

An Introduction to the ALMA Observing Tool

How to turn that great idea into ALMA data..



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Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array
Robert C. Byrd Green Bank Telescope
Very Long Baseline Array



Cycle 3 Capabilities

- At least **36 x 12-m** antennas, plus **10 x 7-m** antennas (for short baselines) and **2 x 12-m** antennas (for zero-spacing)
- Receiver bands 3, 4, 6, 7, 8, 9, & 10 (wavelengths of about 3.1 to 0.35 mm)
- Baselines up to **2 km** for **Bands 8, 9 and 10**
 - up to **5 km** for **Band 7**, and
 - up to **10 km** for **Bands 3, 4, & 6**
- Both single field interferometry and **mosaics** of up to **150 pointings**
- Spectral-line observations with all arrays and continuum observations with the 12-m Array and the 7-m Array. Single dish use will be limited to spectral line observations in Bands 3 to 8.
- Polarization (on-axis, continuum in Band 3, 6 and 7, no ACA, no mosaics, no spectral line, no circular polarization)
- Mixed correlator modes and multiple spectral windows (both high and low frequency resolution in the same observation)
- The **maximum** observing **time** per proposal, as estimated by the OT, is **100 hrs.**

Be mindful of configuration schedule

Start Dates	Configuration	Night LST	Not recommended
2015 October 1	C36-8	~17h - 9h	High frequency projects especially during day time (LST ~10h-16h)
2015 November 10	C36-7	~19h - 11h	High frequency projects especially during day time (LST ~12h-18h)
2015 December 29 (Maintenance in February)	C36-1	~00h - 16h	High frequency projects any time , specially during day time (LST ~17h-23h)
2016 March 22	C36-2	~04h - 20h	High frequency projects day time (LST ~21h-03h)
2016 April 19	C36-3	~07h - 23h	High frequency projects day time (LST ~00h-06h)
2016 May 10	C36-4	~08h - 00h	High frequency projects day time (LST ~01h-07h)
2016 May 31	C36-5	~10h - 02h	High frequency projects day time (LST ~03h-09h)
2016 July 5	C36-6	~13h - 05h	High frequency projects especially during day time (LST ~06h-12h)
2016 August 30	C36-7	~16h - 08h	High frequency projects especially during day time (LST ~09h-15h)

Notes for Table 3: Dates include relocation time at the end of every configuration

Once you have done this...

The screenshot shows the ALMA Observing Tool website. The left sidebar contains a navigation menu with the following items: About, Proposing, Call for Proposals, Road Map, Sensitivity Calculator, DDT proposals, Observing Tool (highlighted), Web Start Download Page, Tarball Download Page, OT Video Tutorials, Troubleshooting, Observing, Data, Documents & Tools, and Knowledgebase/FAQ. Below the menu is a section for 'User Services at ARCs' with links to Helpdesk and EU ARC. The main content area has a breadcrumb trail 'You are here: Home > Proposing > Observing Tool' and a title 'Observing Tool'. The text describes the tool as a Java application for ALMA Phase I and II proposals. It includes a 'Download & Installation' section with two buttons, 'WebStart' and 'Tarball', which are circled in red. Below this is a 'Documentation' section with a list of links to guides and manuals, some of which are also circled in red. The footer contains logos for the National Science Foundation, Associated Universities, Inc., the Expanded Very Large Array, Robert C. Byrd Green Bank Telescope, Very Long Baseline Array, and the NRAO.

About

Proposing

Call for Proposals

Road Map

Sensitivity Calculator

DDT proposals

Observing Tool

Web Start Download Page

Tarball Download Page

OT Video Tutorials

Troubleshooting

Observing

Data

Documents & Tools

Knowledgebase/FAQ

User Services at ARCs

- Helpdesk
- EU ARC

NATIONAL SCIENCE FOUNDATION

Associated Universities, Inc.

Expanded Very Large Array

Robert C. Byrd Green Bank Telescope

Very Long Baseline Array

NRAO

You are here: Home > Proposing > Observing Tool

Observing Tool

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

Download & Installation

The OT will run on most common operating systems, as long as you have Java 6 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 Sun/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 run time environment. Please use this if you have any problems running the OT tarball install with your default Java.

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.
- More in-depth information on the OT can be found in the [User Manual](#), while concise explanations of all fields and menu items in the OT are given in the [Reference Manual](#). These two documents are also available within the OT under the Help menu.

The upper part of the proposal cover page is where you define the proposal: Title, Abstract, Category, Keywords, note related/previous proposals ...

The screenshot shows a web-based proposal form titled "(Cycle3-RC2) - Really catchy title here". The form is divided into several sections, with blue arrows pointing to specific fields from a text box on the left. The left text box states: "The upper part of the proposal cover page is where you define the proposal: Title, Abstract, Category, Keywords, note related/previous proposals ...".

The form sections and their contents are as follows:

- Proposal Title:** Really catchy title here
- Proposal Cycle:** C3UT.1
- Abstract (max. 1200 characters):** Not too abstract, please
- 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 (max. 2 keywords):**
 - Lyman Alpha Emitters/Blobs (LAE/LAB)
 - Lyman Break Galaxies (LBG)
 - Starburst galaxies
 - Sub-mm Galaxies (SMG)
 - High-z Active Galactic Nuclei (AGN)
- Student project:** ☐ Continuation ☐
- Related Proposals:** (Empty text box)
- Previous Proposals:** (Empty text box)
- Investigators:** (Empty text box)

The form also includes a "Launch Editor" button and a "Planned Observing" link in the left sidebar.

Further down, select PI/Co-I's from a search of registered ALMA users and attach the Science Case from a .pdf on disk

Proposal Tool (Cycle3-RC2) - Really catchy title here

Perspective 1



Really catchy title here
Proposal
Planned Observing

☒ 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
(max. 2 keywords)

Lyman Alpha Emitters/Blobs (LAE/LAB)
Lyman Break Galaxies (LBG)
Starburst galaxies
Sub-mm Galaxies (SMG)
High-z Active Galactic Nuclei (AGN)

Student project

Continuation

Related Proposals

Previous Proposals

Investigators

Type	Full name	Email	Affiliation
PI	Not set	Not set	Not set

Science Case will be a PDF with a max of 4 pages, including figures.

Investigator search constraints

ALMA ID

is

hliszt

Find Investigators

Full name	Email	Affiliation	ALMA ID
Harvey Liszt	hliszt@nrao.edu	North American ALMA ...	hliszt

Select PI

Cancel

Select PI...

Add Col...

Remove Col

Add from Proposal...

Science Case (Mandatory, PDF, 4 pages max.)

Attach...

Detach

View...

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

Project Proposal

You can right-click and add blank Science Goals

Editors

Spectral Spatial Project

Principal Investigator

Select PI...

Main Project Information

Project Assigned Priority Project Code None Assigned

Validation History Log

Description Suggestion

Overview

Contextual Help

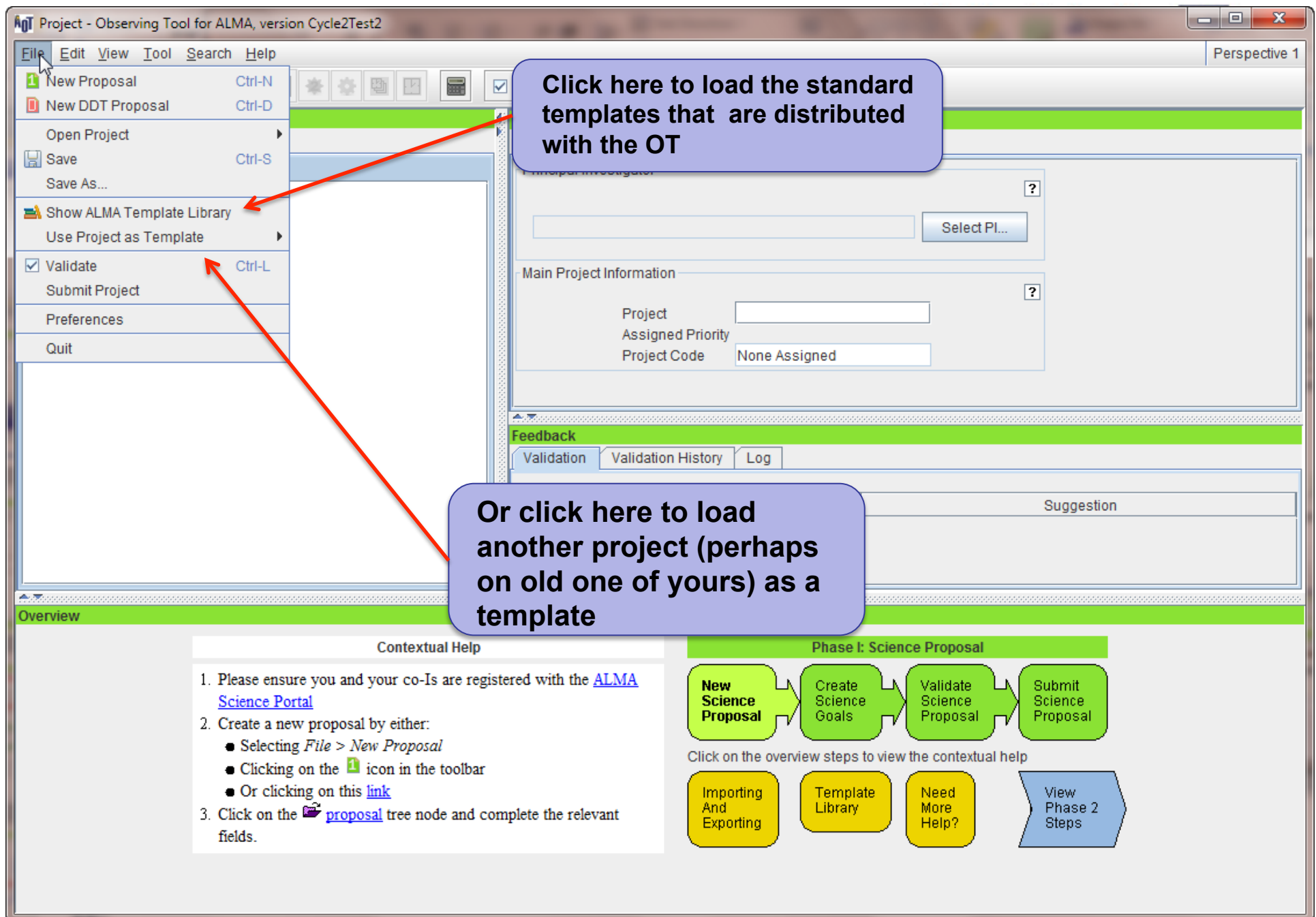
1. Please ensure you and your co-Is are registered with the [ALMA Science Portal](#)
2. Create a new proposal by either:
 - Selecting *File > New Proposal*
 - Clicking on the **1** icon in the toolbar
 - Or clicking on this [link](#)
3. Click on the **proposal** tree node and complete the relevant fields.

