

The ALMA Observing Preparation Tool

NRAO



National Radio Astronomy Observatory

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



For a video version of this material:



https://almascience.nrao.edu/call-for-proposals/observing-tool/video-tutorials

gmail fbook gcal nyt alnet Scijour Arxivsorter Tutorials JIRA CVNRAO UVAEvents ADS cville H

ALMA In search of our Cosmic Origins Search Site

Portals: ESO NRAO NAOJ Kartik Sheth Log out Profile Chan

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 - OT Video Tutorials**
 - Troubleshooting
 - Sensitivity Calculator
 - Notice of Intent
- ALMA Data
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- Project Tracker

Home > Call for Proposals > Observing Tool > OT Video Tutorials

OT Video Tutorials

The OT video tutorials provide an audio-visual demonstration of different aspects of the ALMA OT and proposal preparation:

- **OT video tutorial 1: A brief overview of the OT**

This video will give you a general overview of how the OT works, its layout and the various tools and features that it includes. It will also in to Science Goals: these are used to capture the scientific content of your proposal and are ultimately used to run the observations at the te



- **OT video tutorial 2: Creating a proposal in 10 easy steps**

If you are just interested in being given the quickest possible introduction to the OT, with the basic steps required to submit a proposa then this is for you.



User Services at ARCs

- [Helpdesk](#)
- ALMA@ESO
- ALMA@NRAO
- ALMA@NAOJ



Atacama Large Millimeter/Submillimeter Array

In search of our Cosmic Origins

Welcome to the ALMA Science Portal

Portals:

Please select your preferred ALMA Regional Center (ARC) to access the Science Portal.

The ARCs provide the interface between ALMA and the astronomy community. They are located at NAOJ, in Mitaka, Japan for the East Asian partnership, at ESO in Garching, Germany for the European partnership and at NRAO in Charlottesville, USA for the North American partnership.



Welcome to the ALMA Science Portal

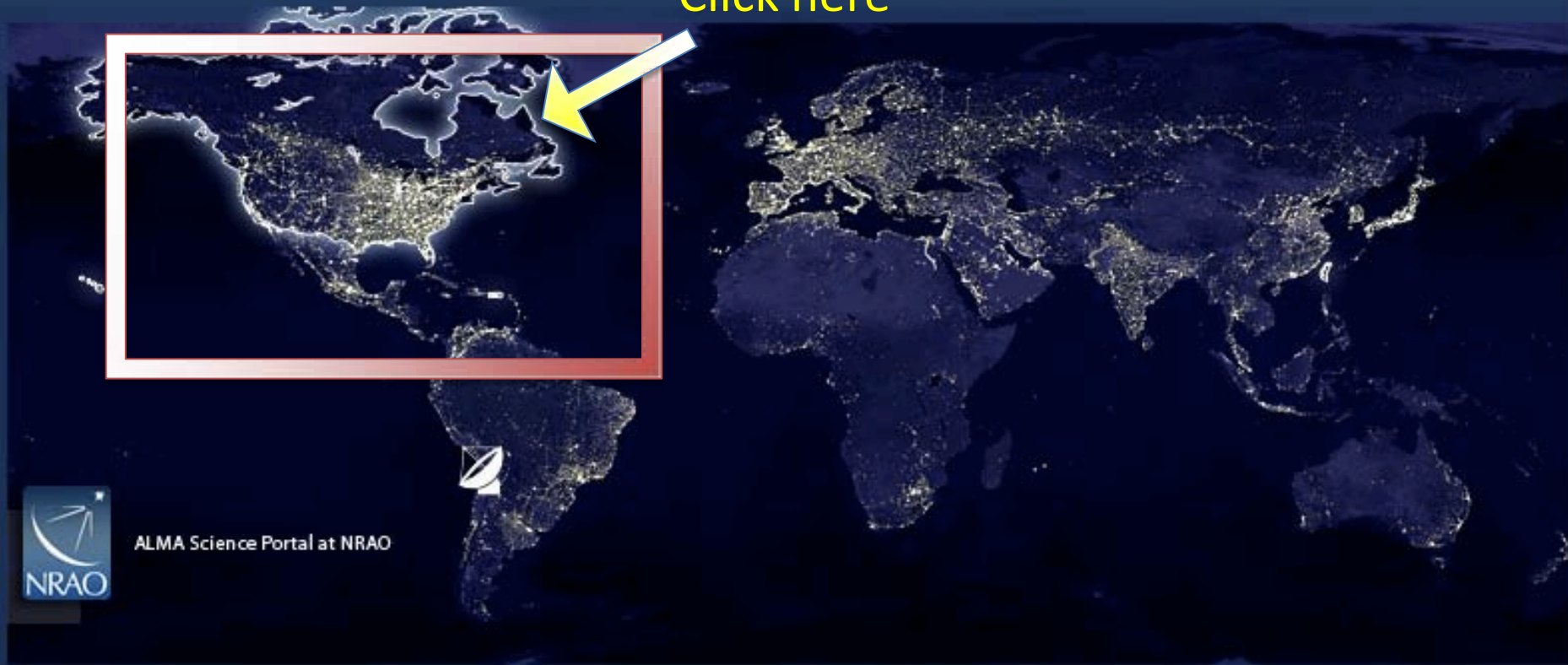
Please select your preferred ALMA Regional Center (ARC) to access the Science Portal.

The ARCs provide the interface between ALMA and the astronomy community. They are located at NAOJ, in Mitaka, Japan for the East Asian partnership, at ESO in Garching, Germany for the European partnership and at NRAO in Charlottesville, USA for the North American partnership.

Portals:



Click here





Home

[About ALMA](#)

[ALMA Science](#)

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[ALMA Data](#)

[Documents & Tools](#)

User Services at ARCs

- [Helpdesk](#)
- [ALMA@ESO](#)
- [ALMA@NRAO](#)
- [ALMA@NAOJ](#)

Welcome to the ALMA Science Portal at NRAO



Overview

The **Atacama Large Millimeter/submillimeter Array (ALMA)** is a major new facility for world astronomy. When completed in 2013, ALMA will consist of a giant array of 12-m antennas, with baselines up to 16 km, and an additional compact array of 7-m and 12-m antennas to greatly enhance ALMA's ability to image extended targets. ALMA is outfitted with state-of-the-art receivers that cover atmospheric windows from 84–950 GHz (3mm – 300 micron). Construction of ALMA started in 2003 and will be completed in 2013. Science observations will start in 2011 with 16 antennas and four receiver bands. The ALMA project is an international collaboration between Europe, East Asia and North America in cooperation with the Republic of Chile. More details can be found via the **About ALMA** link in the left menu.

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.

General News

ALMA Cycle 0 Call for Proposals is now open
Mar 30, 2011

[More...](#)

NRAO Events

2011 Postdoc Symposium
Apr 11 - 13, 2011
Charlottesville, VA

Innovations in Data-Intensive Astronomy
May 03 - 05, 2011
Green Bank, WV

NRAO Users Committee Meeting
May 11 - 12, 2011
Green Bank, WV

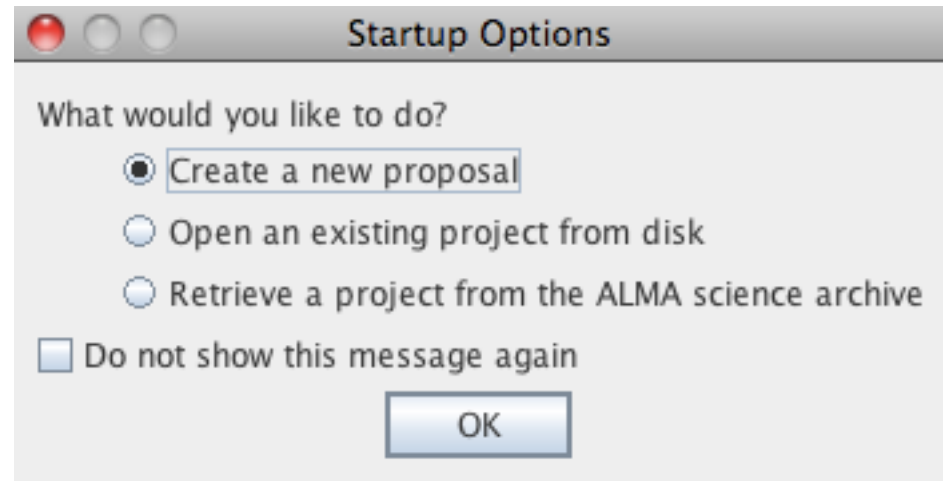
Sixth NAIC/NRAO School on Single Dish Radio Astronomy
Jul 10 - 16, 2011
Green Bank, WV

[View past events...](#)

Registering with User Portal

- To register for the user portal go to:
 - <http://almascience.org/>
- Go to the User Portal to access to..
 - ALMA info and news
 - Call for Proposals
 - ALMA tools and documentation
 - Helpdesk
 - Project Tracker
 - ALMA Science Archive

Launch the Application



A couple of dialog boxes will pop up

File Edit View Tool Search Help



Project Structure

Proposal Program

Editors

Spectral Spatial Proposal

Hover over these icons to get help

- New Proposal (Phase I)
- Open project from ALMA archive
- ...
- New Phase I Science Goal...
- Sensitivity Calculator ...
- Help!

Proposal Title

Proposal Cycle

2011.0

Abstract
(max. 300 words)

Launch Editor

Scientific Category

- Cosmology and the High Redshift Universe
 Galaxies and Galactic Nuclei
 ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets
 Stellar Evolution/the Sun and the Solar System

Proposal Type



- Standard
 Target Of Opportunity

Student Project Continuation (Not Applicable)

Contextual help on proposal workflow

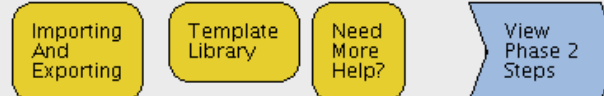
Contextual Help

Phase I: Science Proposal

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



Click on the overview steps to view the contextual help



Project Structure

- (unnamed project)
 - Project
 - Proposal

Editors

Proposal Information

Proposal Title:

Proposal Cycle: 2010.3

Abstract (max. 300 words):

Scientific Category:

- Cosmology and Redshift Universe
- ISM/Astrochemistry Formation/primordial disks/exoplanets

Proposal Type:

- Standard
- Target Of Opportunity

Student Project:

Continuation:

Related Proposals:

Previous Proposals:

Recent Publications:

Investigators:

• Be alert to the presence of sliders, some information may be off-screen



Spectral Spatial Proposal Catalog

Feedback

Description	Suggestion

Problems Information Log

Overview

Contextual Help

- Please ensure you and your co-Is are registered with the [ALMA user portal](#)
- Create a new proposal by either:
 - Clicking on the icon in the toolbar
 - Or clicking on this [link](#)
- 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



Project - Observing Tool for ALMA (Early Science, version [Dec27,1300CET] Perspective 1

File Edit View Tool Search Debug Help

Project Structure (unnamed project)

- Project
 - Proposal

Editors

Proposal Information

Proposal Title

Proposal Cycle 2010.3

Scientific Category

- Cosmology and the High Redshift Universe
- Galaxies and Galactic Nuclei
- ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets
- Stellar Evolution/the Sun and the Solar System

Proposal Type

- Standard
- Target Of Opportunity

Student Project

Continuation

Related Proposals

Previous Proposals

Recent Publications

Investigators

Spectral Spatial Proposal Catalog

Feedback

Description Suggestion

Proposal Program Problems Information Log

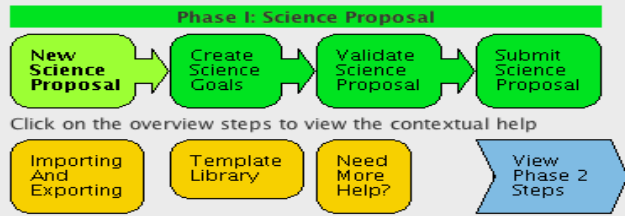
• Stippled edges can be dragged to resize panes



