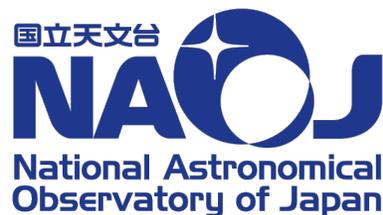


# From scheduling and Phase 2 generation viewpoints

Yu-Ting Wu

(ASIAA, P2G Cognizant Lead in EA)





# Outline

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- What is Phase 2?
- Why do we care about scheduling and Phase 2 generation?
- General considerations
  1. Angular resolution
  2. Weather
  3. Duplications
  4. Resubmissions

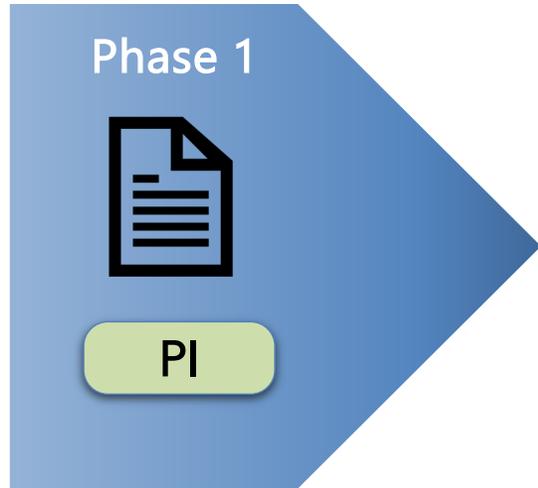
Ref: Section 4.3 and 4.4 of the ALMA Cycle 12 Proposer's Guide  
Appendix A of the ALMA Users' Policies

- Change requests



# What is Phase 2?

---

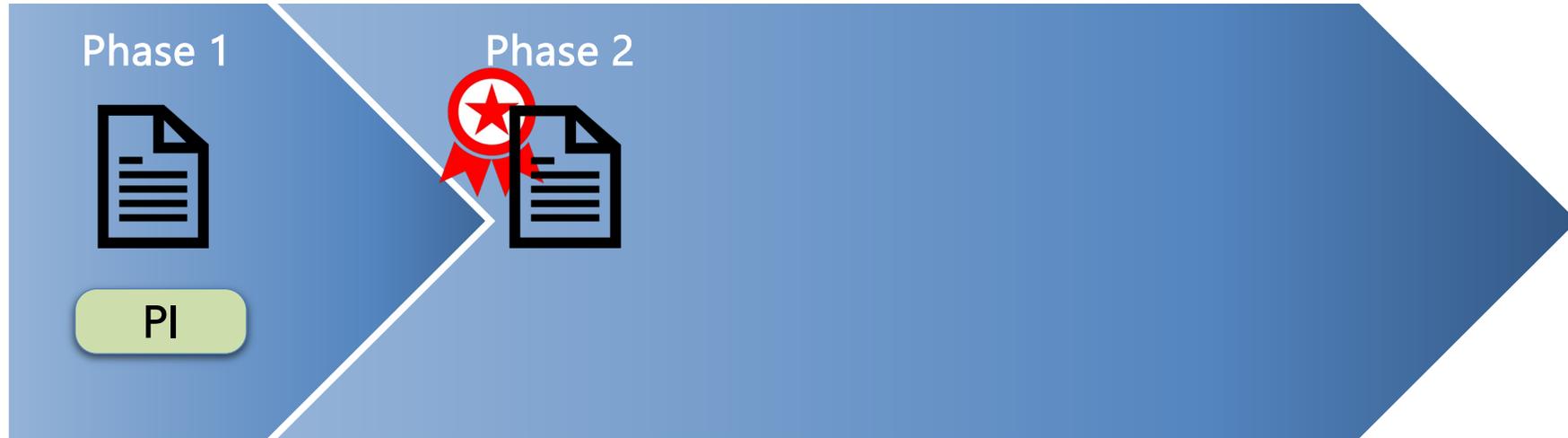


- Phase I process: Proposals are generated and submitted using the ALMA Observing Tool (ALMA OT).



