		18.409 D^2
N2D+ J=3-2, F1=...	Diazenylium	231.319616 GHz	231.120543 GHz	22.203 K		0.311 D^2

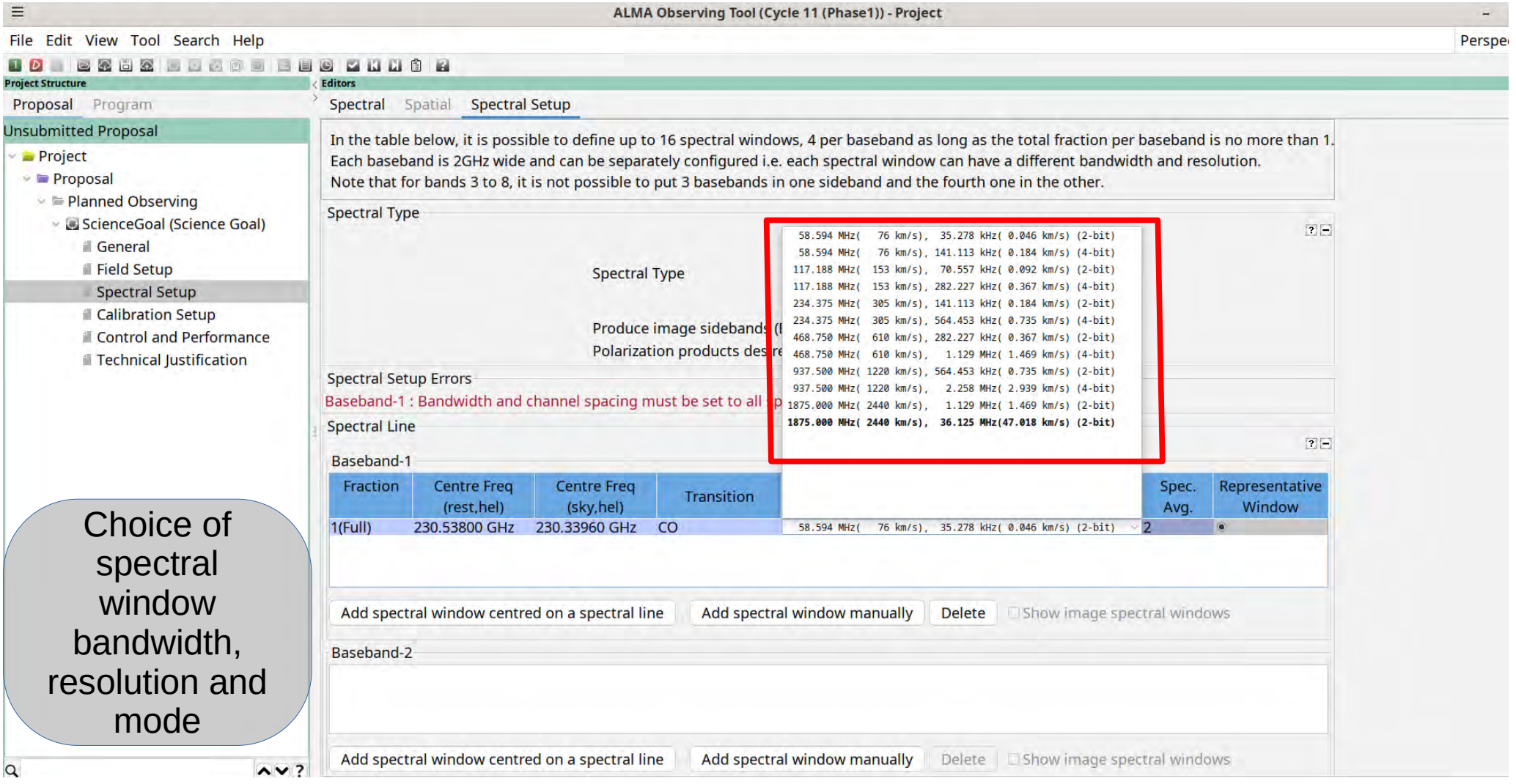
Add to spectral window list

Spectral windows in this baseband (maximum of four)

Transition	Description	Rest Frequency	Sky Frequency
CO		230.538000 GHz	230.339600 GHz
OCS v=0 19-18	Carbonyl Sulfide	231.060993 GHz	230.862143 GHz

Remove spectral window(s)

Can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Technical Justification
In the table below, it is possible to define up to 16 spectral windows, 4 per baseband as long as the total fraction per baseband is no more than 1.
Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution.
Note that for bands 3 to 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.
Spectral Type
Spectral Type
58.594 MHz(76 km/s), 35.278 kHz(0.046 km/s) (2-bit)
58.594 MHz(76 km/s), 141.113 kHz(0.184 km/s) (4-bit)
117.188 MHz(153 km/s), 70.557 kHz(0.092 km/s) (2-bit)
117.188 MHz(153 km/s), 282.227 kHz(0.367 km/s) (4-bit)
234.375 MHz(305 km/s), 141.113 kHz(0.184 km/s) (2-bit)
234.375 MHz(305 km/s), 564.453 kHz(0.735 km/s) (4-bit)
468.750 MHz(610 km/s), 282.227 kHz(0.367 km/s) (2-bit)
468.750 MHz(610 km/s), 1.129 MHz(1.469 km/s) (4-bit)
937.500 MHz(1220 km/s), 564.453 kHz(0.735 km/s) (2-bit)
937.500 MHz(1220 km/s), 2.258 MHz(2.939 km/s) (4-bit)
1875.000 MHz(2440 km/s), 1.129 MHz(1.469 km/s) (2-bit)
1875.000 MHz(2440 km/s), 36.125 MHz(47.018 km/s) (2-bit)
Produce image sidebands
Polarization products des
Spectral Setup Errors
Baseband-1 : Bandwidth and channel spacing must be set to all
Spectral Line
Baseband-1
Fraction
Centre Freq (rest,hel)
Centre Freq (sky,hel)
Transition
Spec. Avg.
Representative Window
1(Full)
230.53800 GHz
230.33960 GHz
CO
58.594 MHz(76 km/s), 35.278 kHz(0.046 km/s) (2-bit)
2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Baseband-2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Choice of spectral window bandwidth, resolution and mode

OT will complain if the setup is impossible

Sensitivity will be calculated at that frequency

Spectral Setup Errors

Baseband-1 : Spectral window resolution mismatch in spectral set-up. All windows must be allocated the same resolution.