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



ALMA Observing Tool (Cycle3) - Project

File Edit View Tool Search Help Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observations

Cycle3 Template Library (read-only)

- Cycle3 Template Library
 - Proposal
 - Planned Observing
 - ScienceGoal (B10 12CO, H₂O)
 - ScienceGoal (B3 CO, C¹⁸O)
 - ScienceGoal (B3 90 GHz gas kinematics ensemble)
 - ScienceGoal (B3 single-point spectral sweep of Sgr)
 - ScienceGoal (B4 TOO_GRB)
 - ScienceGoal (B6 CO, 13CO, C¹⁸O (all J=2-1) cont)
 - ScienceGoal (B6 12CO (2-1): NGC3256 mosaic)
 - ScienceGoal (B7 12CO, HCO+, HCN)
 - ScienceGoal (Comet B7 CO, HCN, CH₃OH, NH₂D, H₂)
 - ScienceGoal (B7 Continuum: Pluto/Charon)
 - ScienceGoal (B7 Polarisation observations of Centau
 - ScienceGoal (B8 Double mosaic)
 - ScienceGoal (B8continuum: Cosmic Eyelash (z=2.32

Editors

Spectral Spatial Proposal

Proposal Information

Proposal Title

Proposal Cycle 2015.1

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

Related Proposals

Drag one SG you'd like to modify, from here up to your Proposal folder. Remember saving to disk!

Template library. Turn the keys on the JTree below & read the descriptions - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

You're now ready to modify the Science Goal (SG)

Give the SG a brief, descriptive name.

A description is useful for you, for the technical assessors, and for your Contact Scientist after your project is approved.

Project Structure

Proposal Program

Unsubmitted Proposal

Project

Proposal

Editors

Spectral Spatial ScienceGoal (B6 12CO (2-1): NGC3256 mosaic)

General (Optional)

Science Goal Name B6 12CO (2-1): NGC3256 mosaic

Description

This is a project to observe the nearby starburst galaxy NGC3256 in the emission line of 12CO (2-1). As the source is extended, a mosaic will be used to cover the 30x30 arcsec area of interest.

Launch Editor

NGC3256

Source

NGC3256

System Object? ☐ Name of object Unspecified

Sexagesimal

Declination 0.00000

Log

Description Suggestion

Overview

Contextual Help

Phase I: Science Proposal

When you resolve a source, check all the returned info

Source name, position, proper motion, velocity velocity rest frame

Rectangular mosaic or 1/more pointings?

The expected source properties are used with the spectral setup, desired angular resolution, rms, to set the S/N, dynamic range and overall project viability

New: Cycle 3 OT calls this FK5 J2000 (to distinguish from ICRS)

New: more than one field source can have a mosaic but it's all with mosaics or none

New: Linewidth *only* given in velocity units km/s or m/s

The screenshot shows the AGT Project - Observing tool interface. The 'Editors' tab is active, with the 'Field Setup' sub-tab selected. The 'Source Name' is 'NGC3256'. The 'System' is set to 'J2000'. The 'Source Coordinates' are RA: 10:27:51.6000 and Dec: -43:54:18.000. The 'Source Radial Velocity' is 0.000 km/s. The 'Target Type' is '1 Rectangular Field'. The 'Expected Source Properties' section includes: Peak Continuum Flux Density per Beam: 0.17400 Jy, Continuum Polarization Percentage: 0.0%, Peak Line Flux Density per Beam: 0.00000 Jy, Line Width: 0.00000 km/s, and Line Polarization Percentage: 0.0%. The 'Rectangle' section is empty. The 'Coords Type' is 'RELATIVE'. The 'Field Center Coordinates' are Offset(Longitude): 0.00000 arcsec and Offset(Latitude): 0.00000 arcsec. The 'Feedback' section has tabs for 'Validation', 'Validation History', and 'Log'. The 'Description' and 'Suggestion' fields are at the bottom.

File Edit View

Project - Observing

Perspective 1

Editors

Spectral Spatial Field Setup

Source Name NGC3256 Resolve

Choose a Solar System Object? ☐ Name of object Unspecified

System J2000 Sexagesimal display? ☒ Parallax 0.00000 mas

Source Coordinates RA 10:27:51.6000 PM RA 0.00000

Dec -43:54:18.000 PM DEC 0.00000

Source Radial Velocity 0.000 km/s hel z 0.000000000

Target Type ☐ Individual Pointing(s) ☒ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam 0.17400 Jy

Continuum Polarization Percentage 0.0 %

Peak Line Flux Density per Beam 0.00000 Jy

Line Width 0.00000 km/s

Line Polarization Percentage 0.0 %

Rectangle

Coords Type ☐ ABSOLUTE ☒ RELATIVE

System J2000

Field Center Coordinates Offset(Longitude) 0.00000 arcsec

Offset(Latitude) 0.00000 arcsec

Feedback

Validation Validation History Log

Description Suggestion

ALMA Observing Tool (2014.6) – Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help Perspective 1

Project Structure

- Unsubmitted Proposal
 - Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial **Field Setup**

anti-bllac

Source

Source Name: anti-bllac [Resolve]

Choose a Solar System Object? ☐ Name of object: Unspecified

System: J2000 Sexagesimal display? ☒ Parallax: 0.0 mas

Source Coordinates: RA: 22:02:43.2912 PM RA: 0.00000 mas/yr
Dec: -42:16:39.978 PM DEC: 0.00000 mas/yr

Source Radial Velocity: 0.000 km/s hel z: 0.000000000 Doppler Type: RELATIVISTIC

Target Type: ☒ Individual Pointing(s) ☐ 1 Rectangular Field

Expected Source Properties

Peak C
Contin
Peak L
Line W
Line Polarization Percentage: 0.0 %

Field Center Coordinates

Custom Mosaic: ☐ (circled with a red circle and an arrow pointing to it)

Pointing Pattern: Offset ☐ Offset Unit: arcsec #Pointings: 2

RA	Dec
22:02:44.2910	-42:16:39.978
22:02:43.2910	-42:16:39.978

Add Delete Import Export

Add Source Load from File... Export to File... Delete Source Delete All Sources

Custom Mosaics using Individual Pointings: Offsets or absolute positions. The OT will convert if you check/uncheck "Offset"

New: You can use the ACA and Total Power with individual pointings

New: you can read/write the pointings from/to a text file

New: Put a mosaic around more than one field source

The Spatial tab gives a graphical visualization of the Field Setup.

Select a background image from an online image server

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Cop)

General

Field Setup

Spectral Setup

Calibration Set

Control and Pe

Technical Just

Editors

Spectral Spatial Field Setup

Source Radial Velocity 2794.200 km/s hel z 0.009364291

Target Type ☐ Individual Pointing(s) ☒ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam 0.17400 Jy

Continuum Polarization Percentage 0.0

Peak Line Flux Density per Beam 0.00000 Jy

Line Width 0.00000 km/s

Line Polarization Percentage 0.0

Rectangle

FOV Parameters

Representative Frequency (Sky) 231.546 GHz

Antenna Diameter ☒ 12m ☐ 7m

Antenna Beamsize (HPBW) 26.706 arcsec

Show Antenna Beamsize ☒

Image Query

Image Server Digitized Sky (Version II) at ESO

Image Size(arcmin) 10.0 Query

p length 2.00000 arcmin

q length 2.00000 arcmin

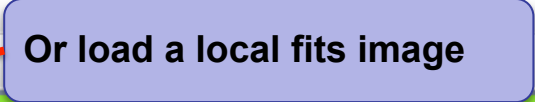
Position Angle 0.00000 deg

Spacing 0.48113

Overview

Contextual Help

Phase I: Science Proposal



New: Put a mosaic around more than one field source

The screenshot displays the 'Project - Observing Tool for ALMA, version Cycle2Test2' interface. The 'Spatial Image' tab is active, showing a field of stars with a red mosaic beam pattern overlaid. A red circle highlights a button in the toolbar that toggles the mosaic beam pattern. A red arrow points from this button to a text box. Another red arrow points from the text box to the 'Rectangle' section of the 'Expected Source Properties' panel. A third red arrow points from the text box to the 'FOV Parameters' section.

Or load a local fits image

You can turn "on/off" the mosaic beam pattern using this button. Each circle is the size of the primary beam, centered on the field center

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Project Structure

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Cop

General

Field Setup

Spectral Setup

Calibration Set

Control and Pe

Technical Just

Editors

Spectral Spatial Field Setup

Spatial Image

NGC3256

Source

Source Name NGC3256

Choose a Solar System Object? ☐ Name of object Unspecified

System J2000 Sexagesimal display? ☒ Parallax 0.000

Source Coordinates RA 10:27:51.6000 PM RA 0.000

Dec -43:54:18.000 PM DEC 0.000

Source Radial Velocity 2794.200 km/s hel z 0.009364291

Target Type ☐ Individual Pointing(s) ☒ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam 0.17400 Jy

Continuum Polarization Percentage 0.0

Peak Line Flux Density per Beam 0.00000 Jy

Line Width 0.00000 km/s

Line Polarization Percentage 0.0

Rectangle

Coords Type ☐ ABSOLUTE ☒ RELATIVE

System J2000

Offset(Longitude) 0.00000 arcsec

FOV Parameters

Image Filename remijan\jsky3\cache\jsky9043341093951517820.fits

1x 388,468 13678.0

10:27:42.245, -43:51:24.64 (J2000)

Overview

New: Put a mosaic around more than one field source

Editors

Spectral Spatial **Field Setup**

System J2000 Sexagesimal display? ☒ Parallax 0.00000

Source S T E

Setting up the mosaic in the Field Setup

Define the length, width and position angle of the region to mosaic. Default is to separate the field centers by about 48% of the primary beam (the Nyquist rate).

Line Width 0.00000 km/s

Line Polarization Percentage 0.0 %

Rectangle

Coords Type ☐ ABSOLUTE ☒ RELATIVE

System J2000

Field Center Coordinates

Offset(Longitude) 0.00000

Offset(Latitude) 0.00000

p length 2.0 arcmin

q length 2.0 arcmin

Position Angle 0.00000 deg

Spacing 0.48113 fraction of main beam

Estimated number of 7m Array pointings

No more than 150 12m Array pointings.

