



EUROPEAN ARC
ALMA Regional Centre || IRAM



ALMA

and how to use it



Edwige Chapillon
On behalf of the IRAM ARC node

ALMA

and how to use it



I- The ALMA observatory

II- The ARC nodes

III- The PI experience

ALMA

Atacama Large Millimeter/Submillimeter Array

World-wide collaboration

- Europe (**ESO**)
- North America (USA, Canada, Taiwan)
- Eastern Asia (Japan, Taiwan, South Korea)
- Chile

- Main array: 50 x 12 m antennas
- ALMA Compact Array (ACA): 4 x 12m + 12 x 7m
- Frequency range: 30—900 GHz (0.3—10 mm)
- 16 km max. baseline



ALMA

Requirement :

- Detect spectral line emission of CO or CI from a normal galaxy (like the Milky-way) at a **redshift 3** in less than 24h of observations
- Image the **gas kinematic in protostars and protoplanetary disks** around young Sun-like stars at a distance of 150pc
- Provide precise image at **0.1 arcsec** resolution



ALMA

- JAO
 - Main operations
- ARC
 - Interface with user
- ARC node
 - Additional user support

AOS

OSF

SCO



OSF

San Pedro de Atacama



AOS



Morita array (ACA)



Morita-array (compact array)

- 12 7-m antennas to observe the short spacings
- offered in stand-alone mode starting cycle 4

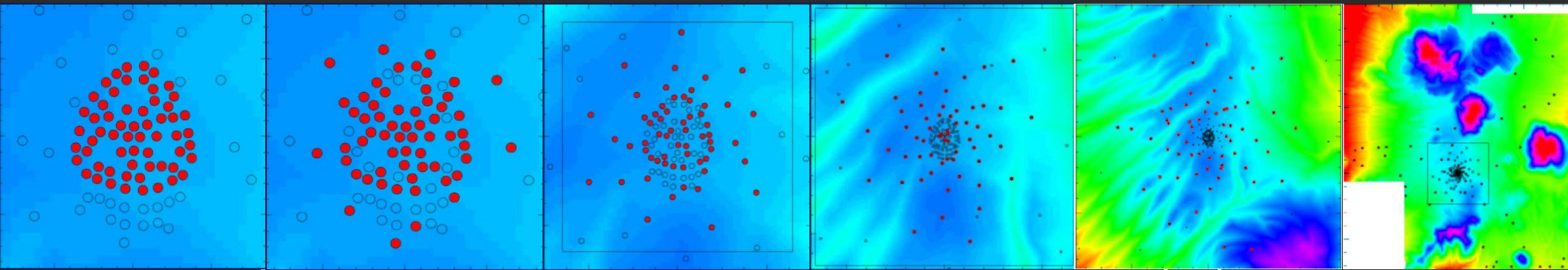
Single-dish antennas

- 4 12-m antennas used in single-dish mode to observe the zero-spacings



Morita array (ACA)

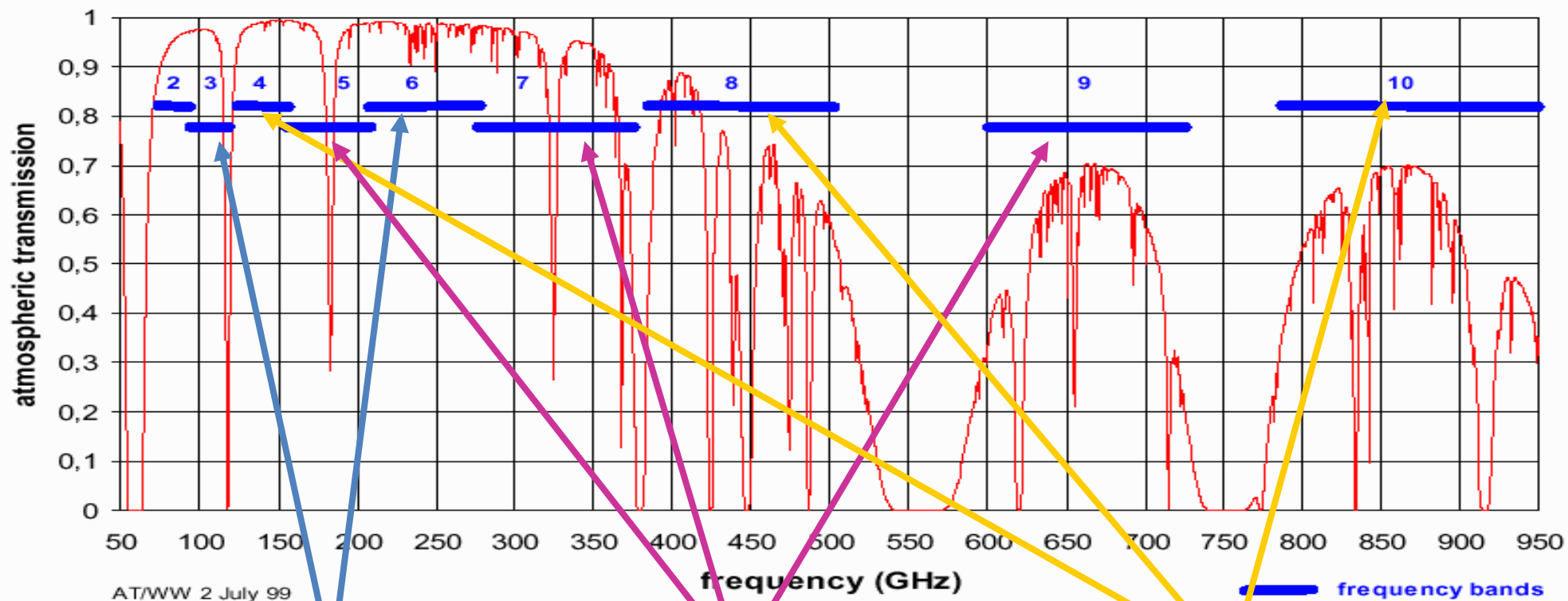
- 50 antennas, 1225 baselines (**Goal = 45 antennas used**)
- Angular resolution λ/B down to 40 mas (100 GHz), 5 mas (900 GHz)
- 28 (TBC) different antenna configurations, from compact to ~16 km



- Caution: not all projects can have ACA data!
- ALMA imaging simulator



Atmospheric transmission at Chajnantor, $\text{pwv} = 0.5 \text{ mm}$



North America

Band 3 (84-116 GHz)
Band 6 (211-275 GHz)

Europe

Band 7 (275-373 GHz)
Band 9 (602-720 GHz)
Band 5 (158-211 GHz)

Japan

Band 4 (125-163 GHz)
Band 8 (385-500 GHz)
Band 10 (787-950 GHz)

Freq. coverage: **30–900 GHz**
Bandwidth: **8 GHz x 2 polarizations**

Band 1 (35-50 GHz): Taiwan + NRAO
Band 2+3 on study

Receivers

- Receiver Bands currently installed on all antennas:
 - Band 3: 3 mm (84-116 GHz)
 - Band 4: 2 mm (125-163 GHz)
 - Band 5: 1.6mm (158-211 GHz)
 - Band 6: 1 mm (211-275 GHz)
 - Band 7: 850 μm (275-370 GHz)
 - Band 8: 650 μm (385-500 GHz)
 - Band 9: 450 μm (602-720 GHz)
 - Band 10: 350 μm band (787-950 GHz)
- Receiver Bands in development
 - Band 1: 7mm (35-50 GHz)
- Receiver Bands in study
 - Band 2 (2+3)
 - Band 11
- All receivers **8 GHz bandwidth x 2 polar.**



Correlator



- 4 units of 2 GHz = baseband
- 4 spectral windows per baseband with compromise bandwidth/resolution
- 1/2/4 polarization products (total number of channels = constant)
- **Caution: data rate limitations! Partially released in C6**



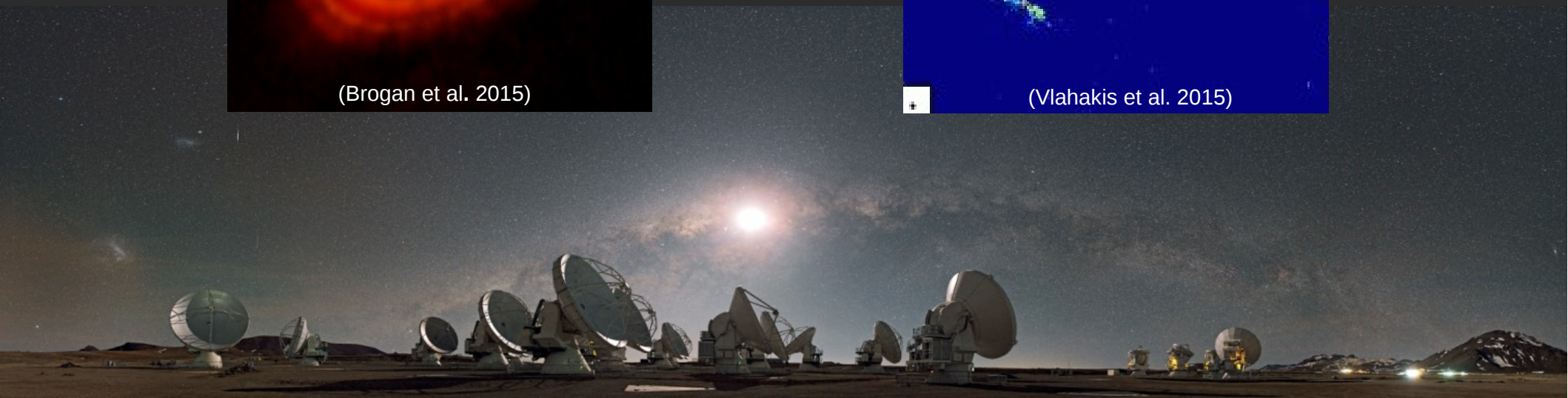
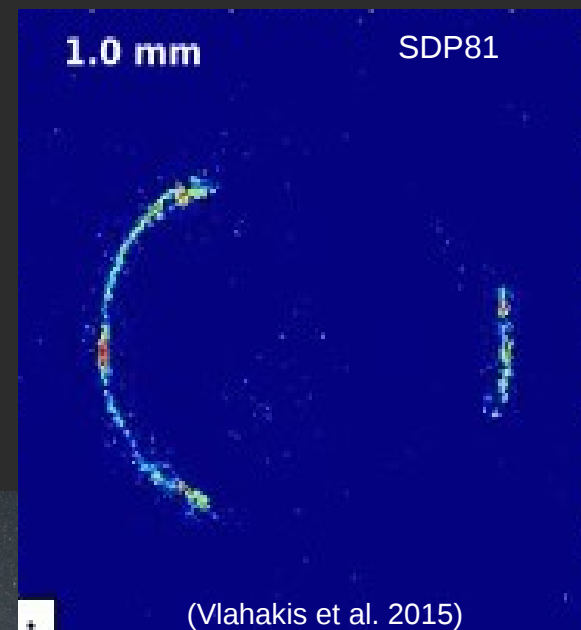
Some results