# What is Phase 2?

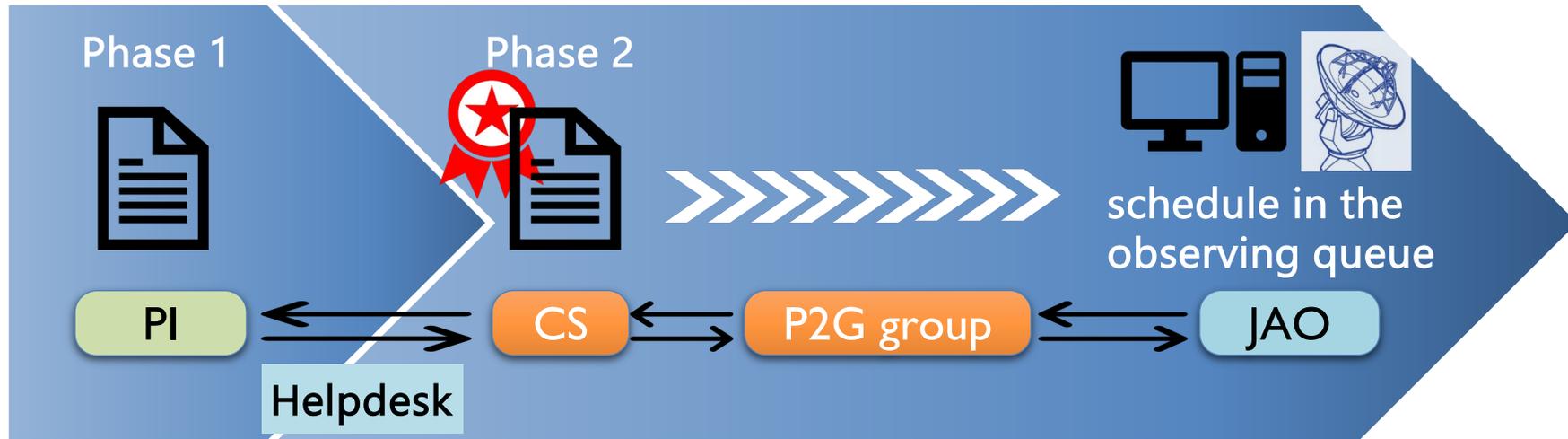
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- Once a project has been approved for scheduling, it passes to Phase 2.



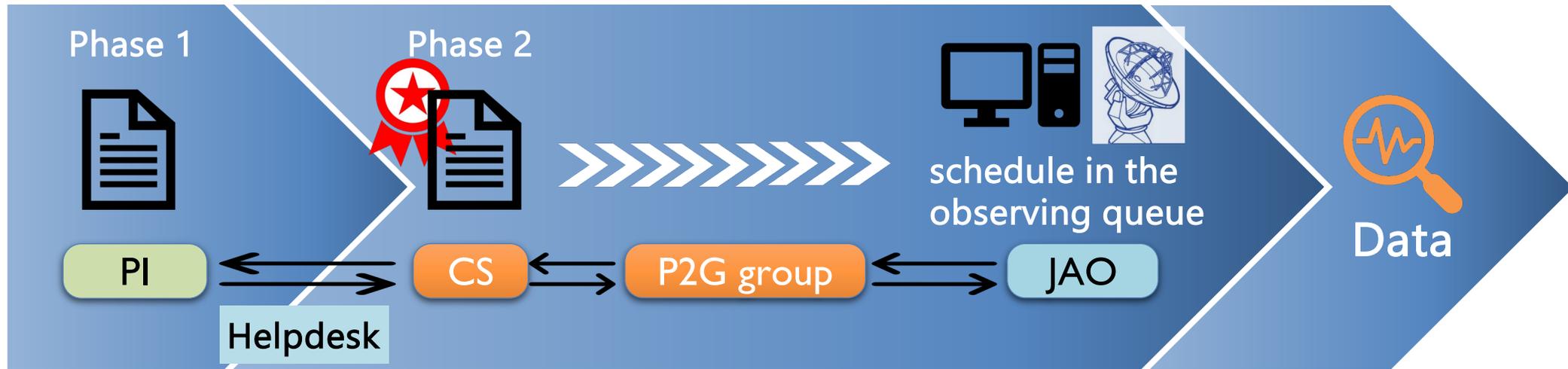
# What is Phase 2?



- Once a project has been approved for scheduling, it passes to Phase 2.
  - Each approved project will be assigned a Contact Scientist (CS).
  - A Helpdesk ticket will be opened on behalf of the PI for communication with the CS and others.
  - The Phase2 Generation group (P2G group) will review the project and submit it to the ALMA observing queue to await execution at the telescope.
    - In case of problems, the CS will contact the PI.



