

An Introduction to ALMA and the ALMA Proposal Process

Where to get all the relevant information but were afraid to ask...



Anthony Remijan

ALMA Program Scientist – (Extension and Optimization of Capabilities)

Atacama Large Millimeter/submillimeter Array

Expanded Very Large Array

Robert C. Byrd Green Bank Telescope

Very Long Baseline Array



Going to assume the following...

- You are new to ALMA and have not yet had experience with the relevant documentation...
- Have not downloaded the ALMA Observing Tool (OT) or even know where to get it.
- Have an absolute *killer* science case that will be essential to follow-up with ALMA facilities...
- Several examples are available for science cases with ALMA since Cycle 0...
- Many of the capabilities presented here were for Cycle 2. Cycle 3 capabilities are still undergoing commissioning – defined by end of October.

This presentation will (hopefully) just highlight sections of the proposal submission processes for ALMA which you can then practice during the “hands on” section...

ALMA Overview

- ◆ A global partnership to deliver a revolutionary millimeter/submillimeter telescope array
 - ◆ North America (US, Canada, Taiwan)
 - ◆ Europe (ESO)
 - ◆ East Asia (Japan, Taiwan)
 - ◆ In collaboration with Chile
- ◆ 5000 m (16,500 ft) site in Chilean Atacama desert
- ◆ 66 telescopes when complete
 - ◆ Main Array: 50 x 12m antennas
 - ◆ Total Power Array: 4 x 12m antennas
 - ◆ Atacama Compact Array (ACA): 12 x 7m antennas



April 2013

ALMA in a Nutshell...

- ◆ Angular resolution down to $0.015''$ (at 300 GHz)
- ◆ Sensitive, precision imaging 84 to 950 GHz (3 mm to 315 μm)
- ◆ State-of-the-art low-noise, wide-band receivers (8 GHz bandwidth)
- ◆ Flexible correlator with high spectral resolution at wide bandwidth
- ◆ Full polarization capabilities
- ◆ Estimated 1 TB/day data rate



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ALMA will be 10-100 times more sensitive and have 10-100 times better angular resolution compared to current millimeter interferometers

- All science data archived
- Pipeline processing

ALMA is a telescope for *all* astronomers



Collecting Area ~ sensitivity

SMA



8

CARMA



23

IRAM PdBI

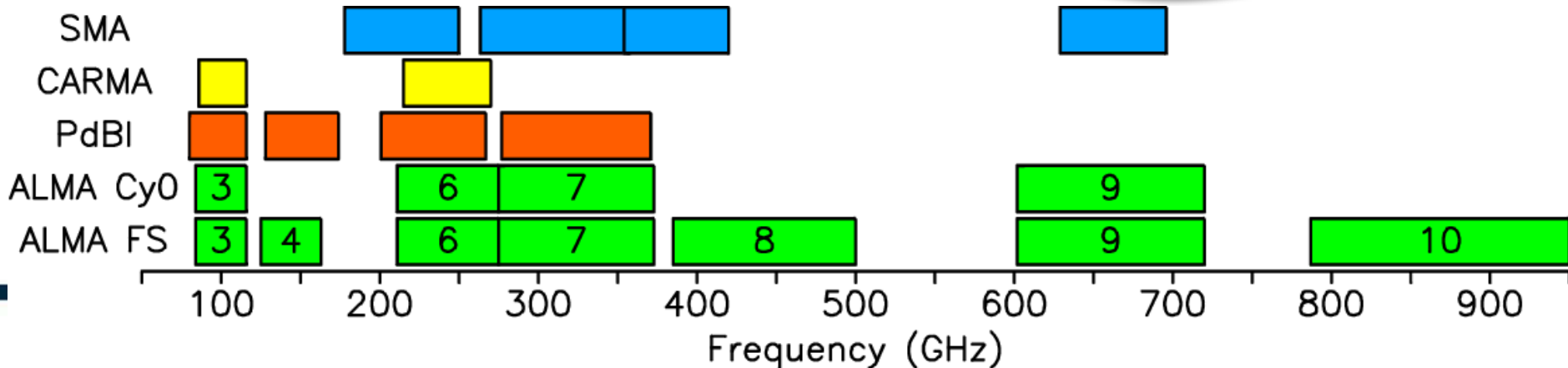


6

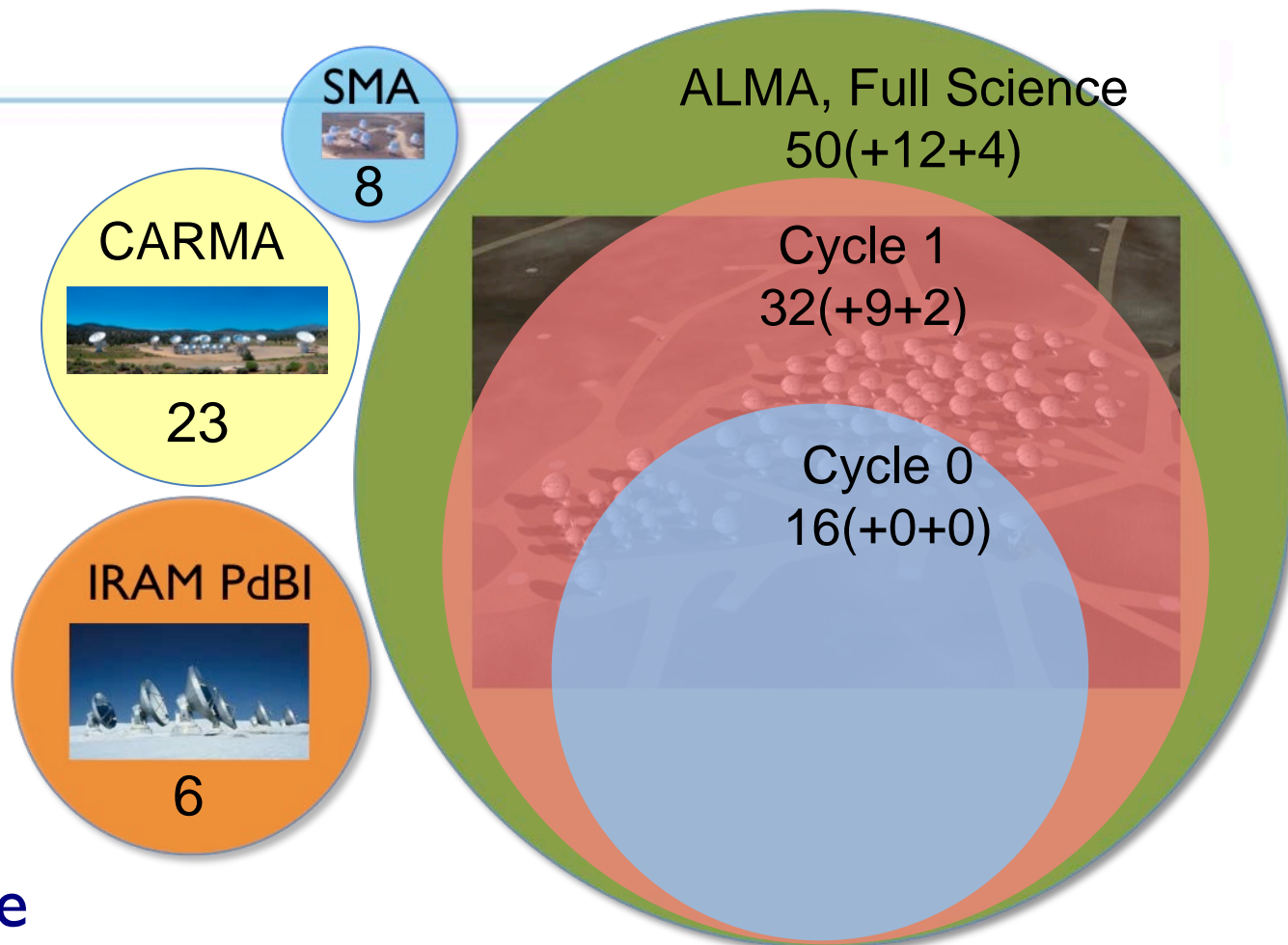
ALMA, Full Science
50(+12+4)



