Proposer's Guide

Hiroshi Nagai,
Interim EA-ARC Manager,
NAOJ Chile Observatory

Contents

1. Requests from the ALMA Observatory

- Do not install JAVA 9 which is not compatible with OT
- Update demographic information in the Science Portal if possible.

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https://almascience.nao.ac.jp 150% fermi lat public light curves

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

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ALMA Cycle 6 Call for Proposals is Now OPEN!
Mar 20, 2018

Additional Information for Cycle 6 Proposals
Feb 01, 2018

New Science Verification data are now available for download
Jan 23, 2018

More…

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Web site for Alma telescope researchers
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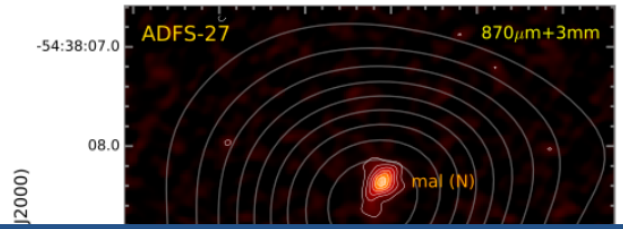
Status

Cycle 6 Call for Proposals
Cycle 6 Proposer's Guide

Refereed publications: 976
Last observed source: UGC 9618 N
Current configuration: C43-4

More...

Science Highlights - Detection of a z~6 Starburst Galaxy with the ALMA Spectral Scan Mode



The ALMA spectral scan mode offers the ability to pinpoint the redshift of luminous gas-rich galaxies at high redshift. In a recent study, Dominik Riechers and his collaborators made use of this mode to measure the

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May 1

Demographics

Please visit the Demographics page and complete that part of your profile.

More...

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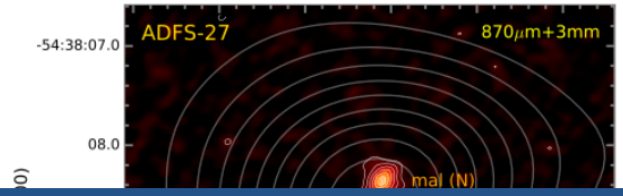
Science Highlights - Detection of a z~6 Starburst Galaxy with the ALMA Spectral Scan Mode

by Portal Admin — last modified Mar 20, 2018 11:29 PM



The ALMA spectral scan mode offers the ability to pinpoint the redshift of luminous gas-rich galaxies at high

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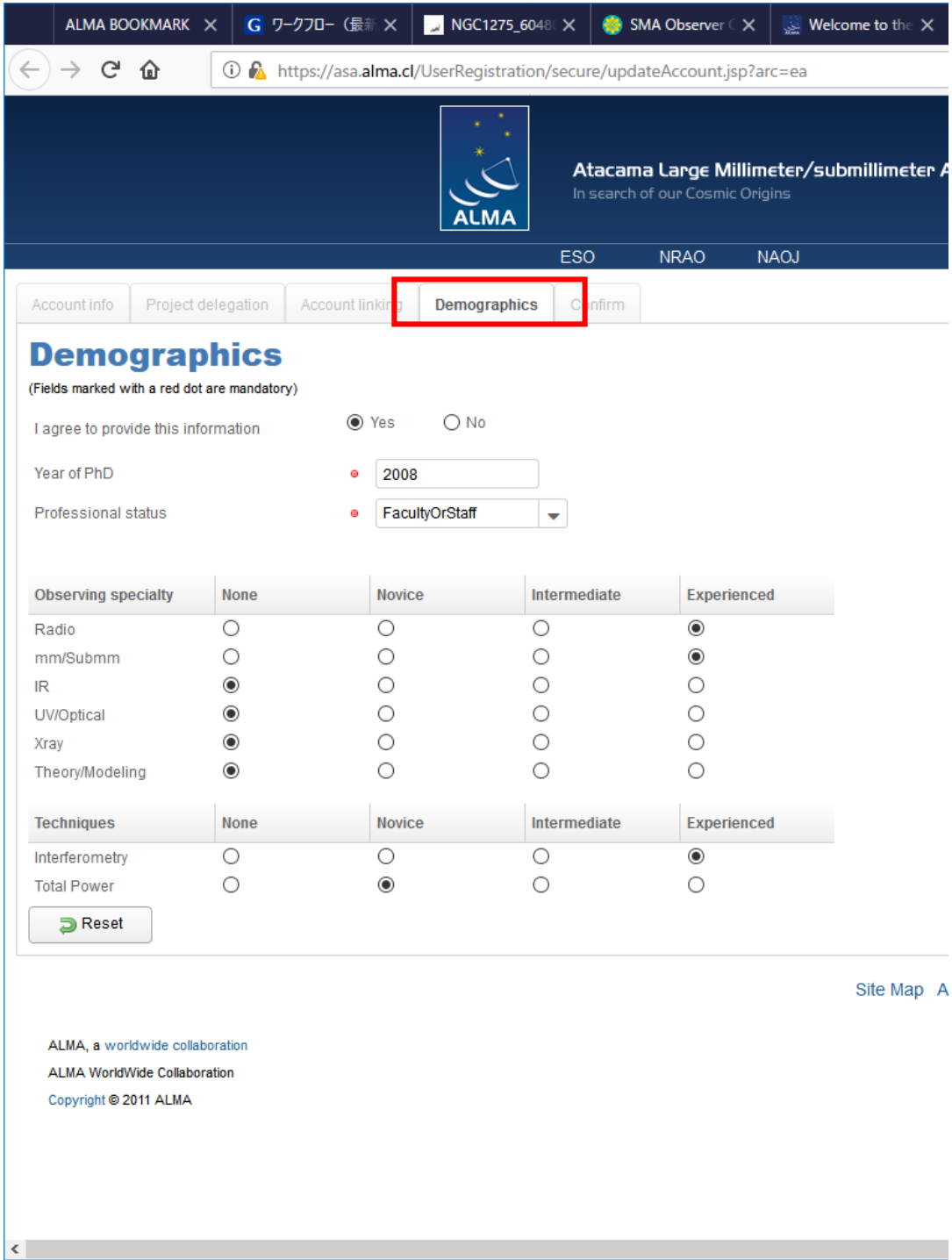
asa.alma.cl/UserRegistration/secure/updateAccount.jsp?arc=ea