# Why do we care about scheduling and Phase 2 generation?



- When an observation is scheduled, various aspects of a proposed observation are important, such as requested angular resolution, weather conditions etc.
- Let's plan observations to maximize project completion and achieve our scientific goals!



# Outline

---

- What is Phase 2?
- Why do we care about scheduling and Phase 2 generation?
- General considerations
  1. Angular resolution
  2. Weather
  3. Duplications
  4. Resubmissions

Ref: Section 4.3 and 4.4 of the ALMA Cycle 12 Proposer's Guide  
Appendix A of the ALMA Users' Policies

- Change requests



# 1. Angular resolution

- Observations are scheduled based on the angular resolution
- For scheduling feasibility and Quality Assurance (QA) purposes, if the PI selects a single value for the Desired Angular Resolution or a range narrower than 20% around its center value, typically, a range of +/-20% around the specified single or center value will be enforced.

Example: for a single value of 2 arcsec => 1.6 to 2.4 arcsec

In OT

The screenshot shows the 'Control and Performance' tab in the ScienceGoal software. The interface includes a sidebar with navigation options: General, Field Setup, Spectral Setup, Calibration Setup, Control and Performance (selected), and Technical Justification. The main panel is titled 'Desired Performance' and contains the following fields and controls:

- Desired Angular Resolution (Synthesized Beam):** Radio buttons for 'Single', 'Range' (selected), 'Any', and 'Standalone ACA'. Below are two input boxes: '2.00000' and '2.70000', each followed by a dropdown menu set to 'arcsec', with a 'to' label between them.
- Largest Angular Structure in source:** Input box '30.00000' followed by a dropdown menu set to 'arcsec'.
- Desired mosaic sensitivity:** Input box '1.70000' followed by a dropdown menu set to 'mJy', with the text 'equivalent to 21.805 mK @ 2.70 "' to its right.
- Bandwidth used for Sensitivity:** A dropdown menu set to 'User' and an input box '40.00000' followed by a dropdown menu set to 'km/s'. The text 'and 0.039739 K @ 2.00 "' is positioned below the input box.
- Override OT's sensitivity-based time estimate (must be justified):** Radio buttons for 'Yes' and 'No' (selected).
- Science Goal Breakdown:** A button labeled 'Planning and Time Estimate' with the text 'time estimate, clustering, beam and configurations' below it.



# 1. Angular resolution

- Observations are scheduled based on the angular resolution
- For scheduling feasibility and Quality Assurance (QA) purposes, if the PI selects a single value for the Desired Angular Resolution or a range narrower than 20% around its center value, typically, a range of +/-20% around the specified single or center value will be enforced.

Example: for a single value of 2 arcsec => 1.6 to 2.4 arc

do this only when your science goals can be achieved!!

ScienceGoal (example)

- General
- Field Setup
- Spectral Setup
- Calibration Setup
- Control and Performance
- T

Desired Performance

Desired Angular Resolution (Synthesized Beam) 2.700 arcsec

Largest Angular Structure in source 30.00000 arcsec

Desired mosaic sensitivity 1.70000 mJy equivalent

Bandwidth used for Sensitivity User

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

Science Goal Breakdown: time estimate, clustering, beam and configurations

Planning and Time Estimate

Planning and Time Estimate

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

**Input Parameters**

Requested sensitivity 1.700 mJy

Bandwidth used for sensitivity 40.000 km/s

Representative frequency (sky, first source) 114.352 GHz

**Estimated Total time for Science Goal 1.77 h**

Cluster 1

Source Name	RA	Dec	Velocity
example	09:59:29.5437	-22:49:34.746	2400.500 km/s

**Possible Configuration Combinations**

	12-m (1)	12-m (2)	7-m	TP
C-1	one	Yes	No	
C-2	one	Yes	No	
C-3	one	Yes	No	



## 2. Weather

- The amount of time with stable atmospheric conditions suitable for observations in Bands 7 through 10 outside of the LST ranges given in the last column is limited.
- The best months for high-frequency observations are from May to November.