Overview

Contextual Help

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



Project - Observing Tool for ALMA (Early Release, version [Dec27,1300CET] Perspective 1

File Edit View Tool Search Debug Help

Project Structure

- unnamed project
 - Project
 - Proposal

Editors

Proposal Information

Proposal Title

Proposal Cycle

Abstract (max. 300 words)

Scientific Category

- Cosmology and the High Redshift Universe
- Galaxies and Galactic Nuclei
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- Stellar Evolution/the Sun and the Solar System
- Target Of Opportunity

Previous Proposals

Recent Publications

Investigators

Spectral Spatial Proposal Catalog

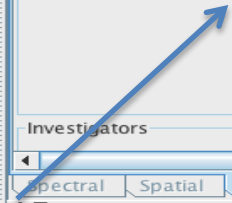
Feedback

Description Suggestion

Proposal Program

Problems Information Log

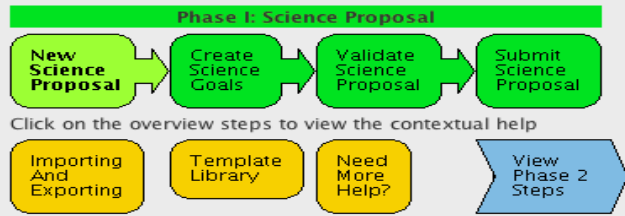
• Arrowheads maximize and minimize panes



Overview

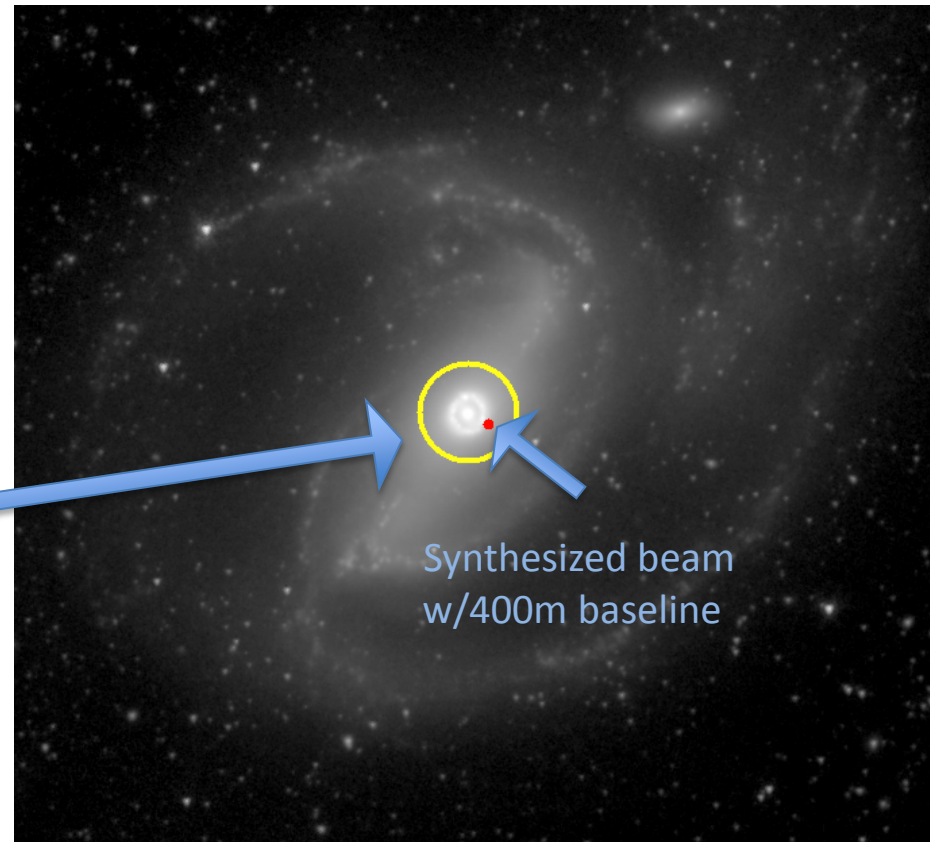
Contextual Help

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



A walk through of a simple example


- Observe molecular gas in NGC 1097
- Use CO (1-0) emission line
 - Rest frequency: 115.2712 GHz
 - Band 3 (2.6 mm)
- Size of NGC 1097 is 9' x 6'
- The field of view for a single pointing at 115 GHz is ~ 45"
- Single pointing of the nucleus
 - * **During ES, up to 50 pointing mosaics are allowed.**




Proposal Preparation Workflow – Using the Contextual help

Overview

Contextual Help

1. Create your science goals by either:
 - Selecting *Edit > New Phase-I Science Goal*
 - Clicking on the  icon in the toolbar
 - Or clicking on this [link](#)
2. Complete the field set-up and spectral set-up, etc. More than one science goal may be added.

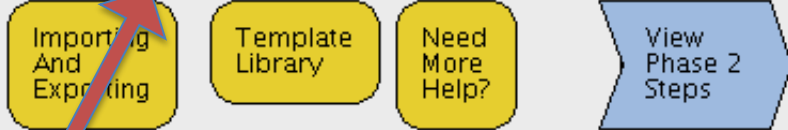
Phase I: Science Proposal



```

            graph LR
            A[New Science Proposal] --> B[Create Science Goals]
            B --> C[Validate Science Proposal]
            C --> D[Submit Science Proposal]
            
```

Click on the overview steps to view the contextual help



Click through the tabs and follow the instructions on the left.

Fill out these relevant fields



File Edit View Tool Search Help

Project Structure: Proposal, Program, Unsubmitted Proposal

Editors: Spectral, Spatial

Proposal

Proposal Title:

Proposal Cycle: 2011.0

Abstract (max. 300 words):

Launch Editor

Scientific Category

- Cosmology and the High Redshift Universe
- Galaxies and Galactic Nuclei
- ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets
- Stellar Evolution/the Sun and the Solar System

Proposal Type

- Standard
- Target Of Opportunity

Student Project

Continuation (Not Applicable)

Overview

Contextual Help

Phase I: Science Proposal

1. Create your science goals by either:

- Selecting *Edit > New Phase I Science Goal*

New

Create

Validate

Submit

Fill out these relevant fields

Proposal

Proposal Title

Proposal Cycle

Abstract (max. 300 words)

Scientific Category

- Cosmology and the High Redshift Universe
- Galaxies and Galactic Nuclei
- ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets
- Stellar Evolution/the Sun and the Solar System

Proposal Type

- Standard
- Target Of Opportunity

Student Project



Fill out these relevant fields



Proposal Type
 Standard Target Of Opportunity

Student Project

Continuation (Not Applicable)

Related Proposals

Previous Proposals

Recent Publications

Investigators



Title	Full name	Email	Affiliation	ALMA ID	Executive
PI	Not set	Not set	Not set	Not set	OTHER

Click here to set PI and co-Is



Select PI...

Add Col...

Remove Col

Add from Proposal...

Type in the name

Investigator search constraints

Name contains ksheth

Find Investigators

Full name	Email	Affiliation	ALMA ID
-----------	-------	-------------	---------

Search Results

No matching users found.

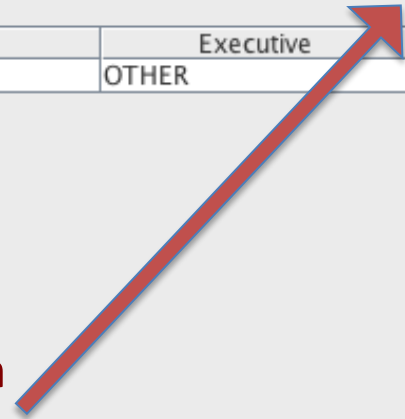
OK

An error may pop up

Select PI Cancel

Finding Help

Investigators



Title	Full name	Email	Affiliation	ALMA ID	Executive
PI	Not set	Not set	Not set	Not set	OTHER

- If you get stuck on any step, look for the ? Icon
- Click on it to get help.

Select PI...

Add Col...

Remove Col

Add from Proposal...

Next Up Previous Contents Index

Next: [Science Case and Supporting Up: The Phase 1 Proposal](#) Previous: [Proposal Information](#) [Contents](#) [Index](#)

Investigators

This panel is used to add information about the proposal investigators. This information is contained within a table that can only be populated by searching the ALMA user database. Therefore, all investigators must already be registered with ALMA via the SciencePortal (<http://almascience.org>). One Principal Investigator (PI) is required and one or more Co-Investigators (CoI) may also be added.

Set PI... Add Col... Remove Col Add from Proposal...

Figure 4.2: The table of investigators in the proposal form.

The table contains a row for each investigator and includes the information contained within the User Database. It is for information only and cannot be edited. The following details are displayed:

- **Title** : This indicates whether the individual is the PI or a CoI.
- **Full Name** : This is the full name of the investigator, as stored in the ALMA user database.
- **Email** : The email address of the investigator, as stored in the ALMA user database.
- **Affiliation** : The affiliation of the investigator, as stored in the ALMA user database.
- **ALMA ID** : This is the ALMA User Portal User ID of the investigator.
- **Executive** : This is the executive of the user that is based on their institute's location and is used for time charging purposes.

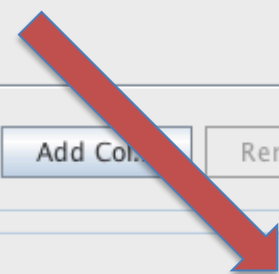
The buttons below the panel can be used to fill the Investigator table:

Adding the Sci / Tech Justification

Investigators ?

Title	Full name	Email	Affiliation	ALMA ID	Executive
PI	Kartik Sheth	ksheth@nrao.edu	National Radio Astron...	kartiksheth	NA
Col	JohnTest HibbardTest	jhibbard@nrao.edu	National Radio Astron...	jhibbard	NA
Col	Martin Zwaan	mzwaan@eso.org	European Southern Ob...	mzwaan	EU

Attach your scientific justification, etc. here as PDF files








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













Science & Technical Case ?

Science & Technical Case (Mandatory, PDF, 5 pages max.) Attach... Detach View...

Observatory Use Only ? +

Open

Look In:     

 n1097hcn.aot	 s4g
 naasc2011pdocshortlist.xlsx	 S4G
 NAASCTutorialsWorkingDoc	 s4g
 obsprep_phase1andload.xls	 s4g
 PostdocNaasc2011.xlsx	 SAC
 proofnotes	 seni

File Name:

Files of Type:

Title	
	Kartik
	JohnTe
	Martin

	Executive
	NA
	NA
	EU

Technical Case

Technical Case (Mandatory, PDF, 5 pages max.)

Click on this turnkey to continue

Project Structure

Proposal Program

Unsubmitted Proposal

- 📁 Nucleus of NGC 1097
 - 📄 Proposal
 - 📁 Planned Observing

Editors

Spectral Spatial Proposal

Proposal Information

Proposal Title

Proposal Cycle

Abstract
(max. 300 words)

Nucleus of NGC 1097

2011.0

We propose to map the nucleus of the prototypical barred spiral NGC 1097 in CO(1-0) emission to map the distribution and kinematics of the molecular gas. These observations will shed crucial light on the connection between molecular gas emission and AGN feeding.