Spectral Line

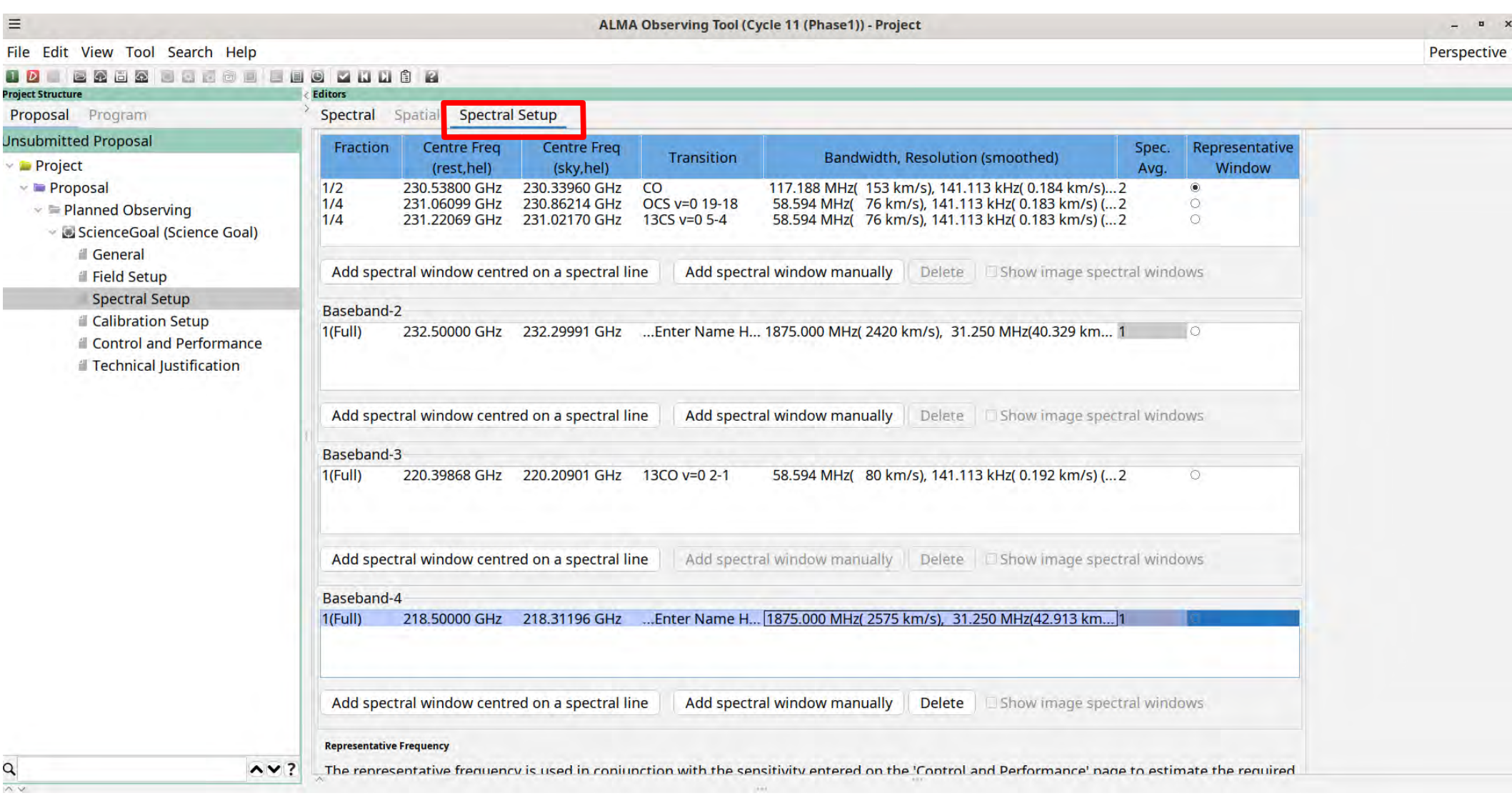
Baseband-1

Fraction	Centre Freq (rest,hel)	Centre Freq (sky,hel)	Transition	Bandwidth, Resolution (smoothed)	Spec. Avg.	Representative Window
1/2	230.53800 GHz	230.33960 GHz	CO	117.188 MHz(153 km/s), 141.113 kHz(0.184 km/s) (2-b...	2	◉
1/4	231.06099 GHz	230.86214 GHz	OCS v=0 19-18	58.594 MHz(76 km/s), 141.113 kHz(0.183 km/s) (2-bit)	2	○
1/4	231.22069 GHz	231.02170 GHz	13CS v=0 5-4	117.188 MHz(152 km/s), 282.227 kHz(0.366 km/s) (2-b...	2	○

Add spectral window centred on a spectral line | Add spectral window manually | Delete | ☐ Show image spectral windows

Baseband-2

1(Full)	233.50000 GHz	233.29905 GHz	...Enter Name Here...	1875.000 MHz(2409 km/s), 31.250 MHz(40.157 km/s) (2...	1	○