### Tentative Configuration Schedule

Start date	Configuration	Longest baseline	LST for best observing conditions
2025 October 1	C-8	8.5 km	~ 22—10 h
2025 October 20	C-7	3.6 km	~ 23—11 h
2025 November 10	C-6	2.5 km	~ 1—13 h
2025 December 1	C-5	1.4 km	~ 2—14 h
2025 December 20	C-4	0.78 km	~ 4—15 h
2026 January 10	C-3	0.50 km	~ 5—17 h
2026 February 1	<i>No observations due to maintenance</i>		
2026 March 1	C-1	0.16 km	~ 8—21 h
2026 March 26	C-2	0.31 km	~ 9—23 h
2026 April 20	C-3	0.50 km	~ 11—0 h
2026 May 10	C-4	0.78 km	~ 12—2 h
2026 May 31	C-5	1.4 km	~ 13—4 h
2026 June 23	C-6	2.5 km	~ 15—6 h
2026 July 28	C-5	1.4 km	~ 17—7 h
2026 August 18	C-4	0.78 km	~ 19—8 h
2026 September 10	C-3	0.50 km	~ 20—9 h

mentioned in Taniguchi-san's talk

Table 3: Planned 12-m Array Configuration Schedule for Cycle 12. Configuration properties are given in Section A.2.



# 3. Duplications

- Duplicate observations of the similar location on the sky with similar observing parameters are not permitted unless scientifically justified (Section 4.4.1)
- Criteria: see Appendix A of the ALMA Users' Policies

## Appendix A Definition of a Duplicate Observation

A proposed observation is considered a duplicate of another observation if *all* of the following conditions are met:

### Target field location

- For single-field interferometry, the proposed position coincides within the half-power beam width of the other observation. Moving objects (e.g., Solar System objects) will be identified by name.
- For mosaic observations, more than 50% of the proposed pointings are within the half power beam width area covered by the other observation.

### Angular Resolution

- The proposed angular resolution differs by a factor of  $\leq 2$  from the other observation.

### Spectral windows

- Continuum: The requested sensitivity (rms) for the aggregate bandwidth is better by a factor of  $\leq 2$  from the other observation and the requested frequency is within a factor of 1.3.

– or –

- Spectral line: If the central frequency in any requested correlator window observed in Frequency Division Mode (FDM) mode is encompassed by the other observation observed in FDM mode and the sensitivity per spectral channel, after smoothing to the same spectral resolution, is better by a factor of  $\leq 2$ .

To be considered a “continuum” observation, the proposed correlator setup must contain 2 or more windows with a bandwidth  $> 1.8$  GHz.

Solar observations will not be checked for duplications.



# 3. Duplications

- It is the responsibility of the Principal Investigator (PI) to check their proposed observations against both the **ALMA Archive** and the **spreadsheet** provided in the Science Portal to avoid duplicate observations.

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

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## Duplicate Observations

In order to ensure the most efficient use of ALMA, duplicate observations of the same location on the sky with similar observing parameters (frequency, angular resolution, coverage, and sensitivity) are not permitted unless scientifically justified. Details on the duplication policy are provided in [Section 4.4](#) of the Cycle 12 Proposer's Guide and Section 6.3 of the [Users' Policies](#). It is the responsibility of the Principal Investigator (PI) to check their proposed observations against both the ALMA Archive and the spreadsheet provided below to avoid duplicate observations.

The [ALMA Archive](#) contains an up-to-date list of the PI science observations, including Cycle 10 programs that have been started or completed. The spreadsheet "Projects in the Queue" supplements the ALMA archive in that it lists the metadata for Grade A main array science goals, as well as Grade A ACA standalone science goals that have not been completed as of 2025 March 03 and are still in the observing queue. The spreadsheet lists the sensitivity and angular resolution that are expected to be achieved assuming the observations are completed in full. Observations for Grade B and C projects that have not been started by 2025 March 03 will not be used in the duplication checks conducted by ALMA even if observations are obtained later in Cycle 11.

The ongoing list of observations is provided in both Excel Workbook (xlsx) and Comma Separated Variable (CSV) text format. It includes one row for each target, rectangular mosaic, or each pointing in custom mosaics. The spreadsheet content is described at the beginning of the file, and includes target names, coordinates, properties of each spectral window, along with the resolution and sensitivity requested by the PI. A link is provided to a user-contributed python script, which contains functions to search, plot, and display source information contained in the list of ongoing observations. Instructions on how to run the script are provided in the script header. The script is made available on an "as-is" basis for convenience and is not supported by the ALMA Regional Centers (ARCs).