[Launch Editor](#)

Scientific Category

Cosmology and the High Redshift Universe

ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets

Galaxies and Galactic Nuclei

Stellar Evolution/the Sun and the Solar System

Proposal Type

Standard

Target Of Opportunity

Student Project

Continuation (Not Applicable)

Related Proposals

File Edit View Tool Search Help

- 1 New Proposal ⌘-N
- Open Project
- Save ⌘-S
- Save As
- Show ALMA Template Library
- Use Project as Template
- Validate ⌘-L
- Preferences
- Quit



Editors

Spectral Spatial Proposal

Proposal Information

Proposal Title Nucleus of NGC 1097

Proposal Cycle 2011.0

Abstract
(max. 300 words)

We propose to map the nucleus of the prototypical barred spiral NGC 1097 in CO(1-0) emission to map the distribution and kinematics of the molecular gas. These observations will shed crucial light on the connection between molecular gas emission and AGN feeding.

Launch Editor

Scientific Category

- Cosmology and the High Redshift Universe
- Galaxies and Galactic Nuclei
- ISM/Astrochemistry/Star Formation/protoplanetary disks/exoplanets
- Stellar Evolution/the Sun and the Solar System

Proposal Type

- Standard
- Target Of Opportunity

Feedback

Problems Information Log

1 error, 0 warnings

	Description	Suggestion
⊗	This proposal contains no Science Goals	Select the Planned Observing node in the Proposal tab and add

At any point you can check whether your proposal passes validation

Validation required before proposal can be submitted



File Edit View Tool Search Help



Project Structure

Editors

Proposal

Program

Spectral

Spatial

Planned Observing

Unsubmitted Proposal

- Nucleus of NGC 1097
 - Proposal
 - Planned Observing
 - Science Goal
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Perfor

**Press on Science Goal tab
to create a science goal**



What is a Science Goal in the OT?

- A science goal is:
 - One correlator ./ front end setup in one ALMA band
 - spectral windows, rest freq, polarization products, line/continuum modes*
 - Subject to one set of control parameters
 - spatial resolution, sensitivity, dynamic range
 - Using one mapping strategy
 - Mosaic or single-pointing
 - And one calibration strategy
 - User or system-defined
 - Applied to an arbitrary set of sky targets (field centers)
 - Each with its own LSR velocity
- **In ES all windows in one science goal must have same bandwidth + channel spacing**

Project Structure

Proposal Program

Unsubmitted Proposal

- Nucleus of NGC 1097
 - Proposal
 - Planned Observing
 - CO observation of nu**
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Perform

Editors

Spectral Spatial Science Goal

General (Optional)

Science Goal Name: CO observation of nucleus

Description: The goal is to resolve the CO line sufficiently ...

Describe your science goal if you wish – for the technical assessors (not required)

Launch Editor

SinglePoint

Source

Source Name: **Enter in Source Name and press here** Resolve

Choose a Solar System Object? Name of object: Unspecified

System: J2000 Sexagesimal display?

Source Coordinates: RA: 00:00:00.000 Dec: 00:00:00.000 Parallax: 0.00000 mas PM RA: 0.00000 mas/yr PM Dec: 0.00000 mas/yr

Source Velocity: 0.000 km/s Isr z: 0.000000 Doppler Type: RADIO


Target Type: Multiple single point fields 1 rectangular field

Expected Source Properties (for Technical Assessment)

Peak Flux Density per Beam: 0.00000 Jy

Polarisation Percentage: 0.0 %

Information

 The object "NGC 1097" was resolved by simbad.ustrasbg.fr
 Co-ordinates are RA: 02:46:19.058, DEC: -30:16:29.680
 Please check the results obtained

Do not show this message again

Source Name

Choose a Solar System Object? Name of object

System Sexagesimal display?

Parallax

PM RA

Source Coordinates RA

Make sure and double check the coordinates.

LAUNCH EDITOR

NGC 1097

Resolve

Star System Object?

Name of object Unspecified

System

J2000

Sexagesimal
display?

Parallax

0.00000

mas

Coordinates

RA

02:46:19.058

PM RA

0.00000

mas/yr

Dec

-30:16:29.680

PM Dec

0.00000

mas/yr

Resolved by simbad.ustrasbg.fr

Velocity

1254.000

km/s

hel

z 0.004192

Doppler Type

RELATIVISTIC

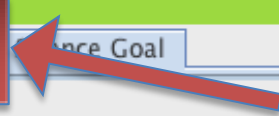
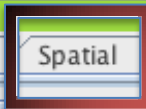
Multiple single point fields 1 rectangular field

Technical Assessment)

Check the velocity used -> observing frequency.

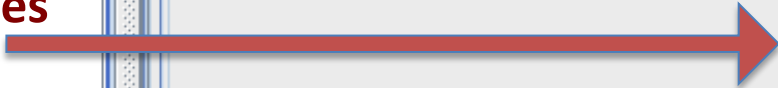
Unsubmitted Proposal

- Nucleus of NGC 1097
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 - CO observation of nu
 - General
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 - Spectral Setup
 - Calibration Setup
 - Control and Perform



Click on Spatial Tab to visualize observations

Red text indicates incorrect value



NGC 1097

Source

Source Name: NGC 1097

Choose a Solar System Object?

Name of object: Unspecified

System: J2000 Sexagesimal display?

Parallax: 0.0000

Source Coordinates: RA: 02:46:19.058 PM RA: 0.0000
Dec: -30:16:29.680 PM Dec: 0.0000
Resolved by simbad.ustrasbg.fr

Source Velocity: 1254.000 km/s hel z: 0.004192 Dop

Target Type: Multiple single point fields 1 rectangular field

Expected Source Properties (for Technical Assessment)

Peak Flux Density per Beam: 0.00000 Jy

Polarisation Percentage: 0.0 %

Line Width: 0.00000 km/s

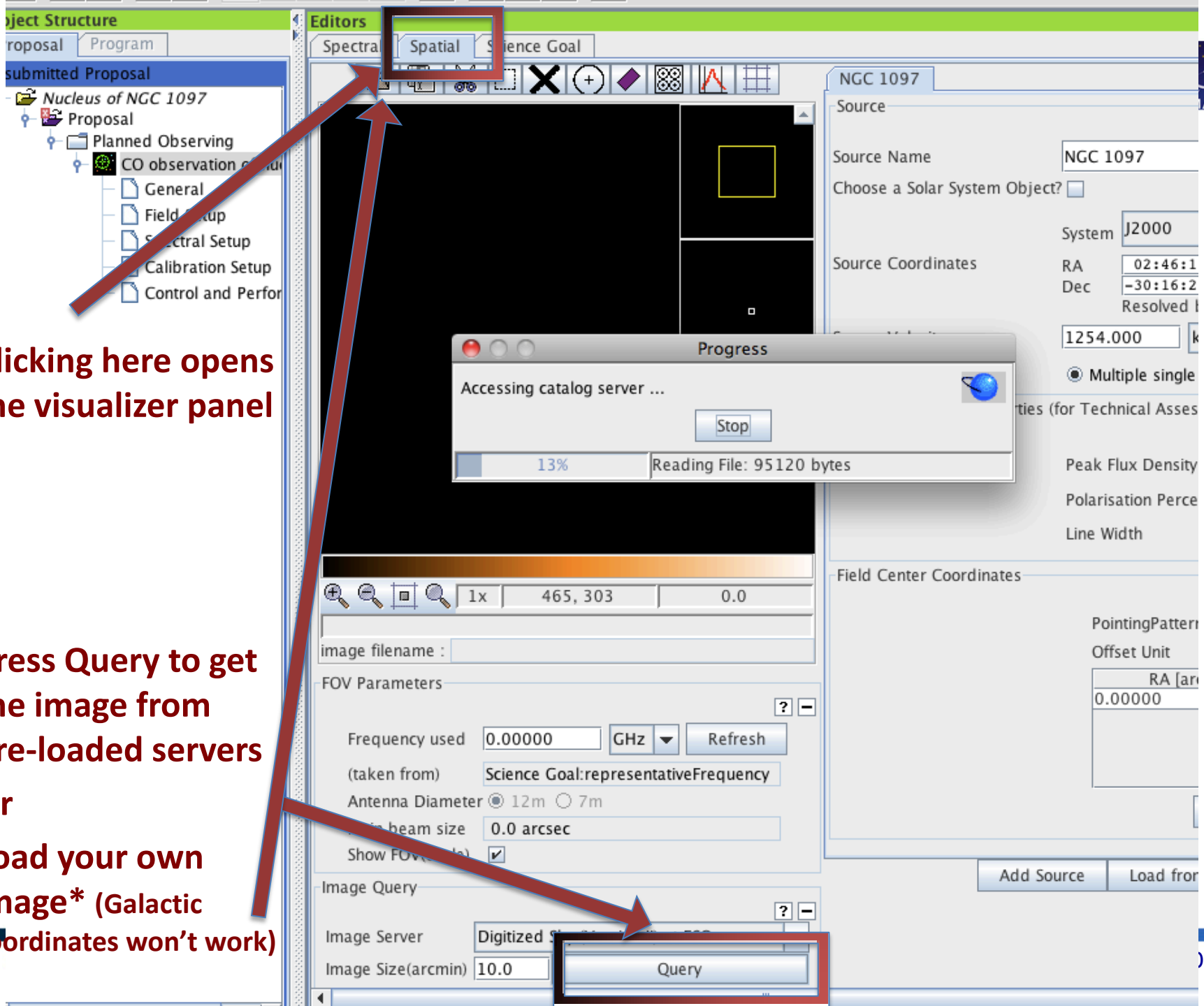
Field Center Coordinates

PointingPattern: Offset

Offset Unit: arcsec

RA [arcsec]	Dec [arcsec]
0.00000	0.00000

Add Delete

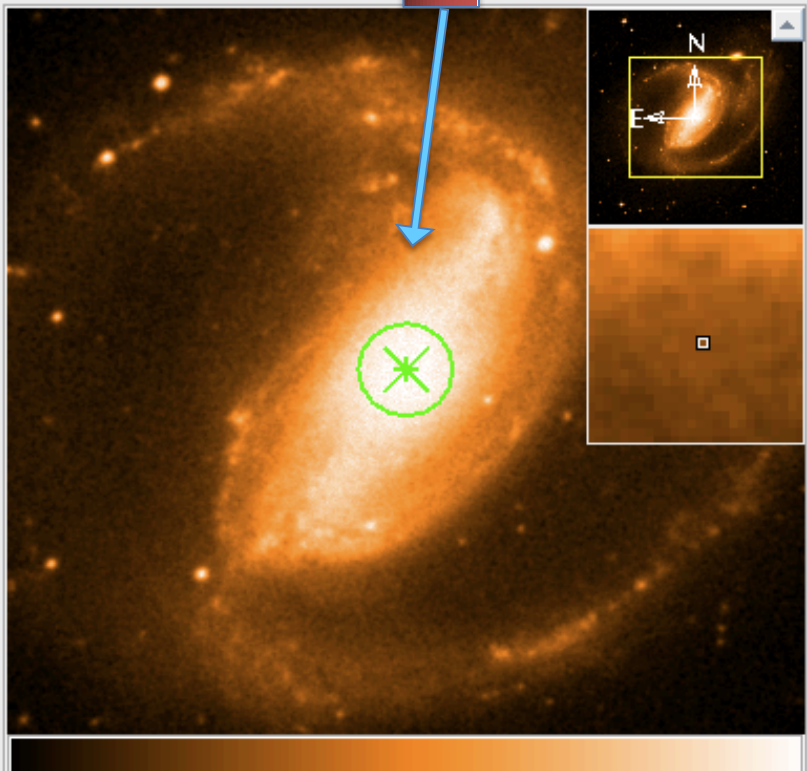


Clicking here opens the visualizer panel

**Press Query to get the image from pre-loaded servers
Or
Load your own image* (Galactic coordinates won't work)**



of nu
p
etup
perfor



NGC 1097

Source
Source Name
Choose a Sol
Source Coord
Source Veloci
Target Type
Expected So
Field Center