ALMA BOOKMARK
https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp?arc=ea
Atacama Large Millimeter/submillimeter A
In search of our Cosmic Origins
ALMA
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Account info
Project delegation
Account linking
Demographics
Confirm
Demographics
(Fields marked with a red dot are mandatory)
I agree to provide this information
Yes
No
Year of PhD
2008
Professional status
FacultyOrStaff
Observing specialty
None
Novice
Intermediate
Experienced
Radio
mm/Submm
IR
UV/Optical
Xray
Theory/Modeling
Techniques
None
Novice
Intermediate
Experienced
Interferometry
Total Power
Reset
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ALMA WorldWide Collaboration
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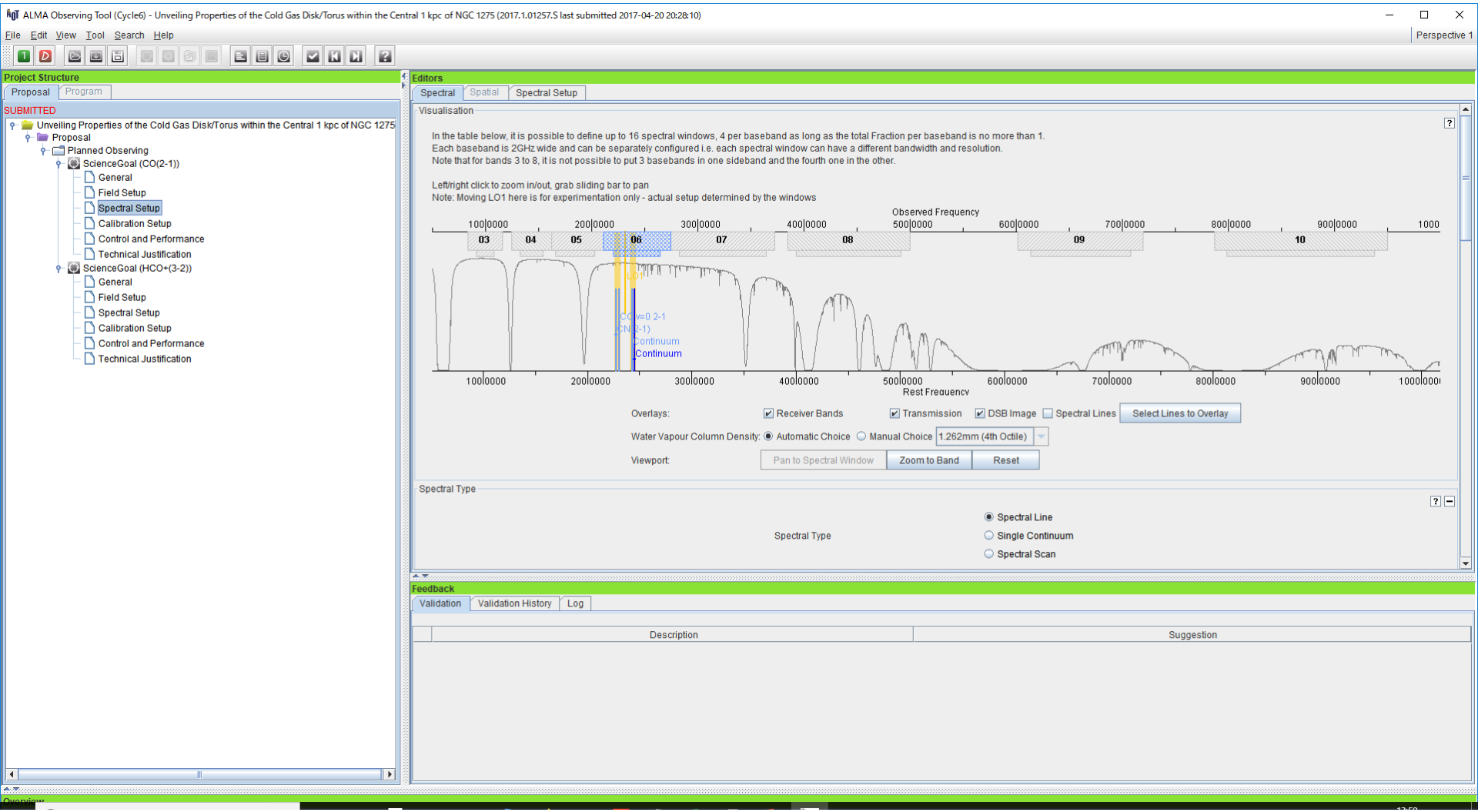
2. Cycle 6 Timeline

Date	Milestone
20 March 2018 (15:00 UT)	Release of Cycle 6 Call for Proposal
19 April 2018 (15:00 UT)	Proposal submission deadline
End of July 2018	Announcement of the outcome of the proposal review process
August - 6 September 2018	Submission of Phase 2 material
October 2018	Start of ALMA Cycle 6 Science Observations
September 2019	End of ALMA Cycle 6

3. Proposal Preparation

- Create your account in ALMA Science Portal https://almascience.nao.ac.jp/
  - Your co-authors should have the accounts as well.
- An ALMA proposal consists of basic proposal information that is entered directly into the ALMA OT, a Science Justification uploaded to the OT as a PDF file, and one or more Science Goals. (See OT tutorial for details)
- Science Goals contain the technical details of the proposed observations and must include a Technical Justification