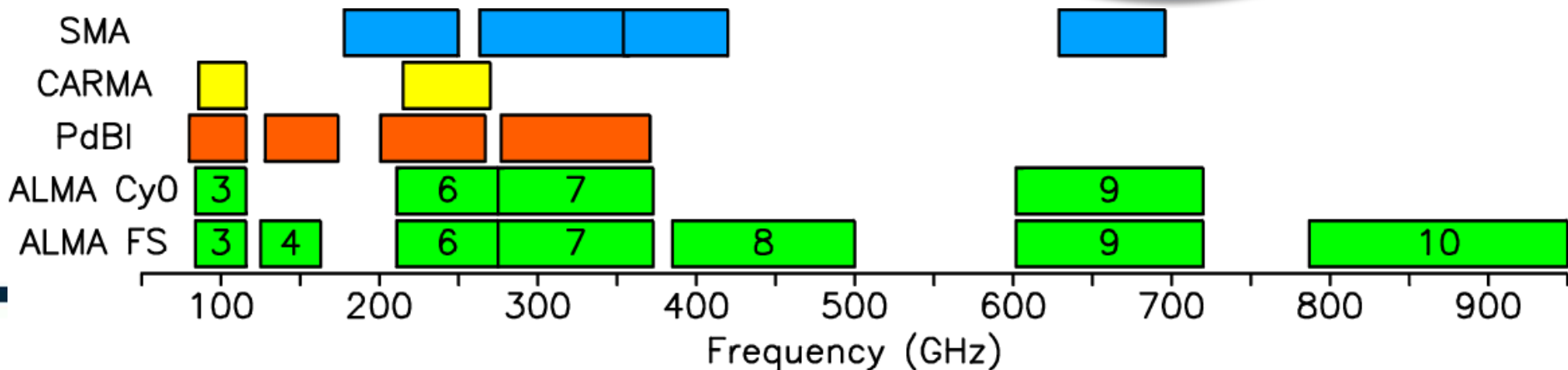
Spectral Coverage



Collecting Area ~ sensitivity




Spectral Coverage



Cycle 2 Capabilities

- ◆ 34 12m, 9 ACA, 2 TP antennas
- ◆ Bands 3, 4, 6, 7, 8, and 9 available
- ◆ Baselines out to 1.5 km (0.15" resolution at 300 GHz) for Bands 3 – 7 (1.0 km for Bands 8 and 9)



Band	Frequency range1	Wavelength range
	(GHz)	(mm)
3	84 – 116	3.6 – 2.6
4	125 – 163	2.4 – 1.8
6	211 – 275	1.4 – 1.1
7	275 – 373	1.1 – 0.8
8	385 – 500	0.78 – 0.60
9	602 – 720	0.50 – 0.42

Cycle 2 Capabilities

- ◆ 12m array – 7 configurations with maximum baselines ranging from 160 m to 1.5 km
- ◆ Angular resolutions for most compact and most expected configurations and maximum recoverable scale without the ACA:

Frequency	Maximum Recoverable Scale without ACA ^{2,3,4}	Coarsest allowed angular resolution ^{2,3,5}	Finest achievable angular resolution ^{2,3,6}
(GHz)	(arcsec)	(arcsec)	(arcsec)
100	25	7.5	0.41
150	17	5.0	0.27
230	11	3.3	0.18
345	7.2	2.2	0.12
460	5.4	1.6	0.12
650	3.8	1.2	0.09

Cycle 2 Capabilities

Maximum recoverable scale including 7m array:

Frequency (GHz)	Maximum Recoverable Scale ^{1,2,3} (arcsec)
100	42
150	28
230	18
345	12
460	9.1
650	6.4

*ACA not offered as stand-alone array

*TP only for spectral line observations in Bands 3

- 8

Cycle 2 Capabilities

Spectral Capabilities:

- ◆ Up to four basebands can be placed within the two receiver sidebands
- ◆ Different correlator modes can be specified for each baseband
- ◆ Up to four spectral windows per baseband are allowed
- ◆ Can smooth data to reduce the data rate (max = 60 MB/s)

Bandwidth(3)	Channel spacing(4)	Spectral resolution	Number of channels	Correlator mode
(MHz)	(MHz)	(MHz)		
20003	15.6	31.2	1283	TDM
1875	0.488	0.976	3840	FDM
938	0.244	0.488	3840	FDM
469	0.122	0.244	3840	FDM
234	0.061	0.122	3840	FDM
117	0.0305	0.061	3840	FDM
58.6	0.0153	0.0305	3840	FDM

Cycle 2 Capabilities

Mapping modes:

- ◆ Mosaic – one rectangular field consisting of up to 150 pointings per Science Goal
- ◆ Individual pointings – a mixture of sources and offsets that
 - ◆ are not separated by more than 10 degrees on the sky
 - ◆ can be observed with one spectral setup
 - ◆ can be observed with no more than five separate frequency settings that all fall within the same receiver band

*The sum over all sources, offsets, and frequency settings must be less than or equal to 150 per Science Goal

Cycle 2 Capabilities

Other:

- ◆ Full polarization continuum measurements for 12-m Array observations in Bands 3, 6 and 7 (offered only for specific frequency settings)
- ◆ “Spectral Scan” option for spectral surveys or redshift searches
- ◆ Target of Opportunity observations (e.g. monitoring and time-constrained projects) in one 12m Array configuration *with restrictions*