#Pointings 12m Array 105 7m Array 39

Reset to Nyquist

Export

Image Filename remijan\jsky3\cache\jsky9043341093951517820.fits

FOV Parameters

Representative Frequency (Sky) 231.546 GHz

Antenna Diameter ☒ 12m ☐ 7m

Antenna Beamsize (HPBW) 26.706 arcsec

Show Antenna Beamsize ☒

Image Query

Image Server Digitized Sky (Version II)

Image Size(arcmin) 10.0

NRAO

File Edit View Tool Search Help Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of B6 12CO (2-1))
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial Spectral Setup

range [-0.03125 GHz, 231.538 GHz]

	(Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	230.53800 GHz	230.53800 GHz	CO v=0 2-1	1875.000 MHz(2438 km/s), 976.563 kHz(1.270 km/s)	1	<input checked="" type="radio"/>

Select Lines to Observe in Baseband-1...

Baseband-2

1(Full)	0.00000 GHz	0.00000 GHz	...Enter Name ...	58.594 MHz, 30.518 kHz	1	<input type="radio"/>
---------	-------------	-------------	-------------------	------------------------	---	-----------------------

Select Lines to Observe in Baseband-2... Add Delete

Baseband-3

#1 ADD spectral windows to get started!

#2 Rest frequency can be entered manually, OT will show sky freq

Define the spectral setup

Template library. Turn the keys on the JTree below & r...

Template library. Turn the keys on the JTree below

- Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep CO
 - ScienceGoal (B7 continuum: COSMO
 - ScienceGoal (B7 CO(9-8): Cosmic Ey
 - ScienceGoal (B9 continuum: Cosmic
 - ScienceGoal (B3 spectral sweep: PK
 - ScienceGoal (B3 continuum: GRB To

Feedback

Validation Validation History Log

Description Sugg

Overview

Contextual Help Phase I: Science Proposal

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of B6 12CO (2-1): NGC32) (selected)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Template library. Turn the keys on the JTree below & r...

- Template library. Turn the keys on the JTree below
 - Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep CO)
 - ScienceGoal (B7 continuum: COSMO)
 - ScienceGoal (B7 CO(9-8): Cosmic Ey)
 - ScienceGoal (B9 continuum: Cosmic
 - ScienceGoal (B3 spectral sweep: PK)
 - ScienceGoal (B3 continuum: GRB To
 - ScienceGoal (B6 continuum: GRB To
 - ScienceGoal (B7 continuum: GRB To
 - ScienceGoal (B6 continuum: GRB To
 - ScienceGoal (B3 continuum: GRB To
 - ScienceGoal (B6 12CO (2-1): NGC32
 - ScienceGoal (B6 13CO (2-1): NGC32
 - ScienceGoal (B6 spectral line: Massi
 - ScienceGoal (B9 spectral line: Massi
 - ScienceGoal (B3 continuum: Protoste
 - ScienceGoal (B6 continuum: Protoste

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, 4, 6, 7 and 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Spectral Type

☒ Spectral Line
☐ Single Continuum
☐ Spectral Scan

Polarization products desired ☐ XX

Spectral Setup Errors

Spectral Line

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth	Rep
1(Full)	230.53800 GHz	230.53800 GHz	CO v=0 2-1	1875.000 MHz(2438 km/s), 976.563 kHz(1.270 km/s)	1

Select Lines to Observe in Baseband-1... Add Delete

Baseband-2

Select Lines to Observe in Baseband-2... Add Delete

Feedback

Validation Validation History Log

Description Suggestion

Define the spectral setup.

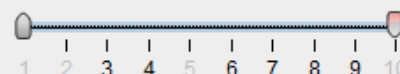
Click here to get a Splatalogue window to select a particular spectral line.

Transition Filter

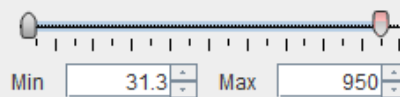
☒ Include description

Frequency Filters

ALMA Band



Sky Frequency (GHz)

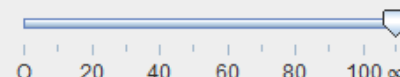


Receiver/Back End Configuration

☐ Hide unobservable lines

☒ Filtering unobservable lines

Maximum Upper-state Energy (K)



Molecule Filter / Environment

Show

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

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 sorted columns.)

Transition	Description	Rest Frequency	Sky Frequency	Upper-state Energy	Line Intensity
CO v=2 1-0	Carbon Monoxide	113.172 GHz	113.172 GHz	6134.675 K	0.01
CO v=1 1-0	Carbon Monoxide	114.222 GHz	114.222 GHz	3089.154 K	0.01
CO v=0 1-0	Carbon Monoxide	115.271 GHz	115.271 GHz	5.532 K	60 0.01
CO v=2 2-1	Carbon Monoxide	226.34 GHz	226.34 GHz	6145.538 K	0.02
CO v=1 2-1	Carbon Monoxide	228.439 GHz	228.439 GHz	3100.118 K	0.62 0.02
CO v=0 2-1	Carbon Monoxide	230.538 GHz	230.538 GHz	16.596 K	70 0.02
CO+ J=2-1, F=3/2-1/2	Carbon Monoxide Ion	235.70 GHz	235.70 GHz		0.1 0.66
CO+ J=2-1, F=5/2-3/2	Carbon Monoxide Ion	236.063 GHz	236.063 GHz		0.1 1.21
CO v=2 3-2	Carbon Monoxide	339.5 GHz	339.5 GHz	6161.831 K	0.03
CO v=1 3-2	Carbon Monoxide	342.648 GHz	342.648 GHz	3116.561 K	0.71 0.03
CO v=0 3-2	Carbon Monoxide	345.796 GHz	345.796 GHz	33.192 K	70 0.03
CO+ J=3-2	Carbon Monoxide Ion	353.741 GHz	353.741 GHz		0.1 1.21
CO+ J=3-2, F=7/2-5/2	Carbon Monoxide Ion	354.014 GHz	354.014 GHz		0.18 1.71
CO v=2 4-3	Carbon Monoxide	452.645 GHz	452.645 GHz	6183.555 K	0.04
CO v=1 4-3	Carbon Monoxide	456.843 GHz	456.843 GHz	3138.486 K	0.04
CO v=0 4-3	Carbon Monoxide	461.041 GHz	461.041 GHz	55.317 K	60 0.04
CO v=2 5-4	Carbon Monoxide	565.774 GHz	565.774 GHz	6210.707 K	0.06
CO v=1 5-4	Carbon Monoxide	571.021 GHz	571.021 GHz	3165.891 K	0.06
CO v=0 5-4	Carbon Monoxide	576.268 GHz	576.268 GHz	82.974 K	0.06
CO v=2 6-5	Carbon Monoxide	678.88 GHz	678.88 GHz	6243.288 K	0.07
CO v=1 6-5	Carbon Monoxide	685.176 GHz	685.176 GHz	3198.774 K	0.07
CO v=0 6-5	Carbon Monoxide	691.473 GHz	691.473 GHz	116.159 K	100 0.07
CO v=2 7-6	Carbon Monoxide	799.306 GHz	799.306 GHz	6281.296 K	0.08
CO v=1 7-6	Carbon Monoxide	799.306 GHz	799.306 GHz	3237.134 K	0.08
CO v=0 7-6	Carbon Monoxide	806.652 GHz	806.652 GHz	154.872 K	110 0.08
CO v=2 8-7	Carbon Monoxide	905.009 GHz	905.009 GHz	6324.729 K	0.09

Select a line from the list

Filters can be used to narrow the search

Selected transitions

Transition	Description	Rest Frequency	Sky Frequency
CO v=0 2-1		230.538 GHz	230.538 GHz

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of B6 12CO (2-1): N
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

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, 4, 6, 7 and 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Spectral Type

☒ Spectral Line
☐ Single Continuum
☐ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Errors

Spectral Line

Baseband-1

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	230.53800 GHz	230.53800 GHz	CO J=1-0	1875.000 MHz (2438 km/s), 976.563 kHz (1.270 km/s)	1	0
	58.594 MHz (76 km/s), 20.518 kHz (0.040 km/s)					
	117.188 MHz (152 km/s), 61.035 kHz (0.079 km/s)					
	234.375 MHz (305 km/s), 122.070 kHz (0.159 km/s)					
	468.750 MHz (610 km/s), 244.141 kHz (0.317 km/s)					
	937.500 MHz (1219 km/s), 488.281 kHz (0.635 km/s)					
	1875.000 MHz (2438 km/s), 976.563 kHz (1.270 km/s)					
	2000.000 MHz (2438 km/s), 31.250 MHz (40.638 km/s)					