ALMA Observing Tool (Cycle6) - Unveiling Properties of the Cold Gas Disk/Torus within the Central 1 kpc of NGC 1275 (2017.1.01257.S last submitted 2017-04-20 20:28:10)
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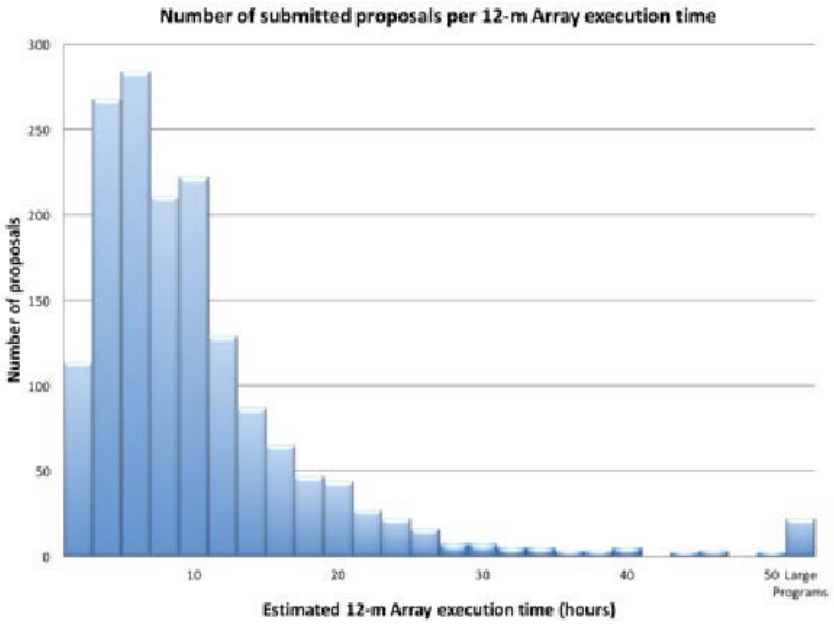
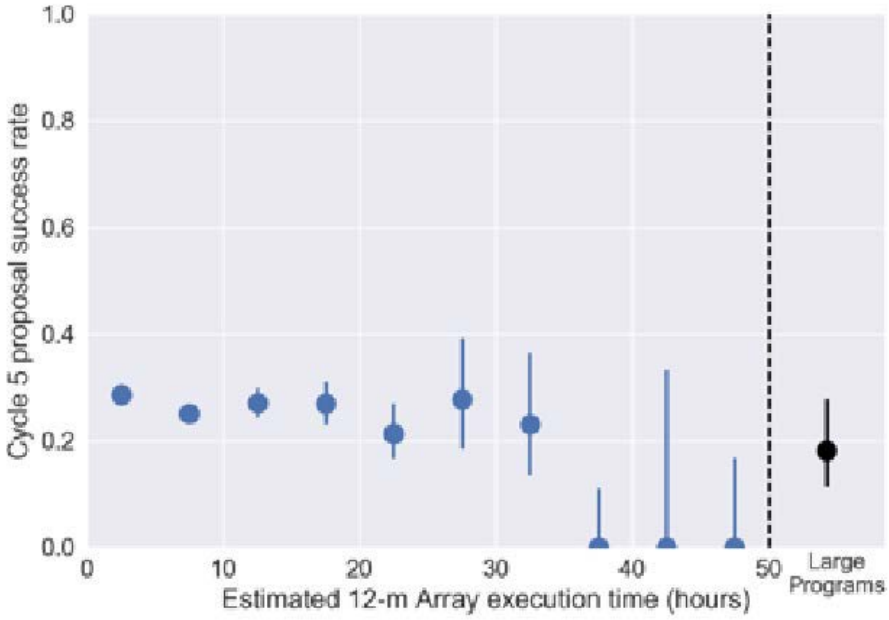
Perspective 1
Project Structure
Proposal Program
SUBMITTED
Unveiling Properties of the Cold Gas Disk/Torus within the Central 1 kpc of NGC 1275
Proposal
Planned Observing
ScienceGoal (CO(2-1))
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
ScienceGoal (HCO+(3-2))
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
Editors
Spectral Spatial Spectral Setup
Visualisation
In the table below, it is possible to define up to 16 spectral windows, 4 per baseband as long as the total Fraction per baseband is no more than 1.
Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution.
Note that for bands 3 to 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.
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
Observed Frequency
100|0000 200|0000 300|0000 400|0000 500|0000 600|0000 700|0000 800|0000 900|0000 1000
03 04 05 06 07 08 09 10
LO1
CO v=0 2-1
HCN 2-1)
Continuum
Continuum
1001|0000 2001|0000 3001|0000 4001|0000 5001|0000 6001|0000 7001|0000 8001|0000 9001|0000 10001|0000
Rest Frequency
Overlays: Receiver Bands Transmission DSB Image Spectral Lines Select Lines to Overlay
Water Vapour Column Density: Automatic Choice Manual Choice 1.262mm (4th Octile)
Viewport: Pan to Spectral Window Zoom to Band Reset
Spectral Type
Spectral Type
Spectral Line
Single Continuum
Spectral Scan
Feedback
Validation Validation History Log
Description
Suggestion

4. Proposal Types

- Regular
  - Execution time does not exceed 50 hours on the 12-m Array or 150 hours on the ACA in stand-alone mode
- ToO
  - Observations that can be anticipated but whose targets and/or time of observation are not known in advance
  - PIs will trigger observations from accepted ToO Proposals through the Project Trigger Submission Page
- Large Programs
  - >50 hours on the 12-m array or >150 hours on the ACA in stand-alone
  - Must include only standard modes and should not involve time-critical or ToO
  - Required to produce high scientific impact, not reproducible by a combination of regular proposals
- VLBI
  - Band 3 with GMVA and Band 6 with EHTC
- DDT
  - May be submitted at any time
  - Need clear statement why the proposed science goal cannot be achieved in the regular proposal framework

Requested Execution Time





5. Standard vs. Non-standard

- Standard
  - Well characterized and the observations can be calibrated with the ALMA Pipeline
- Non-standard
  - Not well characterized and may require additional Observatory resources to calibrate, image, an deliver ALMA data products.
  - Up to 20% of Cy6 observing time will be allocated to non-standards.

5. Standard vs. Non-standard

Bands 9 and 10 observations
Band 7 observations with maximum baselines > 5 km
All polarization observations
Spectral scans
Bandwidth switching projects (having less than 937.5 MHz aggregate bandwidths over all spectral windows)
Solar observations (Bands 3 and 6)
VLBI observations
User-specified calibrations
Astrometric observations

6. Scientific Justification

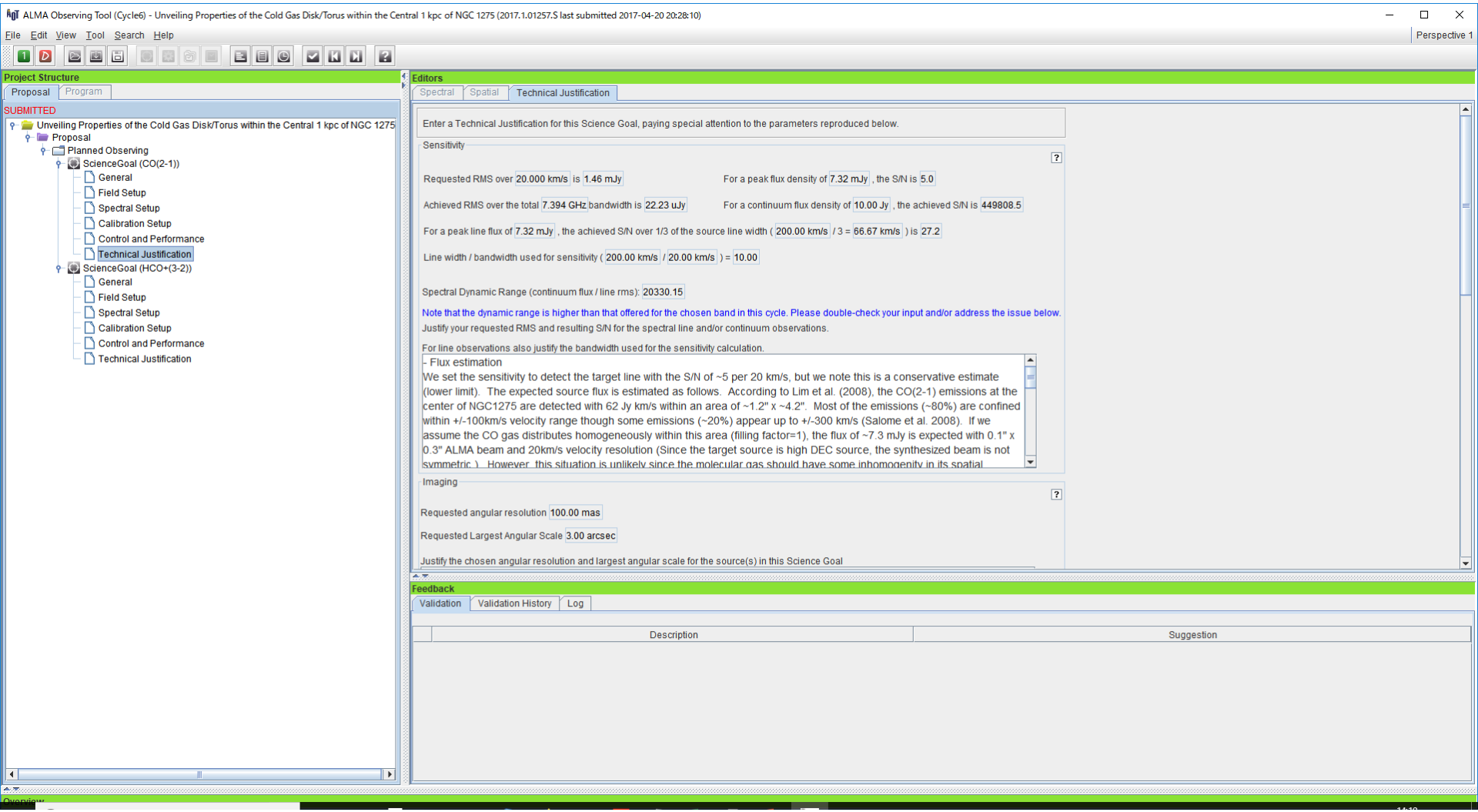
- A single PDF document including a science case written in English
  - May include figures, tables, and references
  - Maximum permitted file size 20MB
- 4 pages for regular, ToO, and VLBI, 6 pages for Large Progorams
- A font size no smaller than 12 points
  - This also applies to the figure caption, tables, and references!