1x | 253, 197 | 10519.0
02:46:22.596, -30:18:11.04 (J2000)
image filename : .jsky3/cache/jsky4822680475609187606.fits

FOV Parameters

Frequency used GHz

(taken from)

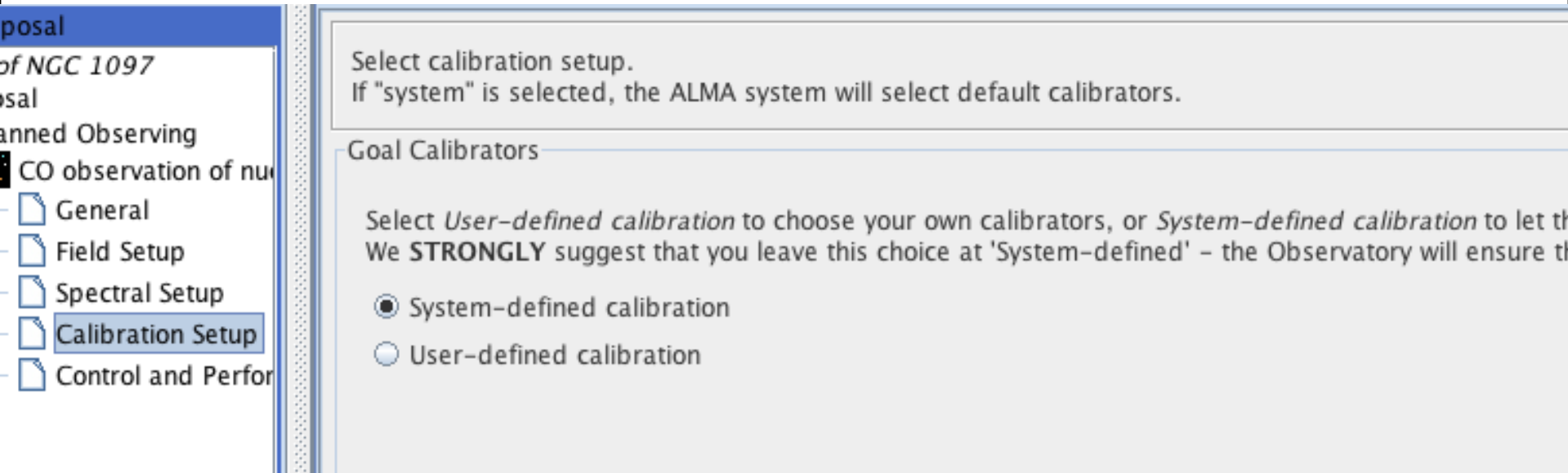
Antenna Diameter 12m 7m

Main beam size

Show FOV(circle)

Enter
frequency





Proposal
of NGC 1097
Proposal
Planned Observing
CO observation of nu
General
Field Setup
Spectral Setup
Calibration Setup
Control and Perform

Select calibration setup.
If "system" is selected, the ALMA system will select default calibrators.

Goal Calibrators

Select *User-defined calibration* to choose your own calibrators, or *System-defined calibration* to let the system choose. We **STRONGLY** suggest that you leave this choice at 'System-defined' – the Observatory will ensure that the system-defined calibration is appropriate for the observation.

System-defined calibration
 User-defined calibration

For Calibration Set up – Unless you have a strong reason for using user-defined calibration – leave this as System-defined calibration.

Program

Proposal

Proposal of NGC 1097

proposal

Planned Observing

CO observation of nu

- General
- Field Setup
- Spectral Setup**
- Calibration Setup
- Control and Perform

Spectral Setup

You can set up spectral windows to be observed. Up to 4 can be observed at the highest frequency resolution depending on the bandwidths you specify. If you want to setup more than 4, you need to arrange them into 4 or fewer sets of spectral windows. Those sets are called "Basebands", and the width of a baseband is 2GHz.

Spectral Type

Spectral Type: Choose the type of spectral observation you wish to make

Polarization Products desired

Up to 4 spectral windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth, Channel Spacing

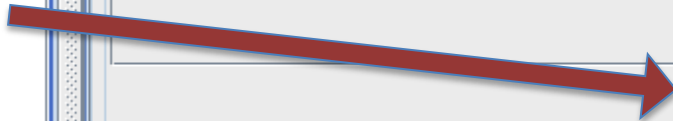
Spectral Setup Errors

No spectral window in the list. No suitable receiver band for the range :[0.0 GHz, 0.0 GHz]

Currently (ES- Cycle 0) supported modes

- Up to 4 spectral windows
- More than 4 spectral windows
- Single continuum (average frequency)
- Spectral scan
- SINGLE-X DUAL

Press here to add a line



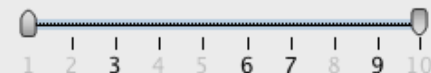
Select Lines to Observe...

Add Delete

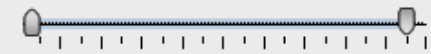
Filter / Species

Include description in search

ALMA Band



Sky Frequency (GHz)

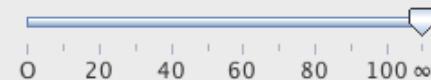


Min 31.3 Max 950

Sideband Filter

- Enable sideband filter
Filtering lines outside sidebands

Maximum Upper-state Energy (K)



Molecule Filter / Environment

Show all atoms and molecules

Reset Filters

Search Online

Notes

- The initial database is an offline database...
Additional transitions from the full catalogue can be found by clicking Search Online.
Search Online is only enabled when a species is given, environment filter is disabled and frequency constrained to one ALMA band or less

Transitions matching your filter settings

Table with columns: Transition, Description, Rest..., Sky Fr..., Upper-s..., Lovas..., Sij μ². Rows include H(99)ε, H(84)γ, HC7N v=0 J=28-27, He(84)γ, C(84)γ, HC13CCCN 12-11, HCCC13CN 12-11, H(92)δ, He(92)δ, C6H J=23/2-21/2, Ω=3/2, l=e, C6H J=23/2-21/2, Ω=3/2, l=f, H2COH+ 3(0,3)-2(1,2), HCC13CCCN 12-11, HCCC13CCN 12-11, HC5N J=12-11, HC9N 55-54, U-32033.9, C6H J=23/2-21/2, Ω=1/2, l=f, C6H J=23/2-21/2, Ω=1/2, l=e, H(104)ζ, C8H J=55/2-53/2, Ω=3/2, F..., C8H J=55/2-53/2, Ω=3/2, F..., C8H J=55/2-53/2, Ω=3/2, F..., C8H J=55/2-53/2, Ω=3/2, F..., H(98)ε, H(73)β, He(73)β, C(73)β, HC9N 56-55

Add to Selected Transitions

Selected transitions

Table with columns: Transition, Description, Rest Frequency, Sky Frequency, Upper-state Energy, Lovas Intensity, Sij μ². Currently empty.

Remove from Selected Transitions

Type in CO

A Splatalogue window will open up.



Filter / Species

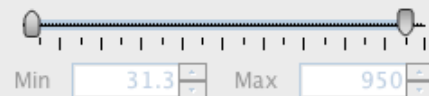
CO

Include description in search

ALMA Band



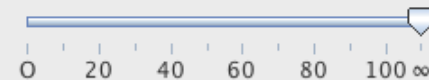
Sky Frequency (GHz)



Sideband Filter

- Enable sideband filter
- Filtering lines outside sidebands

Maximum Upper-state Energy (K)



Molecule Filter / Environment

Show all atoms and molecules

Reset Filters

Search Online

Notes

- The initial database is an online catalogue containing selected transitions from the full spectral line catalogue.
- Additional transitions from the full catalogue can be found by clicking *Search Online*.
- *Search Online* is only enabled when a species is given, environment filter is disabled and frequency constrained to one ALMA band or less

Transitions matching your filter settings

Transition	Description	Rest Freq	Sky Freq	Upper-state Energy	Lovas Intensity	Sij μ^2
CO v=0 1-0	Carbon Monoxide	115.27...	114....	5.532 K	60	0.01...

Double click on the transition

Transition moves into this window

Add to Selected Transitions

Selected transitions

Transition	Description	Rest Frequency	Sky Frequency	Upper-state Energy	Lovas Intensity	Sij μ^2
CO v=0 1-0	Carbon...	115.271 GHz	114.79 GHz	5.532 K	60	0....

Press here to accept selection

Remove from Selected Transitions

Close Dialog and Apply Selection



Spectral Type

- Spectral Type: Choose the type of spectral observation you wish to make
- Up to 4 spectral windows
 - More than 4 spectral windows
 - Single continuum (average frequency)
 - Spectral scan
- Polarization Products desired
- SINGLE-X
 - DUAL

Up to 4 spectral windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth, Channel Spacing	Process As Continuum
115.27120 GHz	114.79004 GHz	CO v=0 1-0	58.594 MHz(153 km/s), 15.259 kHz(0.040 km/s)	<input type="checkbox"/>

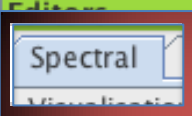
Select Lines to Observe...

Add

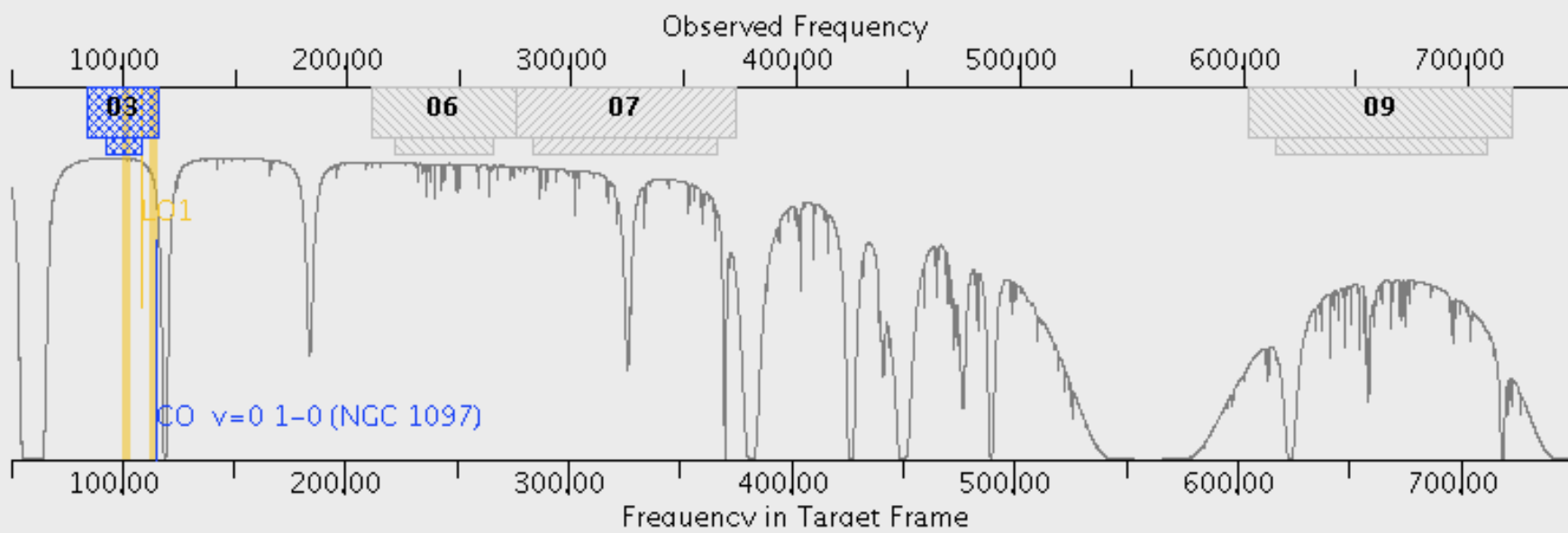
Delete

Spectral Setup Errors

Click on Spectral Tab to visualize observations



After creating spectral setups in the forms you may visualize them here.
Left/right click to zoom in/out, grab sliding bar to pan
Note: Moving LO1 here is for experimentation only - actual setup determined by the windows