Go to the **ALMA Science Portal** for links to Proposer's Guide and ALMA Cycle 2 Capabilities: <https://almascience.nrao.edu/>

Proposal Checklist - ALMA

- Read relevant documentation (CfP Guide, Primer, etc...)
- Create an ALMA account by registering at the Science Portal (almascience.org)
- Download the Observing Tool (OT) & related guides
- Prepare the Science Case (PDF file)
- Prepare Science Goals (sources, frequency & correlator setup, integration times) within the OT
- Prepare the Technical Justification (Text box for each SG)
- Make use of the Helpdesk & the Knowledgebase

Cycle 3 Documentation & Timeline

- CfP Guide
- ALMA Primer
- OT Guide
- ALMA Tech Handbook
- Timeline for Cycle 3
 - Spring 2015 - CfP
 - Summer 2015 – Proposal Deadline
 - Fall 2015 – Start of Cycle 3 Observing



Observing with *ALMA*
A Primer for Early Science



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Atacama Large Millimeter/submillimeter Array
In search of our Cosmic Origins



Search Site



ESO

NRAO

NAOJ

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[Data](#)

[Documents & Tools](#)

[Knowledgebase/FAQ](#)

User Services at ARCs

- [Helpdesk](#)
- [EU ARC](#)
- [NA ARC](#)
- [EA ARC](#)

You are here: [Home](#)

Welcome to the Science Portal at NRAO



This is the website for **The ALMA Science Portal**, served from one of the **ALMA Regional Centers (ARCs)** of the ALMA partner organizations: ESO, NRAO or NAOJ. You may switch between the different instances of the portal through the links to the appropriate ALMA partner at the top banner. Through this portal you can find details about the technical capabilities of ALMA, how to propose for observing time, and how to access ALMA data. It includes links to all official ALMA documents and tools, including those for preparing and submitting proposals and processing ALMA data. In order to access some of the tools, users must register with the project and login to the portal via the links at the top banner.

Each of the three ARCs provides additional **User Services**, including a **Helpdesk** for all user queries. Each ARC maintains additional web pages with information on region-specific user services, such as visitor and student programs, schools, workshops, financial programs and public outreach activities. These are accessed via the links under the **User Services at the ARCs** area in the left menu.

ALMA Newsletter

Newsletter No. 9

May 23, 2012

[More...](#)

General News

ALMA Cycle 1 and Cycle 2
Timelines

May 31, 2013

Cycle 1 Progress Update

Apr 08, 2013

ALMA Cycle 1 Proposal
Review: Detailed Report

Apr 03, 2013

ALMA Director's
Discretionary Time and Target
of Opportunity activation

Feb 28, 2013

Access to ALMA Science
data

Feb 04, 2013

[More...](#)

NRAO User Support

Helpdesk

Call for Proposal

Login



ALMA Science Portal @ NRAO

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Downloading the ALMA OT



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



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.

WebStart

Tarball

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.

Proposal Checklist - ALMA

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The Proposal Cover sheet will be the place where you include the Proposal Title, Abstract, Category, etc...

Perspective 1

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

Template library. Turn the keys on the JTree below

- Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep)
 - ScienceGoal (B7 continuum: G)
 - ScienceGoal (B7 CO(9-8): Cos
 - ScienceGoal (B9 continuum: C
 - ScienceGoal (B3 spectral swe
 - ScienceGoal (B3 continuum: G
 - ScienceGoal (B6 continuum: G
 - ScienceGoal (B7 continuum: G
 - ScienceGoal (B6 continuum: G
 - ScienceGoal (B3 continuum: G
 - ScienceGoal (B6 12CO (2-1): N
 - ScienceGoal (B6 13CO (2-1): N
 - ScienceGoal (B6 spectral line

Proposal Information

Proposal Title

Proposal Cycle

TEST.7

Abstract (max. 1200 characters)

Launch Editor

Proposal Type

☐ Standard ☐ Target Of Opportunity

Scientific Category

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

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

Keywords (max. 2 keywords)

Student project ☐ Continuation ☐ (Not Applicable)

Related Proposals

Overview

...entering related other proposals, a student project and PIs and Co-Is...

Perspective 1

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 - ScienceGoal (B6 continuum: G
 - ScienceGoal (B3 continuum: G
 - ScienceGoal (B6 12CO (2-1): N
 - ScienceGoal (B6 13CO (2-1): N
 - ScienceGoal (B6 spectral line

Spectral Spatial Proposal

Student project ☐ Continuation ☐ (Not Applicable)

Related Proposals

Previous Proposals

Investigators

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

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

Select PI... Add Col... Remove Col Add from Proposal

Science Attach... Detach

Observa

Overview

Proposal Checklist - ALMA

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Project - Observing Tool for ALMA, version Cycle2Test2

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

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 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

A clean slate. From here, you can:

- start a new proposal
- load templates.

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

1 New Proposal Ctrl-N
New DDT Proposal Ctrl-D
Open Project
Save Ctrl-S
Save As...
Show ALMA Template Library
Use Project as Template
Validate Ctrl-L
Submit Project
Preferences
Quit

Click here to load the available
Primer Templates

Principal Investigator
Select PI...

Main Project Information
Project
Assigned Priority
Project Code None Assigned

Feedback
Validation Validation History Log

Suggestion

Overview

Contextual Help

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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

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

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

Description

Launch Editor

NGC3256

Source

Unspecified

Perseus 0.00000

The Cycle 1 Primer Templates.
Drag the one you'd like to modify, from here up to the Proposal folder.

Template library. Turn the keys on the JTree below & read the descriptions

- Template library. Turn the keys on the JTree below & read the descriptions
 - Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep: CO (9-8): CO
 - ScienceGoal (B7 continuum: SMOS SMGs)
 - ScienceGoal (B7 CO (9-8): Cosmic Eyelash (z=
 - ScienceGoal (B9 continuum: Cosmic Eyelash
 - ScienceGoal (B3 spectral sweep: PKS1830-21
 - ScienceGoal (B3 continuum: GRB ToO: days 0
 - ScienceGoal (B6 continuum: GRB ToO: days 0
 - ScienceGoal (B7 continuum: GRB ToO: days 0
 - ScienceGoal (B6 continuum: GRB ToO: day 17
 - ScienceGoal (B3 continuum: GRB ToO: day 30
 - ScienceGoal (B6 12CO (2-1): NGC3256 mosaic
 - ScienceGoal (B6 13CO (2-1): NGC3256)

Feedback

Validation Validation History Log

Description	Suggestion

Overview

Contextual Help Phase I: Science Proposal

AgT 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

Project Structure

Proposal Program

Unsubmitted Proposal

Project

Proposal

Editors

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General (Optional)

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

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

Launch Editor

NGC3256

Source

Source Name

Choose a Solar System Object? ☐

Name of object Unspecified

Sexagesimal

Decay 0.00000

Template library. Turn the keys on the JTree below & read the d...