Long baseline campaign (cycle 3)

Protoplanetary disks



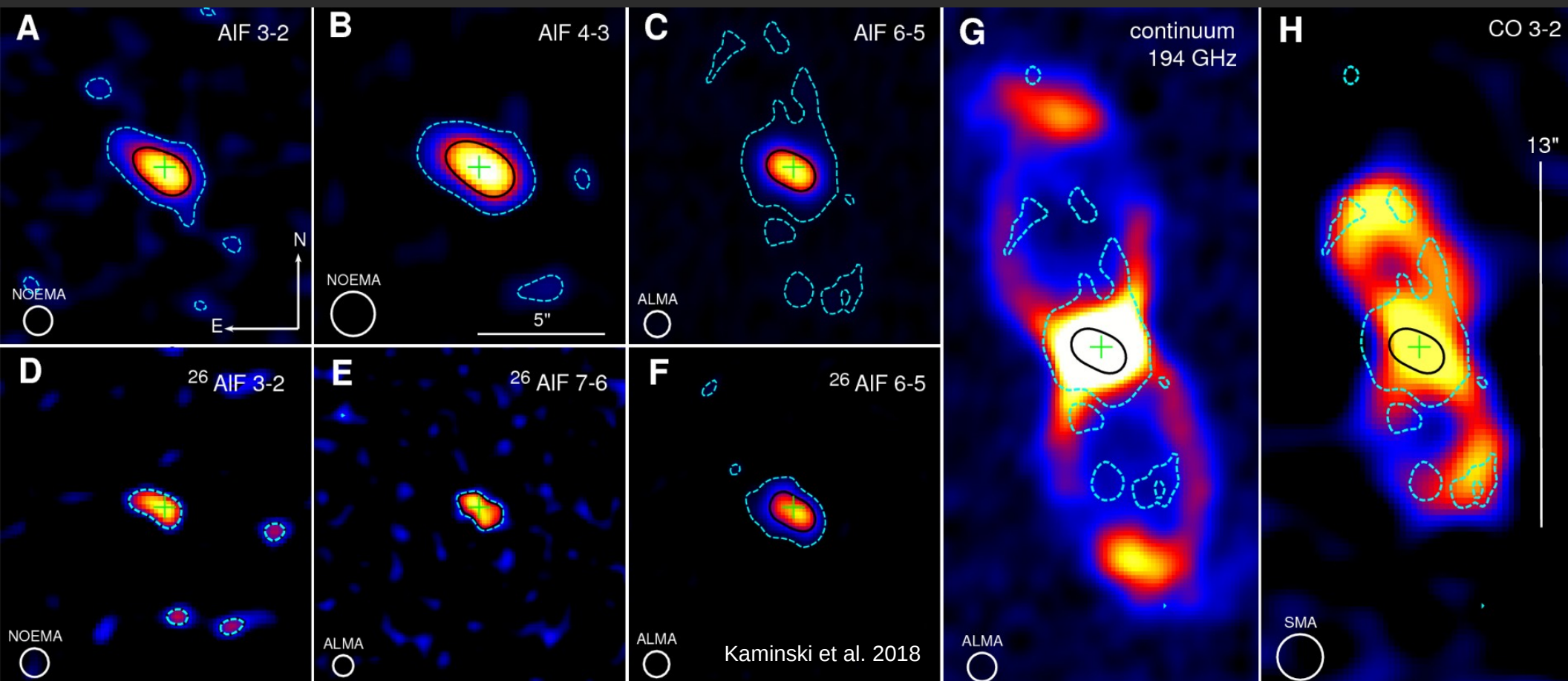
Gravitational lenses



Some results

Detection of ^{26}AlF (ALMA + NOEMA + 30m)

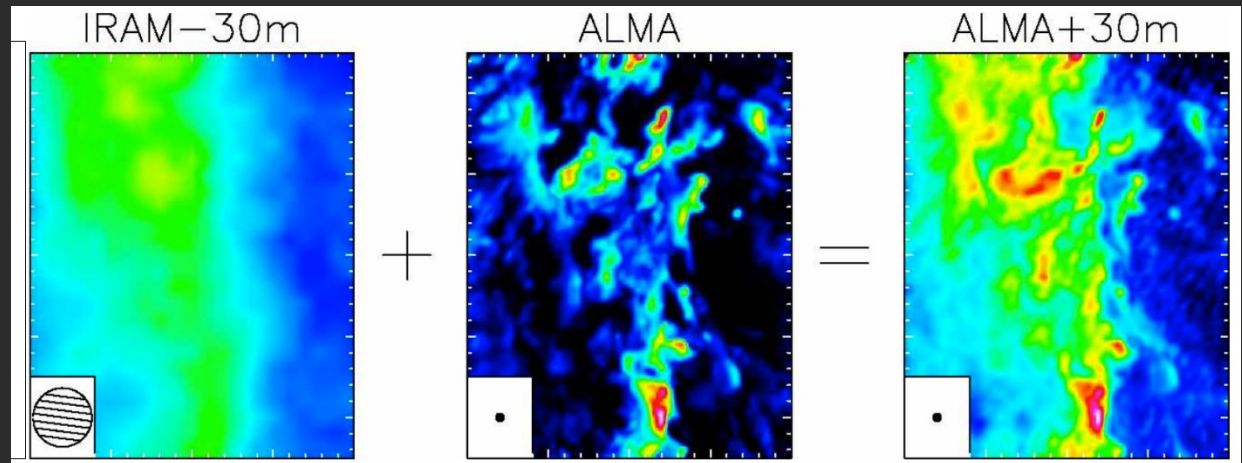
Evolved stars



Some results

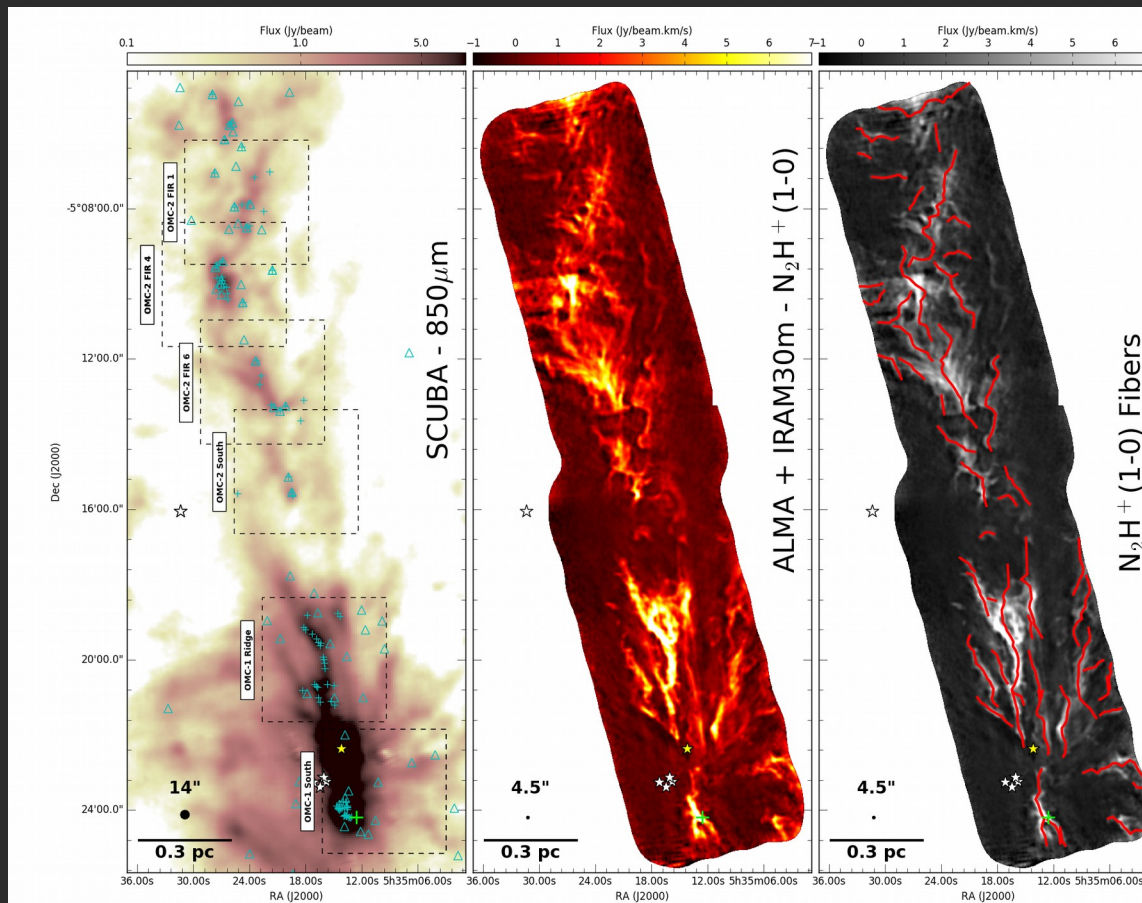
Orion

Combination with 30m



Goicoechea et al. 2016

Compression and
ablation of the photo-
irradiated molecular
cloud of the Orion Bar