Select Lines to Observe in Baseband-1... Add

Baseband-2

Feedback

Validation Validation History Log

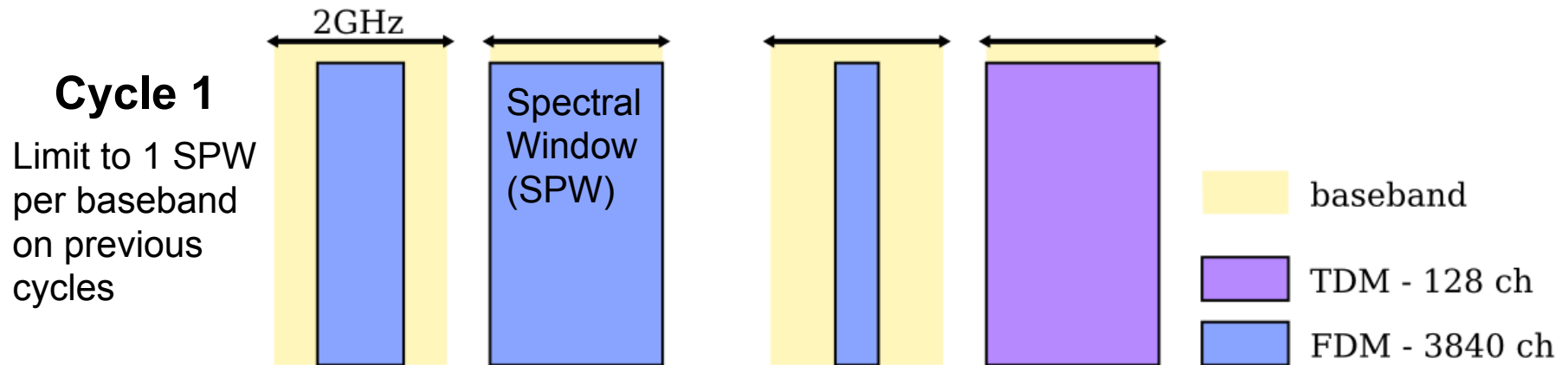
Description Suggestion

Overview

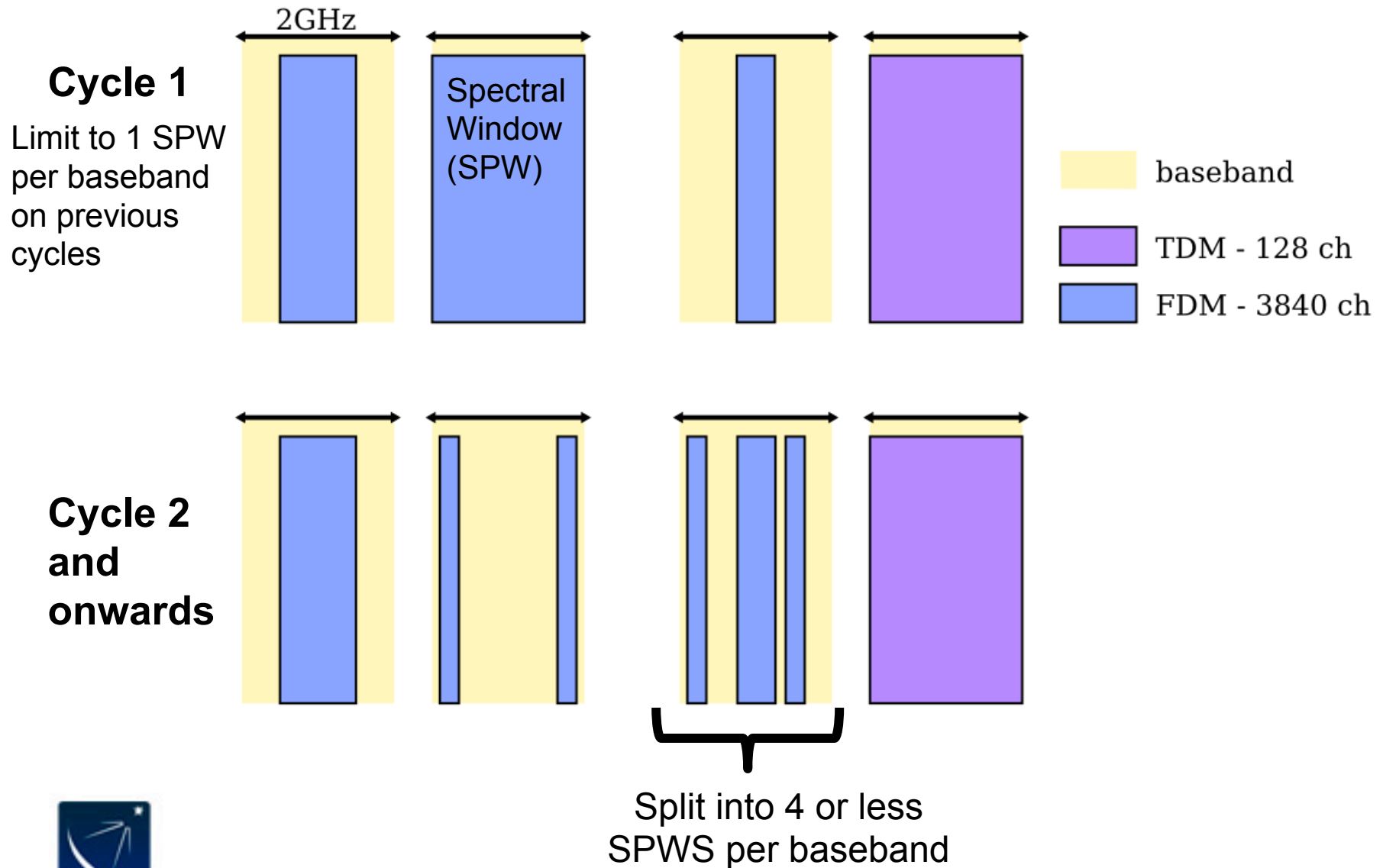
Contextual Help Phase I: Science Proposal

Double click this field to select the desired bandwidth/resolution

Correlator Versatility in Cycle 3



Correlator Versatility in Cycle 3



Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

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

Editors

Spectral Spatial Spectral Setup

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, 4, 6, 7 and 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Spectral Type

☒ Spectral Line
☐ Single
☐ Spectral

Spectral specs share a baseband, sum of shares can't exceed 1

Multiple spectral specs, spectral averaging

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1/4	230.30000 GHz	228.16341 GHz	...Enter Name ...	117.188 MHz(154 km/s), 244.141 kHz(0.321 km/s)	1	<input type="radio"/>
1/4	231.10000 GHz	228.95599 GHz	...Enter Name ...	117.188 MHz(153 km/s), 244.141 kHz(0.320 km/s)	1	<input type="radio"/>
1/2	230.53800 GHz	228.39920 GHz	CO v=0 2-1	234.375 MHz(308 km/s), 484.619 kHz(0.636 km/s)	1	<input checked="" type="radio"/>

Select Lines to Observe in Baseband-1... Add Delete

Feedback

Validation Validation History Log

15 errors, 0 warnings

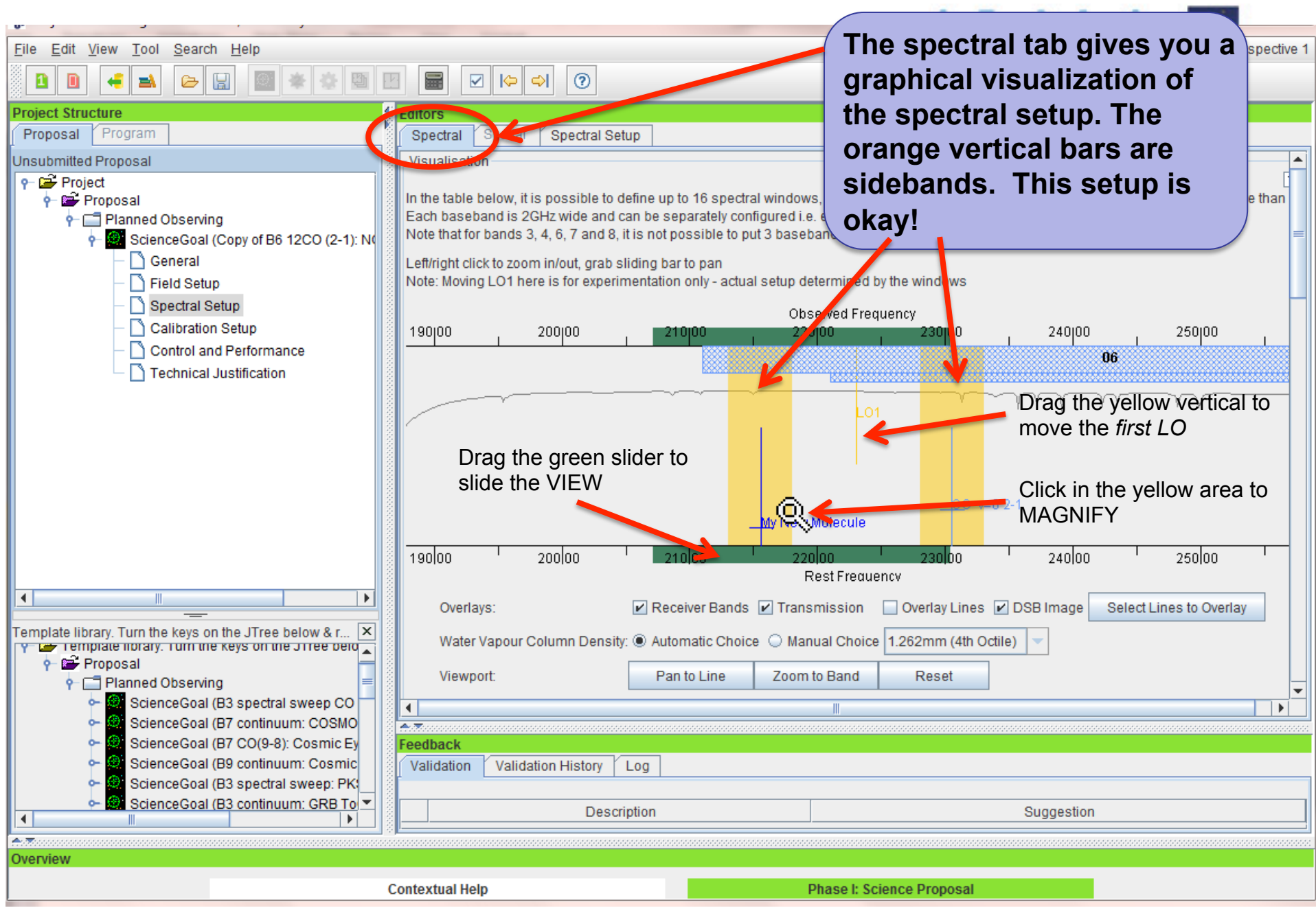
Description
no science case: a science and technical case is a mandatory part of the proposal
Must select a minimum of 1 science keywords
Largest scale is not achievable with the 12m array configuration
Spectral Window name is invalid
Spectral Window name is invalid

Failing to rename a spw brings a validation error

Overview

Contextual Help Phase I: Science Proposal

NRAO



Full Continuum & Polarization

ALMA Observing Tool (2014.6) – Proposal test of OT TJ

File Edit View Tool Search Help

Perspective 1

Project Structure

- Unsubmitted Proposal
 - Proposal test of OT TJ
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration
 - Contrast
 - Technical

Editors

Spectral Spatial Spectral Setup

Spectral Type

Spectral Type

☐ Spectral Line
☒ Single Continuum
☐ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Receiver Band 10 [787.0–950.0 GHz]

Sky Frequency

Rest Frequency

3 [84.0–116.0 GHz]
 4 [125.0–163.0 GHz]
 6 [211.0–275.0 GHz]
 7 [275.0–373.0 GHz]
 8 [385.0–500.0 GHz]
 9 [602.0–720.0 GHz]
 10 [787.0–950.0 GHz]

Standard single continuum setups, can be modified with justification

Full Polarization for Bands 3, 6 and 7
New: User can edit frequencies used for full polarization

New: Band 10!

Template library. Turn the keys on the JTr...

Template library. Turn the keys on the JTr...