Template library. Turn the keys on the JTree below & read the d...

Proposal

Planned Observing

- ScienceGoal (B6 spectral sweep: CO(2-1) CO(2-1))
- ScienceGoal (B7 continuum: COSMOS SMGs)
- ScienceGoal (B7 CO(2-1) CO(2-1))
- ScienceGoal (B9 continuum: Cosmic EyeLash)
- ScienceGoal (B5 spectral sweep: CO(2-1) CO(2-1))
- ScienceGoal (B3 continuum: GRB ToO: days 0)
- ScienceGoal (B6 continuum: GRB ToO: days 0)
- ScienceGoal (B7 continuum: GRB ToO: days 0)
- ScienceGoal (B6 continuum: GRB ToO: day 17)
- ScienceGoal (B3 continuum: GRB ToO: day 30)
- ScienceGoal (B6 12CO (2-1): NGC3256 mosaic)
- ScienceGoal (B6 13CO (2-1): NGC3256)

Validation Validation History Log

Description	Suggestion

Overview

Contextual Help Phase I: Science Proposal

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 should your project be approved.

File Edit View Tool Search Help



Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of B6 12CO (2-1): NGC3256)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Archiving
- Template library: Turn the keys on the JTree below & T...
 - Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep CO)
 - ScienceGoal (B7 continuum: COSMO)
 - ScienceGoal (B9 continuum: Cosmic Ey)
 - ScienceGoal (B1 spectral sweep: PLK)
 - 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 (B9 spectral line: Massi)
 - ScienceGoal (B3 continuum: Protoste)
 - ScienceGoal (B6 continuum: Protoste)

Editors

Spectral Spatial Field Setup

Source Name

Choose a Solar System Object? ☐ Name of object

System Sexagesimal display? ☒ Parallax

Source Coordinates RA PM RA

Dec PM DEC

Source Radial Velocity z Doppler type

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

Expected Source Properties

Peak Continuum Flux Density per Beam

Continuum Polarization Percentage %

Peak Line Flux Density per Beam

Line Width

Line Polarization Percentage %

Rectangle

Coords Type ☐ ABSOLUTE ☒ RELATIVE

System

Field Center Coordinates Offset(Longitude)

Offset(Latitude)

Source name, position, velocity, etc.

Let's make a mosaic!

Expected source properties (for tech assessors)

Set up the mosaic. But first...

Feedback

Validation Validation History Log

| Description | Suggestion |
|-------------|------------|
|-------------|------------|

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): NGC325) (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 Eye)
 - ScienceGoal (B9 continuum: Cosmic Eye)
 - 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): NGC325)
 - ScienceGoal (B6 13CO (2-1): NGC325)
 - ScienceGoal (B6 spectral line: Massive Star)
 - ScienceGoal (B9 spectral line: Massive Star)
 - ScienceGoal (B3 continuum: Protostar)
 - ScienceGoal (B6 continuum: Protostar)

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 ☒ Full ☐ Full

Spectral Setup Errors

Spectral Line

Baseband-1

| Fraction | Center Freq (Rest) | Center Freq (Sky) | Transition | Bandwidth, Resolution (smoothed) | Spec Rep Avg. |
|----------|--------------------|-------------------|------------|--|---------------|
| 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

First need to define the spectral setup.

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

Transition Filter

CO*

☒ 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

☐ Hide unobservable lines

☒ Filtering unobservable lines

Maximum Upper-state Energy (K)

0 20 40 60 80 100 ∞

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.

Find More...

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 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, F=5/2-3/2 | 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 | 791.96 GHz | 791.96 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 |

Add to Selected Transitions

Selected transitions

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

Remove from Selected Transitions

Select a line from the list

Filters can be used to narrow the search


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): NOVA) 
 - 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 v=1-0 | 1875.000 MHz (2438 km/s), 976.563 kHz (1.270 km/s) | 1 | |
| | | | | 58.594 MHz (76 km/s), 29.518 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

Double click this field to select the desired bandwidth/resolution

Template library

- Template library. Turn the keys on the JTree field
- Proposal
 - Planned Observing
 - ScienceGoal (B7 continuum: COSMO)
 - ScienceGoal (B7 CO(9-8): Cosmic Ev
 - ScienceGoal (B9 continuum: Cosmic
 - ScienceGoal (B3 spectral sweep: PK
 - ScienceGoal (B3 continuum: GRB To

Feedback

Validation Validation History Log

Description Suggestion

Overview

Contextual Help Phase I: Science Proposal

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): NO...
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial Spectral Setup

Spectral Setup Errors

No suitable receiver band for the range [-0.03125 GHz, 231.538 GHz]

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 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