Overlays: Receiver Bands Transmission Overlay Lines [Select Lines to Overlay...](#)

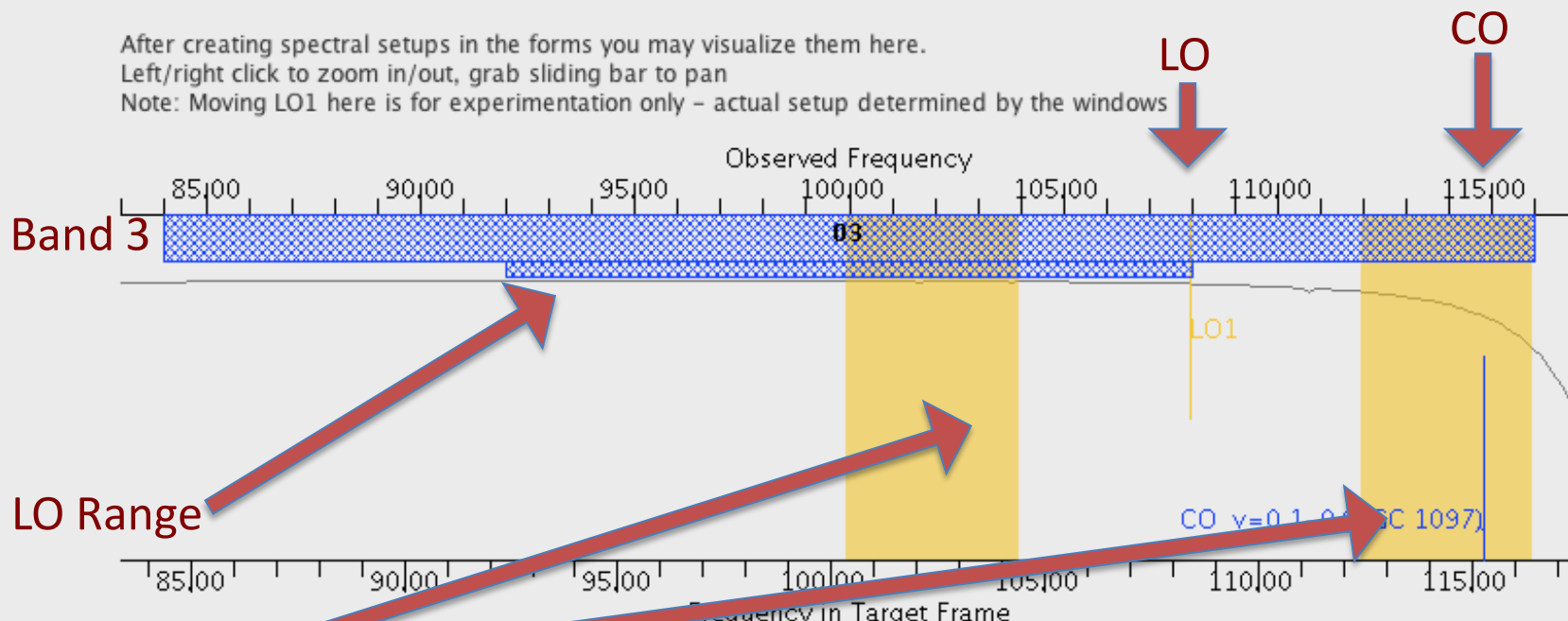
Viewport: [Pan to Line](#) [Zoom to Band](#) [Reset](#)

Spectral Type

Up to 4 spectral windows

Visualisation

After creating spectral setups in the forms you may visualize them here.
 Left/right click to zoom in/out, grab sliding bar to pan
 Note: Moving LO1 here is for experimentation only - actual setup determined by the windows



Sidebands

Overlays: Receiver Bands Transmission Overlay Lines [Select Lines to Overlay...](#)

Viewport: [Pan to Line](#) [Zoom to Band](#) [Reset](#)

Spectral Type

- Spectral Type: Choose the type of spectral observation you wish to make
- Up to 4 spectral windows
 - More than 4 spectral windows
 - Single continuum (average frequency)
 - Spectral scan
- Polarization Products desired
- SINGLE-X
 - DUAL

Press here to change resolution

Up to 4 spectral windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth, Channel Spacing	Process As Continuum
115.27120 GHz	114.79004 GHz	CO v=0 1-0	58.594 MHz(153 km/s), 15.259 kHz(0.040 km/s)	<input type="checkbox"/>

Spectral scan

Polarization Products desired

SINGLE-X DUAL

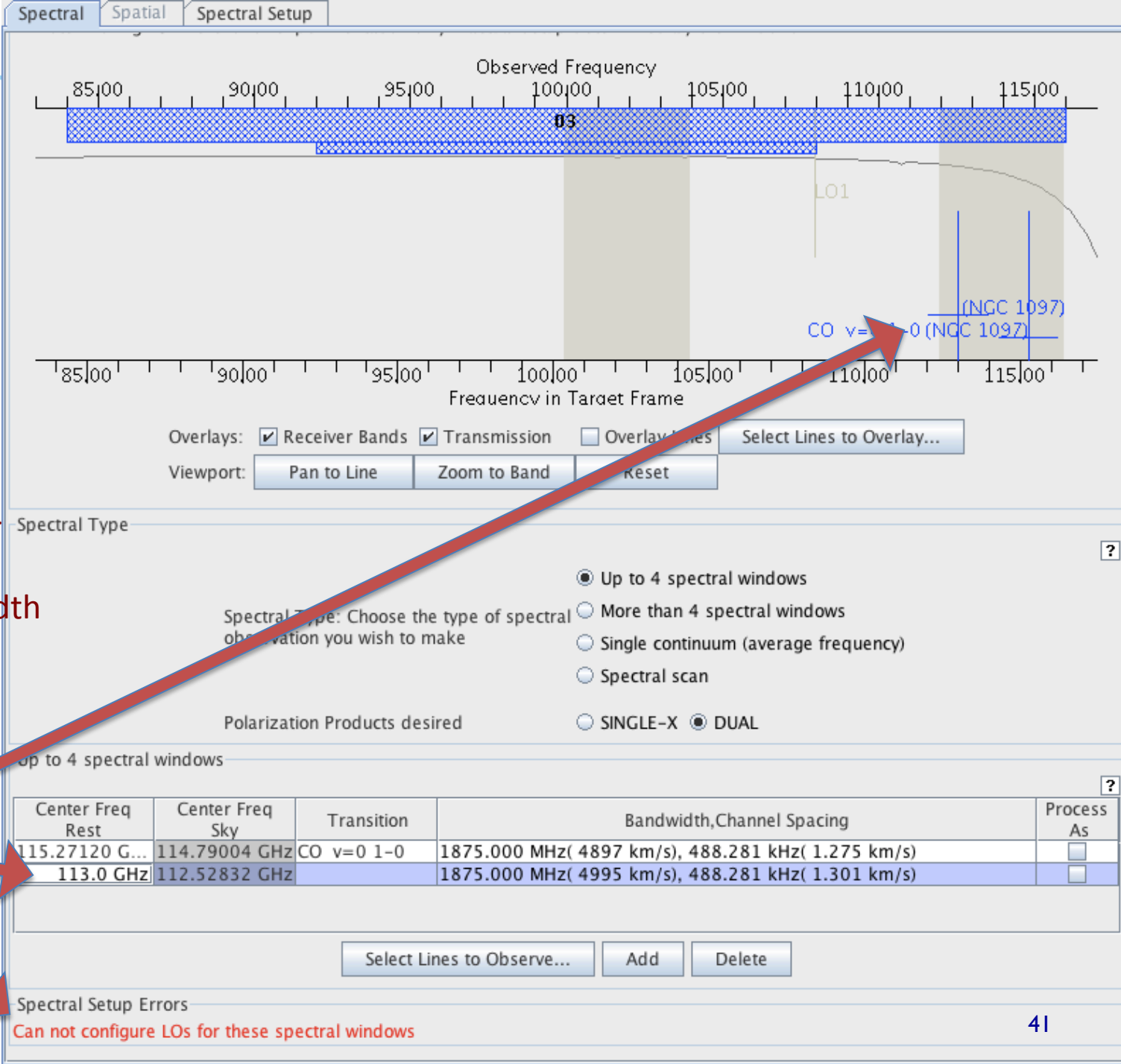
Up to 4 spectral windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth, Channel Spacing
115.27120 GHz	114.79004 GHz	CO v=0 1-0	58.594 MHz (153 km/s), 15.259 kHz (0.040 km/s)
			58.594 MHz (153 km/s), 15.259 kHz (0.040 km/s)
			117.188 MHz (306 km/s), 30.518 kHz (0.080 km/s)
			234.375 MHz (612 km/s), 61.035 kHz (0.159 km/s)
			468.750 MHz (1224 km/s), 122.070 kHz (0.319 km/s)
			937.500 MHz (2448 km/s), 244.141 kHz (0.638 km/s)
			1875.000 MHz (4897 km/s), 488.281 kHz (1.275 km/s)
			2000.000 MHz (5223 km/s), 15.625 MHz (40.807 km/s)

Select

Spectral Setup Errors

Tradeoff between
bandwidth & resolution

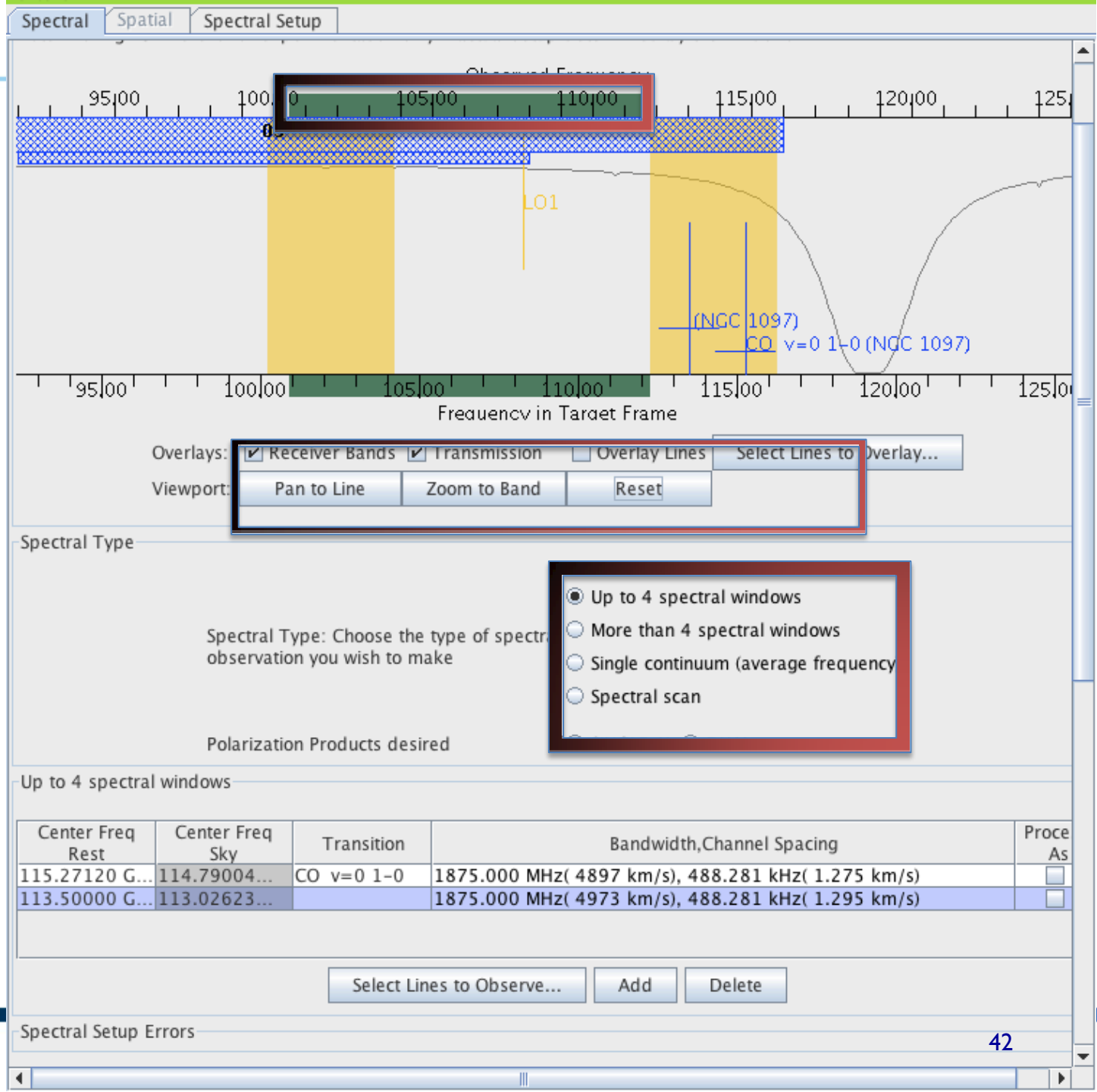


Can add up to 4 spectral windows — **must** have same resolution/bandwidth for early science