Proposal

Planned Observing

- ScienceGoal (B3 spectral sv
- ScienceGoal (B7 continuum
- ScienceGoal (B7 CO(9–8): C
- ScienceGoal (B9 continuum
- ScienceGoal (B3 spectral sv
- ScienceGoal (B3 continuum
- ScienceGoal (B6 continuum
- ScienceGoal (B7 continuum
- ScienceGoal (B6 continuum
- ScienceGoal (B3 continuum
- ScienceGoal (B6 12CO (2–1
- ScienceGoal (B6 13CO (2–1
- ScienceGoal (B6 spectral lin
- ScienceGoal (B9 spectral lin
- ScienceGoal (B3 continuum
- ScienceGoal (B6 continuum

Baseband-1

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	866.25000 G...	866.25000 G...	Single Contin...	1875.000 MHz(649 km/s), 31.250 MHz(10.815 km/s)	1	<input type="radio"/>

Baseband-2

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	868.25000 G...	868.25000 G...	Single Contin...	1875.000 MHz(647 km/s), 31.250 MHz(10.790 km/s)	1	<input type="radio"/>

Baseband-3

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	870.25000 G...	870.25000 G...	Single Contin...	1875.000 MHz(646 km/s), 31.250 MHz(10.765 km/s)	1	<input type="radio"/>

Baseband-4

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1(Full)	872.25000 G...	872.25000 G...	Single Contin...	1875.000 MHz(644 km/s), 31.250 MHz(10.741 km/s)	1	<input checked="" type="radio"/>

NEW: Width of TDM windows shown as 1.875 GHz, results are not changed

Automated spectral scan - I

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setu
 - Control and Perf
 - Technical Justifi

Editors

Spectral Spatial Spectral Setup

Spectral Type

- ☐ Spectral Line
- ☐ Single Continuum
- ☒ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Errors

Spectral Scan

Requested start frequency (sky) 95.0 GHz

Requested end frequency (sky) 107.0 GHz

Requested range (rest) 95.8896 GHz - 108.0020 GHz

Achieved scan range (sky) 95.0 GHz - 110.0 GHz

Bandwidth, Resolution (Hanning smoothed) 1875.000 MHz, 976.563 kHz

Spectral averaging 1

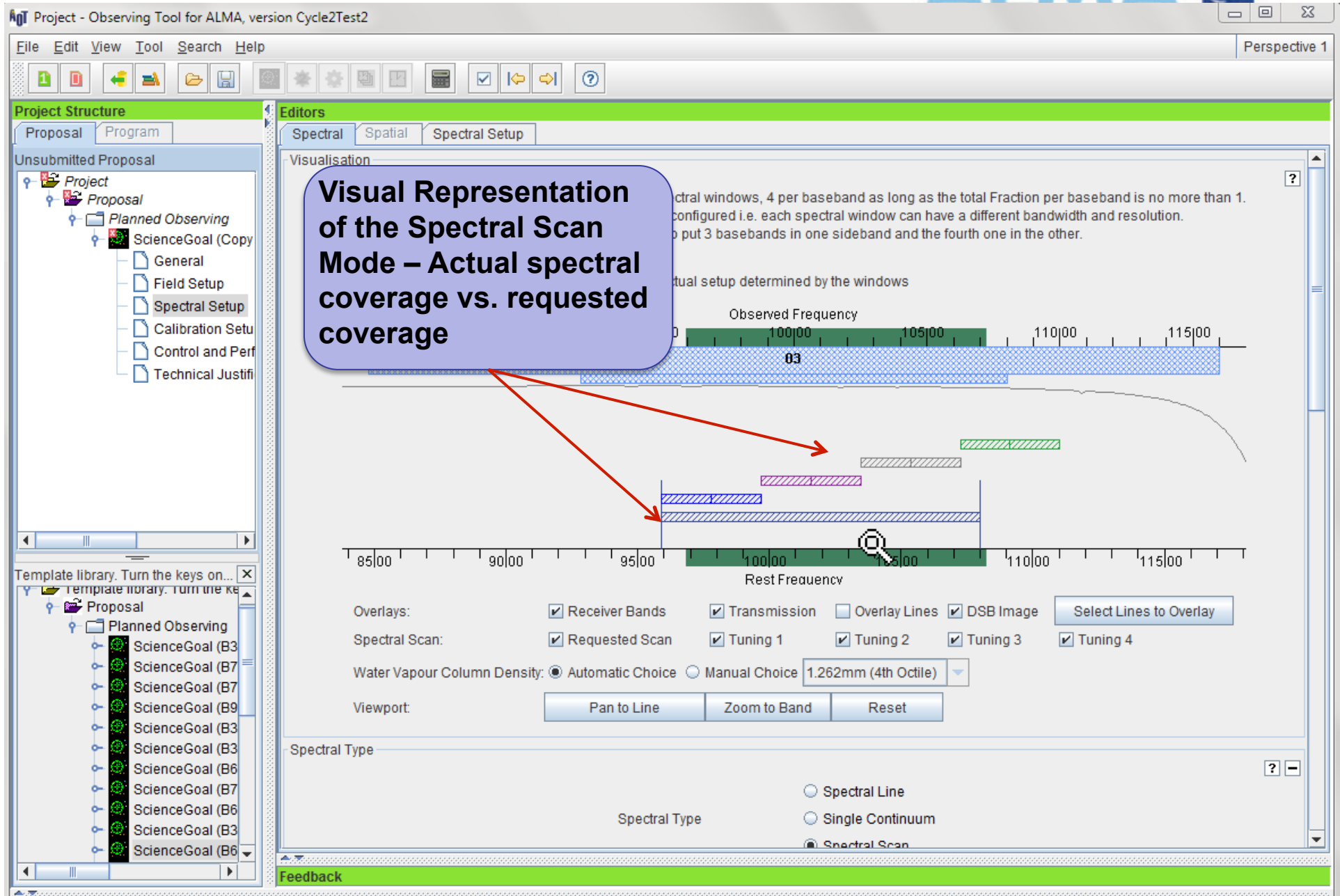
Representative frequency (sky) 102.50000 GHz

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)
1	95.9375 GHz	97.8125 GHz
2	99.6875 GHz	101.5625 GHz
3	103.4375 GHz	105.3125 GHz
4	107.1875 GHz	109.0625 GHz

Feedback

Automated spectral scan - II



ALMA Observing Tool (2014.6) – Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help

Project Structure

Proposal Program

Unsubmitted Proposal

- Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance**
 - Technical justification

Editors

Spectral Spatial **Control and Performance**

These parameters are used to control various aspects of the observation.

Control and Performance

Configuration Information

Antenna Beamsize ($1.13 \cdot \lambda / D$) 12m 17.276 arcsec 7m 29.615 arcsec

Number of Antennas 12m 36 7m 10 TP 2

Most compact 12m configuration Most extended 12m configuration

Longest baseline (L_{\max}) 0.185 km 5.499 km

Synthesized beamsize (λ/L_{\max}) 0.994 arcsec 0.033 arcsec

Shortest baseline (L_{\min}) 0.015 km 0.212 km

Maximum recoverable scale ($0.6\lambda/L_{\min}$) 8.123 arcsec 0.541 arcsec

Desired Performance

Desired Angular Resolution 0.00000

Largest Angular Structure in source Undefined

Desired sensitivity per pointing 0.00000 Jy equivalent to Infinity K

Bandwidth used for Sensitivity RepresentativeWindowResolution Frequency Width 0.122070 MHz

Do you request complementary ACA Observations? ☐ Yes ☒ No

Science goal integration time estimate

Override OT's sensitivity-based time estimate (must be justified) ☐ Yes ☒ No

Are the observations time-constrained? ☐ Yes ☒ No

Feedback

Validation Validation History Log

Description	Suggestion
-------------	------------

Control and Performance defines the required angular resolution, sensitivity, largest angular scale, etc.

Array properties summarized
New: Varies with declination

ALMA Observing Tool (2014.6) - Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help

Project Structure

Proposal Program

Unsubmitted Proposal

- Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance**
 - Technical justification

Editors

Spectral Spatial **Control and Performance**

These parameters are used to control various aspects of the observation.

Control and Performance

Configuration Information

Antenna Beamsize ($1.13 * \lambda / D$) 12m 17.276 arcsec 7m 29.615 arcsec

Number of Antennas 12m 36 7m 10 TP 2

Longest baseline (L_{max})

Synthesized beamsize (λ/L_{max})

Shortest baseline (L_{min})

Maximum recoverable scale ($0.6\lambda/L_{min}$)

Desired Performance

Desired Angular Resolution 0.00000 arcsec

Largest Angular Structure in source Undefined arcsec

Desired sensitivity per pointing 0.00000 Jy equivalent

Bandwidth used for Sensitivity RepresentativeWindowResolution Frequency Width 0.122070 MHz

Do you request complementary ACA Observations? ☐ Yes ☒ No

Science goal integration time estimate

Override OT's sensitivity-based time estimate (must be justified) ☐ Yes ☒ No

Are the observations time-constrained? ☐ Yes ☒ No

Feedback

Validation Validation History Log

Description	Suggestion
-------------	------------

Control and Performance defines the required angular resolution, sensitivity, largest angular scale, etc.