Feedback

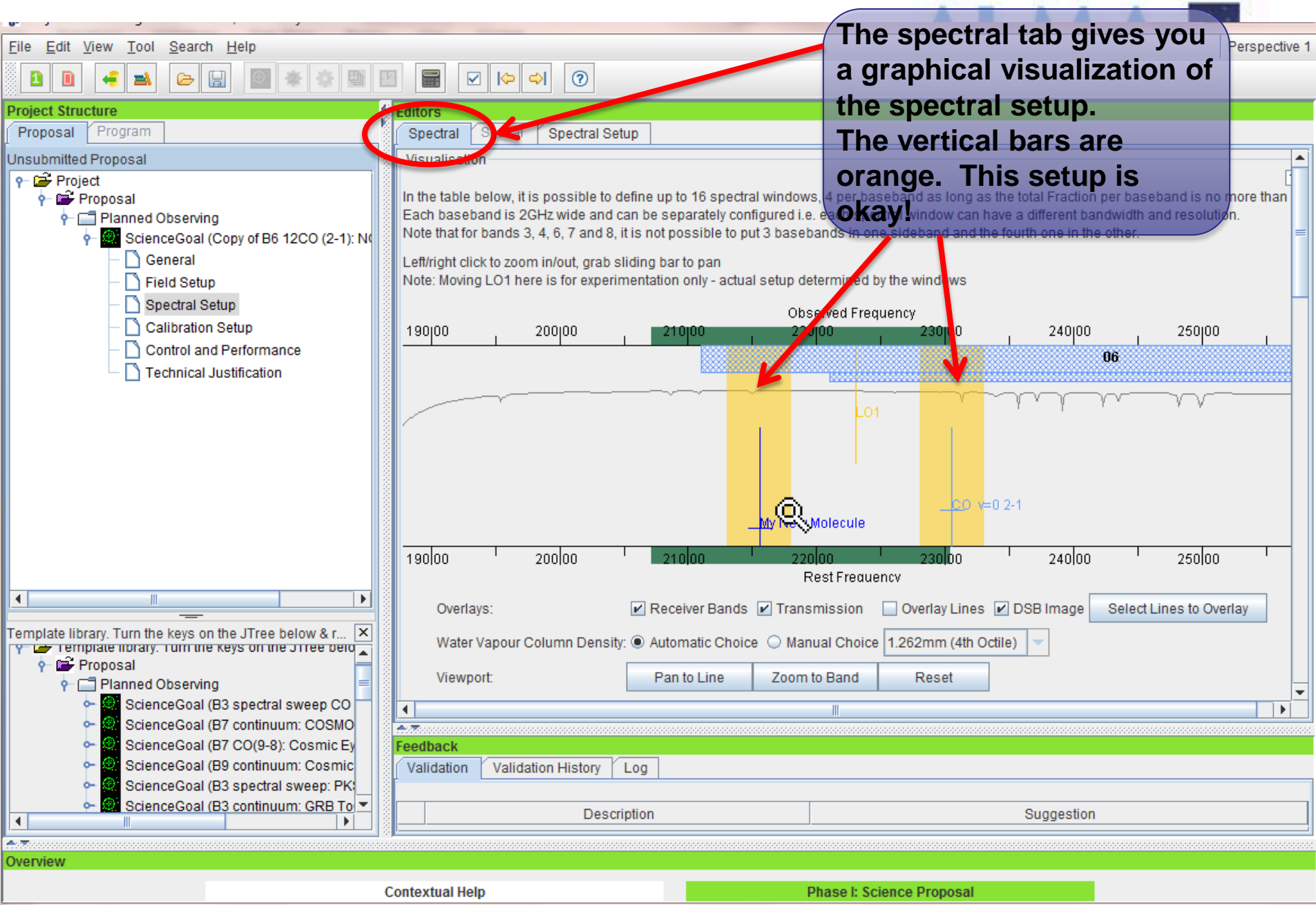
Validation Validation History Log

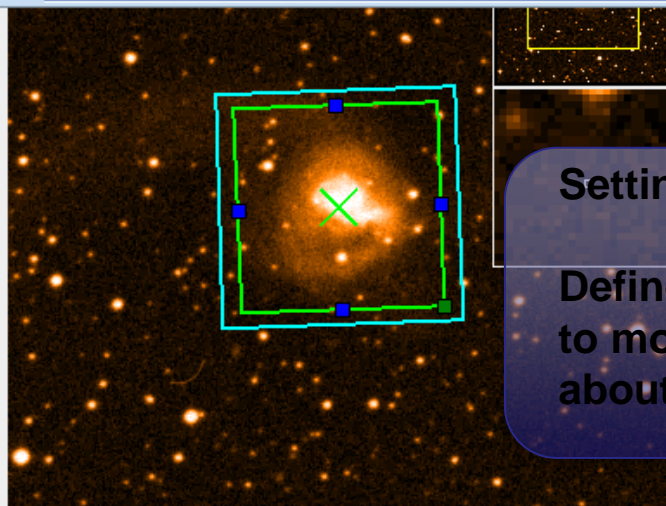
Description Sugg

Overview

Contextual Help Phase I: Science Proposal

A rest frequency can be entered manually into this field.





1x 469, 175 13357.0
10:27:35.522, -43:56:25.99 (J2000)
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) at ESO
Image Size(arcmin) 10.0 Query

Source Coordinates

System J2000 Sexagesimal display? ☒
Parallax 0.00000 mas
RA 10:27:51.6000 PM RA 0.00000 mas
Dec -43:54:18.000 PM DEC 0.00000 mas

Source Radial Velocity 2794.200 km/s hel z 0.009364291 Doppler Type
Target Type ☐ Individual Pointing(s) ☒ 1 Rectangular Field

Expected Source Properties
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
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
#Pointings 12m Array 105 7m Array 39
Reset to Nyquist
Export

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).

Estimated number of 7m Array pointings

No more than 150 12m Array pointings in Cycle 2.



Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Cop
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Template library. Turn the keys o...

- Template library. Turn the keys o...
 - Proposal
 - Planned Observing
 - ScienceGoal (B
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 - ScienceGoal (B

Editors

Spectral Spatial **Control and Performance**

Configuration Information

| | | |
|---|-------------------|------------------|
| Antenna Beamsize ($1.2 * \lambda / D$) | 12m 26.706 arcsec | 7m 45.782 arcsec |
| Number of Antennas | 12m 34 | 7m 9 TP 2 |
| Most extended 12m configuration Most compact 12m configuration | | |
| Longest baseline (L_{max}) | 1.508 km | 0.166 km |
| Synthesized beamsize (λL_{max}) | 0.177 arcsec | 1.612 arcsec |
| Shortest baseline (L_{min}) | 0.041 km | 0.014 km |
| Maximum acceptable baseline ($0.001 \lambda_{min}$) | 3.940 arcsec | 11.293 arcsec |

Desired Performance

Desired Angular Resolution: 1.10000 arcsec

☐ Point Source ☒ Extended Source 3.00000 arcmin

0.22674 K equivalent to 0.01193 Jy

Bandwidth: FinestResolution Frequency Width 0.976563 MHz

Do you request complementary observations? ☒ Yes ☐ No

Science goal integration time estimate **Suggest** Time Estimate

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

Are the observations time-constrained? ☐ Yes ☒ No

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

With the desired angular resolution, maximum scale, and sensitivity (see pages 13-15 of the Cycle 2 Primer), ACA observations are recommended for this project.

Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Cop
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Set
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Template library. Turn the keys o...

- Template library. Turn the
 - Proposal
 - Planned Observing
 - ScienceGoal (B
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Editors

Spectral Spatial **Control and Performance**

Configuration Information

| | | | |
|---|-------------------|------------------|------|
| Antenna Beamsize ($1.2 * \lambda / D$) | 12m 26.706 arcsec | 7m 45.782 arcsec | |
| Number of Antennas | 12m 34 | 7m 9 | TP 2 |
| Most extended 12m configuration Most compact 12m configuration | | | |
| Longest baseline (L_{max}) | 1.508 km | 0.166 km | |
| Synthesized beamsize (λL_{max}) | 0.177 arcsec | 1.612 arcsec | |
| Shortest baseline (L_{min}) | 0.041 km | 0.014 km | |
| Maximum recoverable scale ($0.6 \lambda L_{min}$) | 3.946 arcsec | 11.293 arcsec | |

Desired Performance

Desired Angular Resolution

Largest Angular Structure in source ☐ Point Source ☒ Extended Source

Desired mosaic sensitivity equivalent to

Bandwidth used for Sensitivity

Do you request complementary ACA Observations? ☒ Yes ☐ No

Science goal integration time estimate

Is more time required due to uuy com...