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
File Edit View Tool Search Help
Perspective
Project Structure
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Unsubmitted Proposal
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Planned Observing
ScienceGoal (Science Goal)
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Calibration Setup
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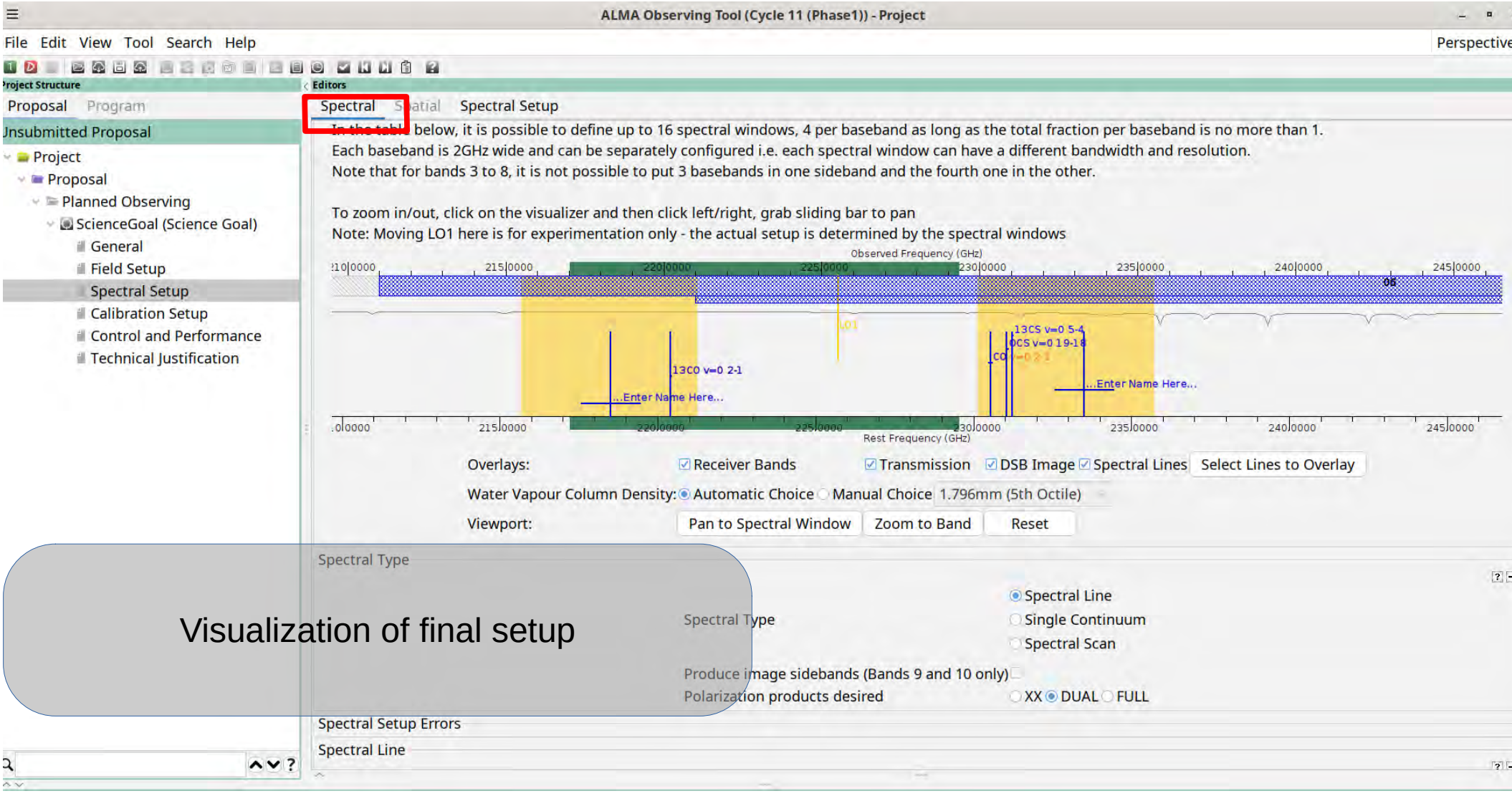
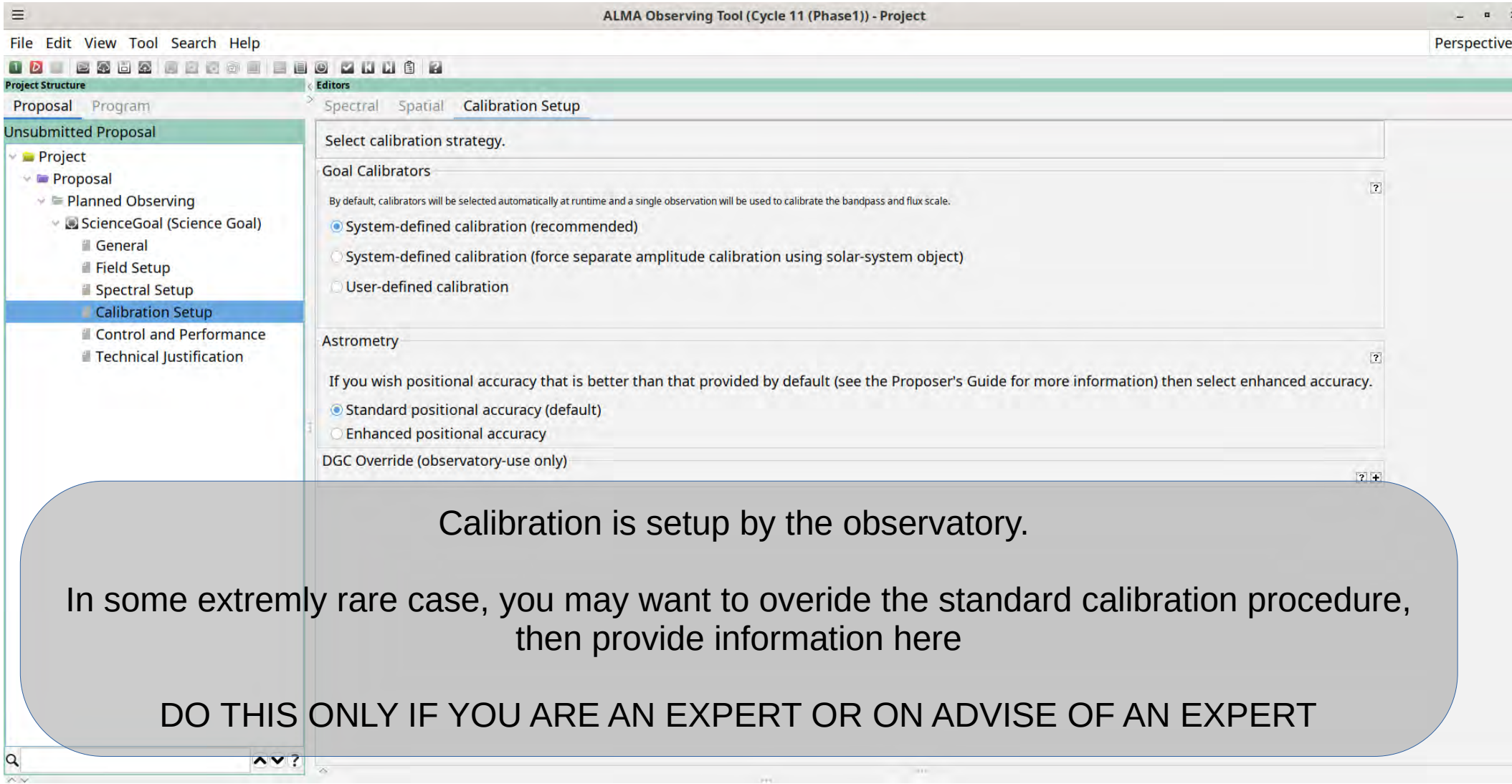
Technical Justification
Editors
Spectral Spatial Spectral Setup
Fraction Centre Freq (rest,hel) Centre Freq (sky,hel) Transition Bandwidth, Resolution (smoothed) Spec. Avg. Representative Window
1/2 230.53800 GHz 230.33960 GHz CO 117.188 MHz(153 km/s), 141.113 kHz(0.184 km/s)... 2
1/4 231.06099 GHz 230.86214 GHz OCS v=0 19-18 58.594 MHz(76 km/s), 141.113 kHz(0.183 km/s) (... 2
1/4 231.22069 GHz 231.02170 GHz 13CS v=0 5-4 58.594 MHz(76 km/s), 141.113 kHz(0.183 km/s) (... 2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Baseband-2
1(Full) 232.50000 GHz 232.29991 GHz ...Enter Name H... 1875.000 MHz(2420 km/s), 31.250 MHz(40.329 km... 1
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Baseband-3
1(Full) 220.39868 GHz 220.20901 GHz 13CO v=0 2-1 58.594 MHz(80 km/s), 141.113 kHz(0.192 km/s) (... 2
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Baseband-4
1(Full) 218.50000 GHz 218.31196 GHz ...Enter Name H... 1875.000 MHz(2575 km/s), 31.250 MHz(42.913 km... 1
Add spectral window centred on a spectral line
Add spectral window manually
Delete
Show image spectral windows
Representative Frequency
The representative frequency is used in conjunction with the sensitivity entered on the 'Control and Performance' page to estimate the required



Visualization of final setup

Calibration setup

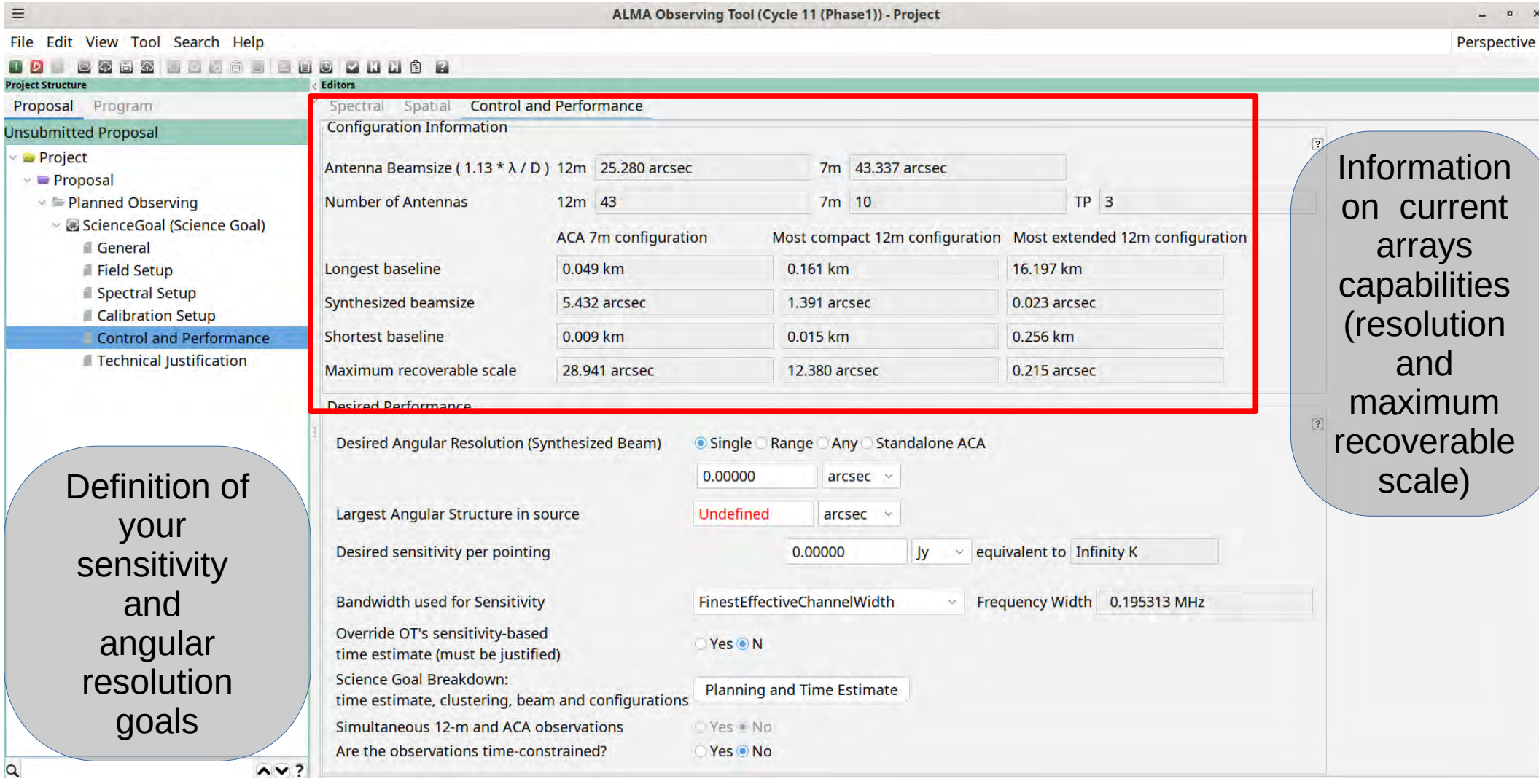


Calibration is setup by the observatory.