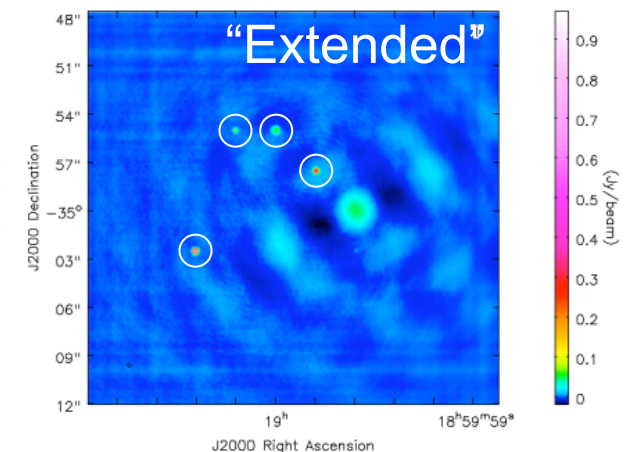
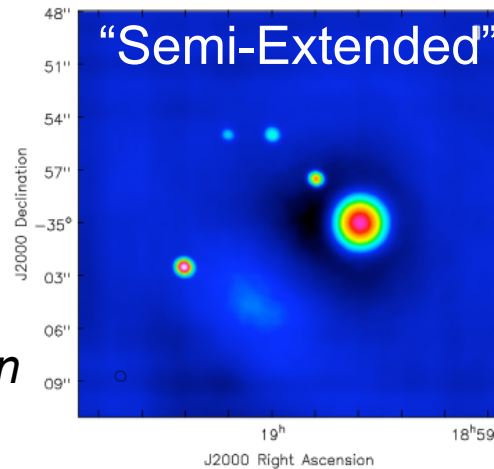
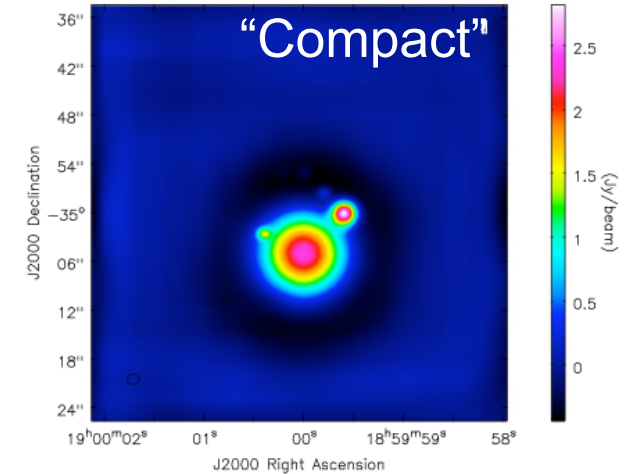
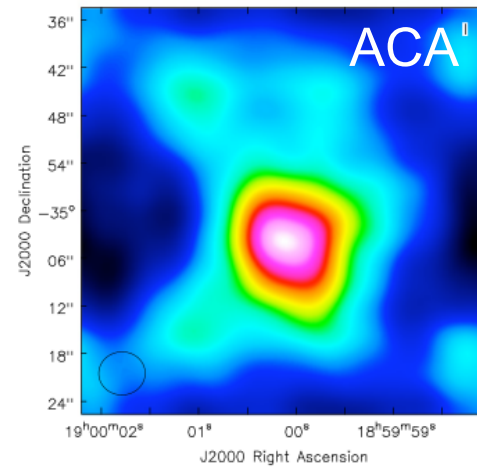
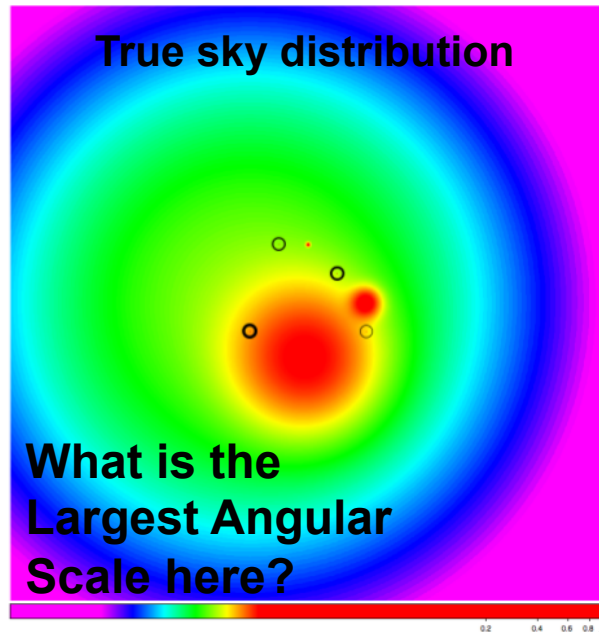
Specify the desired angular resolution and the largest structure in the map area

New: Use 0 for a true point source. There is no default!

Think about your target...



→ Observed with different ALMA configurations



Credit: Allegro group in Leiden



ALMA Observing Tool (2014.6) - Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help

Project Structure

- Unsubmitted Proposal
 - Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance**
 - Technical Justification

Editors

Spectral Spatial **Control and Performance**

These parameters are used to control various aspects of the observation.

Control and Performance

Configuration Information

Antenna Beamsize ($1.13 * \lambda / D$)	12m 17.276 arcsec	7m 29.615 arcsec
Number of Antennas	12m 36	7m 10
Longest baseline (L_{max})	0.185 km	5.499 km
Synthesized beamsize (λ / L_{max})	0.994 arcsec	0.033 arcsec
Shortest baseline (L_{min})	0.015 km	0.212 km
Maximum recoverable scale ($0.6\lambda / L_{min}$)	8.123 arcsec	0.541 arcsec

Most compact 12m configuration Most extended 12m configuration

Desired Performance

Desired Angular Resolution 0.12000 arcsec

Largest Angular Structure in source 12.0 arcsec

Desired sensitivity per pointing 0.00000 Jy equivalent to 0.00000 Jy

Bandwidth used for Sensitivity RepresentativeWindowResolution Frequency

Do you request complementary ACA Observations? ☐ Yes ☒ No **Suggest**

Science goal integration time

Override OT's sensitivity-based recommendations

Are the observations time-critical?

ACA Necessity Estimator

ACA use is recommended

The ALMA Observing Tool suggests this observation *needs* the ACA because the desired largest scale 12.0[arcsec] is large enough relative to the main array recoverable scale.

OK Cancel

Feedback

Validation Validation History Log

Description Suggestion

Control and Performance defines the required angular resolution, sensitivity, largest angular scale, etc.

Some combinations of angular scale and resolution require the compact array.

The "Suggest" button will tell you when

ALMA Observing Tool (2014.6) – Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help

Project Structure

Proposal Program

Unsubmitted Proposal

- Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance**
 - Technical justification

Editors

Spectral Spatial **Control and Performance**

These parameters are used to control various aspects of the observation.

Control and Performance

Configuration Information

Antenna Beamsize ($1.13 * \lambda / D$) 12m 17.276 arcsec 7m 29.615 arcsec

Number of Antennas 12m 36 7m 10 TP 2

Most compact 12m configuration Most extended 12m configuration

Longest baseline (L_{max}) 0.185 km 5.499 km

Synthesized beamsize (λ / L_{max}) 0.994 arcsec 0.033 arcsec

Shortest baseline (L_{min}) 0.015 km 0.212 km

Maximum recoverable scale ($0.6\lambda / L_{min}$) 8.123 arcsec 0.541 arcsec

Desired Performance

Desired Angular Resolution 0.00000 arcsec

Largest Angular Structure in source Undefined arcsec

Desired sensitivity per pointing 0.00000 Jy equivalent to Infinity K

Bandwidth used for Sensitivity RepresentativeWindowResolution Frequency Width 0.122070 MHz

Do you request complex flagging?

Science goal integration

Override OT's sensitivity

Are the observations time-critical?

Feedback

Validation Validation History Log

Description Suggestion

Control and Performance defines the required angular resolution, sensitivity, largest angular scale, etc.

Specify desired noise level (Jy/beam) and the bandwidth over which that should be measured

Driven by your science!

The sensitivity calculator is available separately in the OT (or on the web)

The screenshot shows the 'ALMA LO Configuration Tool' interface. The 'Tool' menu in the top bar is circled in red. A red arrow points from this menu to the 'Sensitivity Calculator' dialog box, which is open in the foreground. The dialog box contains two main sections: 'Common Parameters' and 'Individual Parameters'.

Common Parameters:

- Dec: 00:00:00.000
- Polarization: Dual
- Observing Frequency: 345.00000 GHz
- Bandwidth per Polarization: 0.00000 GHz
- Water Vapour: ☒ Automatic Choice ☐ Manual Choice
- Column Density: 0.913mm (3rd Octile)
- tau/Tsky: tau=0.158, Tsky=44.400 K
- Tsys: 153.577 K

Individual Parameters:

	12m Array	7m Array	Total Power Array
Number of Antennas	34	9	2
Resolution	0.00000 arcsec	5.974554 arcsec	17.923662 arcsec
Sensitivity(rms)	0.00000 Jy	0.00000 Jy	0.00000 Jy
(equivalent to)	Infinity K	0.00000 K	0.00000 K
Integration Time	0.00000 s	0.00000 s	0.00000 s

Integration Time Unit Option: Automatic

Buttons: Calculate Integration Time, Calculate Sensitivity, Close

The background interface shows a 'Project Structure' tree on the left with 'Planned Observing' selected. The main panel displays 'Configuration Information' and 'Desired Performance' tabs.

Estimated Time

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	10.00 mJy
Bandwidth used for sensitivity	0.122 MHz
Representative frequency (sky, first source)	337.06 GHz
Precipitable water vapour (all sources)	0.658mm (2nd Octile)

Time required for largest 12-m array

Time on source per pointing (first source)	22.17 min [22.08 min]
Total number of pointings (all sources)	1
Number of tunings	1
Total time on source	22.17 min [22.08 min]
Calibration time	27.98 min
Other overheads	20.10 min
Total time for 1 SB execution	1.17 h
Number of SB executions	1
Total time to complete SB	1.17 h

Calibration Breakdown per SB execution

3 x Pointing	34.00 s
1 x SidebandRatio	1.68 min
1 x Amplitude	2.60 min
2 x Bandpass	15.20 min
4 x Phase	2.40 min
2 x Phase reference check source	1.20 min
6 x Atmospheric	4.00 min

Additional Arrays

Number of additional 12-m configurations	1
Time required for additional 12-m	35.13 min
ACA 7-m time (t _{12m} x 2)	2.34 h
Total ACA time (max[t _{7-m} , t _{TP}])	2.34 h

Estimated total time for science goal 4.10 h

OK

You can see how much time you need and get a breakdown

New: Total power will not be scheduled when 12m+7m synthesis suffice

You can see how much time you need and get a breakdown

New: Total power will not be scheduled when $12m+7m$ synthesis suffice

Time estimates - II



Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

ALMA OT - Information

Estimated time

Requested sensitivity	2.4640 mJy
Bandwidth used for sensitivity	0.977 MHz
Representative frequency (sky, first source)	102.50 GHz
Precipitable water vapour (all sources)	5.186mm (7th Octile)

ALMA 12m Array - 34 antennas

Time on source per pointing (first source)	4.83 min
Total number of pointings (all sources)	23
Estimated number of tunings required	4
Total time on source	7.41 h
Total time on calibrators	4.46 h
Total overheads	105.60 min
Total 12m array time (inc. calibration & overheads)	13.63 h

Calibration Breakdown

16 x SidebandRatio	26.93 min
12 x Pointing	3.60 min
16 x Amplitude (inc. AtmosphericCal)	52.27 min
16 x Bandpass (inc. AtmosphericCal)	1.54 h
48 x Phase (inc. AtmosphericCal)	1.01 h
48 x Atmospheric	32.00 min
Additional calibration overheads	1.45 h

Additional 12M Array Configurations

No of 12M Array Configurations	2
Additional overhead for extra configurations	6.82 h

Estimated total time for science goal 20.45 h

OK

aspects of the observations, including the required antenna configurations and integration times.