Are the observations time-constrained? ☐ Yes ☒ No

Click Time Estimate to see how long these observations will take. Must be less than 100 hours in Cycle 2.



Project Structure

Proposal Program

Unsubmitted Proposal

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

Template library. Turn the keys on...

- Template library. Turn the keys on...
 - Proposal
 - Planned Observing
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)
 - ScienceGoal (B)

Overview

ALMA OT - Information



Estimated time

| | |
|--|----------------------|
| Requested sensitivity | 11.9255 mJy |
| Bandwidth used for sensitivity | 0.977 MHz |
| Representative frequency (sky, first source) | 231.55 GHz |
| Precipitable water vapour (all sources) | 1.262mm (4th Octile) |

ALMA 12m Array - 34 antennas

| | |
|---|-----------|
| Time on source per pointing (first source) | 19.56 s |
| Total number of pointings (all sources) | 105 |
| Estimated number of tunings required | 1 |
| Total time on source | 34.23 min |
| Total time on calibrators | 34.83 min |
| Total overheads | 20.05 min |
| Total 12m array time (inc. calibration & overheads) | 1.49 h |

Calibration Breakdown

| | |
|-------------------------------------|-----------|
| 2 x SidebandRatio | 3.37 min |
| 6 x Pointing | 1.80 min |
| 2 x Amplitude (inc. AtmosphericCal) | 6.53 min |
| 2 x Bandpass (inc. AtmosphericCal) | 11.53 min |
| 6 x Phase (inc. AtmosphericCal) | 7.60 min |
| 6 x Atmospheric | 4.00 min |
| Additional calibration overheads | 14.80 min |

Atacama Compact Array

| | |
|----------------------------------|--------|
| ACA 7m time estimate coefficient | 2.0 |
| Total ACA 7m time | 2.97 h |
| ACA TP time estimate coefficient | 4.0 |
| Total ACA TP time | 5.94 h |

Estimated total time for science goal 7.43 h

OK

Perspective 1

Project Structure

- Proposal
- Program
- Unsubmitted Proposal
 - Project
 - Proposal
 - Planned Observing
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 - General
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Template library. Turn the keys o...

- Template library. Turn the keys o...
- Proposal
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 - ScienceGoal (B
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 - ScienceGoal (B
 - ScienceGoal (B

Editors

- Spectral
- Spatial
- Control and Performance

Configuration Information

Antenna Beamsize ($1.2 * \lambda / D$)

Number of Antennas

Longest baseline (L_{max})

Synthesized beamsize ($N L_{max}$)

Shortest baseline (L_{min})

Maximum recoverable scale (0

Desired Performance

Desired Angular Resolution

Largest Angular Structure in sou

Desired mosaic sensitivity

Bandwidth used for Sensitivity

Do you request complementary

Science goal integration time es

Is more time required due to u,v

Are the observations time-const

Sensitivity Calculator

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

Calculate Integration Time

Calculate Sensitivity

Close

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

Project Structure

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Cop

General

Field Setup

Spectral Setup

Calibration Set

Control and Pe

Technical Justi

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

Offset(Latitude) 0.00000 arcsec

Field Center Coordinates

Antenna Diameter 12m 7m

Image Filename emijan\jsky3\cache\jsky9043341093951517820.fits

FOV Parameters

1x 71, -52 0.0

10:28:13.821, -44:00:03.43 (J2000)

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

Overview

Phase I: Science Proposal

Or load a local fits image

File Edit View Tool Search Help

Perspective 1

Project Structure

Editors

Proposal Program

Spectral Spatial Field Setup

Unsubmitted Proposal

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

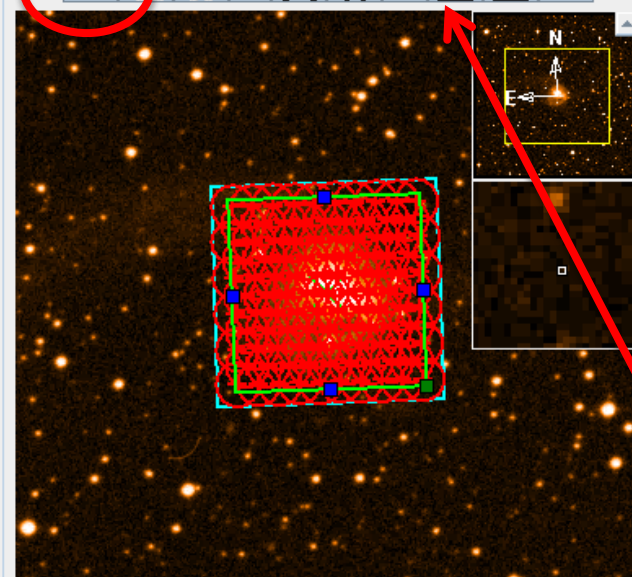
Line Polarization Percentage 0.0

Rectangle

Coords Type ☐ ABSOLUTE ☒ RELATIVE

System J2000

Offset(Longitude) 0.00000 arcsec



1x 388, 468 13678.0

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

Image Filename emijan\jsky3\cache\jsky9043341093951517820.fits

FOV Parameters

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

Overview

Phase I: Science Proposal

What's New in the Cycle 2 OT?

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help Perspective 1

Object Structure

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

Editors

Spectral Spatial **Field Setup**

Source Coordinates
RA 10:27:51.6000 PMRA 0.00000 mas/yr
Dec -43:54:18.000 PM DEC 0.00000 mas/yr

Source Radial Velocity 2794.200 km/s hel z 0.009364291 Doppler Type RELATIVISTIC

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 %

Field Center Coordinates

Custom Mosaic: ☒ **Custom Mosaics using Individual Pointings**

PointingPattern: Subset ☒
Offset Unit arcsec
#Pointings 2

| RA [arcsec] | Dec [arcsec] |
|-------------|--------------|
| 0.00000 | 0.00000 |
| 0.00000 | 0.00000 |

Add Delete

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

What's New in the Cycle 2 OT?