6. Scientific Justification

- Each proposal must describe the astronomical importance of the proposed project and include a clear statement of its immediate goals. (See Proposal Writing WS)
- It is also recommended to provide a brief justification of the requested sensitivity and angular resolution, with full details provided in the Technical Justification.
- If you wish to show figures and tables for technical justification, their results should be included in the SJ and references in the relevant Technical Justification.

7. Technical Justification

- The TJ must include a quantitative description and justification of the expected source brightness, the requested sensitivity and S/N ratio, angular resolution and spectral setup. An incomplete Technical Justification may lead to the rejection of the proposal on technical grounds.
- Except for the figures, the TJ must be self-contained, and there should be no expectation or requirement that the technical assessor reads the Scientific Justification for details.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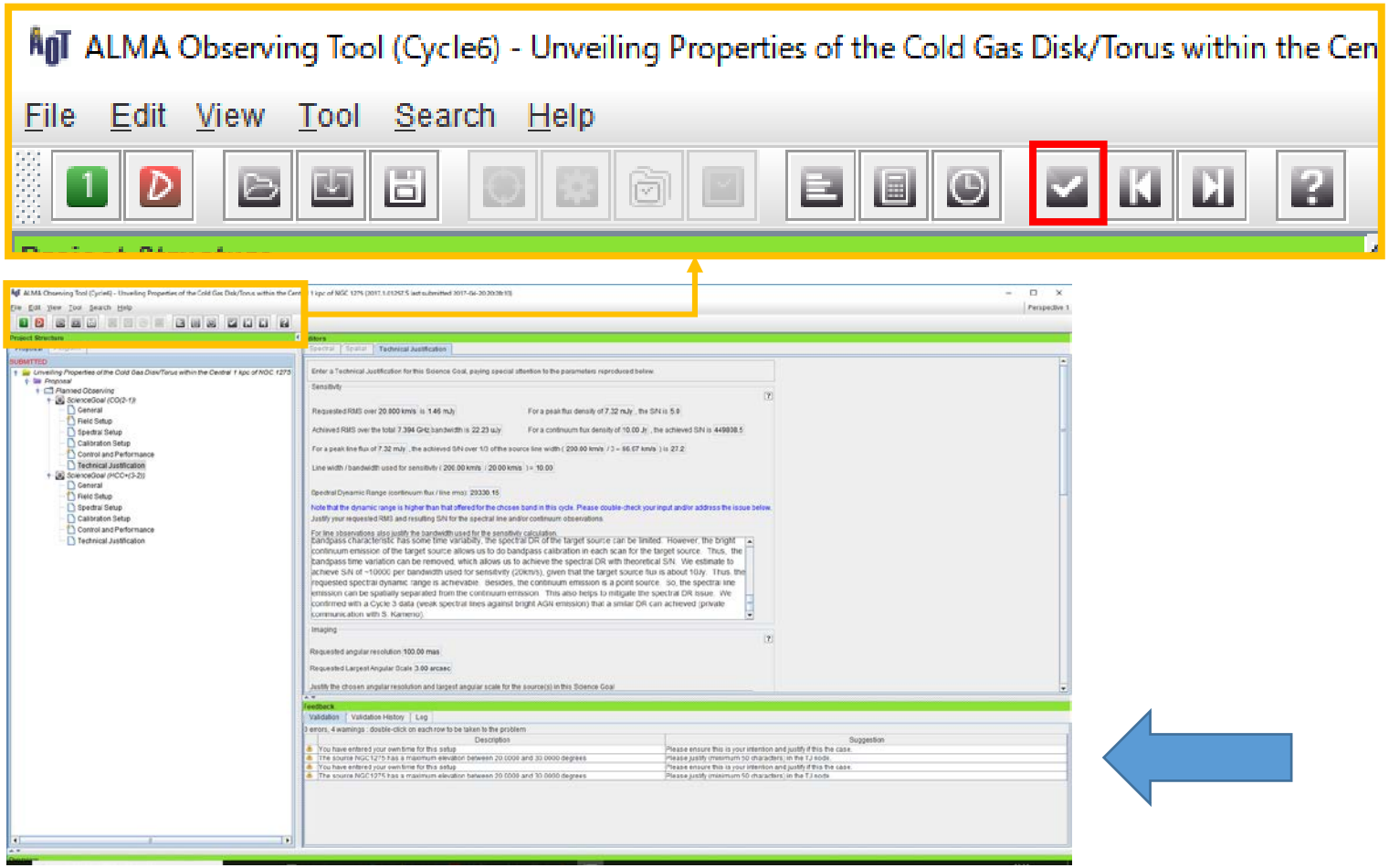
ScienceGoal (HCO+(3-2))
General
Field Setup
Spectral Setup
Calibration Setup
Control and Performance
Technical Justification
Editors
Spectral Spatial Technical Justification
Enter a Technical Justification for this Science Goal, paying special attention to the parameters reproduced below.
Sensitivity
Requested RMS over 20.000 km/s is 1.46 mJy
For a peak flux density of 7.32 mJy , the S/N is 5.0
Achieved RMS over the total 7.394 GHz bandwidth is 22.23 uJy
For a continuum flux density of 10.00 Jy , the achieved S/N is 449808.5
For a peak line flux of 7.32 mJy , the achieved S/N over 1/3 of the source line width (200.00 km/s / 3 = 66.67 km/s) is 27.2
Line width / bandwidth used for sensitivity (200.00 km/s / 20.00 km/s) = 10.00
Spectral Dynamic Range (continuum flux / line rms): 20330.15
Note that the dynamic range is higher than that offered for the chosen band in this cycle. Please double-check your input and/or address the issue below.
Justify your requested RMS and resulting S/N for the spectral line and/or continuum observations.
For line observations also justify the bandwidth used for the sensitivity calculation.
- Flux estimation
We set the sensitivity to detect the target line with the S/N of ~5 per 20 km/s, but we note this is a conservative estimate (lower limit). The expected source flux is estimated as follows. According to Lim et al. (2008), the CO(2-1) emissions at the center of NGC1275 are detected with 62 Jy km/s within an area of ~1.2" x ~4.2". Most of the emissions (~80%) are confined within +/-100km/s velocity range though some emissions (~20%) appear up to +/-300 km/s (Salome et al. 2008). If we assume the CO gas distributes homogeneously within this area (filling factor=1), the flux of ~7.3 mJy is expected with 0.1" x 0.3" ALMA beam and 20km/s velocity resolution (Since the target source is high DEC source, the synthesized beam is not symmetric.) However, this situation is unlikely since the molecular gas should have some inhomogenity in its spatial
Imaging
Requested angular resolution 100.00 mas
Requested Largest Angular Scale 3.00 arcsec
Justify the chosen angular resolution and largest angular scale for the source(s) in this Science Goal
Feedback
Validation Validation History Log
Description
Suggestion