Multiple fibers in the
heart of the Orion
star-forming region

Hacar et al. 2018

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I- The ALMA observatory

II- The ARC nodes

III- The PI experience

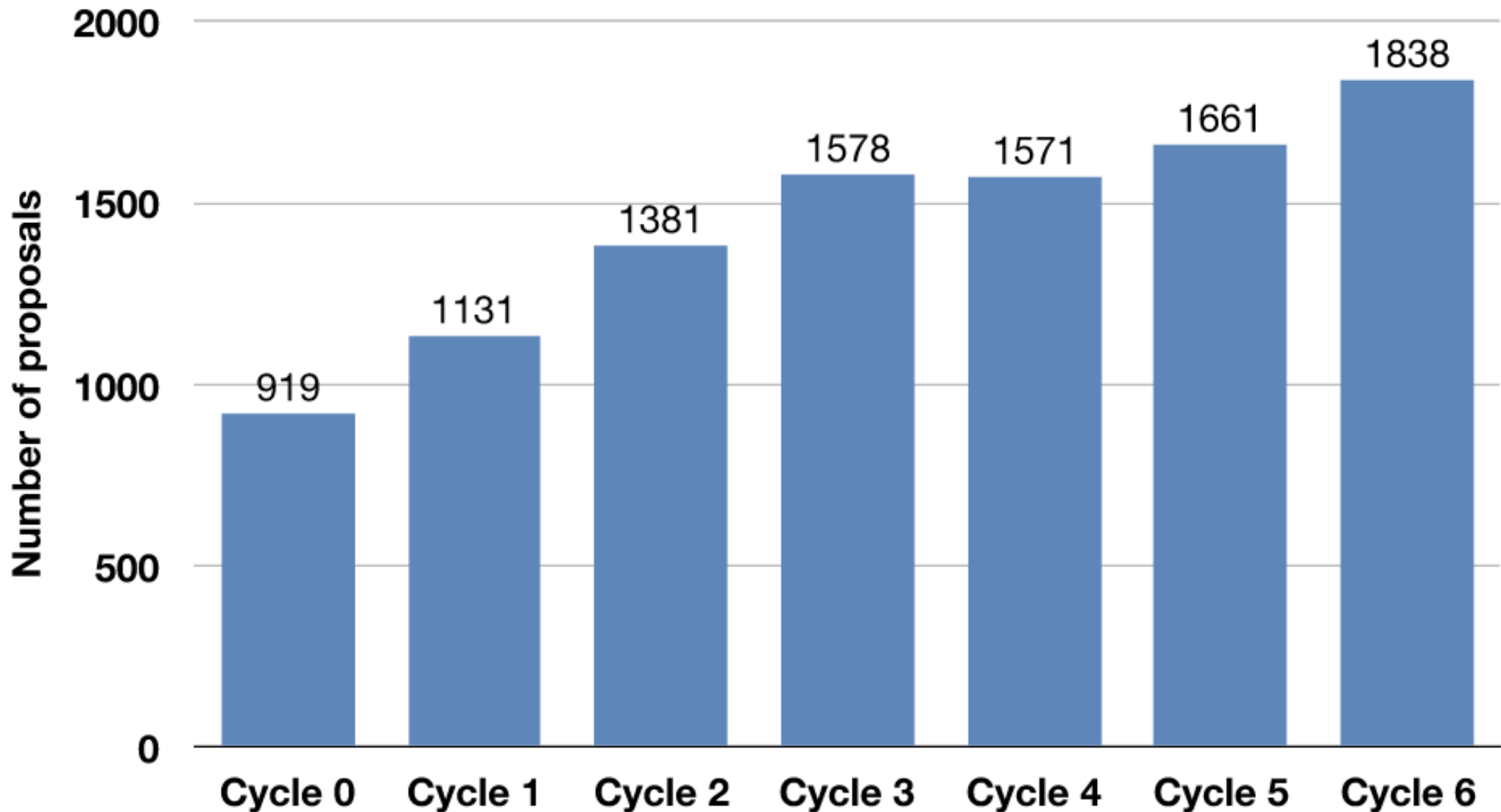
ALMA Operations

- Service observing **operated by JAO** with the help of the ARCs
- Proprietary period = 12 months
- One single Time Allocation Committee for NA+EU+EA+CL
 - No guaranteed time
 - EU 33.75%, NA 33.75%, EA 22.5%, Chile 10%
- In full operations:
 - One call for proposals per year (deadline ~ April) **started in Cycle 3**
 - Dynamic scheduling: best project determined every SB (hour scale) (**goal for Cycle 7**)
 - Calibration & imaging pipeline (**calibration and imaging for standard projects**)
 - Polarimetry (**partially open since Cycle 3**)
 - Large programs (**opened in Cycle 4**)
 - ACA stand alone (**opened in Cycle 4**)
 - Solar observation (**opened in Cycle 4, still in progress**)
 - VLBI (**open in Cycle 4**)



ALMA Early Science

Number of Submitted Proposals by Cycle

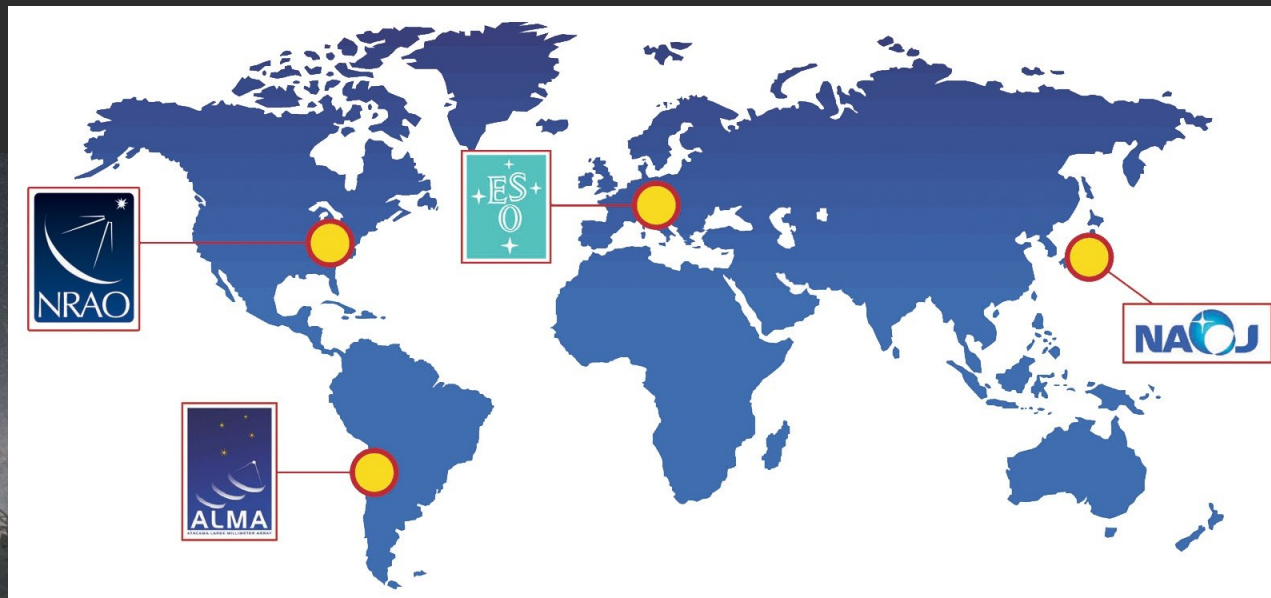


ALMA Regional Centers

Scientific operations & user support outside Chile

- Contact point between users and ALMA
- Call for proposals
- ALMA Helpdesk
- Data product support = delivering data and software
- ALMA archive operations

Three ARCs + JAO



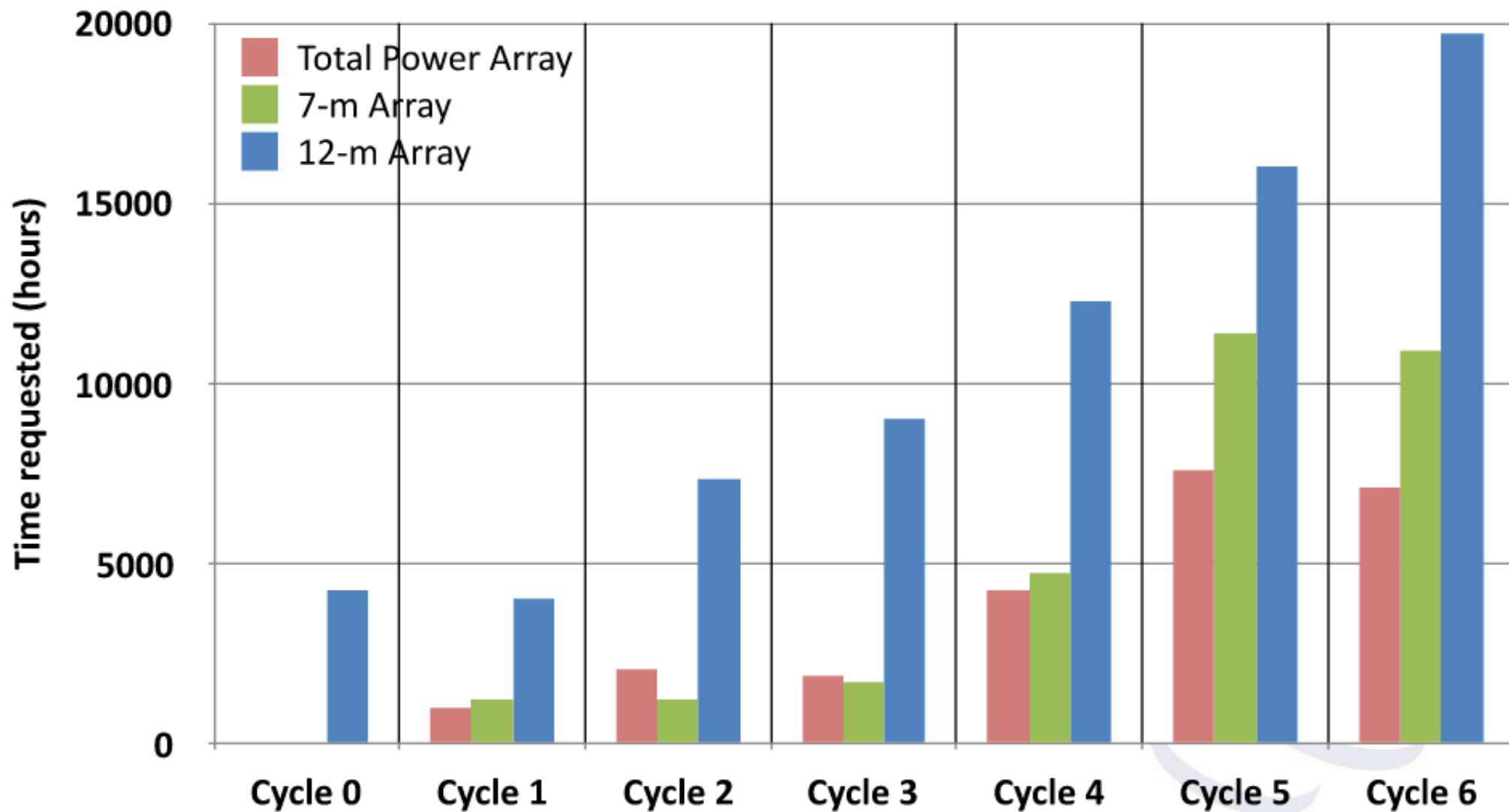
ARCs:

- EU : ESO Garching (D)
- NA: NRAO Charlottesville (USA)
- EA: NAOJ Mitaka (J)



ALMA Early Science

Time requested by Cycle



ALMA Early Science

ALMA capabilities deployment

Now distinguish between standard and non-standard modes

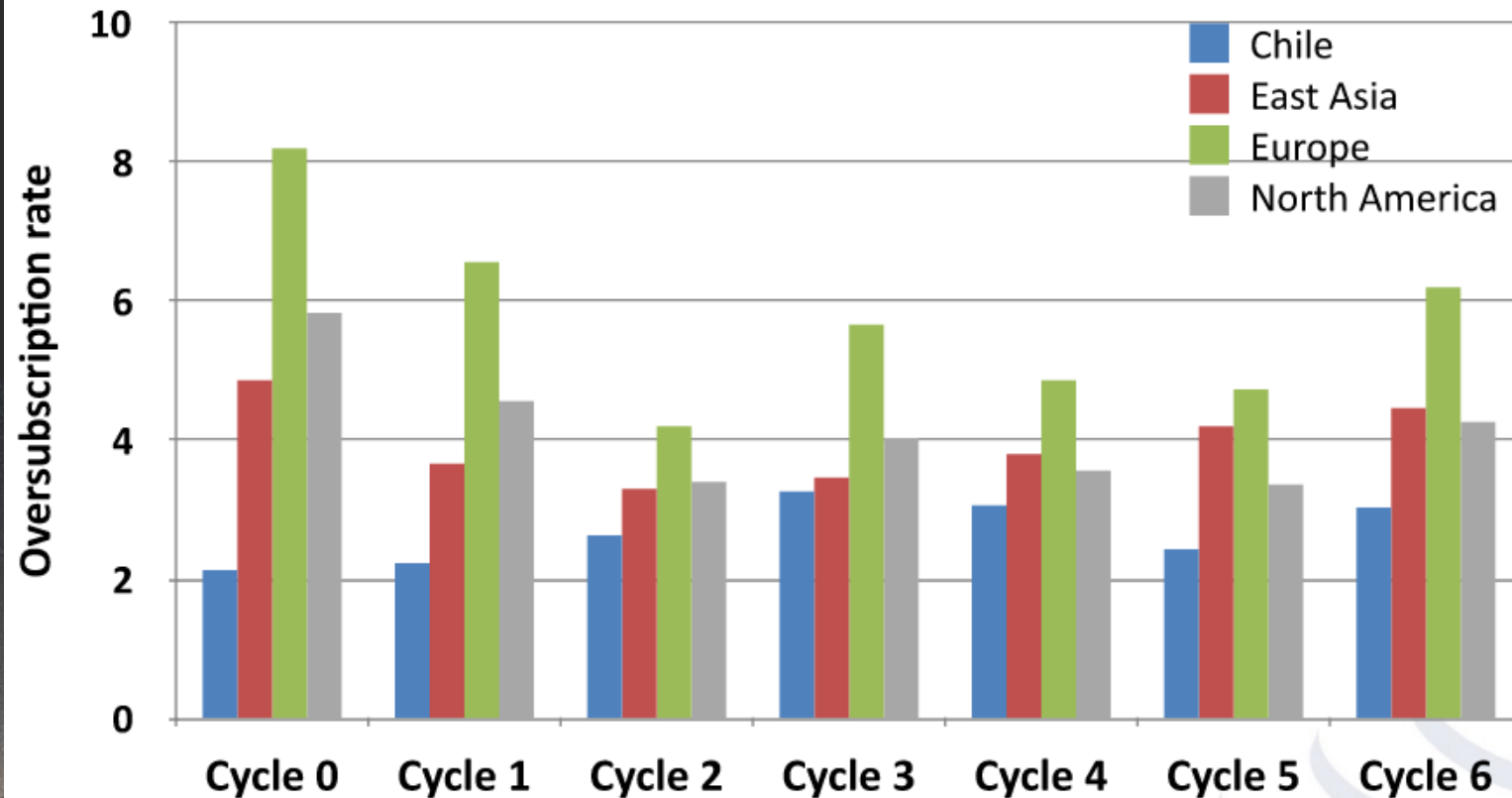
- VLBI,
- polarimetry,
- long baselines

Pressure factor

~ **5–10**



Oversubscription Rate: 12-m Array



European ARC network

Additional tasks : ARC nodes

- User formation & community development
- Phase II support
- Face-to-face support for data reduction
- New developments
- All nodes open to all European scientists but target own community
- **IRAM = French, German, and Spanish communities**

Seven ARC nodes in Europe

- INAF Bologna (I)
- Univ. Bonn (D)
- IRAM (F,D,E)
- Leiden Obs. (NL)
- Manchester Obs. (UK)
- Onsala Obs. (S,DK,SF)
- Prague (CZ)
- + Lisbon (P) Center of Expertise



IRAM ARC node

- Phase II and f2f support to ALMA
 - Local contact assigned to each project
 - Use existing infrastructures and procedures
 - Travels to Grenoble funded by IRAM (same rules as NOEMA)
Radionet Marcus funding
 - Limited staff (<2 FTE)
 - ~ 33% of European projects



ARC node representative: Frédéric Gueth

Name	Status	FTE	Expertise/task
Edwige Chapillon	Staff	0.5	CS, f2f (QA2)
Ana Lopez Sepulcre	Staff	0.5	CS, f2f (QA2)
Ka Tat Wong	Post-doc	0.5	CS, f2f (QA2)
Cinthya Herrera Contreras	Post-doc	0.2	CS, (QA2)
Aranca Castro-Carrizo	Staff	0.1	CS, f2f



User support

- **Contact Scientists**
 - SB support for all accepted + fillers projects (> observed projects)
 - Interface between PI and ESO & ALMA
 - Also: check projects status during Cycle
 - helpdesk
- **f2f support for data reduction**
 - Main task
 - Re-calibration
 - Re-imaging
 - Covers most bands & observing modes
 - Travel funding available (for PI affiliated to IRAM funding agencies), limited Marcus funding
 - No funding for specific computing equipment.
- **Schools, workshops**





EUROPEAN ARC

ALMA Regional Centre || IRAM



ALMA

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I- The ALMA observatory

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The PI experience

- Phase I : Proposal preparation and submission
- Phase II : Science Block preparation
- Observation
- Quality assessment (QA0 & QA2)
- Data delivery
- Check (QA3)
- Analysis and publication :-)

Phase 1 : Proposal

Call for proposal issued by JAO and the ARC
1 /year, in April

- Proposal preparation
 - Documentation
 - Science portal (almascience.eso.org)
- Duplication check
 - Alma archive
 - Accepted proposal list
- Proposal submission
 - Observing tool

Phase 1 : Science portal

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

NRAO Associated Universities, Inc. NSF

Log in

About Science **Proposing** Observing Data Processing Tools **Documentation** Help Search Site

Observatory News

ALMA Cycle 6 Proposal Review: Detailed Report
Aug 29, 2018

ALMA announces new ACA observatory filler programs for Cycle 5
Aug 28, 2018

Cycle 6 Proposal Submission Statistics
May 23, 2018

More...

NRAO News

Jansky Lecture: Roger Blandford
Oct 30, 2018

Jansky Lecture: Roger Blandford
Nov 01, 2018

Jansky Lecture: Roger Blandford
Nov 09, 2018

More...

Status

Configuration Schedule
Cycle 6 Highest Priority Projects

Refereed publications: 1164
Last observed source: NGC_4666
Current configuration: C43-6

More...

- 3 mirrors : ESO/NRAO/NAOJ
- Documentation
- User account

Phase 1 : Science portal

The screenshot shows the ALMA Science Portal website. The browser address bar displays <https://almascience.nrao.edu/proposing/documents-and-tools/>. The page header includes the ALMA logo, the text "Atacama Large Millimeter/submillimeter Array" and "In search of our Cosmic Origins", and logos for NRAO, Associated Universities, Inc., and SI. A navigation menu contains links for About, Science, Proposing, Observing, Data, Processing, Tools, Documentation (highlighted), and Help. A search bar is located on the right. The main content area is titled "Documentation" and "Call for Proposals", with a sub-header "Documentation supporting the current ALMA Call for Proposals - Cycle 6. Documents from previous Cycles are provided [here](#)." Below this is a table with two columns: "Document" and "Description".