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 Continuum
☐ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Receiver Band

3 [14.0-116.0 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]

Sky Frequency

Rest Frequency 232.153787 GHz

Baseband-1

| Fraction | Center Freq (Rest) | Center Freq (Sky) | Transition | Bandwidth, Resolution (smoothed) | Spec Avg. | Representative Window |
|----------|--------------------|-------------------|------------------|---|-----------|-----------------------|
| 1(Full) | 223.06951 GHz | 221.00000 GHz | Single Contin... | 2000.000 MHz(2543 km/s), 31.250 MHz(42.391 km/s) | 1 | <input type="radio"/> |

Baseband-2

| | | | | | | |
|---------|---------------|---------------|------------------|---|---|-----------------------|
| 1(Full) | 225.08824 GHz | 223.00000 GHz | Single Contin... | 2000.000 MHz(2521 km/s), 31.250 MHz(42.011 km/s) | 1 | <input type="radio"/> |
|---------|---------------|---------------|------------------|---|---|-----------------------|

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)

Overview

Contextual Help

Phase I: Science Proposal

Templates for standard single continuum

What's New in the Cycle 2 OT?

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

- 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 Continuum
☐ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Full Polarization for Bands 3, 6 and 7

Receiver Band: 6 [211.0-275.0 GHz]
Sky Frequency: 7 [275.0-373.0 GHz]
Rest Frequency: 232.153787 GHz

Baseband-1

| Fraction | Center Freq (Rest) | Center Freq (Sky) | Transition | Bandwidth, Resolution (smoothed) | Spec Avg. | Representative Window |
|----------|--------------------|-------------------|------------------|---|-----------|-----------------------|
| 1(Full) | 223.06951 GHz | 221.00000 GHz | Single Contin... | 2000.000 MHz(2543 km/s), 31.250 MHz(42.391 km/s) | 1 | <input type="radio"/> |

Baseband-2

| | | | | | | |
|---------|---------------|---------------|------------------|---|---|-----------------------|
| 1(Full) | 225.08824 GHz | 223.00000 GHz | Single Contin... | 2000.000 MHz(2521 km/s), 31.250 MHz(42.011 km/s) | 1 | <input type="radio"/> |
|---------|---------------|---------------|------------------|---|---|-----------------------|

Overview

Contextual Help Phase I: Science Proposal

What's New in the Cycle 2 OT?

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Proposal Program

Unsubmitted Proposal

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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 Continuum
☐ Spectral Line

Spectral Type

Polarization products desired ☐ XX ☒ YY

Spectral Setup Errors

Spectral Line

Baseband-1

| 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

1
2
4
8
16

Feedback

Validation Validation History Log

15 errors, 0 warnings

| Description | Suggestion |
|---|---|
| no science case: a science and technical case is a mandatory | Select the proposal node in the Proposal tab and add a science case |
| Must select a minimum of 1 science keywords | Select the Proposal node and then add some science keywords (minimum 1 keywords) |
| Largest scale is not achievable with the 12m array configurations | Select the Control Parameters in the Science Goal and reduce the value or check the |
| Spectral Window name is invalid | Change the name to something more meaningful |
| Spectral Window name is invalid | Change the name to something more meaningful |

Overview

Contextual Help Phase I: Science Proposal

Multiple spectral specs, spectral averaging

What's New in the Cycle 2 OT?

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 Type

☒ Spectral Line

☐ Single Continuum

☐ Spectral Line

Polarization products desired ☐ XX ☒ YY

Spectral Setup Errors

Spectral Line

Baseband-1

| Fraction | Center Freq (Rest) | Center Freq (Sky) | Transition | Bandwidth, Resolution (smoothed) | Spec Avg. | Representative Window |
|----------|--------------------|-------------------|-------------------|--|-----------|----------------------------------|
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| 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

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Overview

Contextual Help

Phase I: Science Proposal

Multiple spectral specs, spectral averaging

What's New in the Cycle 2 OT?

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

Automated Spectral Scan mode and tunings

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

What's New in the Cycle 2 OT?

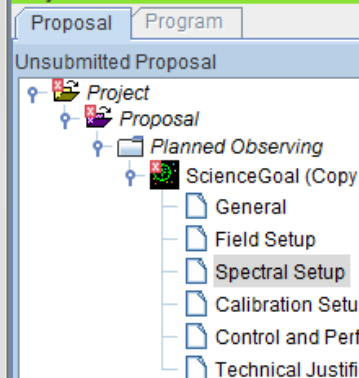
Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

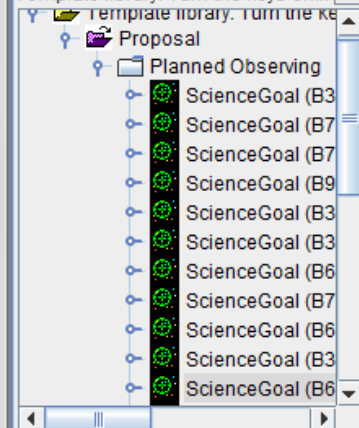
Perspective 1



Project Structure



Template library. Turn the keys on...



Editors

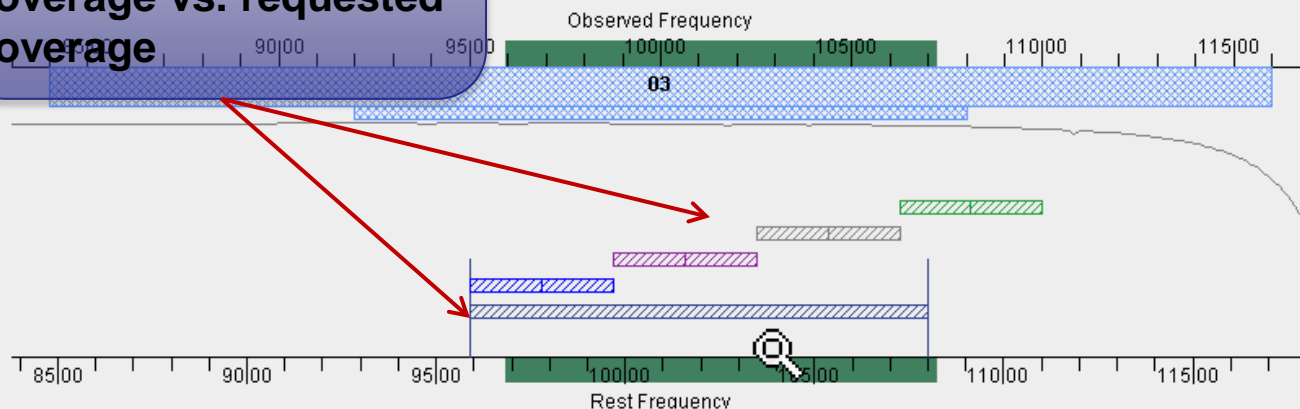
Spectral Spatial Spectral Setup

Visualisation

**Visual Representation
of the Spectral Scan
Mode — Actual spectral
coverage vs. requested
coverage**

Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution. Note that the total bandwidth cannot be put 3 basebands in one sideband and the fourth one in the other.