In some extremly rare case, you may want to overide the standard calibration procedure, then provide information here

DO THIS ONLY IF YOU ARE AN EXPERT OR ON ADVISE OF AN EXPERT

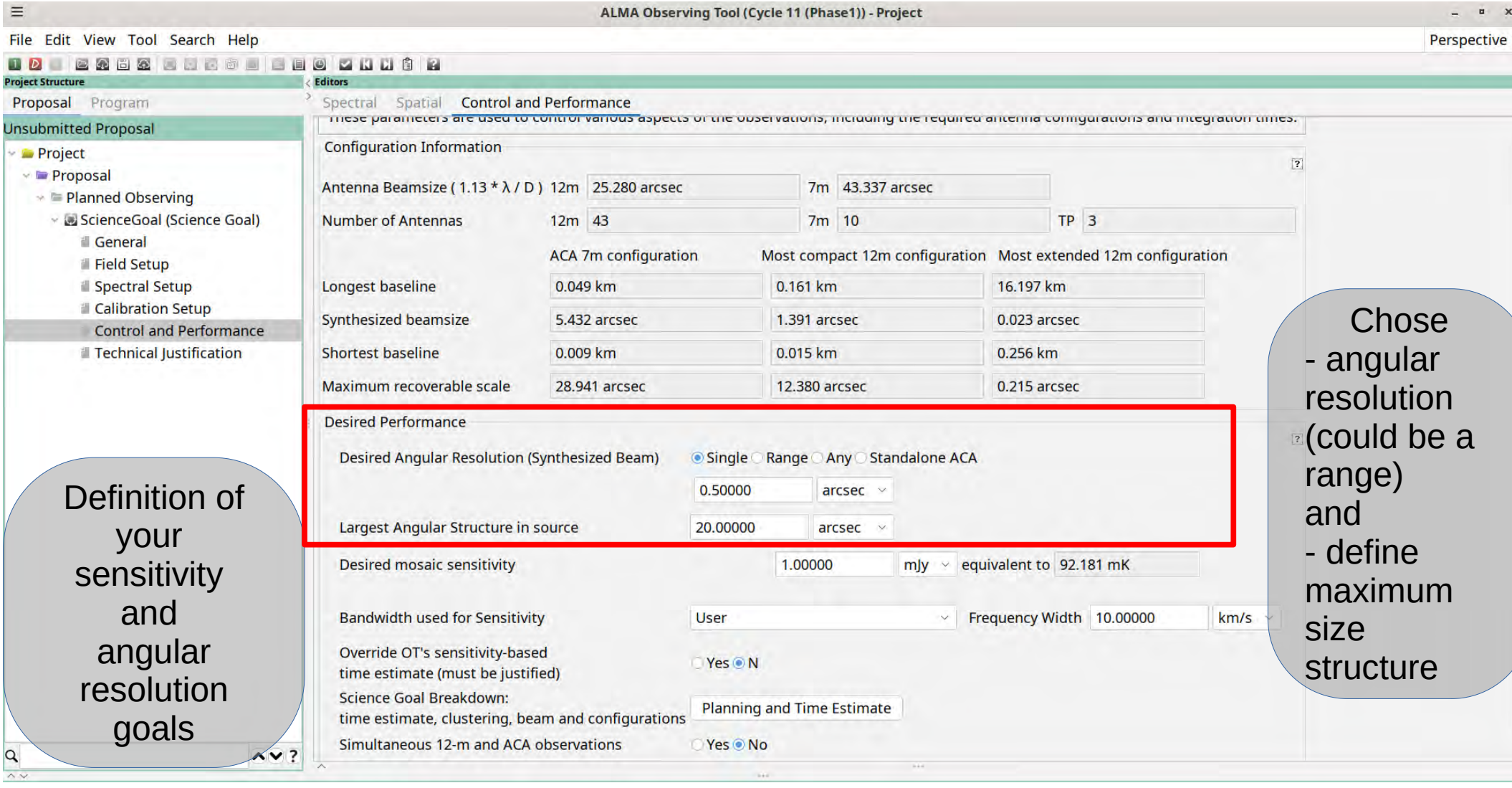
Control and Performance



Definition of your sensitivity and angular resolution goals

Information on current arrays capabilities (resolution and maximum recoverable scale)

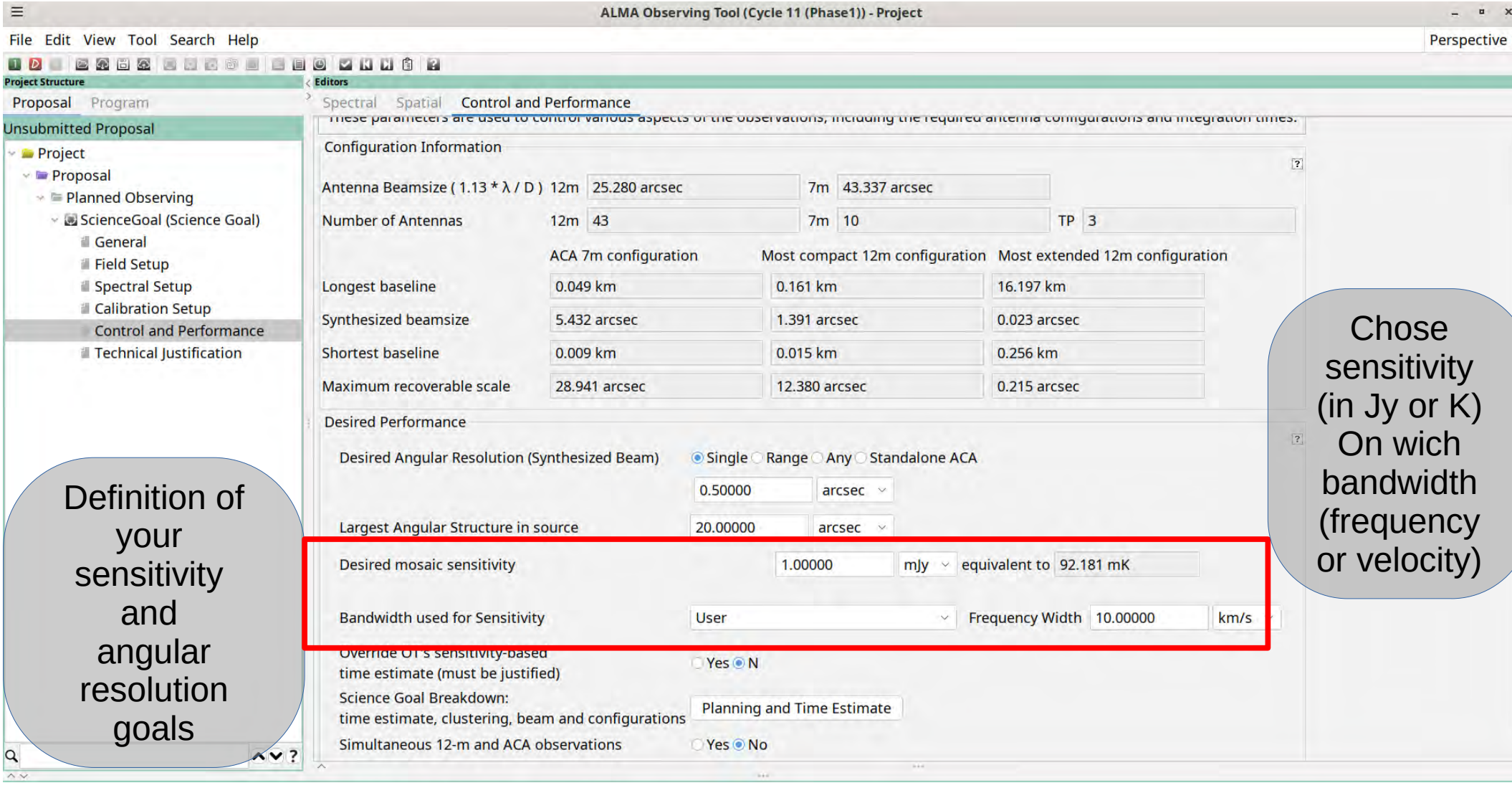
Control and Performance



Definition of your sensitivity and angular resolution goals

Chose
- angular resolution (could be a range)
and
- define maximum size structure