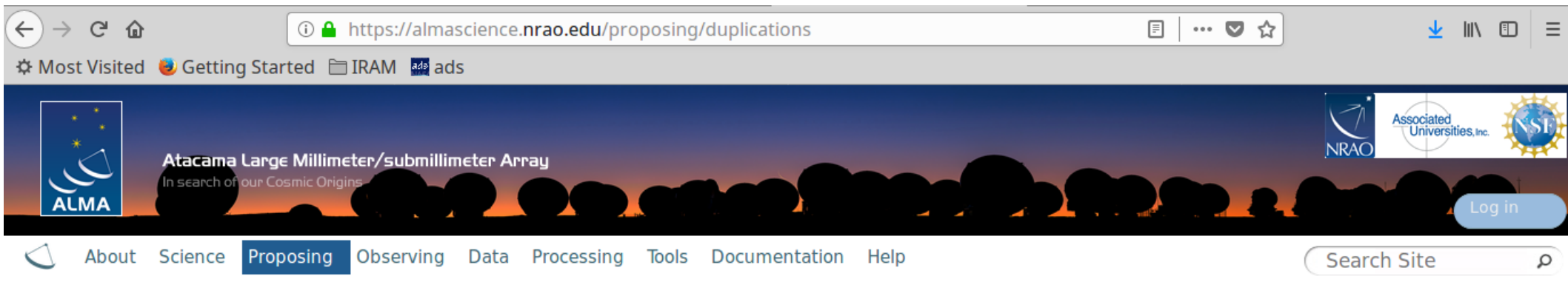
Document	Description
ALMA Proposer's Guide	Contains all pertinent information regarding the ALMA Call for Proposals
ALMA Technical Handbook	A comprehensive description of the ALMA observatory and its components
ALMA Users' Policies	The long-term core policies for use of the ALMA and ALMA data by the science community
Observing With ALMA - A Primer	Introduction to interferometry and how to use ALMA
ALMA Proposal Template	LaTeX format. Recommended but not mandatory
ALMA Proposal Review Process	The latest version of the ALMA Principles of the ALMA Proposal Review Process

On the right side of the page, there is a "Contents" section with a list of links:

- [1. Call for Proposals](#)
- [2. Phase 1 & 2](#)
- [3. Guides to the ALMA Regional Centers](#)
- [4. ALMA Science Data Tracking, Data Processing and Pipeline, Archive and QA2 Data Products](#)
- [5. ALMA Reports, Memos and Newsletters](#)

- 3 mirrors : ESO/NRAO/NAOJ
- Documentation (copy on the IRAM ARC node website)
- User account

Phase 1 : Science portal



The screenshot shows a web browser window with the URL <https://almascience.nrao.edu/proposing/duplications>. The page header features the ALMA logo with the tagline "Atacama Large Millimeter/submillimeter Array" and "In search of our Cosmic Origins". Logos for NRAO and Associated Universities, Inc. are also present. A navigation menu includes "About", "Science", "Proposing" (highlighted), "Observing", "Data", "Processing", "Tools", "Documentation", and "Help". A search bar labeled "Search Site" is on the right. A "Log in" button is visible in the top right corner.

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 6 Proposer's Guide and [Section 5.2](#) 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 5 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 projects that have not been completed as of 2018 March 17 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 from for Grade B and C projects that have not been started by 2018 March 17 will not be used in the duplication checks conducted by ALMA even if observations are obtained later in Cycle 5.

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).

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

Phase 1 : Archive

← → ↻ 🏠 ⋮

⚙️ Most Visited 🌐 Getting Started 📁 IRAM 📄 ads

Query Form

Results Table

ALMA Science Archive

Search

Reset

Query Help

📍 Position

Source name (Resolver)
Source name (ALMA)
RA Dec
Galactic
Target list
Angular resolution
Largest angular scale
Field of view

📡 Energy

Frequency
Bandwidth
Spectral resolution
Band

🕒 Time

Observation date
Integration time

✕ Polarisation

Polarisation type

🔍 Observation

Line sensitivity (10 km/s)
Continuum sensitivity
Water vapour

💡 Project

Project code
Project title
PI name
Proposal authors
Project abstract
Publication count
Science keyword

📄 Publication

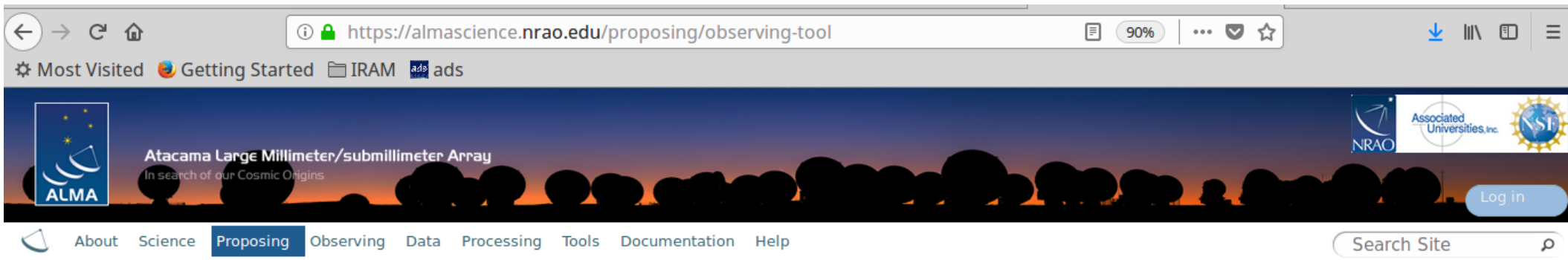
Bibcode
Title
First author
Authors
Abstract
Year

☰ Options

View:


- observation
- project
- publication
- public data only
- science observations only




Phase 1 : Observing tool



← → ↻ 🏠 <https://almascience.nrao.edu/proposing/observing-tool> 90% ⋮ ⌵ ☆

⚙️ Most Visited 🌐 Getting Started 📁 IRAM ads

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

Log in

🏠 About Science **Proposing** Observing Data Processing Tools Documentation Help

Search Site 🔍

Observing Tool

The ALMA Observing Tool (OT) is a Java application used for the preparation and submission of ALMA Phase 1 (observing proposal) and Phase 2 (telescope runfiles for accepted proposals) materials. It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals. The current *Cycle 6* release of the OT is configured for the present capabilities of ALMA as described in the [Cycle 6 Call For Proposals](#). Note that in order to submit proposals you will have to register with the ALMA Science Portal beforehand.

Download & Installation

The OT will run on most common operating systems, as long as a **64-bit version of Java 8** is installed (see the [troubleshooting page](#) if you are experiencing Java problems). The ALMA OT is available in two flavours: Web Start and tarball.

The **Web Start** application is the recommended way of using the OT. It has the advantage that the OT is automatically downloaded and installed on your computer and it will also automatically detect and install updates. There are some issues with Web Start, particularly that it does not work with the Open JDK versions of Java such as the "Iced Tea" flavour common on many modern Linux installations. The Oracle variant of Java should therefore be installed instead. If this is not possible, then the tarball installation of the OT is available.

The **tarball** version must be installed manually and will not automatically update itself, however there should be no installation issues.

Webstart

Tarball

Documentation

Extensive documentation is available to help you work with the OT and optimally prepare your proposal:

- If you are a novice OT user you should start with the [OT Quickstart Guide](#), which takes you through the basic steps of ALMA proposal preparation.
- Audio-visual illustrations of different aspects of the OT can be found in the [OT video tutorials](#). These are recommended for novices and advanced users alike.
- More in-depth information on the OT can be found in the [User Manual](#), while concise explanations of all fields and menu items in the OT are given in the [Reference Manual](#). These two documents are also available within the OT under the Help menu.

Troubleshooting

If you have problems with the installation and/or startup of the OT, please see the [troubleshooting page](#). A list of currently known bugs, their status and possible workarounds can be found on the regularly updated [known OT Issues](#) page. A further source of information is the [OT section of the ALMA Helpdesk Knowledgebase](#) - this contains a number of articles that deal with frequently-asked questions. After exploring these resources, if confusion over some aspect of the OT remains, or if a previously unidentified bug has been uncovered, please file a [Helpdesk ticket](#).

Phase 1 : Observing tool

- Java too mandatory to prepare and submit the proposal
- Need the **right java version** (not always the latest, check the documentation!)
- **DO NOT START AT THE LATEST MOMENT**
- Doc : Alma Observing Tool Quickstart Guide
- Troubleshooting page

Phase 1 : Observing tool

The image shows a software interface for 'Phase 1: Observing tool' with several key components labeled:

- Menu:** Located at the top left, containing 'File', 'Edit', 'View', 'Tool', 'Search', and 'Help'.
- Toolbar:** Located below the menu, containing various icons for file operations and editing.
- Project Structure Pane:** Located on the left side, showing a tree view of the project structure with 'Project' and 'Proposal' nodes. A label indicates it is used to 'Expand/collapse project tree'.
- Editor Pane:** The main central area for editing, containing a form for 'Principal Investigator' and 'Project Information' (Project, Assigned Priority, Project Code). A label indicates it is used to 'Define the Setup'.
- Feedback Pane:** Located at the bottom, containing a table for 'Validation feedback' with columns for 'Description' and 'Suggestion'.
- Overview Pane:** Located at the bottom right, containing a flowchart for 'Phase I: Science Proposal' and a 'Contextual Help' section. The flowchart steps are: 'New Science Proposal' -> 'Create Science Goals' -> 'Validate Science Proposal' -> 'Submit Science Proposal'. Below the flowchart are buttons for 'Importing And Exporting', 'Template Library', 'Need More Help?', and 'View Phase 2 Steps'. The 'Contextual Help' section contains instructions on how to create a new proposal.
- Maximise/minimise pane:** Located at the bottom left, containing a 'Maximise/minimise pane' label.

Phase 1 : Observing tool

File Edit View Tool Search Help Perspective 1

Project Structure

- Proposal
- Program
- Unsubmitted Proposal
 - Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial Spectral Setup

Spectral Type

Spectral Type

Spectral Line
 Single Continuum
 Spectral Scan

Polarization products desired XX DUAL FULL

Spectral Setup Errors

Spectral Line

Baseband-1

Fraction	Centre Freq (rest,lsrk)	Centre Freq (sky,bar)	Transition	Bandwidth, Resolution (smoothed)	Spec Avg.	Representative Window
1/2	230.53800 G...	230.53822 G...	CO v=0 2-1	117.188 MHz(152 km/s), 122.070 kHz(0.159 km/s)	1	<input checked="" type="radio"/>
1/4	231.22069 G...	231.22091 G...	13CS v=0 5-4	58.594 MHz(76 km/s), 122.070 kHz(0.158 km/s)	1	<input type="radio"/>
1/4	231.32183 G...	231.32205 G...	N2D+ J=3-2	58.594 MHz(76 km/s), 122.070 kHz(0.158 km/s)	1	<input type="radio"/>

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

Baseband-2

1(Full)	230.00000 G...	230.00022 G...	...Enter Name...	1875.000 MHz(2444 km/s), 31.250 MHz(40.733 km/s)	1	<input type="radio"/>
---------	----------------	----------------	------------------	---	---	-----------------------

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

Baseband-3

Feedback

Validation Validation History Log

Phase 1 : Observing tool

In case of any problem, do not hesitate to

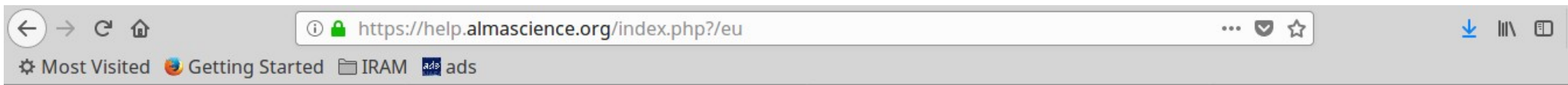
- Write to the **helpdesk** (recommended)
Access through the science portal
- Write to the **ARC node**

DO NOT WAIT FOR THE LAST MOMENT!