60.328 arcsec	7m	103.420 a
34	7m	9

extended 12m configuration Most compact 12m

508 km	0.166 km
400 arcsec	3.642 arcsec
041 km	0.014 km
913 arcsec	25.511 arcsec

n

0.22674 K equivalent to 0.00246 Jy

FinestResolution Frequency Width 0.976563 MHz

Yes No

Suggest

Time Estimate

ues? (must be justified) Yes No

Multiple array configuration time estimates based on resolution and largest angular scale.

Time constrained observing



Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help Perspective 1

Project Structure

- Proposal
- Program
- Unsubmitted Proposal
 - Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setu
 - Control and Perf
 - Technical Justifi

Editors

Spectral Spatial Control and Performance

Do you request complementary ACA Observations? ☐ Yes ☒ No Suggest

Science goal integration time estimate Time Estimate

Is more time required due to u,v coverage issues? (must be justified) ☐ Yes ☒ No

Are the observations time-constrained? ☒ Yes ☐ No

☒ Specific Dates ☐ Multiple Epochs ☐ Continuous Monitoring

Number of time windows specified : 1

Start Date/Time (UTC)	End Date/Time (UTC)
2013-10-02 13:17	2013-10-02 13:18

Please specify one or more suitable time windows for your observation

Your observation will be scheduled once during on

Template library. Turn the keys on...

- Template library. Turn the ke
- Proposal
- Planned Observing
 - ScienceGoal (B3)
 - ScienceGoal (B7)
 - ScienceGoal (B7)
 - ScienceGoal (B9)
 - ScienceGoal (B3)
 - ScienceGoal (B3)
 - ScienceGoal (B6)
 - ScienceGoal (B7)
 - ScienceGoal (B6)
 - ScienceGoal (B3)
 - ScienceGoal (B6)

Feedback

Overview

Contextual Help Phase I: Science Proposal

Entering Time Constrained observations – Dates, Epochs or Monitoring

appropriate justification or additional information

What else new in Cycle 3 OT?

undhog Day Test Perspective 1

Project Structure

- Proposal
- Program
- Unsubmitted Proposal
 - Observing Tool for ALMA Cycle3 Group
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial ScienceGoal (Science Goal)

System J2000 Sexagesimal display? ☒ Parallax 0.00000 mas

Source Coordinates RA 22:02:43.2912 PM RA 0.00000 mas/yr

Dec -42:16:39.978 PM DEC 0.00000 mas/yr

Source Radial Velocity 0.000 km/s hel z 0.000000000 Doppler Type RELATIVISTIC

Target Type ☒ Individual Pointing(s) ☐ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam 0.00000 Jy

Continuum Polarization Percentage 0.0 %

Peak Line Flux Density per Beam 0.00000 Jy

Line Width 0.00000 km/s

Line Polarization Percentage 0.0 %

Field Center Coordinates

Offset ☒ arcsec

1

RA [arcsec] Dec [arcsec]

0.00000 0.00000

Feedback

Validation Validation History Log

9 errors, 0 warnings

Description	Suggestion
No Principal Investigator specified	Select the top level Project node in the tree and fill in the Principal Investigator field
No scientific category defined	Select Proposal node and set a scientific category
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
Expected peak continuum flux is required for a single continuum	Select the Target Parameters (anti-bllac) in the Science Goal and enter a valid value
Either a continuum or a line polarization percentage is required for	Select the Target Parameters (anti-bllac) in the Science Goal and enter a valid value

Clicking on a validation error usually takes you to the problem directly

Tech Justification New for Cycle 3!!

The screenshot displays the ALMA Observing Tool (2014.6) interface. The 'Project Structure' pane on the left shows a tree view with 'Unsubmitted Proposal' expanded, containing 'Observing Tool for ALMA Cycle3 Groundhog Day Test', 'Proposal', 'Planned Observing', 'ScienceGoal (Science Goal)', 'General', 'Field Setup', 'Spectral Setup', 'Calibration Setup', 'Control and Performance', and 'Technical Justification'. The 'Technical Justification' item is circled in red. The 'Editors' pane on the right shows the 'Technical Justification' tab selected. It contains a text area for entering a technical justification, with a 'Sensitivity' section highlighted by a red circle. The 'Sensitivity' section includes the following text: 'Enter a Technical Justification for this Science Goal, paying special attention to the parameters reproduced below.' followed by a table of parameters: Requested RMS over 2.4414062500000005E-4 GHz is 3.00 mJy, For a peak flux density of 30.00 mJy, the achieved S/N is 10.0, Achieved RMS over the total 351.56 MHz bandwidth is 111.80 uJy, For a continuum flux density of 100.00 mJy, the achieved S/N is 894.4, For a peak line flux of 30.00 mJy, the achieved S/N over 1/3 of the source line width (30.00 km/s / 3 = 10.00 km/s) is 26.1, Line width / bandwidth used for sensitivity 30.00 km/s / 731.92 m/s = 40.99, Dynamic Range: 33.33. Below this is a text area for justifying the 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. The 'Imaging' section below it shows 'Requested angular resolution : 1.10 arcsec' and 'Requested largest angular scale : 1.00 arcsec'. A red text overlay in the center of the 'Imaging' section reads: 'Here would be the standard required justification of the sensitivity parameters'. A blue callout box on the right contains the text: 'There are separate sections for Sensitivity, Imaging and Correlator setup. Each requires its own 50+ word justification'.

ALMA Observing Tool (2014.6) - Observing Tool for ALMA Cycle3 Groundhog Day Test

File Edit View Tool Search Help Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

- Observing Tool for ALMA Cycle3 Groundhog Day Test
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial Technical Justification

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

Sensitivity

Requested RMS over 2.4414062500000005E-4 GHz is 3.00 mJy For a peak flux density of 30.00 mJy, the achieved S/N is 10.0

Achieved RMS over the total 351.56 MHz bandwidth is 111.80 uJy For a continuum flux density of 100.00 mJy, the achieved S/N is 894.4

For a peak line flux of 30.00 mJy, the achieved S/N over 1/3 of the source line width (30.00 km/s / 3 = 10.00 km/s) is 26.1

Line width / bandwidth used for sensitivity 30.00 km/s / 731.92 m/s = 40.99

Dynamic Range: 33.33

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.

Imaging

Requested angular resolution : 1.10 arcsec

Requested largest angular scale : 1.00 arcsec

Justify the chosen angular resolution and largest angular scale for the source.

Here would be the standard required justification of the sensitivity parameters

There are separate sections for Sensitivity, Imaging and Correlator setup

Each requires its own 50+ word justification

Tech Justification New for Cycle 3

The screenshot displays the ALMA Cycle 3 proposal software interface. The top menu bar includes File, Edit, View, Tool, Search, and Help. The Project Structure pane on the left shows a tree view with 'Unsubmitted Proposal' expanded, containing 'Observing Tool for ALMA Cycle3 Ground' and 'Proposal'. Under 'Proposal', 'Planned Observing' is expanded, showing 'ScienceGoal (Science Goal)' with sub-items: General, Field Setup, Spectral Setup, Calibration Setup, Control and Performance, and 'Technical Justification' (highlighted with a red circle). The Editors pane on the right has tabs for Spectral, Spatial, and Technical Justification. The 'Imaging' sub-tab is selected and highlighted with a red circle. It contains fields for 'Requested angular resolution : 1.10 arcsec' and 'Requested largest angular scale : 1.00 arcsec'. Below these is a large text box for justification, with a red arrow pointing to it and the text: 'Here would be the standard required justification of the imaging parameters'. Further down, a note states 'ACA is not recommended but is selected. Justify over-riding of the OT recommendation for the ACA'. A red arrow points to this note, and a blue text box explains: 'Exceptions to standard practice require separate justification. Here, the OT notes that the ACA is selected even though the OT thinks it is unneeded.' Below this is the 'Correlator configuration' section, showing 'line width / representative spectral window resolution: 30.00 km/s / 731.92 m/s = 40.99' and 'Representative spectral window width : 702.64 km/s'. A final text box at the bottom is labeled with a red arrow and the text: 'Here would be the regular required correlator justification'.

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

Observing Tool for ALMA Cycle3 Ground

Proposal

Planned Observing

ScienceGoal (Science Goal)

General

Field Setup

Spectral Setup

Calibration Setup

Control and Performance

Technical Justification

Editors

Spectral Spatial Technical Justification

Imaging

Requested angular resolution : 1.10 arcsec

Requested largest angular scale : 1.00 arcsec

Justify the chosen angular resolution and largest angular scale for the source(s) in this Science Goal

Here would be the standard required justification of the imaging parameters

ACA is not recommended but is selected.
Justify over-riding of the OT recommendation for the ACA

Exceptions to standard practice require separate justification. Here, the OT notes that the ACA is selected even though the OT thinks it is unneeded.