1. [ALMA Science Archive Query](#) 2. [Projects in the Queue \(Excel spreadsheet\)](#) [Projects in the Queue \(CSV text file\)](#) [Python Script](#)

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# 3. Duplications

- Provide justification in OT

The screenshot shows the ALMA proposal submission interface. The left pane displays the project structure under 'Unsubmitted Proposal' with a tree view including 'Demo', 'Proposal', 'Planned Observing', and 'ScienceGoal (Demo)'. The 'ScienceGoal (Demo)' folder is expanded to show sub-sections: 'General', 'Field Setup', 'Spectral Setup', 'Calibration Setup', 'Control and Performance', and 'Technical Justification'. The main editor area is titled 'Editors' and has tabs for 'Spectral', 'Spatial', and 'Proposal'. The 'Proposal' tab is active, showing instructions for reviewers and a 'Science Case' section. The 'Duplicate observations' section is highlighted with a red box and contains the following text:

Duplicate observations

Briefly justify any new observations that duplicate archival data or accepted programs. Information regarding the ALMA Duplication Policy and how to search archival data an

<https://asa.alma.cl/UserRegistration/secure/updateAcc>

peaches\_aca.pdf



## 4. Resubmission of an unfinished proposal

---

- Proposal teams that submit a Cycle 12 proposal to observe some or all the SGs of an unfinished project will have the relevant SGs identified as a “resubmission”.
- Criteria: Appendix A of the ALMA Users’ Policies
- Policies (Section 4.4.2 of the ALMA Cycle 12 Proposer’s Guide):
  - If the observations are successfully **completed** in Cycle 11: the relevant portion of the Cycle 12 proposal will be **anceled**
  - If the observations **started** in a previous cycle: they will continue to be observed with **the setup of the previous cycle**



# 4. Resubmission of an unfinished proposal

- Example: Cycle 11 **accepted** project observation **started**

Cycle 12 project

Desired Performance

Desired Angular Resolution (Synthesized Beam)  Single  Range  Any  Standalone ACA

2.00000 arcsec to 2.70000 arcsec

Largest Angular Structure in source 10.00000 arcsec

Desired mosaic sensitivity **1.00000 mJy** equivalent to 12.826 mK @ 2.70 " and 0.023376 K @ 2.00 "

Bandwidth used for Sensitivity User Frequency Width 40.00000 km/s

Desired Performance

Desired Angular Resolution (Synthesized Beam)  Single  Range  Any  Standalone ACA

2.00000 arcsec to 2.70000 arcsec

Largest Angular Structure in source 10.00000 arcsec

Desired mosaic sensitivity **0.50000 mJy** equivalent to 6.4132 mK @ 2.70 " and 0.011688 K @ 2.00 "

Bandwidth used for Sensitivity User Frequency Width 40.00000 km/s

not better by a factor of  $\leq 2$   
=> identified as resubmission

Planning and Time Estimate

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

**Input Parameters**

Requested sensitivity 1.000 mJy

Bandwidth used for sensitivity 40.000 km/s

Representative frequency (sky, first source) 114.352 GHz

**Estimated Total time for Science Goal** **1.20 h**

Planning and Time Estimate

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

**Input Parameters**

Requested sensitivity 0.5000 mJy

Bandwidth used for sensitivity 40.000 km/s

Representative frequency (sky, first source) 114.352 GHz

**Estimated Total time for Science Goal** **4.81 h**

Cluster 1

Source Name	RA	Dec	Velocity
example	09:59:29.5437	-22:49:34.746	2400.500 km/s

Possible Configuration Combinations

	12-m (1)	12-m (2)	7-m	TP
C-1	None	No	No	No
C-2	None	No	No	No
C-3	None	No	No	No

Cluster 1

Source Name	RA	Dec	Velocity
example	09:59:29.5437	-22:49:34.746	2400.500 km/s

Possible Configuration Combinations

	12-m (1)	12-m (2)	7-m	TP
C-1	None	No	No	No
C-2	None	No	No	No
C-3	None	No	No	No



## 4. Resubmission of an unfinished proposal

---

- Proposal teams that submit a Cycle 12 proposal to observe some or all the SGs of an unfinished project will have the relevant SGs identified as a “resubmission”.
- Criteria: Appendix A of the ALMA Users’ Policies
- Policies (Section 4.4.2 of the ALMA Cycle 12 Proposer’s Guide):
  - If the observations are successfully **completed** in Cycle 11: the relevant portion of the Cycle 12 proposal will be **anceled**
  - If the observations **started** in a previous cycle: they will continue to be observed with **the setup of the previous cycle**