Phase 1 : Helpdesk

Need the science portal user account

Phase 1 : Helpdesk




- [Dashboard](#)
- [My Tickets](#)
- [Submit a Ticket](#)
- [Knowledgebase](#)
- [News](#)
- [TOO](#)

What can we help you with?

Search in: Tickets KB articles Science Portal

[Help](#)

- 
[My Tickets](#)
- 
[Submit a Ticket](#)
- 
[Knowledgebase](#)
- 
[News](#)
- 
[TOO](#)

Account

- [My Profile](#)
- [Preferences](#)
- [Logout](#)

Latest Updates

We've got nothing to display here

Phase 2 : You get time !

Result of the APRC by end of July

Goal of Phase 2 : generate the observation scripts

Has evolved from cycle to cycle

- By batch along the years prior to cycle 3
- Hard deadline around Sept 6 since cycle 4
- PI generate the SB up to cycle 4
- PI review the phase1 material since cycle 5
SB are generated by ARC (P2G members)

Check the documentation / helpdesk

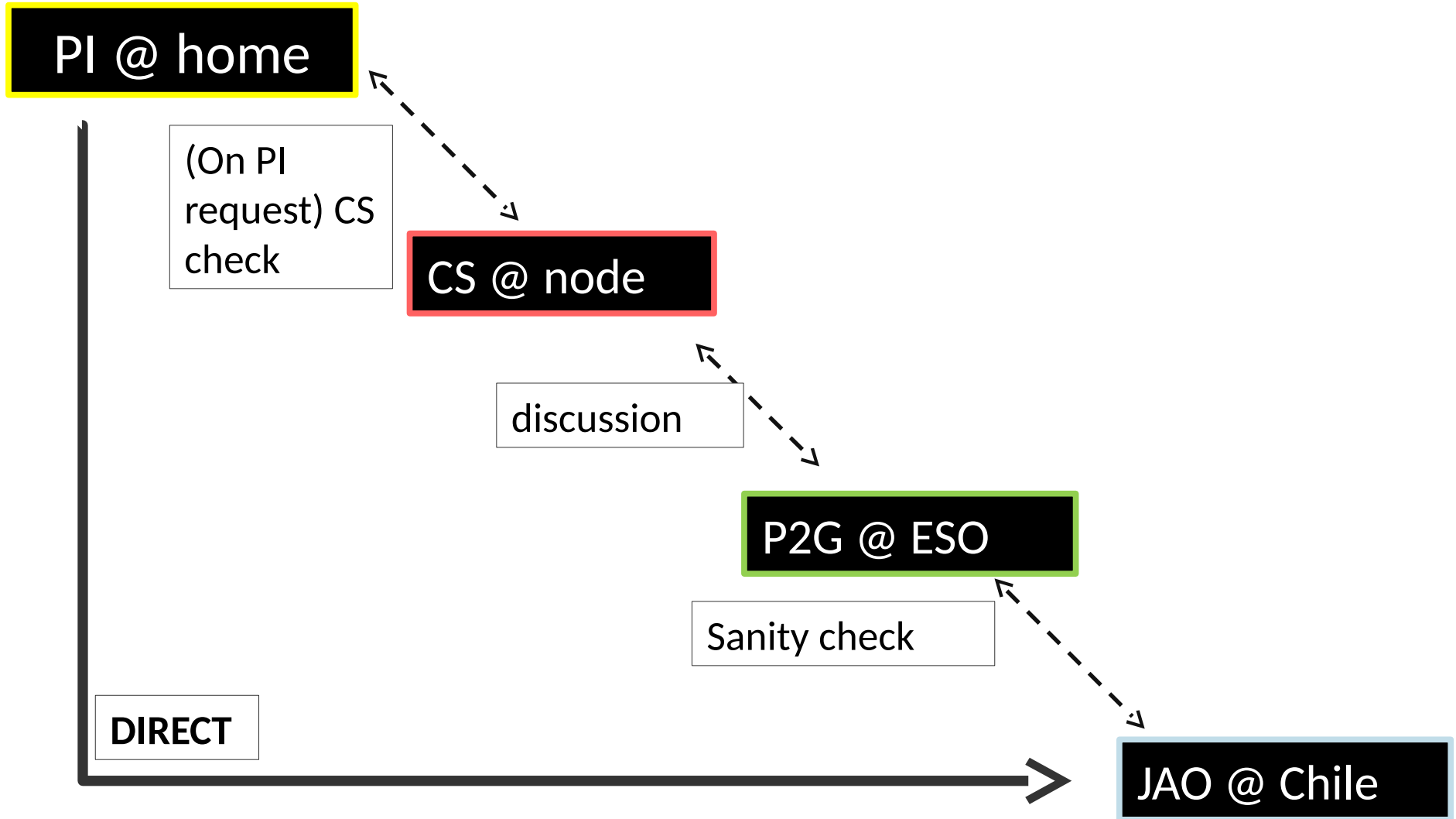
Phase 2 : in practice

- You will receive the result of APRC by mail by end of July
- A CS will be assigned to each of your projects
- An helpdesk ticket will be created for each of your projects → email
- **OT version for phase 2** should be ready in the following days
- “Open from archive” your project → under the “Program” tab
- Review your material (source coordinates, mosaic, spectral setup) and submit by the deadline

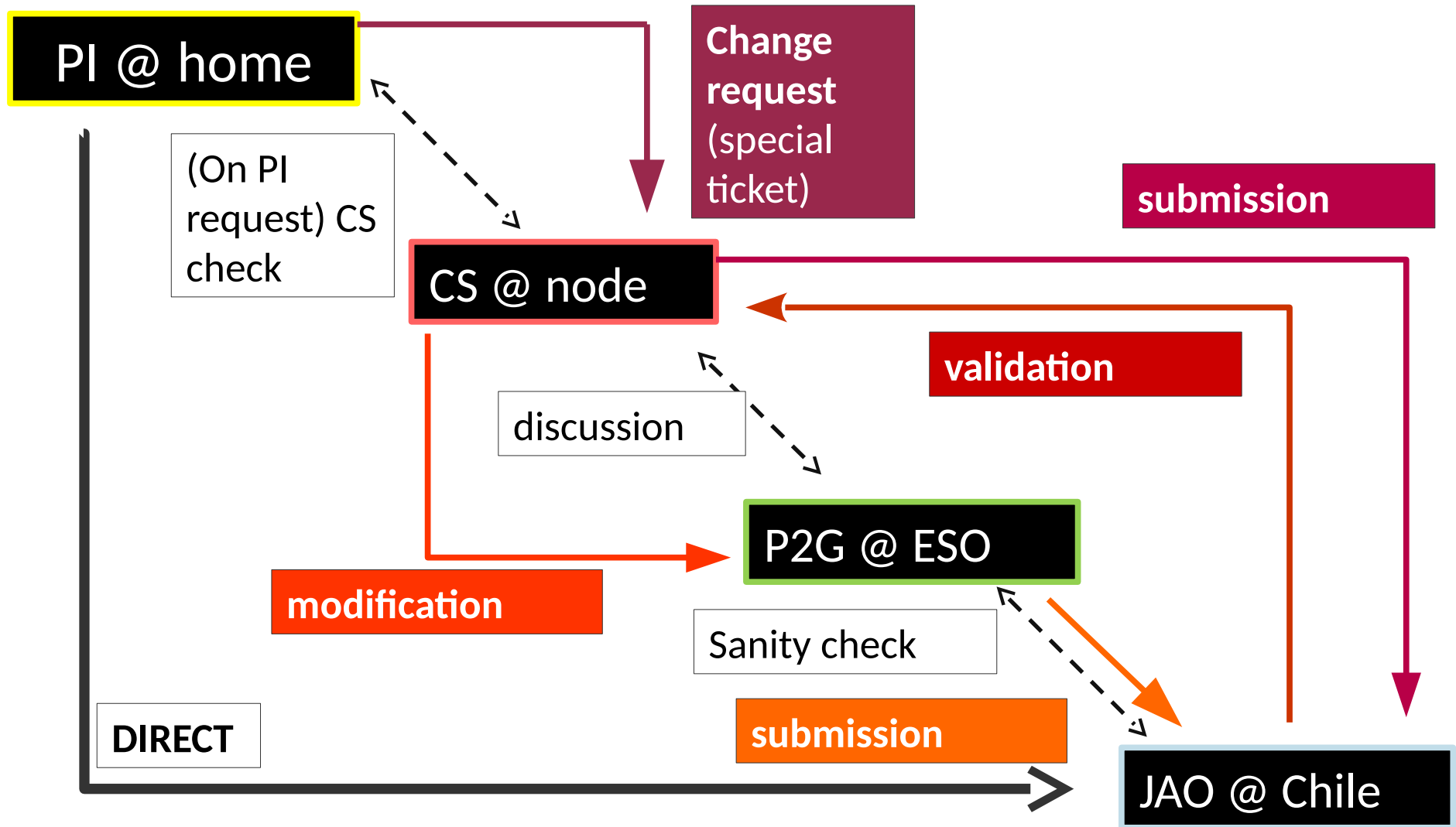
Phase 2 : in practice

- Inform your CS via the helpdesk of any peculiar need (e.g. new time constraint)
- For TP observation, give OFF positions
- Possibility to delegate
- Doc : Phase 2 Quickstart Guide
Video tutorial
- Submission with the OT by the deadline
HARD DEADLINE, PROJECT COULD BE DOWNGRADED