8. Proposal Validation and Submission

- Once the proposal is validated within the OT, it can be submitted to the ALMA Archive.



8. Proposal Validation and Submission

- If a proposal contains many SGs, validation process could take minutes or even longer. Please make sure to validate your proposal before the proposal deadline well in advance!
- Your proposal can be submitted once you pass the validation.
- A proposal can be resubmitted as many times as needed before the deadline.
- Submitted proposals cannot be modified after the deadline.

9. Proposal evaluation and selection

- See section 5.5 in PG document about peer review.
- Proposal ranking will be based on the overall scientific merit and potential contribution to the advancement of scientific knowledge and technical feasibility.
- Following factors are also considered for the LP evaluation
  - Scheduling feasibility
  - Data products (if those are useful for the community at large)
  - Management plan
- Proposal selection will be made by taking into account the scientific ranking, scheduling constrains, and regional balance (22.5% for EA).

10. Duplication and Resubmission

- 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.
- PIs should visit duplication check page in SP and are responsible for checking duplications.
- A proposal which was approved in previous cycles but unfinished (including SGs delivered as QA2 semipass) can be resubmitted to Cycle 6. Only unfinished SGs in the proposal will be observed in Cy6 if approved.
  - Note long baseline configurations (config. 7,8,9,10) will not be revisited in Cy5 anymore!

Cycle 6 Capabilities

Hiroshi Nagai,
Interim EA-ARC Manager,
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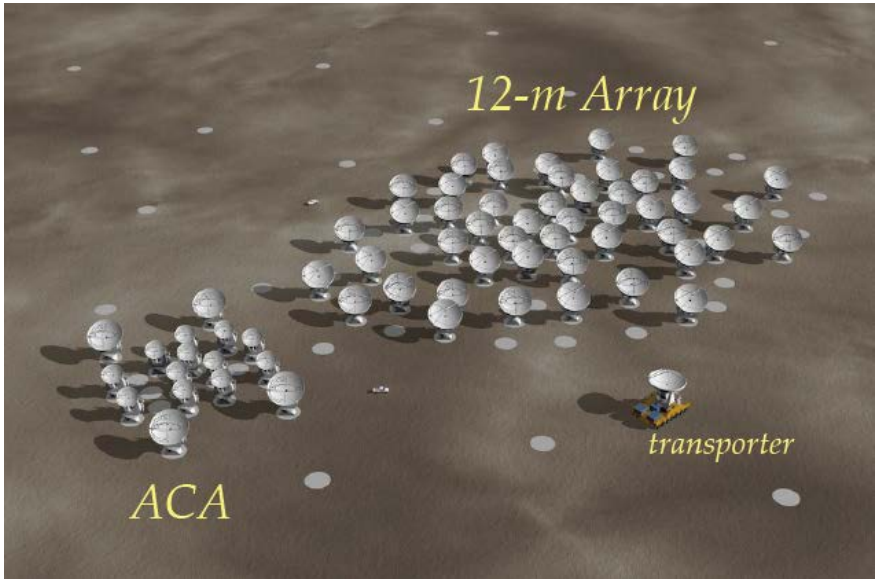
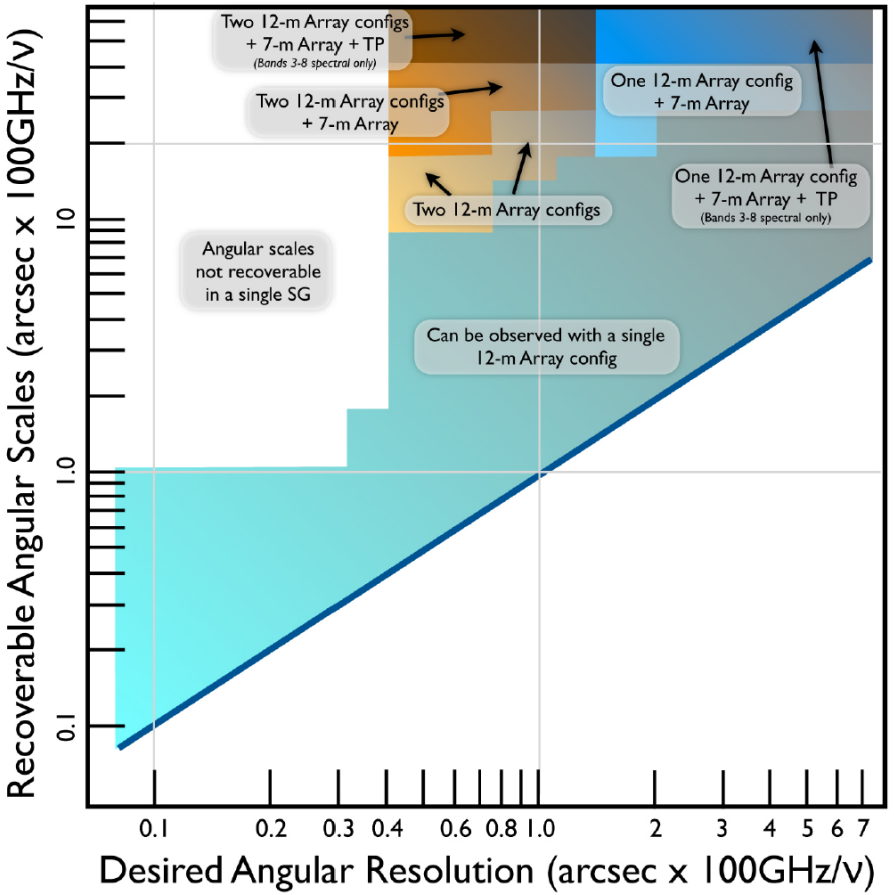
Contents