# 4. Resubmission of an unfinished proposal

- Example: Cycle 11 **accepted** project observation **started**

Cycle 12 project

Desired Performance

Desired Angular Resolution (Synthesized Beam)  Single  Range  Any  Standalone ACA

2.00000 arcsec to 2.70000 arcsec

Largest Angular Structure in source 10.00000 arcsec

Desired mosaic sensitivity **1.00000 mJy** equivalent to 12.826 mK @ 2.70 "

0.023376 K @ 2.00 "

Bandwidth used for Sensitivity User Frequency Width 40.00000 km/s

Desired Performance

Desired Angular Resolution (Synthesized Beam)  Single  Range  Any  Standalone ACA

2.00000 arcsec to 2.70000 arcsec

Largest Angular Structure in source 10.00000 arcsec

Desired mosaic sensitivity **0.50000 mJy** equivalent to 6.4132 mK @ 2.70 "

and 0 @ 2.00 "

Bandwidth used for Sensitivity User Frequency Width 40.00000 km/s

Planning and Estimate

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

Representative frequency (sky, first source) 114.352 GHz

Estimated Total time for Science Goal **1.20 h**

Planning and Estimate

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

Input Parameters

Requested sensitivity 0.5000 mJy

Bandwidth used for sensitivity 40.000 km/s

Representative frequency (sky, first source) 114.352 GHz

Estimated Total time for Science Goal **4.81 h**

Observation will continue with this setup

Cluster 1

Source Name	RA	Dec	Velocity
example	09:59:29.5437	-22:49:34.746	2400.500 km/s

Possible Configuration Combinations

	12-m (1)	12-m (2)	7-m	TP
C-1	None	No	No	No
C-2	None	No	No	No
C-3	None	No	No	No

Source Name	RA	Dec	Velocity
example	09:59:29.5437	-22:49:34.746	2400.500 km/s

Possible Configuration Combinations

	12-m (1)	12-m (2)	7-m	TP
C-1	None	No	No	No
C-2	None	No	No	No
C-3	None	No	No	No



# Change requests

---

- Section 6.2 of the ALMA Cycle 12 Proposer's Guide and Section 8 of the ALMA Users' Policies
- After the PIs have been notified of the results of the proposal review process, PIs of scheduled proposals may request necessary changes to their project.
- All change requests are made through the ALMA Helpdesk.
- The request must include a clear description of the proposed change along with a clear, substantive justification for the change.
- Minor changes
- Major changes (defined in Appendix B of the ALMA Users' Policies)



# Change requests

---

- Section 6.2 of the ALMA Cycle 12 Proposer's Guide and Section 8 of the ALMA Users' Policies
- After the PIs have been notified of the results of the proposal review process, PIs of scheduled proposals may request necessary changes to their project.
- All change requests are made through the ALMA Helpdesk.
- The request must include a clear description of the proposed change along with a clear, substantive justification for the change.
- Minor changes can usually be made, but PIs are strongly encouraged to make any necessary requests well in advance of the potential scheduling of observations.
- Major changes (defined in Appendix B of the ALMA Users' Policies) are allowed **only if the change is essential for the science goals** of the project.



# Change requests

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- Major change requests may be motivated by the following considerations
  - New information received since the original proposal submission
  - Technical considerations for implementation during Phase 2 (that are initiated by the PI, e.g. to optimize the scientific yield of the observations)
  - Mistakes made by the PI
- Major changes whose main motivation is to increase the observing window, for example by changing the angular resolution or configuration, are **not** typically accepted.
- Please read **Section 8** and **Appendix B** of the ALMA Users' Policies carefully before requesting any changes!
- Triple-check all setups before the proposal submission deadline!



# Edit Profile

(Fields marked with a red dot are mandatory)

First name	<input type="text"/>
Middle initials	<input type="text"/>
Surname	<input type="text"/>
Gender	<input type="text"/>
E-mail	<input type="text"/>
Receive optional emails	<input type="text"/>
Notify me of changes I make	<input type="checkbox"/>
Account name	<input type="text"/>
Password	<input type="password"/>
Re-type password	<input type="password"/>
Institution	<input type="text" value="Choose country..."/> <input type="text" value="Choose Institution..."/>

Please keep the affiliation and email up to date during the whole cycle so that you can get adequate support from the corresponding ARC.

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