Phase 2 : in practice



Phase 2 : in practice



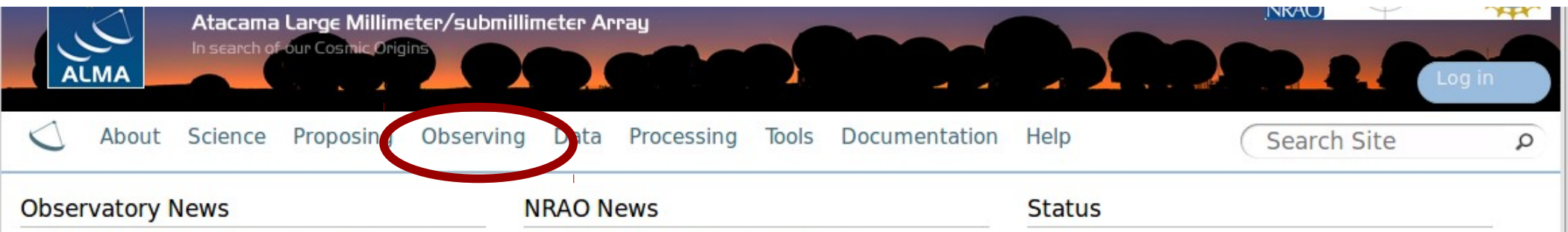
Phase 2 : in practice

If you have question, do not hesitate to

- **Consult**
 - Troubleshooting page
 - Known OT issue
- Write to the **helpdesk** (recommended)
- **Contact an arc node**

Project status

- Antennas configuration spread along the year
- Informations under the “Observing” tab on the Science Portal
 - ALMA status page
 - Configuration schedule
 - SnooPI



Project status : Project tree

Science Goal (SG)

└ Group Observing Unit set (GOUS)

└ Member OUS (MOUS)

└ Science Block (SB)

└ Execution Block (EB)

SG : [source(s) + freq. setup]

GOUS : include several ant.conf.

MOUS : [source(s) + freq. setup + 1 ant.conf.]

SB : smallest unit for observing

EB : actual observation of 1 SB



EB are limited to 2h long → several EB / SB

Project status : observation life

For each SB (i.e. 1 freq /source/ant.conf),

- 1 observation = 1 EB, first status = “READY”
- After each EB : **QA0** (sanity check)
- When the requested # of QA0 EB is reached → “fullyObserved”
- Then go to **QA2**
 - Standard projects calibration with the pipeline at JAO
 - Others calibrated “by hand” mainly at ARC (nodes)
 - Images done by pipeline in most of the case
 - DRM (Data Reduction Manager) at ARC decides if it is PASS or FAIL
- If FAIL go back to the observation queue
- If PASS delivered to PI status “delivered”

Project status : SnooPI







SnooPI  **SnooPI** John Smith
Executive: EU; ARC: EU 


NAVIGATION

- Home
- My Projects
- My SchedBlocks

QUICK LINKS


- User Manual
- Science Portal
- Archive Query
- Helpdesk

 5/8 PI Projects	 9/9 PI Scheduling Blocks
 22/34 Co-I Projects	 58/60 Co-I Scheduling Blocks
 0/2 Delegee Projects	 0/2 Delegee Scheduling Blocks






















 Since 2015-07-02 [More news...](#)

2015-10-23 ObsUnitSet [Member OUS \(w51\)](#) of project [2013.1.00308.S](#) is now Delivered
2015-08-30 All data taken for Scheduling Block [w51_a_06_TE](#) of project [2013.1.00308.S](#)
2015-07-02 All data taken for Scheduling Block [SgrB2_a_03_TE](#) of project [2013.1.00269.S](#)

Q Search Projects or Scheduling Blocks



Project status : SnooPI

		Executions
 2013.1.06789.S		
 Observing the centre of the galaxy with ALMA		
 ObsUnitSet		
 SG OUS (CH3CN 5-4 & isotopologue, H2CS 3-2, HCO+ 1-0, HCN 1-0, HNC 1-0 map)		
 Group OUS		
 Member OUS (SgrB2)		
 SgrB2_a_03_TP		41/40
 Member OUS (SgrB2)		
 SgrB2_a_03_TC		4/3
 Member OUS (SgrB2)		
 SgrB2_a_03_7M		4/4
 Member OUS (query)		
 3c454.3_SgrB2_a_03_TP		6/1
 Member OUS (SgrB2)		
 SgrB2_a_03_TE		4/4

Click on a SB → details of the EB

access to the QA0 report / EB
QA2 report for the SB

After observation

One of your SB is delivered (i.e. not necessary all your project!)

Proprietary period start the day of delivery, i.e. it is **different for each SB**

Delivered data consist of :

- Raw data (asdm format)
- Calibration and imaging “scripts” used for the QA2
- Weblog / plots made during the manual QA2
- Images
- Calibration tables

Your data

Need to go to the archive

- Link in the delivery email
- Search in the archive “download request”

The screenshot shows the ALMA Science Archive search interface. At the top, there is a browser address bar with the URL `almascience.eso.org/aq/`. Below the address bar, there are navigation tabs for "Query Form" and "Results Table", with "Query Form" being the active tab. To the right of the tabs, the text "ALMA Science Archive" is displayed. Below the tabs, there are "Search" and "Reset" buttons, and a "Query Help" link on the right. The main content area is divided into eight panels, each representing a different search criterion:

- Position**: Source name (Resolver), Source name (ALMA), RA Dec, Galactic, Target list, Angular resolution, Largest angular scale, Field of view.
- Energy**: Frequency, Bandwidth, Spectral resolution, Band.
- Time**: Observation date, Integration time.
- Polarisation**: Polarisation type.
- Observation**: Line sensitivity (10 km/s), Continuum sensitivity, Water vapour.
- Project**: Project code, Project title, PI name, Proposal authors, Project abstract, Publication count, Science keyword.
- Publication**: Bibcode, Title, First author, Authors, Abstract, Year.
- Options**: View: observation, project, publication, public data only, science observations only.

Your data

Download Selected

readme product auxiliary raw raw (semipass)

Project / OUSet / Executionblock	File	Size	Accessible
Request 2145351141293			
Project 2015.1.01273.S			
readme	2015.1.01273.S.readme.txt		
Science Goal OUS uid://A001/X2f7/X500			
Group OUS uid://A001/X2f7/X501			
Member OUS uid://A001/X2f7/X502			
SB W43-MM1_a_06_TE			
<input checked="" type="checkbox"/> product	2015.1.01273.S uid_A001_X2f7_X502_001_of_001.tar	7.0GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb372db_X237e.asdm.sdm.tar	75.9GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb3c4ab_X124d.asdm.sdm.tar	75.7GB	✓
<input type="checkbox"/> raw (semipass)	2015.1.01273.S uid_A002_Xb3cc45_X1265.asdm.sdm.tar	10.8GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb3cc45_X1353.asdm.sdm.tar	62.5GB	✓
Member OUS uid://A001/X2f7/X504			
SB W43-MM1_a_06_TC			
<input checked="" type="checkbox"/> product	2015.1.01273.S uid_A001_X2f7_X504_001_of_001.tar	1.8GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xae5b1d_X2ae0.asdm.sdm.tar	23.9GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xae5b1d_X2d2c.asdm.sdm.tar	47.9GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xae6c13_X1768.asdm.sdm.tar	57.3GB	✓
Member OUS uid://A001/X2f7/X506			
SB W43-MM1_a_06_7M			
<input checked="" type="checkbox"/> product	2015.1.01273.S uid_A001_X2f7_X506_001_of_001.tar	599.3MB	✓
<input type="checkbox"/> raw (semipass)	2015.1.01273.S uid_A002_Xb10f33_Xdb49.asdm.sdm.tar	697.5MB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb51110_Xa38.asdm.sdm.tar	1.4GB	✓
Member OUS uid://A001/X2f7/X50a			
SB W43-MM1_a_06_TP			
<input checked="" type="checkbox"/> product	2015.1.01273.S uid_A001_X2f7_X50a_001_of_001.tar	2.3GB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb09eed_Xba2a.asdm.sdm.tar	903.5MB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb09eed_Xbe88.asdm.sdm.tar	903.6MB	✓
<input type="checkbox"/> raw (semipass)	2015.1.01273.S uid_A002_Xb09eed_X4279.asdm.sdm.tar	903.5MB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb44b49_X1e72.asdm.sdm.tar	77.0MB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb4655b_X42fc.asdm.sdm.tar	809.6MB	✓
<input type="checkbox"/> raw	2015.1.01273.S uid_A002_Xb4655b_X469a.asdm.sdm.tar	899.8MB	✓

Total: 422.0GB

Your data

Download Selected

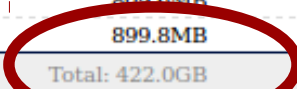
readme product auxiliary raw raw (semipass)

Project / OUSet / Executionblock	File	Size	Accessible
Request 2145351141293			
Project 2015.1.01273.S			
readme	2015.1.01273.S.readme.txt		
Science Goal OUS uid://A001/X2f7/X500			
Group OUS uid://A001/X2f7/X501			
Member OUS uid://A001/X2f7/X502			
SB W43-MM1_a_06_TE			
<input checked="" type="checkbox"/> product		7.0GB	✓
<input type="checkbox"/> raw		75.9GB	✓
<input type="checkbox"/> raw		75.7GB	✓
<input type="checkbox"/> raw (semipass)		10.8GB	✓
<input type="checkbox"/> raw		62.5GB	✓
Member OUS uid://A001/X2f7/X504			
SB W43-MM1_a_06_TC			
<input checked="" type="checkbox"/> product		1.8GB	✓
<input type="checkbox"/> raw		23.9GB	✓
<input type="checkbox"/> raw		47.9GB	✓
<input type="checkbox"/> raw		57.3GB	✓
Member OUS uid://A001/X2f7/X506			
SB W43-MM1_a_06_7M			
<input checked="" type="checkbox"/> product		599.3MB	✓
<input type="checkbox"/> raw (semipass)		697.5MB	✓
<input type="checkbox"/> raw		1.4GB	✓
Member OUS uid://A001/X2f7/X508			
SB W43-MM1_a_06_TP			
<input checked="" type="checkbox"/> product		2.3GB	✓
<input type="checkbox"/> raw		903.5MB	✓
<input type="checkbox"/> raw		903.6MB	✓
<input type="checkbox"/> raw (semipass)		903.5MB	✓
<input type="checkbox"/> raw		77.0MB	✓
<input type="checkbox"/> raw (semipass)		809.6MB	✓
<input type="checkbox"/> raw		899.8MB	✓
		Total: 422.0GB	

No combined data

By default select only the products (images, [QA2 and “scripts”])

Data are HUGE (here 422GB)



Your data

“packaging” slightly change from one cycle to other
(README content, “auxiliary” files...)