Location of windows is constrained



A very versatile tool with lots of options



Program | Spectral | Spatial | **Control and Performance**

Proposal
 Proposal of NGC 1097
 Planned Observing
 CO observation of nu
 General
 Field Setup
 Spectral Setup
 Calibration Setup
 Control and Performance

These parameters are used to control various aspects of the observations, including the required antenna configurations and integration time. The Representative Frequency is used to evaluate these performance targets, perhaps most critically in the time estimate where it sets the OT. The OT chooses a reasonable default although this can be changed.

Control and Performance

Representative Frequency: 114.79004 GHz

Antenna Beamsize (λ/D): 12m 44.9 arcsec

Early Science Extended Configuration:
 Max Baseline(L) and corresponding beam size(λ/L): 400.0 m 1.4 arcsec

Early Science Compact Configuration:
 Max Baseline(L) and corresponding beam size(λ/L): 125.0 m 4.3 arcsec

Desired Angular Resolution: 0.00000 arcsec

Largest Angular Scale of source: Point Source Extended Source 0.00000 arcsec

Desired Sensitivity per Pointing: 0.00000 Jy equivalent to Infinity K

Bandwidth used for Sensitivity: [dropdown] Resolution: [dropdown] Frequency Width: 488.281 kHz

Sensitivity Calculator | Time Estimate

Does your setup need more time than is indicated by the time estimate? Yes No

Is this observing time constrained (occultations, coordinate observing,...)? Yes No

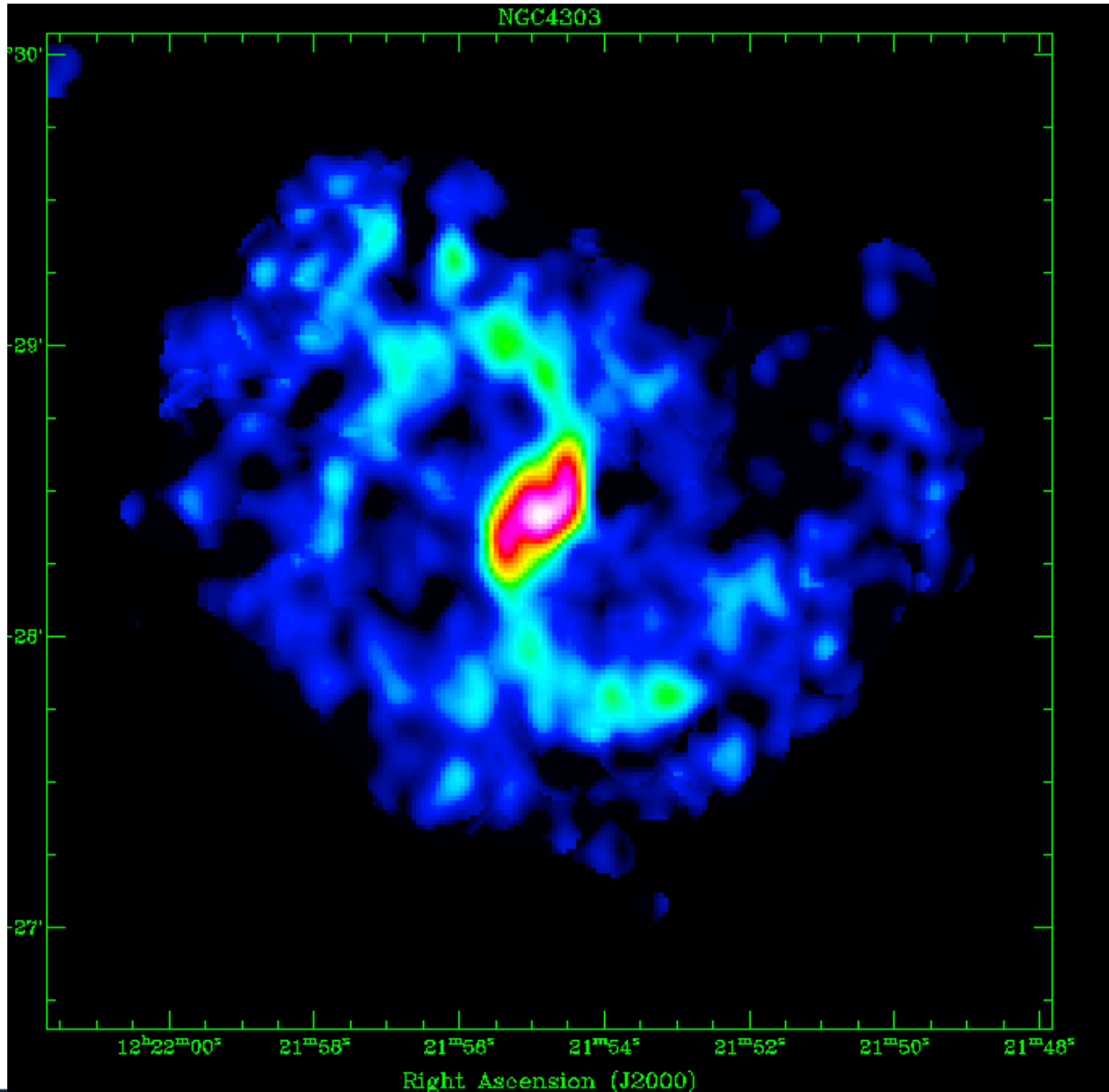
ACA Use: (ACA Not yet available)

Enter in Max Angular Scale

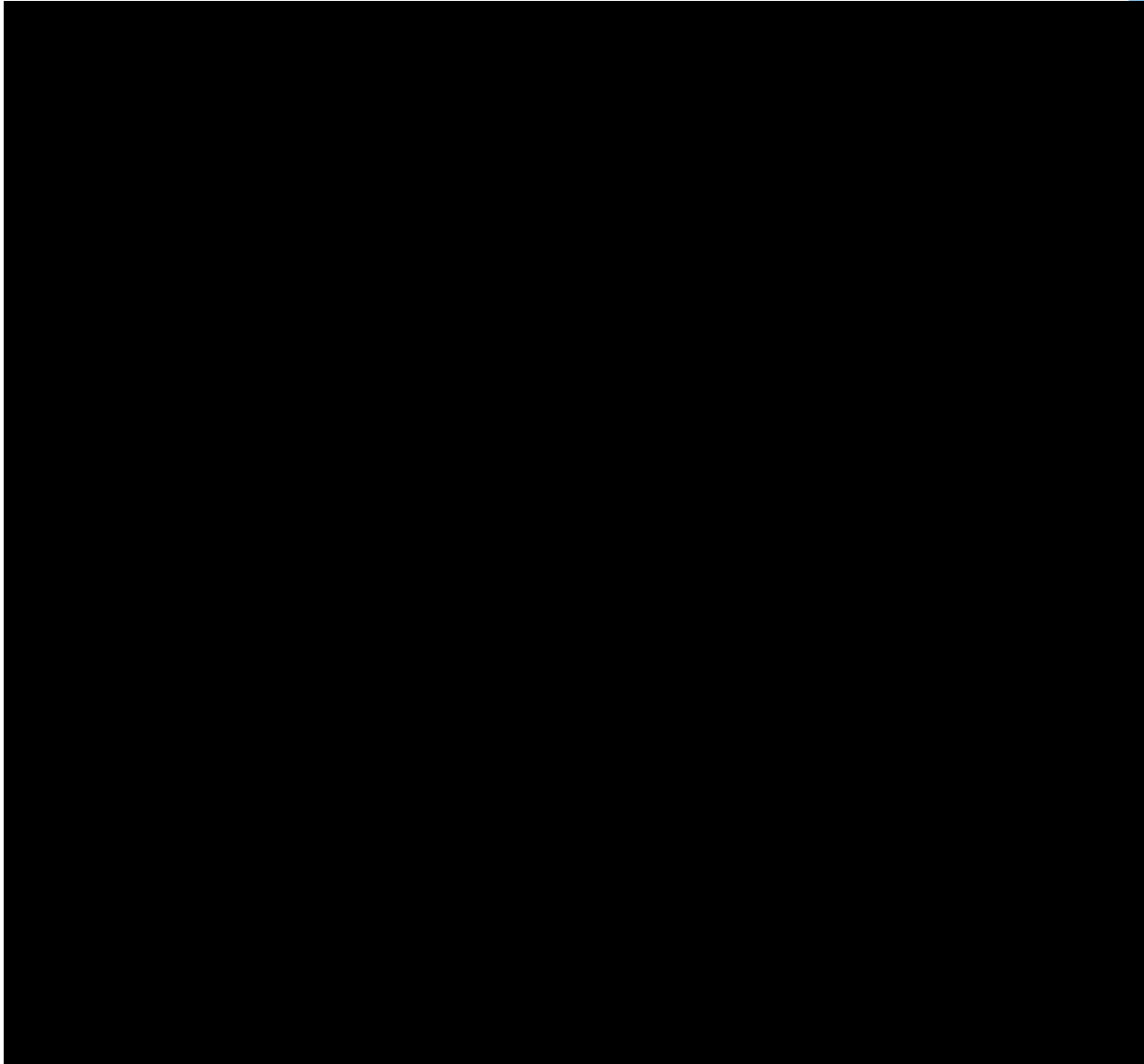
Request the resolution and sensitivity you need for your science goal