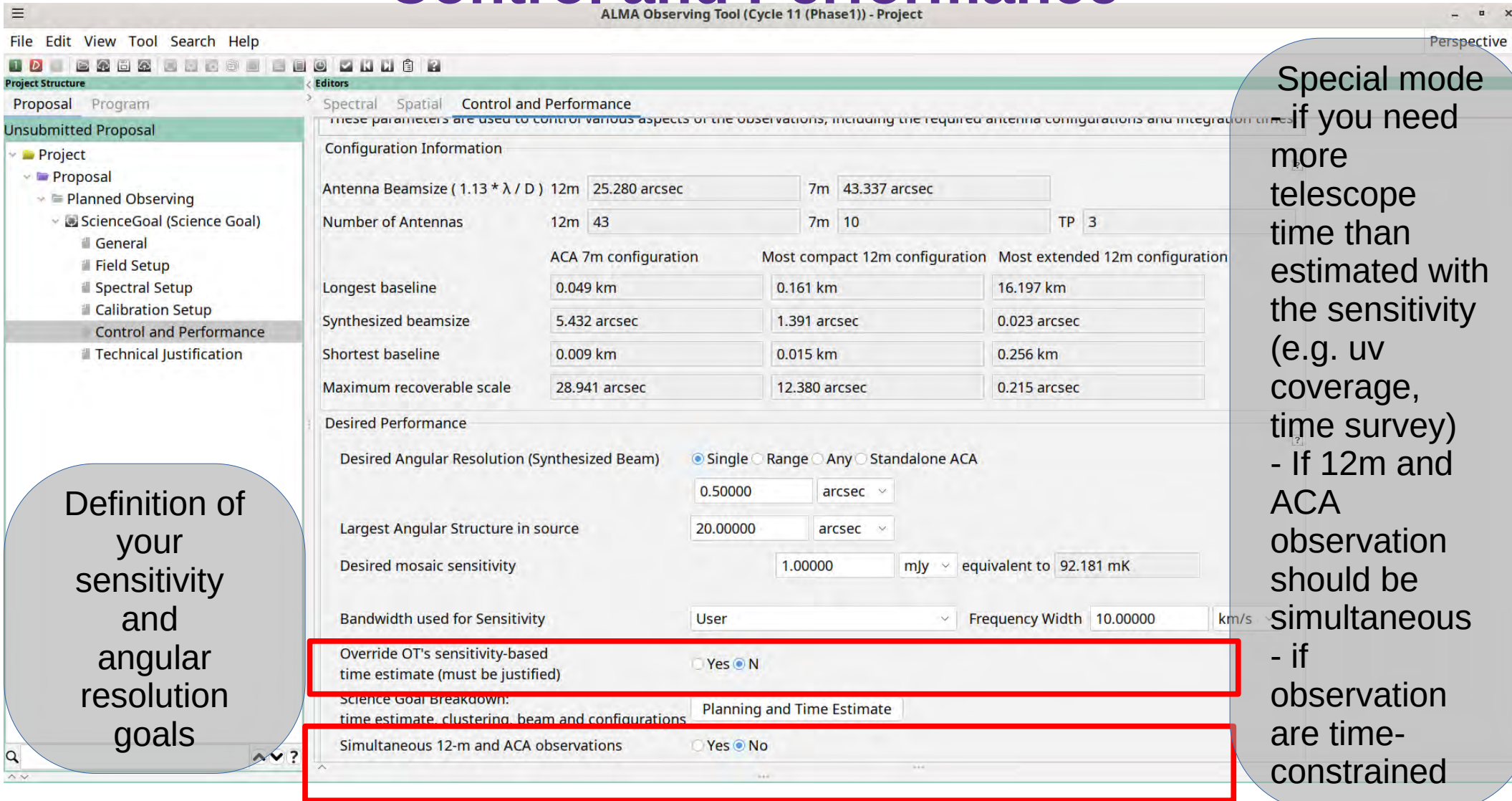
Control and Performance



Definition of your sensitivity and angular resolution goals

Chose sensitivity (in Jy or K) On wich bandwidth (frequency or velocity)

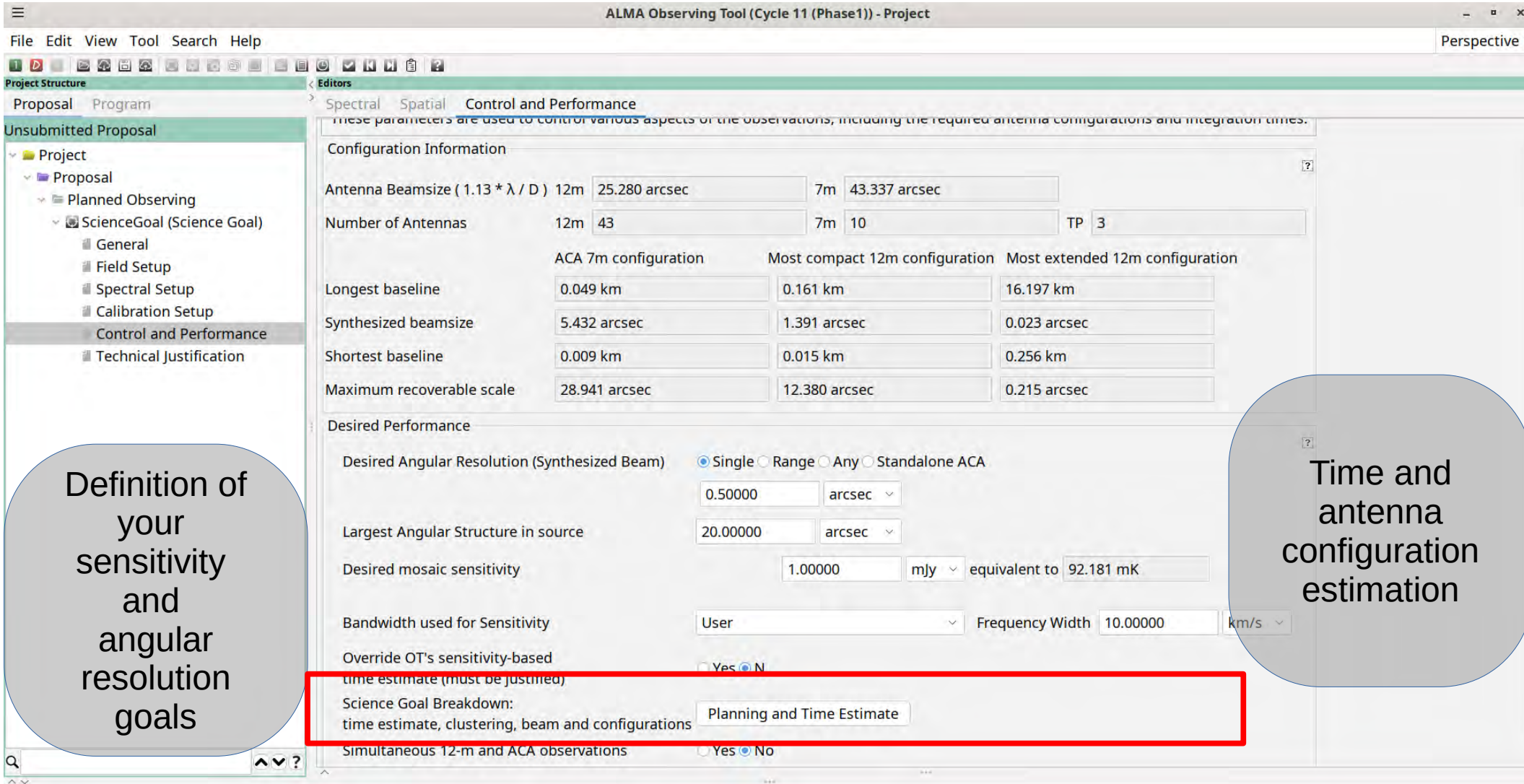
Control and Performance



Definition of your sensitivity and angular resolution goals

Special mode - if you need more telescope time than estimated with the sensitivity (e.g. uv coverage, time survey)
- If 12m and ACA observation should be simultaneous
- if observation are time-constrained