1. What's New in Cy6?

- Circular polarization observations (with very limited sensitivity)
- Simultaneous observations of the 12m Array with the 7m Array
  - Except for "long baselone configurations"
- Band 8 stand-alone ACA
- Band 6 IF extension

2.1 Recap: ALMA Arrays

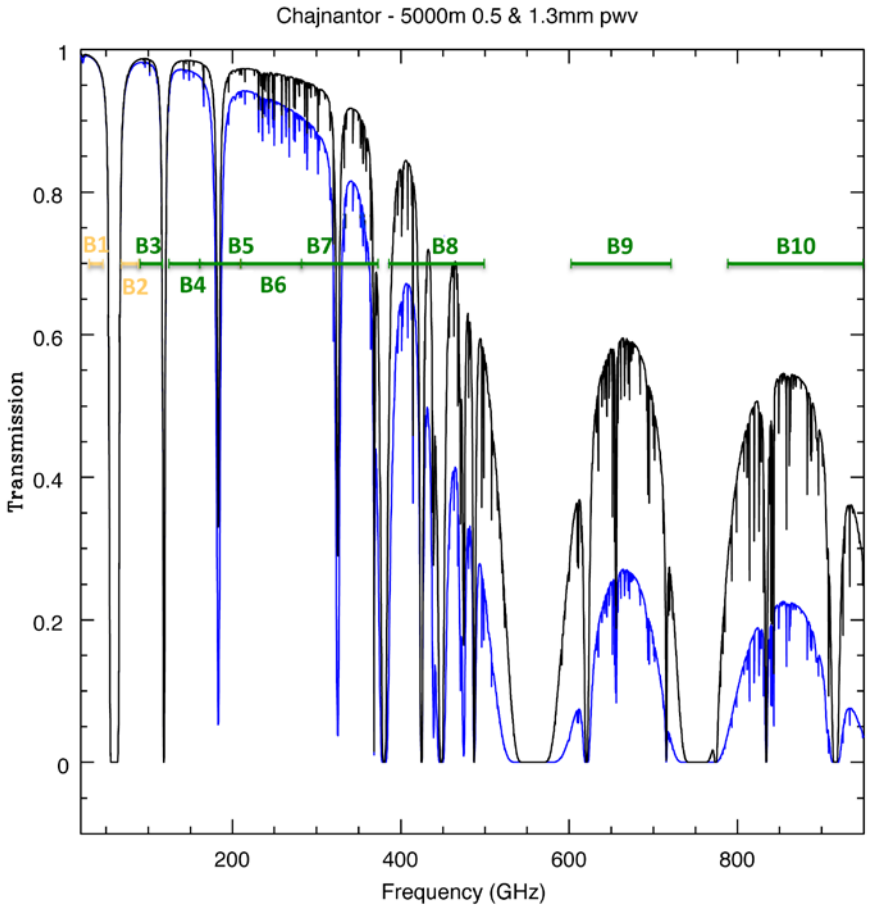




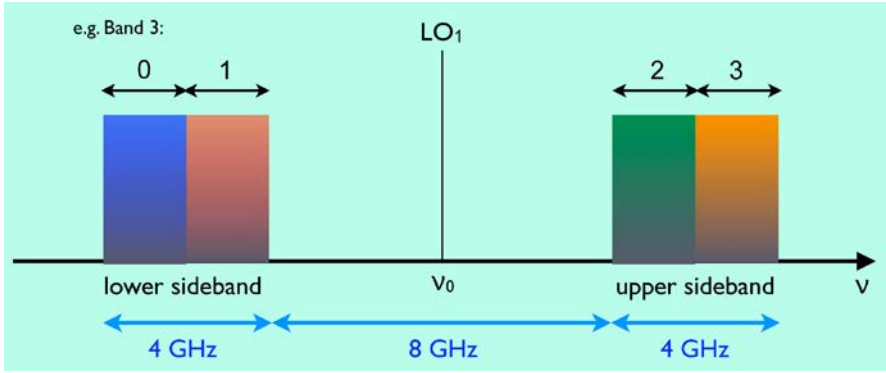
See Primer Document

2.2 Recap: Frequency Bands

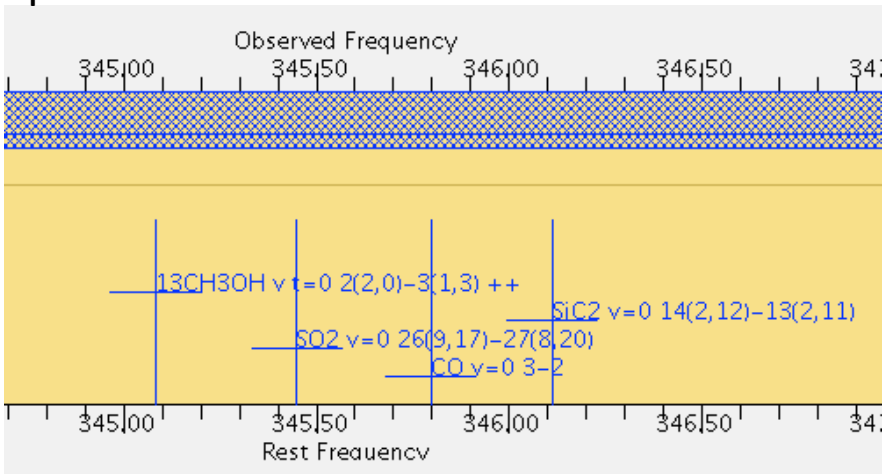
ALMA Bands



Sidebands, Basebands



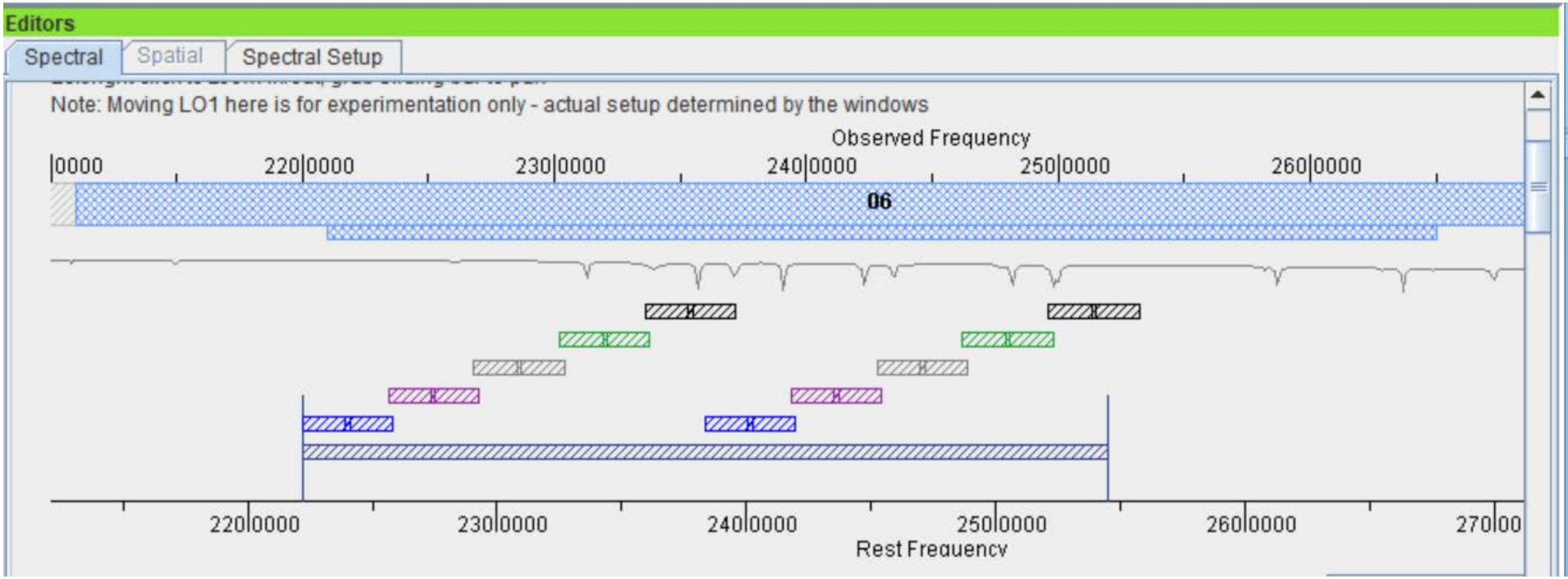
Spectral windows



2.3 Recap: Spectral Setups

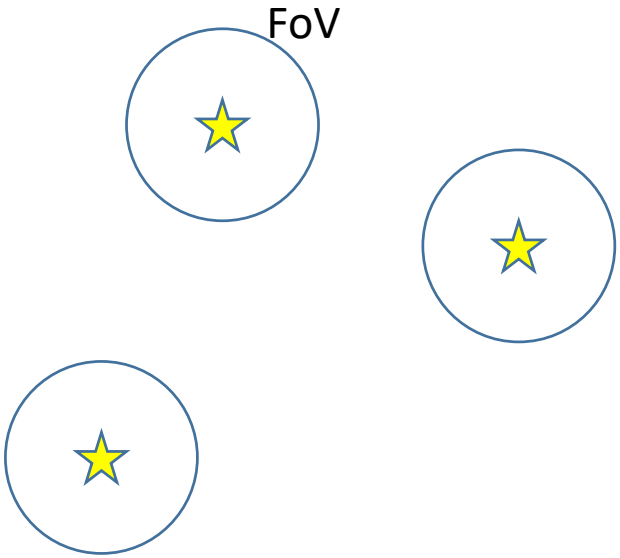
Bandwidth (MHz)	Channel spacing[3] (MHz)	Spectral resolution (MHz)	Number of channels	Correlator mode[4]
1875	15.6	31.2	120	TDM
1875	0.488	0.976	3840	FDM
938	0.244	0.488	3840	FDM
469	0.122	0.244	3840	FDM
234	0.061	0.122	3840	FDM
117	0.0305	0.061	3840	FDM
58.6	0.0153	0.0305	3840	FDM