Typical CO Emission in Nearby Galaxies



NGC 4303

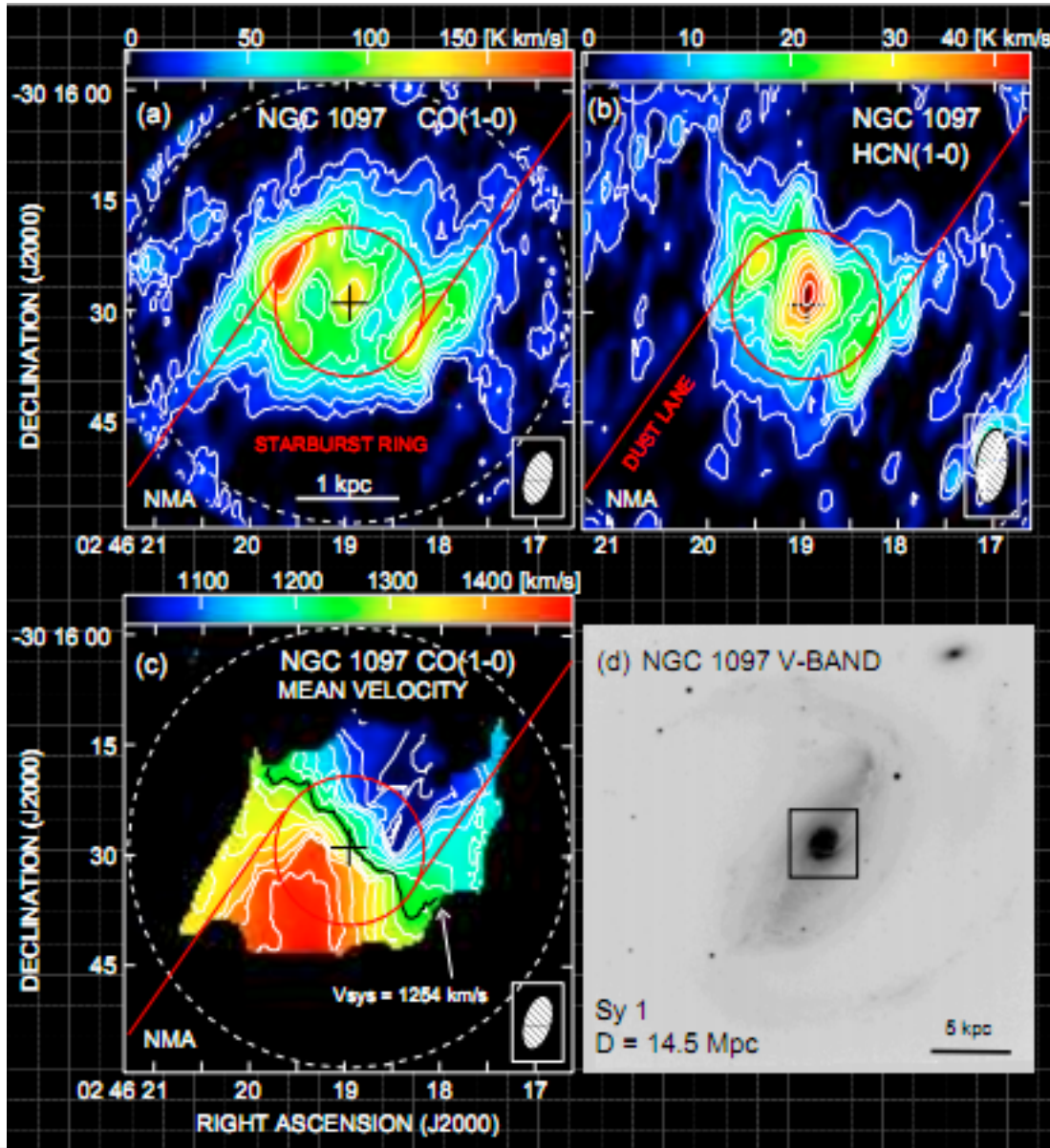


Start thinking in terms of data cubes

We can measure not only the mass and distribution of the molecular gas but also its kinematics

NGC 4303

Back to our example of NGC 1097



To get a 10σ detection on the faintest emission in the map requires ~ 10 mJy/bm in a 10 km/s channel.

The ALMA correlator gives 1.275 km/s channels – we will bin 8 channels to get to 10 km/s.

(So required sensitivity in 1 ALMA correlator channel ~ 10 mJy/bm * $\sqrt{8}$ ~ 28 mJy/bm)

Control and Performance

Representative Frequency

114.79004 GHz

Antenna Beamsize (λ/D)

12m 44.9 arcsec

Early Science Extended Configuration:

Max Baseline(L) and corresponding beam size(λ/L)

400.0 m 1.4 arcsec

Early Science Compact Configuration:

Max Baseline(L) and corresponding beam size(λ/L)

125.0 m 4.3 arcsec

Desired Angular Resolution

1.40000 arcsec

Largest Angular Scale of source

Point Source Extended Source 20.0 arcsec

Desired Sensitivity per Pointing

10.00000 mJy equivalent to 0.52200 K

Bandwidth used for Sensitivity

User Frequency Width 10.00000 km/s

Sensitivity Calculator

Time Estimate

Does your setup need more time than is indicated by the time estimate?

Yes No

**1.4" ~ 110pc
Sufficient to
resolve the ring**

**Press here to get an idea of
how long it will take to do this**

Common Parameters

Dec	-30:16:29.680		
Polarization	Dual		▼
Observing Frequency	114.79004	GHz	▼
Bandwidth per Polarization	0.00383	GHz	▼
Water Vapour Column Density	Calculator Chooses		▼
tau/Tsky	tau=0.169, Tsky=40.711 K		
Tsys	118.671 K		

Individual Parameters

	12m Array		7m Array		Total P
Number of Antennas	16		0		0
Resolution	1.40000	arcsec ▼	17.956446 arcsec		44.89
Sensitivity(rms)	10.00000	mJy ▼	10.00000	mJy ▼	10.000
(equivalent to)	0.52200	K ▼	0.00317	K ▼	0.0003
Integration Time	2.46813	min ▼	Infinity	d ▼	Infinity

Integration Time Unit Option

ALMA with 16 x 12m antennas is very fast!

- **BUT be aware that your UV-coverage may not be ideal – we recommend that you use simdata to check**

Control and Performance

Representative Frequency	<input type="text" value="114.79004"/>	GHz	▼
Antenna Beamsize (λ/D)	<input type="text" value="12m44.9 arcsec"/>		
Early Science Extended Configuration: Max Baseline(L) and corresponding beam size(λ/L)	<input type="text" value="400.0 m"/>	<input type="text" value="1.4 arcsec"/>	
Early Science Compact Configuration: Max Baseline(L) and corresponding beam size(λ/L)	<input type="text" value="125.0 m"/>	<input type="text" value="4.3 arcsec"/>	
Desired Angular Resolution	<input type="text" value="1.40000"/>	arcsec	▼
Largest Angular Scale of source	<input type="radio"/> Point Source	<input checked="" type="radio"/> Extended Source	<input type="text" value="20.0"/> arcsec ▼
Desired Sensitivity per Pointing	<input type="text" value="10.00000"/>	mJy ▼	equivalent to <input type="text" value="0.52200"/> K ▼
Bandwidth used for Sensitivity	User ▼	Frequency Width	<input type="text" value="10.00000"/> km/s ▼
	Sensitivity Calculator		Time Estimate
Does your setup need more time than is indicated by the time estimate?	<input type="radio"/> Yes <input checked="" type="radio"/> No		

Information

Estimated time

Requested Sensitivity	10.0000 mJy
Bandwidth used for Sensitivity	0.004 GHz
Required Time on Source per Pointing	2.47 min
Number of Antenna Configurations	1
Total Number of Pointings	1
Total on Source	2.47 min
Total Estimated Time (inc. Calibration)	3.87 min

Calibration Breakdown

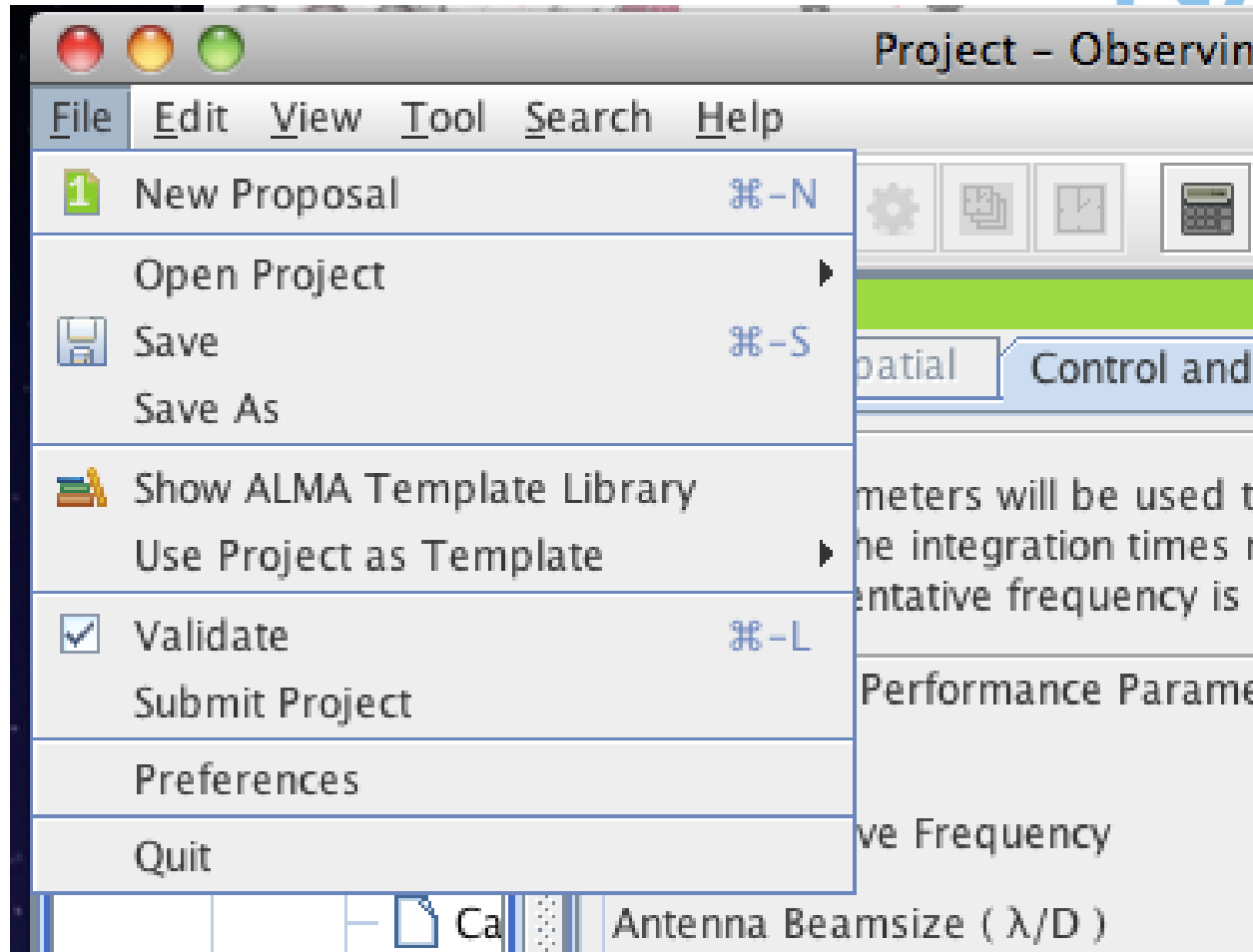
Amplitude (inc. AtmosphericCal)	26.12 s x 1 = 26.12 s
Pointing	18.00 s x 1 = 18.00 s
Phase	8.00 s x 1 = 8.00 s
Bandpass (inc. AtmosphericCal)	32.10 s x 1 = 32.10 s

Achievable Sensitivity

CO v=0 1-0 with 12m Array	10.0000 mJy
Line@114 with 12m Array	7.9280 mJy

OK

Time allocation for the proposal will be the Total Estimated time.



Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - Science Goal
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Perform

Editors

Spectral Spatial Control and Performance

These parameters are used to control various aspects of the observations, including the required antenna configurations and integration times. The Representative Frequency is used to evaluate these performance targets, perhaps most critically in the time estimate where it sets the atmosphere. The OT chooses a reasonable default although this can be changed.