Control and Performance



Definition of your sensitivity and angular resolution goals

Time and antenna configuration estimation

Planning and Time Estimate

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	1.000 mJy
Bandwidth used for sensitivity	10.000 km/s
Representative frequency (sky, first source)	230.340 GHz
Estimated Total time for Science Goal	**8.90 h**

Cluster 1

Source Name	RA	Dec	Velocity
NGC253	08:47:33.1300	-25:17:19.600	258.000 km/s

Possible Configuration Combinations

12-m (1)	12-m (2)	7-m	TP
C-4	C-1	Yes	No

Input Parameters

Precipitable water vapour (all sources)	1.796mm (5th Octile)

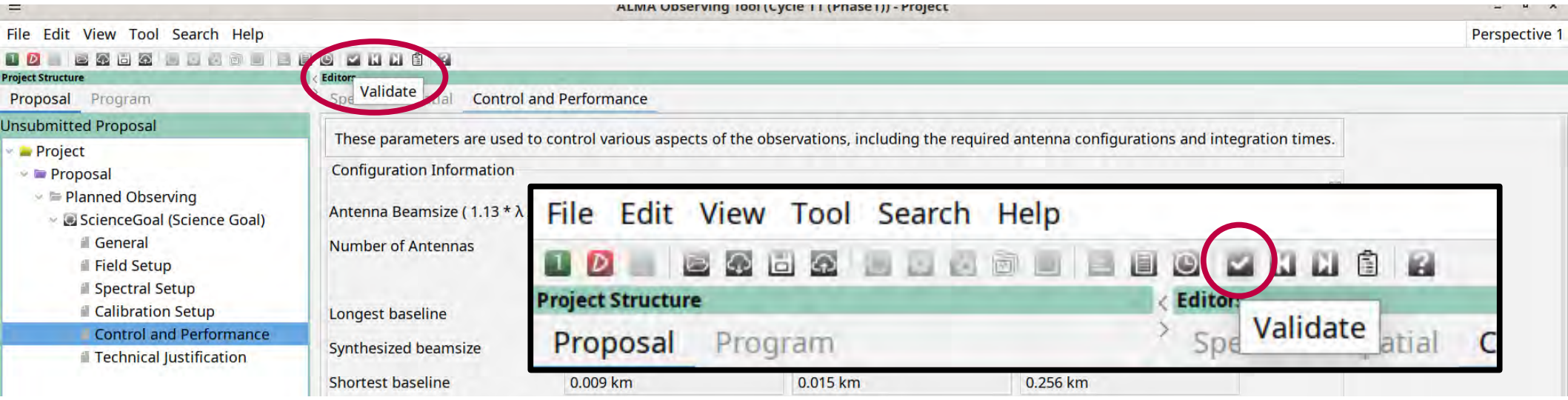
Time required for 12m (1) [C-4]

Time on source per pointing (first source)	6.05 min [5.14 min]
Total number of pointings (all sources)	14
Number of tunings	1
Total time on source	1.41 h [1.20 h]
Total calibration time	39.13 min
Other overheads	7.53 min

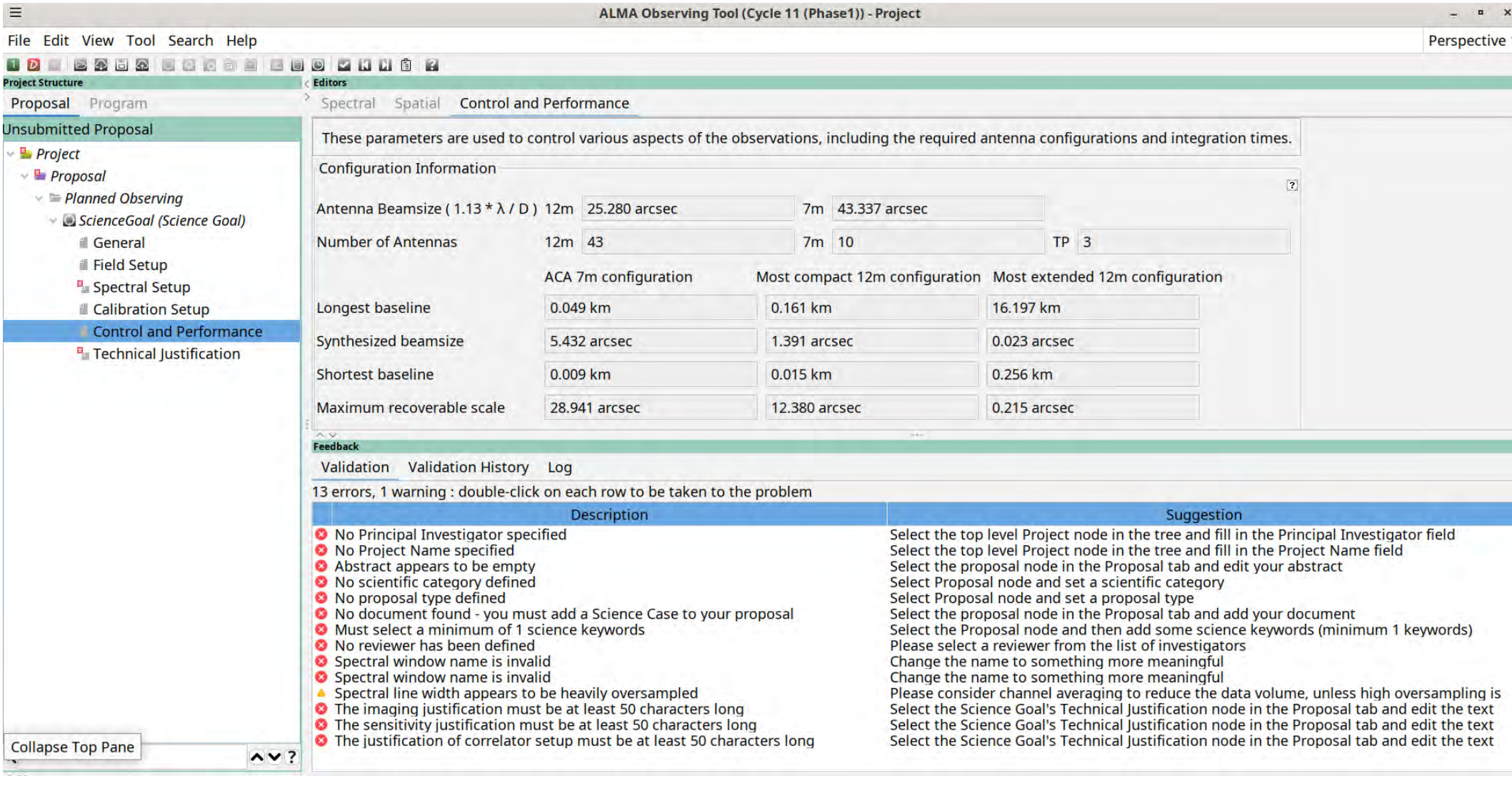
Close

Validation

- You can setup several Science Goal
- After you setup up all the technical points
- VERIFY THAT THE FILE VALIDATES
- You can submit only a valid proposal