Recap: Spectral scan

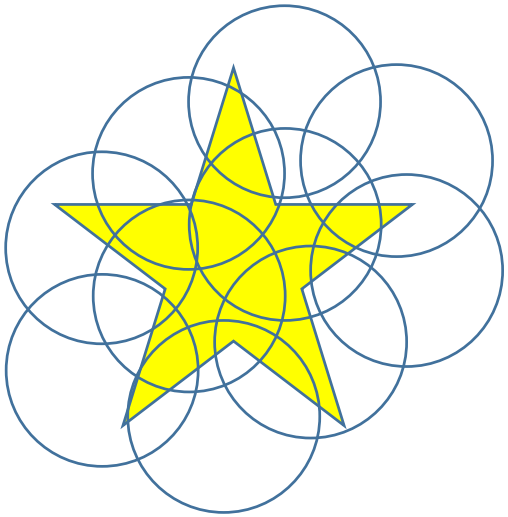


Recap: Pointing

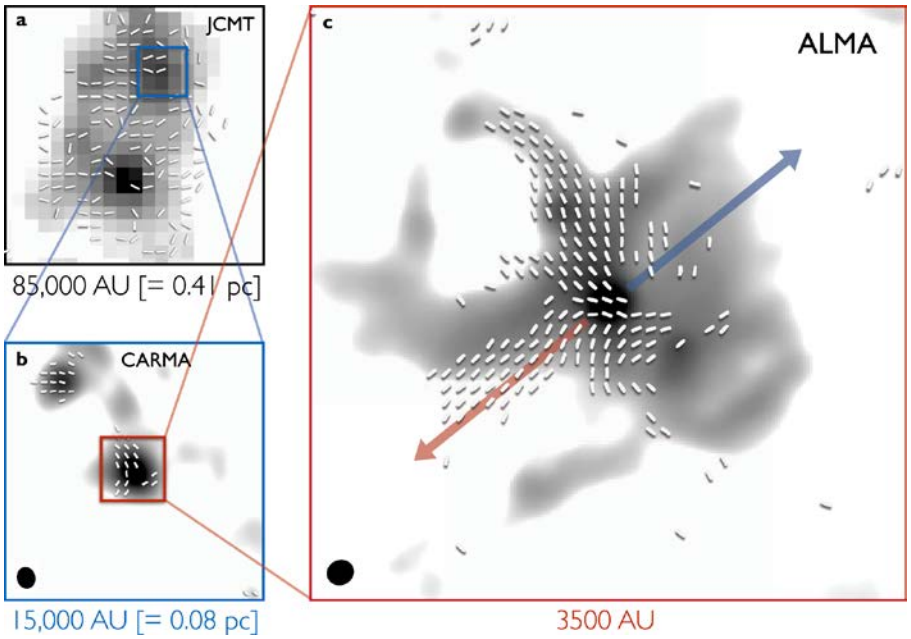
Individual (Multiple) pointing



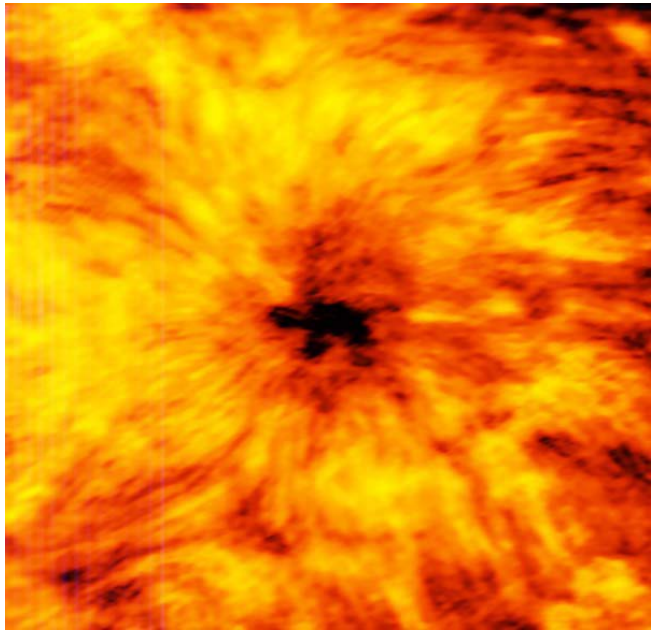
Mosaicing



Polarization, Solar



Hull+ 2017



ALMA Science Verification Data

3. Summary of Capabilities

- At least forty-three (43) antennas in the 12-m Array.
- At least ten 7 m antennas (for short baselines) and three 12 m antennas (for making single-dish maps) in the ACA.
- Receiver Bands 3, 4, 5, 6, 7, 8, 9, and 10 (wavelengths of about 3.0, 2.0, 1.6, 1.3, 0.85, 0.65, 0.45, and 0.35 mm, respectively).
- 12-m Array Configurations
  - The maximum possible baseline for Bands 8, 9 and 10 is 3.6 km.
  - The maximum possible baseline for Band 7 is 8.5 km.
  - The maximum possible baseline for Bands 3, 4, 5 and 6 is 16 km.
- Configurations with maximum baselines equal or longer than 3.6 km (C43-7 to C43-10) are considered “long-baseline configurations”.

3. Summary of Capabilities

- Spectral-line and continuum observations with the 12-m Array and the 7-m Array in all bands.
- Single-field interferometry (all bands) and mosaics (Bands 3 to 9) with the 12-m Array and the 7-m Array.
- Single-dish spectral-line observations in Bands 3 to 8.
- Single pointing, on axis, full linear and circular polarization capabilities for continuum and full spectral resolution observations in Bands 3, 4, 5, 6 and 7 on the 12-m Array. The field of view of linear and circular polarization observations is limited to the inner one-third and the inner one-tenth of the primary beam, respectively.

4. Configuration schedule

Start date	Configuration	Longest baseline	LST for best observing conditions
2018 October 1	C43-6	2.5 km	~ 22h – 10h
2018 October 15	C43-5	1.4 km	~ 0h – 12h
2018 November 25	C43-4	0.78 km	~ 2h – 14h
2018 December 15	C43-3	0.50 km	~ 4h – 15h
2019 January 5	C43-2	0.31 km	~ 5h – 16h
2019 January 20	C43-1	0.16 km	~ 6h – 17h
2019 February 1-28	*No observations due to February shutdown*		
2019 March 1	C43-1	0.16 km	~ 8h – 21h
2019 March 15	C43-2	0.31 km	~ 8h – 22h
2019 April 1	C43-3	0.50 km	~ 9h – 23h
2019 April 15	C43-4	0.78 km	~ 10h – 0h
2019 May 1	*No observations due to major antenna relocation*		
2019 June 1	C43-10	16.2 km	~ 13h – 3h
2019 June 20	C43-9	13.9 km	~ 14h – 5h