Control and Performance

Representative Frequency GHz

Antenna Beamsize (λ/D)

Early Science Extended Configuration:
Max Baseline(L) and corresponding beam size(λ/L)

Early Science Compact Configuration:
Max Baseline(L) and corresponding beam size(λ/L)

Desired Angular Resolution arcsec

Largest Angular Scale of source Point Source Extended Source arcsec

Desired Sensitivity per Pointing Jy equivalent to K

Bandwidth used for Sensitivity Frequency Width

Does your setup need more time than is indicated by the time estimate? Yes No

Is this observing time constrained? Yes No

Feedback

Problems Information Log

14 errors, 1 warning

	Description	Suggestion
✘	No Principal Investigator specified	Select the top level Project node in the tree and fill in the Principal Investigator
✘	No Project Name specified	Select the top level Project node in the tree and fill in the Project Name field
✘	Abstract appears to be empty	Select the proposal node in the Proposal tab and edit your abstract
✘	No scientific category defined	Select Proposal node and set a scientific category
✘	No proposal type defined	Select Proposal node and set a proposal type
✘	No document found - you must add a Science Case to your	Select the proposal node in the Proposal tab and add your document
✘	At least 1 spectral window is needed.	Revise the spectral setup or move some of the targets to a different Science
✘	Desired sensitivity is too small	Select the Control Parameters in the Science Goal and enter a valid value
✘	Representative frequency is not valid	Select the Control Parameters in the Science Goal and enter a valid value
✘	Desired Angular resolution is outside the range of possible	Select the Control Parameters in the Science Goal and enter a valid value

See also known issues:

<http://almasw.hq.eso.org/almasw/bin/view/OBSPREP/Cycle0KnownIssues>

Portals: [ESO](#) [NRAO](#) [NAOJ](#)

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[Capabilities](#)

[Road Map](#)

[Proposers Guide](#)

[Technical Guide](#)

[Observing Tool](#)

[Webstart Download Page](#)

[Tarball Download Page](#)

[OT Video Tutorials](#)

[Troubleshooting](#)

[Sensitivity Calculator](#)

[Notice of Intent](#)

[ALMA Data](#)

[Documents & Tools](#)

User Services at ARCs

- [Helpdesk](#)
- ALMA@ESO
- ALMA@NRAO

Home ▶ Call for Proposals ▶ Observing Tool ▶ **Troubleshooting**

Troubleshooting

On this page we provide help for a number of common problems encountered with the OT. If you have any further questions or discover a new bug, please contact us via the ALMA Helpdesk.

A web page with [known OT issues](#) is maintained and updated regularly. Please check this page for any reports of issues related to the problem you are experiencing.

Which version of Java am I running?

Java 6 is often synonymously called Java 1.6 or J2SE 1.6 which refers to its internal version number. Check your java version on the command line by typing

```
> java -version
```

The output should read something like this:

```
java version "1.6.0_21"
Java(TM) SE Runtime Environment (build 1.6.0_21-b06)
Java HotSpot(TM) Client VM (build 17.0-b16, mixed mode, sharing)
```

An output like this (with the 1.6.x) means you have Java 6 installed.

What do I do if I don't have Java 6 installed?

If you do not have Java 6 installed, go to <http://www.java.com>. Download and install Java Runtime Environment Version 6.0. For LINUX users we also provide an OT installation complete with the appropriate version of Java (see the tarball installations page).

What do I do if I can't install Java 6 on my Mac?

Apple do not provide Java 6 for 32-bit Macs (Intel or PowerPC) unless you are running OS X 10.6 (Snow Leopard). This is clearly a significant issue, but fortunately there is a relatively simple solution in the form of an open source alternative called [SoyLatte](#). SoyLatte does not appear to support Java WebStart, so it has to be used with the tarball version of the OT.

To get started with SoyLatte, first install it on your system and set the PATH and JAVA_HOME environment variables appropriately. You can check the SoyLatte java executable is found by the system by typing 'java -version', which should output something like 'Java(TM) SE Runtime Environment (build 1.6.0_03-p3-landonf_19_aug_2008_15_52-b00)'. Also, if you 'echo \$JAVA_HOME' it should show the location of your SoyLatte installation. For more

Contents

1. [Which version of Java am I running?](#)
2. [What do I do if I don't have Java 6 installed?](#)
3. [What do I do if I can't install Java 6 on my Mac?](#)
4. [I am a Linux user running the Iced Tea version of Java. What do I do?](#)
5. [What do I do if I am experiencing problems with Java WebStart?](#)
6. [What do I do if nothing happens on-screen when I try to start the OT?](#)
7. [Where do I find the .almaot file?](#)
8. [What do I do if startup of the OT fails?](#)
9. [What do I do if the OT screen appears, but I permanently see dialog boxes saying "your current look-and-feel caused an error"?](#)
10. [What do I do if I see unformatted text or no content at all in the OT subwindows?](#)
11. [Why am I experiencing disk space problems when running the WebStart version of the OT?](#)



NAASC Tutorials & Community Events

- Jan 18, Victoria, BC
- Feb 10-11, Honolulu, HI
- Feb 24-25, Charlottesville, VA
- Mar 7, Philadelphia, PA
- Mar 11, Santa Fe, NM (New Horizons conference)
- Mar 15-16, Pasadena, CA
- Apr 18, Baltimore, MD
- Apr 20, Boston, MA
- Apr 26-27, Charlottesville, VA
- May 2-3, Gainesville, FL
- May 9-10, Iowa City, IOA
- May 9-10, Charlottesville, VA
- May 22-26, Boston, MA (AAS)
- May 27, NYC, NY



Rectangle Panel

This panel is only visible when "1 rectangular field" is selected in the *Source* panel (see above).



Figure 5.3: The *Rectangle* panel in the the Field Setup form for the Science Goal

- **Coords Type** : Field center in absolute or relative coordinates. If **Absolute** is selected the specifications for the field center need to be provided. In case **Relative** the offset from the source coordinates shall be provided.
- **System** : Coordinate System (**ABSOLUTE** only).
- **Sexagesimal display** : Check to switch between the coordinates formats.
- **RA** : The center coordinate (RA) of the rectangle (**ABSOLUTE** only).
- **DEC** : The center coordinate (Dec) of the rectangle (**ABSOLUTE** only).
- **Offset(Longitude)** : Longitude offset of the center of the rectangle from the source coordinate (**RELATIVE** only).
- **Offset(latitude)** : Latitude offset of the center of the rectangle from the source coordinate (**RELATIVE** only).
- **p length** : Length of the long side of the rectangle.
- **q length** : Length of the short side of the rectangle.
- **Position Angle** : Position angle of the long side of rectangle.
- **Spacing** : Spacing of the data required within the rectangle.

NGC 1097 ? -

Source Name Resolve

Choose a Solar System Object? Name of object

Source Coordinates

System Sexagesimal display?

Parallax

RA PM RA

Dec PM Dec

Source Velocity z

Target Type Multiple single point fields 1 rectangular field

Expected Target Properties (for Technical Assessment) ? -

Peak Flux Density

Polarisation Percentage

Line Width

Rectangle ? -

Coords Type ABSOLUTE RELATIVE

Field Center Coordinates

Offset(Longitude)

Offset(Latitude)

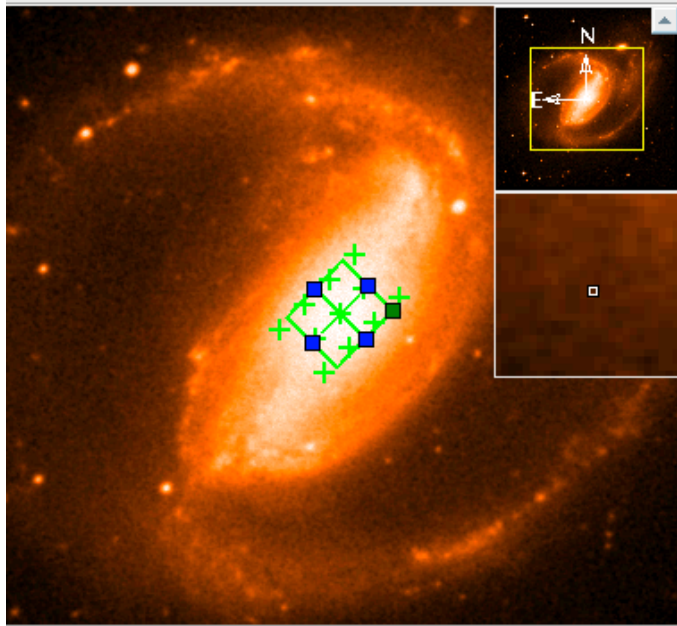
p length

q length

Position Angle

Spacing





1x 195, 146 7446.0

02:46:27.141, -30:19:02.04 (J2000)

image filename : .jsky3/cache/jsky8750309927902442062.fits

FOV Parameters

Frequency used GHz

(taken from)

Antenna Diameter 12m 7m

Main beam size

Show FOV(circle)

Image Query

Image Server

Image Size(arcmin)

NGC 1097

Source

Source Name

Choose a Solar System Object? Name of object

System Sexagesimal display?

Source Coordinates

RA	<input type="text" value="02:46:19.058"/>	Parallax	<input type="text" value="0.00000"/>	<input type="text" value="mas"/>
Dec	<input type="text" value="-30:16:29.680"/>	PM RA	<input type="text" value="0.00000"/>	<input type="text" value="mas/yr"/>
		PM Dec	<input type="text" value="0.00000"/>	<input type="text" value="mas/yr"/>

Source Velocity km/s z

Target Type Multiple single point fields 1 rectangular field

Expected Target Properties (for Technical Assessment)

Peak Flux Density Jy

Polarisation Percentage

Line Width km/s

Rectangle

Coords Type ABSOLUTE RELATIVE

Field Center Coordinates

Offset(Longitude) arcsec

Offset(Latitude) arcsec

p length arcsec

q length arcsec

Position Angle deg

Spacing arcsec

Editors

You can set up spectral elements (windows) to be observed. Up to 4 can be observed at the highest frequency resolution depending on the bandwidths you specify. If you want to setup more than 4, you need to arrange them into 4 or fewer sets of spectral elements/windows. Those sets are called "Basebands", and the width of a baseband is 2GHz.

Spectral Type ?

Spectral Type: Choose the type of spectral observation you wish to make

Polarization Products desired

Up to 4 spectral elements/windows
 More than 4 spectral elements/windows
 Single continuum (average frequency)
 Spectral scan

SINGLE_X SINGLE_Y DOUBLE FULL

Single continuum (average frequency) ?

Input Frequency Type Rest Frequency Sky Frequency

Sky Frequency GHz

Rest Frequency

Feedback

No suitable receiver band for the range :[107.2712000001 GHz, 123.27119999989999 GHz]

Editors

You can set up spectral elements (windows) to be observed. Up to 4 can be observed at the highest frequency resolution depending on the bandwidths you specify. If you want to setup more than 4, you need to arrange them into 4 or fewer sets of spectral elements/windows. Those sets are called "Basebands", and the width of a baseband is 2GHz.

Spectral Type



Spectral Type: Choose the type of spectral observation you wish to make

- Up to 4 spectral elements/windows
- More than 4 spectral elements/windows
- Single continuum (average frequency)
- Spectral scan

Polarization Products desired

- SINGLE_X
- SINGLE_Y
- DOUBLE
- FULL

Single continuum (average frequency)



Input Frequency Type Rest Frequency Sky Frequency

Rest Frequency GHz

Sky Frequency

Feedback

File Edit View Tool Search Debug Help

Preferences

Appearance Connection Colours Dialogs Telescope Advanced

Colours

General

- Clipboard
- Error
- Warning
- Phase1
- Phase2

Spectral Display

- Baseband
- Spectral Window
- Averaging Region
- Suppressed Windows
- Rest Frequency
- Centre Frequency
- Catalog Lines

Catalog Lines

Swatches HSB RGB

Recent:

Preview

Sample Text Sample Text

Sample Text Sample Text

Sample Text Sample Text

OK Cancel Reset