Note: Moving LO1 here is for experimentation only - actual setup determined by the windows



Overlays: ☒ Receiver Bands ☒ Transmission ☐ Overlay Lines ☒ DSB Image

Spectral Scan: ☒ Requested Scan ☒ Tuning 1 ☒ Tuning 2 ☒ Tuning 3 ☒ Tuning 4

Water Vapour Column Density: ☒ Automatic Choice ☐ Manual Choice 1.262mm (4th Octile)

Viewport:

Spectral Type

Spectral Type

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

Feedback

What's New in the Cycle 2 OT?



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 arcsec |
| 34 | 7m | 9 |

Extended 12m configuration Most compact 12m configuration

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

0.5 arcsec

☐ Point Source ☒ Extended Source 3.00000 arcmin

0.22674 K equivalent to 0.00246 Jy

FinestResolution Frequency Width 0.976563 MHz

☐ Yes ☒ No

Suggest

Time Estimate

Issues? (must be justified) ☐ Yes ☒ No

Overview

Contextual Help

Phase I: Science Proposal

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

What's New in the Cycle 2 OT?



Project - Observing Tool for ALMA, version Cycle2Test2

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Perspective 1

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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 these times.

Entering Time Constrained observations
– Dates, Epochs or Monitoring
– appropriate justification or additional information

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

Proposal

- Planned Observing
 - ScienceGoal (B3)
 - ScienceGoal (B7)
 - ScienceGoal (B7)
 - ScienceGoal (B3)
 - ScienceGoal (B3)
 - ScienceGoal (B3)
 - ScienceGoal (B6)
 - ScienceGoal (B7)
 - ScienceGoal (B6)
 - ScienceGoal (B3)
 - ScienceGoal (B6)

Feedback

Overview

Contextual Help

Phase I: Science Proposal

Proposal Checklist - ALMA

- Read relevant documentation (CfP Guide, Primer, etc...)
- Create an ALMA account by registering at the Science Portal (almascience.org)
- Download the Observing Tool (OT) & related guides
- Prepare the Science Case (PDF file)
- Prepare Science Goals (sources, frequency & correlator setup, integration times) within the OT
- **Prepare the Technical Justification (Text box for each SG)**
- Make use of the Helpdesk & the Knowledgebase

What's New in the Cycle 2 OT?

Project - Observing Tool for ALMA, version Cycle2Test2

File Edit View Tool Search Help

Perspective 1

Project Structure

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Copy of B6 12CO (2-1): NGC3256)

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.

Relevant science parameters

| | | | |
|---------------------------|------------|-----------------------|-------------|
| Sensitivity | 2.46 mJy | Angular Resolution | 0.50 arcsec |
| Bandwidth for sensitivity | 976.56 kHz | Largest angular scale | 3.00 arcmin |
| Representative frequency | 102.50 GHz | ACA | No |

Expected source properties

Continuum:

| | | | |
|-------------------------------------|----------|-------------|----------|
| Aggregate bandwidth | 3.75 GHz | Sensitivity | 0.00 mJy |
| Peak flux density | 0.17 Jy | SNR | 83947.23 |
| Dynamic Range (cont. peak/line rms) | 70.62 | | |

Non-standard choices

Field setup:

Spectral Setup:

Calibration:

Control and Performance:

ACA suggestion overridden

Time Constrained

Justification text (max 4000 characters)

NEW Technical Justification

Must be entered separately for each Science Goal...

Overview

Proposal Checklist - ALMA

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Atacama Large Millimeter/submillimeter Array
In search of our Cosmic Origins



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- [EA ARC](#)

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Welcome to the Science Portal at NRAO



This is the website for **The ALMA Science Portal**, served from one of the **ALMA Regional Centers (ARCs)** of the ALMA partner organizations: ESO, NRAO or NAOJ. You may switch between the different instances of the portal through the links to the appropriate ALMA partner at the top banner. Through this portal you can find details about the technical capabilities of ALMA, how to propose for observing time, and how to access ALMA data. It includes links to all official ALMA documents and tools, including those for preparing and submitting proposals and processing ALMA data. In order to access some of the tools, users must register with the project and login to the portal via the links at the top banner.

Each of the three ARCs provides additional **User Services**, including a **Helpdesk** for all user queries. Each ARC maintains additional web pages with information on region-specific user services, such as visitor and student programs, schools, workshops, financial programs and public outreach activities. These are accessed via the links under the **User Services at the ARCs** area in the left menu.

NRAO User Support

Helpdesk

ALMA Newsletter

Newsletter No. 9

May 23, 2012

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General News

ALMA Cycle 1 and Cycle 2
Timelines

May 31, 2013

Cycle 1 Progress Update

Apr 08, 2013

ALMA Cycle 1 Proposal
Review: Detailed Report

Apr 03, 2013

ALMA Director's
Discretionary Time and Target
of Opportunity activation

Feb 28, 2013

Access to ALMA Science
data

Feb 04, 2013

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ALMA Science Portal @ NRAO



Atacama Large Millimeter/submillimeter Array
In search of our Cosmic Origins

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ALMA

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Live Chat Software by Kayako

[SEARCH](#)

Knowledgebase

General ALMA Queries (13)

- Can I submit a ticket in Japanese?
- How close can ALMA observe to the Sun?

Project Planning (14)

- What should I include for the content of the Technical Justification and in what format should I submit it?
- Where can I find the online ALMA observing simulator developed by the University of Manchester?

Early Science - Cycle 1 (31)

- Can I use "breakpoints" in ALMA cycle 1?
- The Cycle 1 Technical Handbook has some gaps in its discussion of ALMA receivers (SSB, 2SB, DSB). What else can you tell me about them?

ALMA Observing Tool (OT) (29)

- What do I do if I can't get the OT to work?
- How do I deal with targets with unspecified coordinates in the OT?

Resources & Observer Support (12)

- How do I arrange a visit to one of the ARCs?
- Where can I find ALMA documentation and manuals?

Proposal Handling (5)

- May I submit an identical proposal to more than one category, e.g. submitting a proposal on distant galaxies both to cosmology and to galaxy categories?
- Which category should I submit a proposal on distant galaxies: "cosmology/high-z" or "Galaxies/Nuclei"?



Now its your turn...



We have prepared a “playbook” for setting up an ALMA Proposal. You can follow the playbook from here:

http://casaguides.nrao.edu/index.php?title=OT_tutorial_SISS

If you want to try and set up an ALMA OT Phase 1 Proposal based on your science, try looking up the “Did you Know?” document prepared here:

<https://science.nrao.edu/facilities/alma/facilities/alma/didyouknow>

There are specifications on sensitivity, largest angular scale, angular resolution, spectral set-ups, etc...that will help guide you through the proposal preparation process.