2019 July 10	C43-8	8.5 km	~ 16h – 6h
2019 August 1	C43-7	3.6 km	~ 18h – 8h
2019 September 5	C43-6	2.5 km	~ 20h – 9h

Config	Lmax		Band 3	Band 4	Band 5	Band 6	Band 7	Band 8	Band 9	Band 10
	Lmin		100 GHz	150 GHz	183 GHz	230 GHz	345 GHz	460 GHz	650 GHz	870 GHz
7-m Array	45 m	AR	12.5"	8.4"	6.8"	5.4"	3.6"	2.7"	1.9"	1.4"
	9 m	MRS	66.7"	44.5"	36.1"	29.0"	19.3"	14.5"	10.3"	7.7"
C43-1	161 m	AR	3.4"	2.3"	1.8"	1.5"	1.0"	0.74"	0.52"	0.39"
	15 m	MRS	28.5"	19.0"	15.4"	12.4"	8.3"	6.2"	4.4"	3.3"
C43-2	314 m	AR	2.3"	1.5"	1.2"	1.0"	0.67"	0.50"	0.35"	0.26"
	15 m	MRS	22.6"	15.0"	12.2"	9.8"	6.5"	4.9"	3.5"	2.6"
C43-3	500 m	AR	1.4"	0.94"	0.77"	0.62"	0.41"	0.31"	0.22"	0.16"
	15 m	MRS	16.2"	10.8"	8.7"	7.0"	4.7"	3.5"	2.5"	1.9"
C43-4	784 m	AR	0.92"	0.61"	0.50"	0.40"	0.27"	0.20"	0.14"	0.11"
	15 m	MRS	11.2"	7.5"	6.1"	4.9"	3.3"	2.4"	1.7"	1.3"
C43-5	1.4 km	AR	0.54"	0.36"	0.30"	0.24"	0.16"	0.12"	0.084"	0.063"
	15 m	MRS	6.7"	4.5"	3.6"	2.9"	1.9"	1.5"	1.0"	0.77"
C43-6	2.5 km	AR	0.31"	0.20"	0.16"	0.13"	0.089"	0.067"	0.047"	0.035"
	15 m	MRS	4.1"	2.7"	2.2"	1.8"	1.2"	0.89"	0.63"	0.47"
C43-7	3.6 km	AR	0.21"	0.14"	0.11"	0.092"	0.061"	0.046"	0.033"	0.024"
	64 m	MRS	2.6"	1.7"	1.4"	1.1"	0.75"	0.56"	0.40"	0.30"
C43-8	8.5 km	AR	0.096"	0.064"	0.052"	0.042"	0.028"	N/A	N/A	N/A
	110 m	MRS	1.4"	0.95"	0.77"	0.62"	0.41"			
C43-9	13.9 km	AR	0.057"	0.038"	0.031"	0.025"	N/A	N/A	N/A	N/A
	368 m	MRS	0.81"	0.54"	0.44"	0.35"				
C43-10	16.2 km	AR	0.042"	0.028"	0.023"	0.018"	N/A	N/A	N/A	N/A
	244 m	MRS	0.50"	0.33"	0.27"	0.22"				

5. Array Combination and Time Multiplier

Most Extended configuration	Allowed Compact configuration pairings	Extended 12-m Array Multiplier	Multiplier if compact 12-m Array	Multiplier if 7-m Array needed	Multiplier if TP Array needed and
7-m Array	TP			1	1.7
C43-1	7-m Array & TP	1		7.0	11.9
C43-2	7-m Array & TP	1		4.7	8.0
C43-3	7-m Array & TP	1		2.4	4.1
C43-4	C43-1 & 7-m Array & TP	1	0.34	2.4	4.0
C43-5	C43-2 & 7-m Array & TP	1	0.26	1.2	2.1
C43-6	C43-3 & 7-m Array & TP	1	0.25	0.6	1.0
C43-7	C43-4	1	0.23		
C43-8	C43-5	1	0.22		
C43-9	C43-6	1	0.21		
C43-10	-	1			

Notes for Table A.2:

6. Scheduling Consideration

- Weather
- Requested angular resolution and largest angular resolution
- More details will be explain by D. Espada
- Should not be too much afraid to try high frq.