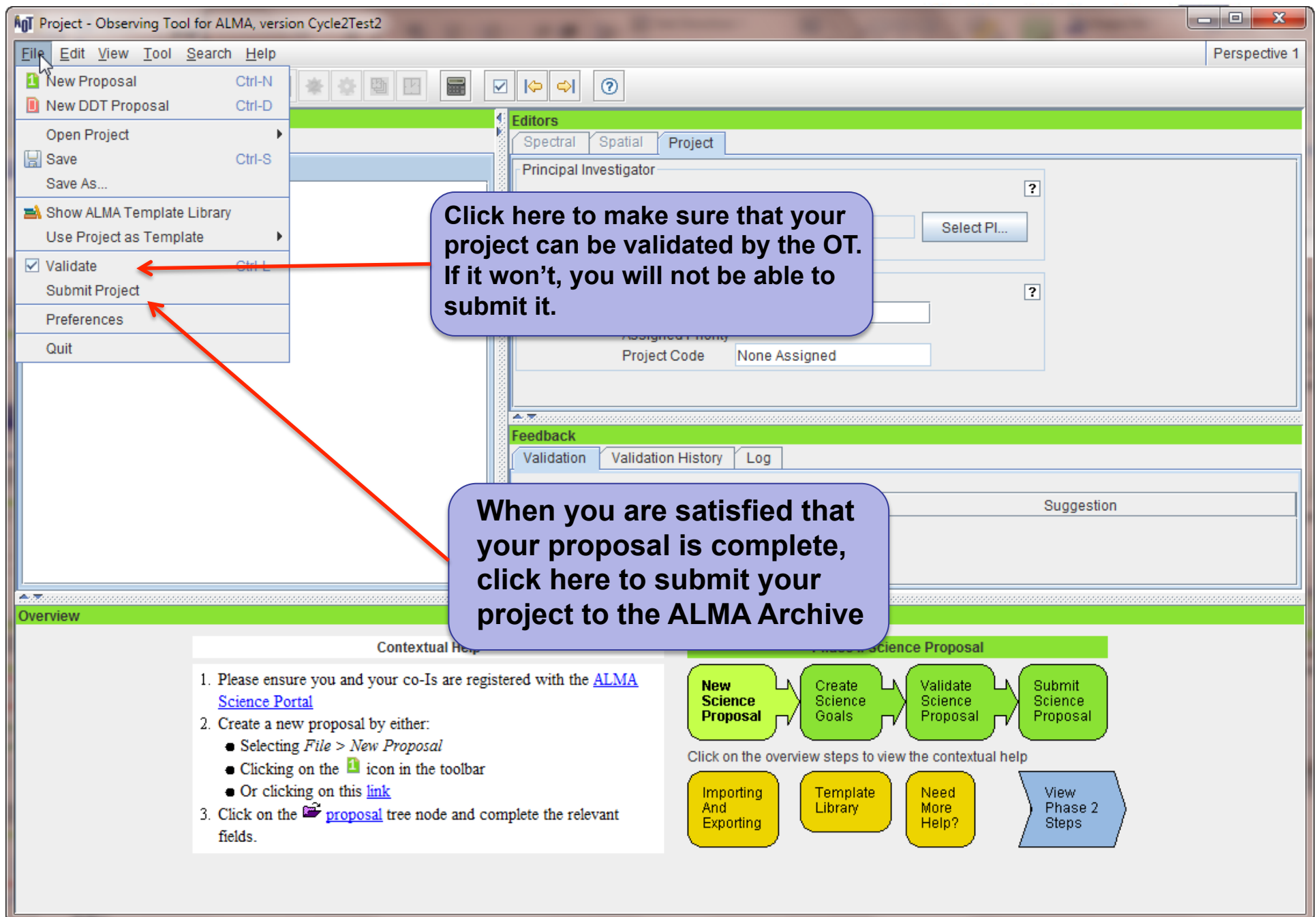
Correlator configuration

line width / representative spectral window resolution: 30.00 km/s / 731.92 m/s = 40.99

Representative spectral window width : 702.64 km/s

Justify your correlator set-up with particular reference to the number of spectral resolution elements per line width.
You may want to consider spectral averaging to lower the data rate

Here would be the regular required correlator justification



Summary: New for Cycle 3 OT



For Cycle 3, there are a relatively small number of new "ALMA" features:

- + Band 10 (780 – 950 GHz)
- + Free choice of TDM frequency for full polarization observations (Bands 3, 6 and 7)
- + 36 12-m array, 10 7-m array, 2 TP

There are more new "OT" features:

- + *Sesame* is now used to query source information
- + A Science Goal can contain multiple sources with rectangular field definitions
- + The TP mapping area is automatically calculated for custom mosaics or single pointings
- + Import/export of pointing positions has been updated slightly
- + Absolute positions can be used for pointing centers
- + "Point source" button has been removed, use 0 for LAS, *there is no default*
- + TP will not be scheduled if 7-m array can achieve the requested LAS
- + Various improvements to time-constrained interface
- + Technical Justification node completely overhauled
- + Total time for a proposal can be displayed in the main OT GUI – Under "Tool" in menu bar





For more info:

<https://almascience.nrao.edu/>

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. ALMA is funded in Europe by the European Organization for Astronomical Research in the Southern Hemisphere (ESO), in North America by the U.S. National Science Foundation (NSF) in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC), and in East Asia by the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Academia Sinica (AS) in Taiwan. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI), and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction and operation of ALMA.



Use preferences to customize

The image shows a collage of screenshots from the ALMA software interface, illustrating how to access and use the 'Preferences' dialog box to customize the application.

Top Left: A screenshot of the 'File' menu with 'Preferences' highlighted. A blue arrow points from the 'File' menu to the 'Preferences' option.

Top Center: A screenshot of the 'Preferences' dialog box with the 'Appearance' tab selected. The 'Tab Placement' section shows 'top' selected. The 'Font Size' is set to 12. The 'Mouse-over Tooltips' section shows 'Show for 4 secs.' The 'Science Goal Summary View' section shows 'all its page editors' selected. The 'Text Forms' section shows 'select it (for easy overwriting)' selected. The 'Perspective' section shows '1' selected. The 'Look and Feel' section shows 'Metal' selected.

Top Right: A screenshot of the 'Preferences' dialog box with the 'Colours' tab selected. The 'General' section shows 'Clipboard' (magenta), 'Error' (red), 'Warning' (yellow), 'Phase 1' (green), 'Phase 2' (blue), 'DDT' (red), 'FOV' (red), and 'FOV 1/3 HPBW' (green). The 'Spectral Display' section shows 'Baseband' (green), 'Spectral Window' (blue), 'Averaging Region' (grey), 'Suppressed Windows' (grey), 'Rest Frequency' (blue), 'Centre Frequency' (red), 'Catalog Lines' (green), 'Sidebands' (yellow), 'Sidebands(Unconfigured)' (grey), and 'Transmission Spectrum' (grey).

Bottom Center: A screenshot of the 'Preferences' dialog box with the 'Connection' tab selected. The 'User Authentication' section shows 'ALMA ID' as 'hliszl', 'Password' as '*****', and 'Server URL' as 'https://ote.alma.cl/cycle-3/'. The 'Connection to Project Repository' section shows 'Location of Service' as 'https://ote.alma.cl/cycle-3/'.

Bottom Right: A screenshot of the 'Preferences' dialog box with the 'Dialogs' tab selected. The 'Wanted Dialogs' section shows a list of dialog boxes with checkboxes indicating whether they are wanted. The list includes: (All Others), Add.Confirm, Close.DiscardChanges, Delete.Confirm, Display field source name resolution information, Display initial start-up options, Display offset coordinates reference system change message, Display sky coordinates reference system change message, Display velocity reference system change message, Editor.UnexpectedError, Export to file. Overwrite existing file?, ExportProject.OverwriteFile, ExportSB.OverwriteFile, Exporting to file. Coordinates out of range, Exporting to file. Ignoring unsupported coordinates, Exporting to file. Invalid coordinates, Exporting to file. Problem while writing file, IAU lookups are not advised, Import.ConfirmConversion, Import.OverwriteInvestigators, Import.SaveCurrentProject, NetworkService.offline, Notify the user that basebands have been re-ordered, OT Version Check, and PointingPatternEditor.OverwriteFile.

Bottom Left: Logos for the 'NATIONAL SCIENCE FOUNDATION' and 'Associated Universities, Inc.'.

Bottom Right: Logos for the 'Green Bank Telescope', 'Very Long Baseline Array', and 'NRAO'.

ALMA Observing Tool (2014.6) - Bulge Asymmetries and Dynamical Evolution (BAaDE) (2013.1.01180.S last submitted 2014-11-14 17:52:31)

File Edit View **Tool** Search Help

ALMA Calibrator Selection Tool...
ALMA LO Configuration Tool...
Sensitivity Calculator...
Generate SBs from the Selected Goal
Display Project Time Summary
Generate Phase I SBs from all the Science Goals
Generate Phase II SBs from all the Science Goals (lsjouwer@nrao.edu)
Export selected Scheduling
Generate a PDF of Whole P
Disable Edit Protect

Project Structure
Proposal
SUBMITTED
Bulge Asymmetries and D
Proposed
Planned Observing

ScienceGoal (MSXiiiRA16b1)
ScienceGoal (MSXiiiRA16b2)

Template library. Turn the keys on the JTr...
Template library. Turn the keys on the JTr...
Proposal
Planned Observing
ScienceGoal (B3 spectral sv
ScienceGoal (B7 continuum
ScienceGoal (B7 CO(9-8): C
ScienceGoal (B9 continuum
ScienceGoal (B3 spectral sv
ScienceGoal (B3 continuum
ScienceGoal (B6 continuum
ScienceGoal (B7 continuum
ScienceGoal (B6 continuum
ScienceGoal (B3 continuum
ScienceGoal (B6 12CO (2-1
ScienceGoal (B6 13CO (2-1
ScienceGoal (B6 spectral lir
ScienceGoal (B9 spectral lir
ScienceGoal (B3 continuum
ScienceGoal (B6 continuum
ScienceGoal (B7 continuum

New: Project-level Total Time and Data Volume Summary can also be seen after right-click on Proposal

Total and Calibration Times

Science Goal	12-m Ext.		12-m Compact		12-m Ext. + Compact		ACA 7-m		ACA TP		Overall		Non-standard Mode
	Tot.	Cal.	Tot.	Cal.	Tot.	Cal.	Tot.	Cal.	Tot.	Cal.	Tot.	Cal.	
MSXiiiRA16a1	51.12 min	24.75 min	-	-	51.12 min	24.75 min	-	-	-	-	51.12 min	24.75 min	No
MSXiiiRA16a2	51.12 min	24.75 min	-	-	51.12 min	24.75 min	-	-	-	-	51.12 min	24.75 min	No
MSXiiiRA16a3	51.97 min	24.75 min	-	-	51.97 min	24.75 min	-	-	-	-	51.97 min	24.75 min	No
MSXiiiRA16a4	51.12 min	24.75 min	-	-	51.12 min	24.75 min	-	-	-	-	51.12 min	24.75 min	No
MSXiiiRA16b1	1.29 h	29.95 min	-	-	1.29 h	29.95 min	-	-	-	-	1.29 h	29.95 min	No
MSXiiiRA16b2	1.29 h	29.95 min	-	-	1.29 h	29.95 min	-	-	-	-	1.29 h	29.95 min	No
Overall	6.01 h	2.65 h	-	-	6.01 h	2.65 h	-	-	-	-	6.01 h	2.65 h	

Data Volumes and Data Rates

Science Goal	Data Volume			Data Rate		
	12-m	ACA 7-m	ACA TP	12-m	ACA 7-m	ACA TP
MSXiiiRA16a1	54.85 GB	-	-	18.31 MB/s	-	-
MSXiiiRA16a2	54.85 GB	-	-	18.31 MB/s	-	-
MSXiiiRA16a3	55.77 GB	-	-	18.31 MB/s	-	-
MSXiiiRA16a4	54.85 GB	-	-	18.31 MB/s	-	-
MSXiiiRA16b1	83.35 GB	-	-	18.31 MB/s	-	-
MSXiiiRA16b2	83.35 GB	-	-	18.31 MB/s	-	-
Overall	387.01 GB	-	-			

OK