Validation


ALMA Observing Tool (Cycle 11 (Phase1)) - Project
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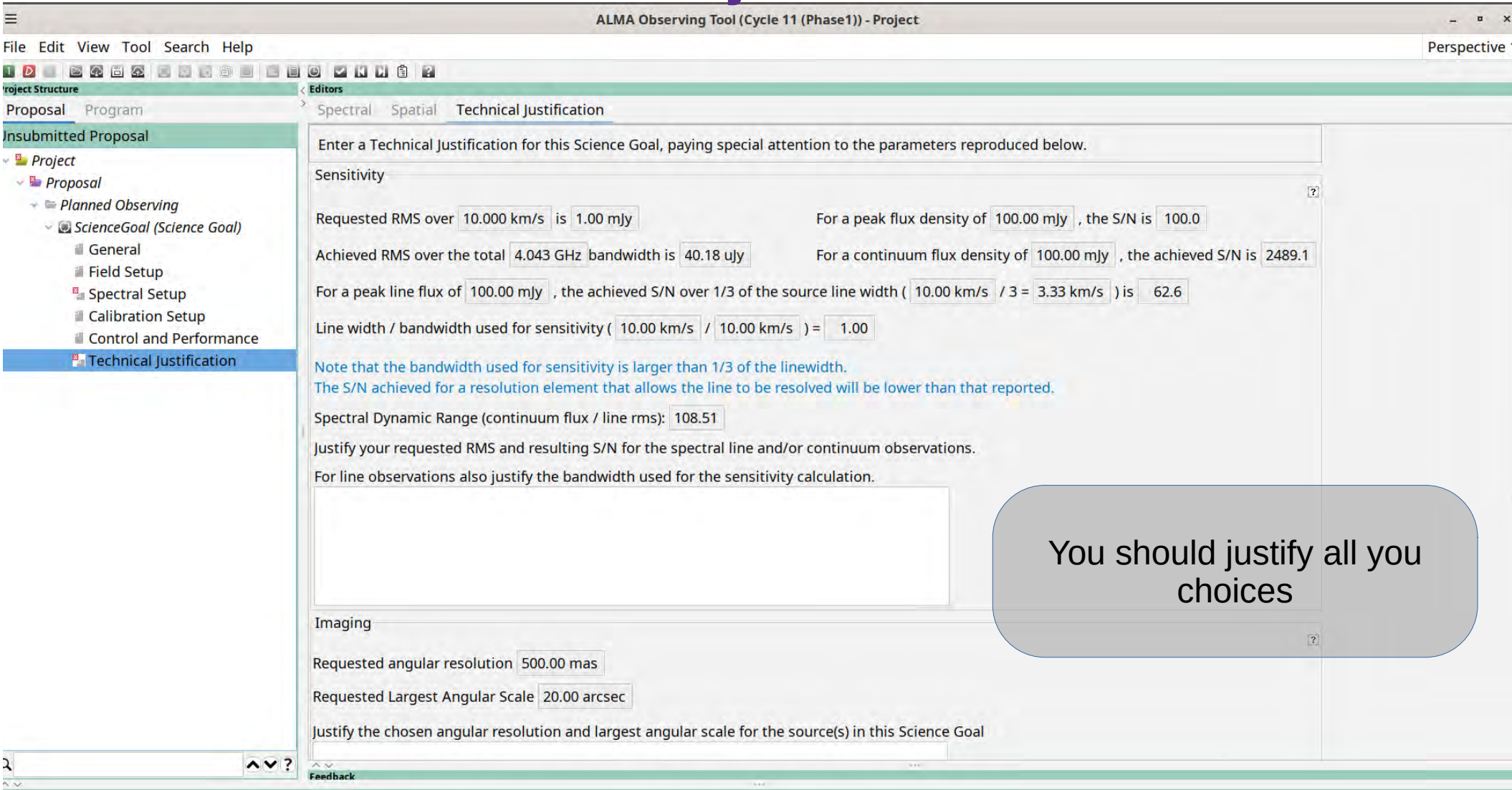
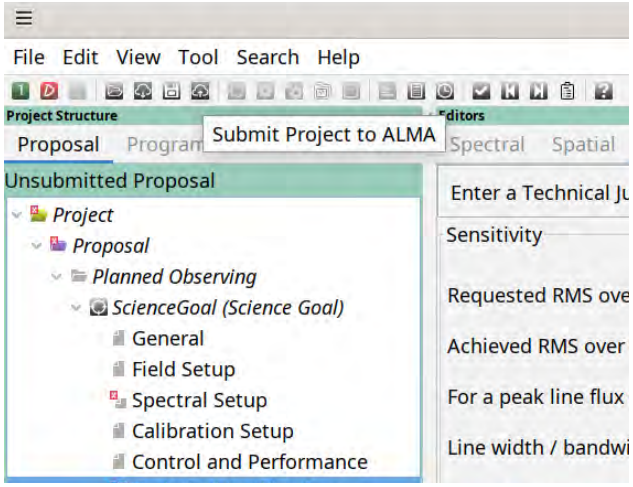
Control and Performance
Technical Justification
Collapse Top Pane
Editors
Spectral Spatial Control and Performance
These parameters are used to control various aspects of the observations, including the required antenna configurations and integration times.
Configuration Information
Antenna Beamsize (1.13 * λ / D) 12m 25.280 arcsec 7m 43.337 arcsec
Number of Antennas 12m 43 7m 10 TP 3
ACA 7m configuration
Most compact 12m configuration
Most extended 12m configuration
Longest baseline 0.049 km 0.161 km 16.197 km
Synthesized beamsize 5.432 arcsec 1.391 arcsec 0.023 arcsec
Shortest baseline 0.009 km 0.015 km 0.256 km
Maximum recoverable scale 28.941 arcsec 12.380 arcsec 0.215 arcsec
Feedback
Validation Validation History Log
13 errors, 1 warning : double-click on each row to be taken to the problem
Description
Suggestion
No Principal Investigator specified
Select the top level Project node in the tree and fill in the Principal Investigator field
No Project Name specified
Select the top level Project node in the tree and fill in the Project Name field
Abstract appears to be empty
Select the proposal node in the Proposal tab and edit your abstract
No scientific category defined
Select Proposal node and set a scientific category
No proposal type defined
Select Proposal node and set a proposal type
No document found - you must add a Science Case to your proposal
Select the proposal node in the Proposal tab and add your document
Must select a minimum of 1 science keywords
Select the Proposal node and then add some science keywords (minimum 1 keywords)
No reviewer has been defined
Please select a reviewer from the list of investigators
Spectral window name is invalid
Change the name to something more meaningful
Spectral window name is invalid
Change the name to something more meaningful
Spectral line width appears to be heavily oversampled
Please consider channel averaging to reduce the data volume, unless high oversampling is
The imaging justification must be at least 50 characters long
Select the Science Goal's Technical Justification node in the Proposal tab and edit the text
The sensitivity justification must be at least 50 characters long
Select the Science Goal's Technical Justification node in the Proposal tab and edit the text
The justification of correlator setup must be at least 50 characters long
Select the Science Goal's Technical Justification node in the Proposal tab and edit the text

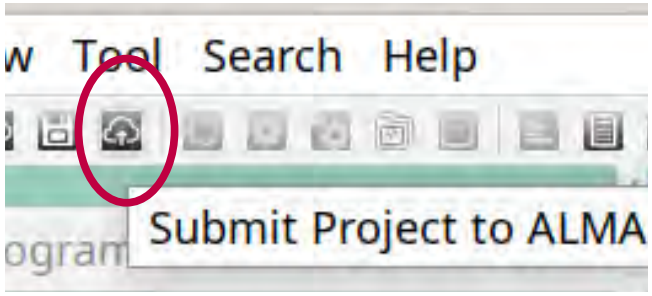
Technical justification

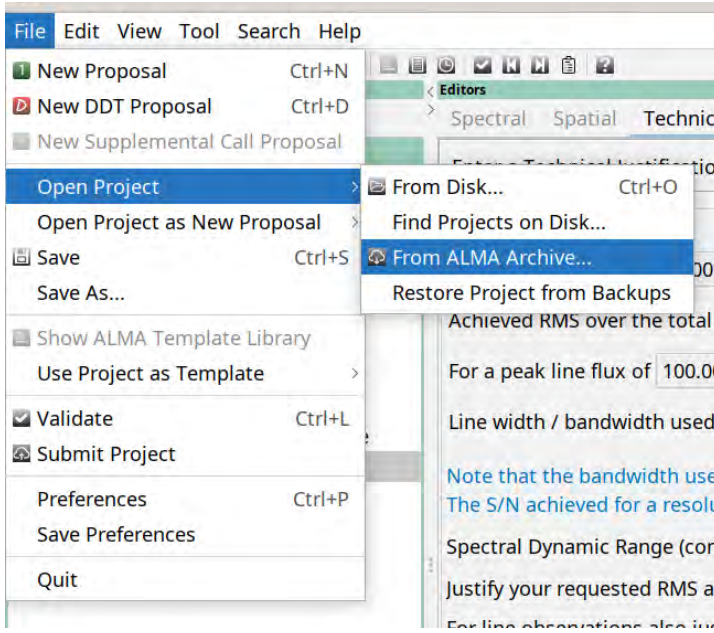


You should justify all you choices

Submission



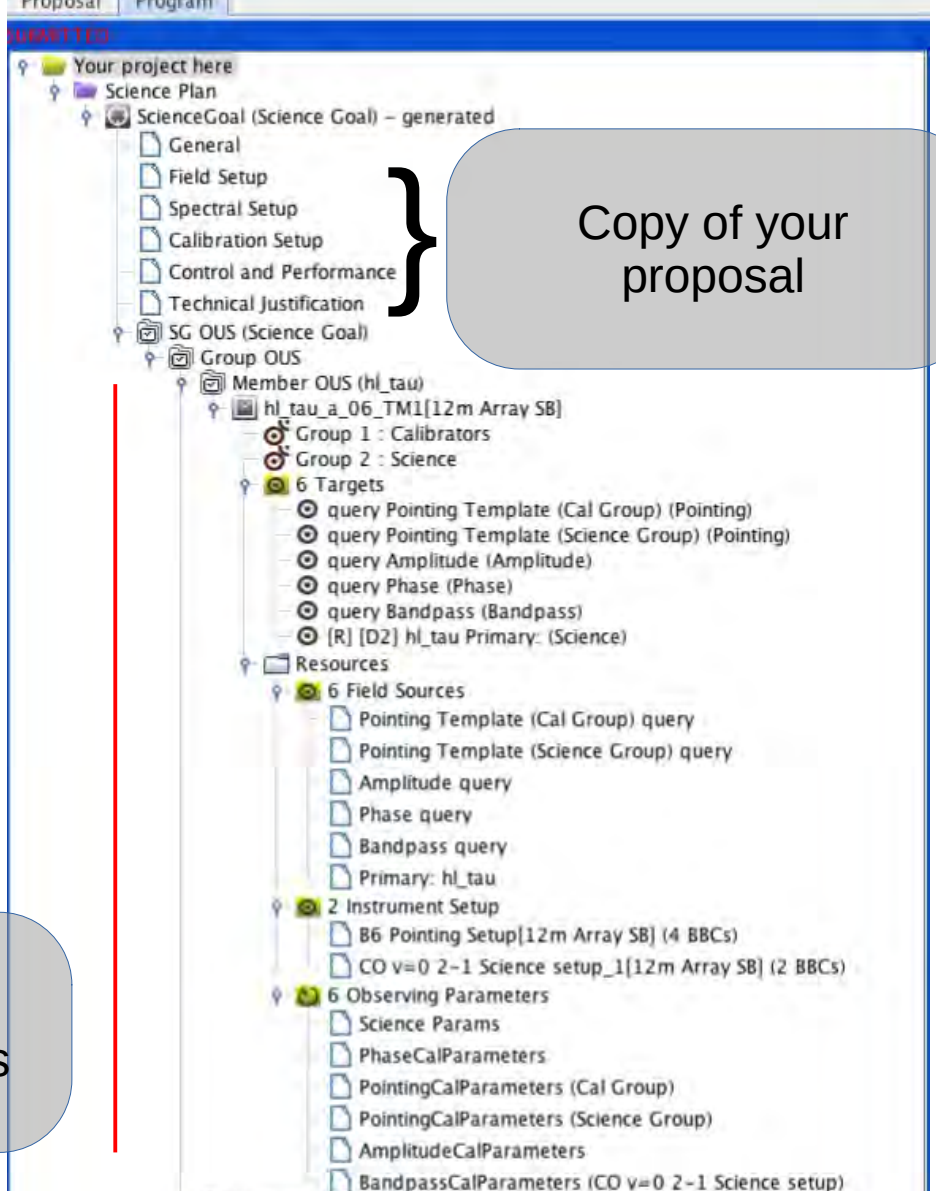




- After successful validation SUBMIT your proposal
- You will get a proposal number
- Save the submitted version on your disk
- You can still edit this version and resubmit up to the deadline
- Or you can retrieved the submitted version from the ALMA archive (tab “file”)

If you get time

- Congratulation !
- The “science blocks” and the “observing unit set” (~observing scripts) will be generated automatically
- If needed, you can double check under the “Program” tab



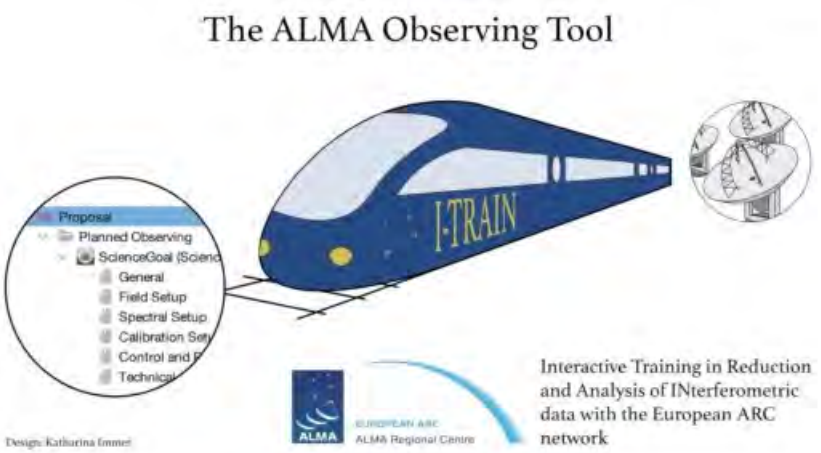
Some thoughts

- Do not start to fill the OT at the last minute
- Be careful to use the correct version
- Check the validation often (in peculiar if you have a complex frequency setup
- Use all spectral windows and add continuum when possible (it ease calibration)
- Be careful an interferometer is a filter → think about short spacing
- Check documentation and ask for help if you are not sure

Documentation and help

- **Documentation on the science portal**
  https://almascience.eso.org/proposing/observing-tool
  - alma-ot-quickstart.pdf
  - alma-ot-refmanual.pdf
  - alma-ot-usermanual.pdf

- **Eu ARC**
  - I-train video #23 (YouTube)
  - https://www.youtube.com/watch?v=D0Fv8DkGV-s



- **“human” interaction**
  - ALMA helpdesk https://help.almascience.org/
  - Consult / visit EU ARC nodes

Future and WSU

- New generation OT **ngOT**
  - Same functionality
  - **WEB-BASED**, no need to download anymore
  - Currently in testing
  - Planned to be offered for cycle 13