Structure of the delivery data :

```
|-- project_id/  
| |-- sg_ouss_id/  
| | |-- group_ouss_id/  
| | | |-- member_ouss_id/  
| | | | |-- README          (  
| | | | |-- product/       (  
| | | | |-- calibration/   (  
| | | | |-- qa/            (  
| | | | |-- script/        (  
| | | | |-- log/           (  
| | | | |-- raw/           (  


---


```

Your data

- **Recommended** : to check the calibration (QA2 report / weblog), and/or redo imaging
- You need to rerun the calibration scripts to have the calibrated visibilities, using the **SAME CASA version** used by the QA2 (not always the same for all SB)
The script “scriptForPI.py” call all others and hide details
- **DISK SPACE** : rule of thumb **10-20 times** the raw data

Your data

To get some help :

- CASA guides casaguides.nrao.edu
- Question via the **helpdesk** (ticket directed to CS or ARC/JAO people)
- Do a **F2F visit in an ARC node** (you can choose a different node from your CS or “standard” affiliation)
- In case of problem, ask for re-reduction and/or re-observation via the helpdesk = **QA3**

Your data / data-mining

ALMA Science

Query Form Results

Submit download request

Showing 94 of 94 rows.

<input type="checkbox"/>	Project code
Filter:	<input type="text"/>
<input type="checkbox"/>	2012.1.00681.S
<input type="checkbox"/>	2013.1.01268.S
<input type="checkbox"/>	2013.1.01268.S
<input type="checkbox"/>	2013.1.01268.S
<input type="checkbox"/>	2013.1.01268.S
<input type="checkbox"/>	2013.1.01268.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00366.S
<input type="checkbox"/>	2013.1.00527.S
<input checked="" type="checkbox"/>	2013.1.00226.S
<input checked="" type="checkbox"/>	2013.1.00226.S

Add/remove displayed columns

Drag & drop columns above or below the red bar, move the red bar itself or click on the checkboxes.

Reorder columns

Drag & drop the columns or drag & drop the column headers directly in the results table.

Show all columns Reset column order Order alphabetically

<input checked="" type="checkbox"/>	Project code		Project code, in the form YYYY.NNNNN.C.AAA, where:
<input checked="" type="checkbox"/>	Source name		Name of the source as registered in the ASDM. Partial matches through wildcards (? , *), and boolean OR expressions (" "), can be used.
<input checked="" type="checkbox"/>	Band		ALMA receiver band.
<input checked="" type="checkbox"/>	Integration	s	Aggregated integration time for the field in the ASDM.
<input checked="" type="checkbox"/>	Release date		
<input checked="" type="checkbox"/>	Velocity resolution	m/s	Estimated velocity resolution from all the spectral windows, from frequency resolution.
<input checked="" type="checkbox"/>	Frequency support	GHz	All frequency ranges used by the field
<input checked="" type="checkbox"/>	Spatial resolution		
<input checked="" type="checkbox"/>	Frequency resolution	kHz	Estimated frequency resolution from all the spectral windows, using median values of channel widths.
<hr style="border: 2px solid red;"/>			
<input type="checkbox"/>	Dec	deg	Declination of the field pointing.
<input type="checkbox"/>	RA	deg	Right Ascension of the field pointing.
<input type="checkbox"/>	Pol products		Polarisation products provided.
<input type="checkbox"/>	Observation date		
<input type="checkbox"/>	PI name		case-insensitive partial match over the full PI name. Wildcards can be used

Your data / data-mining

- Exactly the same data as the PI
(same structure, same scripts)
- **Do not believe blindly the data delivery !**
 - Calibration problem
 - Too much flagging
 - Quick and dirty imaging (if human processed)
 - ...

Artemix



an ALMA data mining
experiment prototype

Artemix

- Explore the public data of the ALMA archive
- Goal :
 - Search by product (not instrument configuration)
 - Provide trans-project queries
 - Rapid idea of the data content (fits file)
- Means :
 - ALMA meta data (observing configuration preview)
 - ALMA cube preview (QA2 products)
- Developed by P. Salome, M. Caillat, L. Loria & N. Kasradze (Obs. Paris LERMA)
- Similar tools : CARTA (PI: Erik Rosolowsky)
Japanese Virtual Observatory

Artemix

Search

alma-name

cenA

CenA

HH:MM:SS

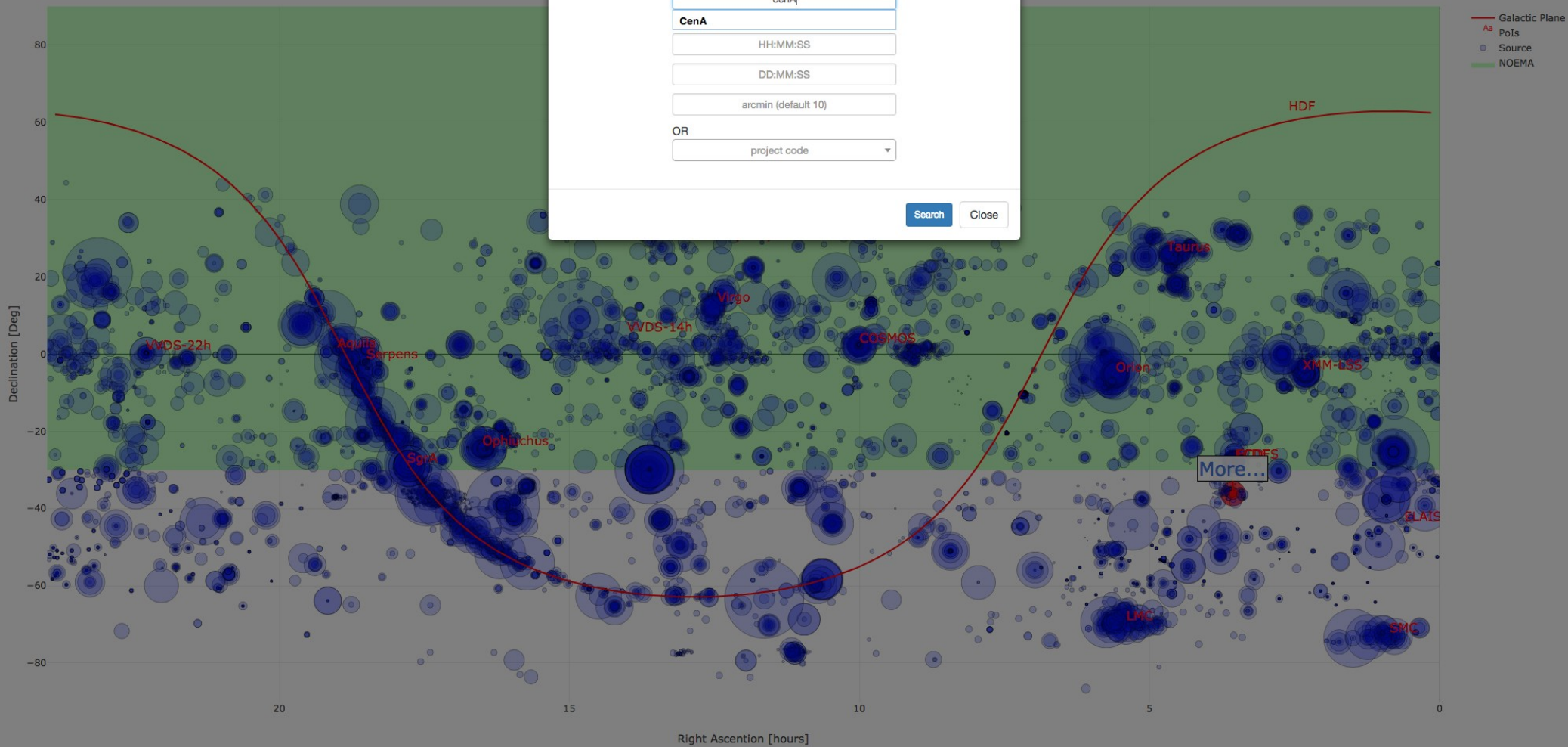
DD:MM:SS

arcmin (default 10)

OR

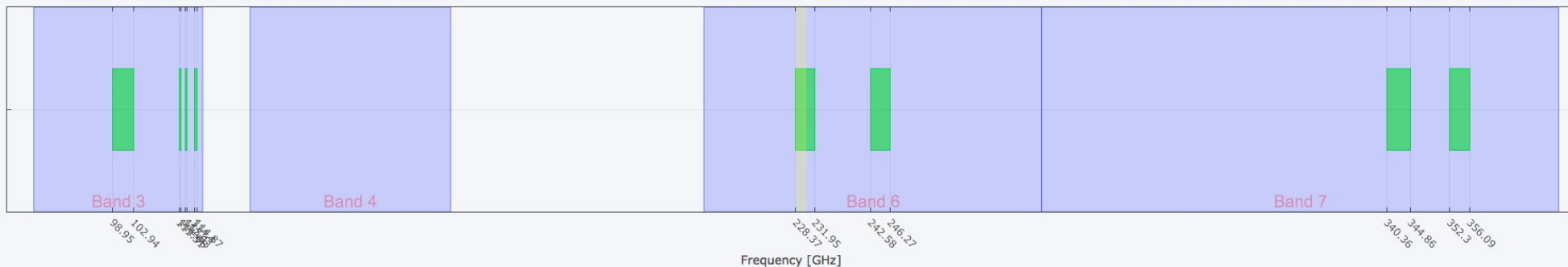
project code

Search Close



Artemix

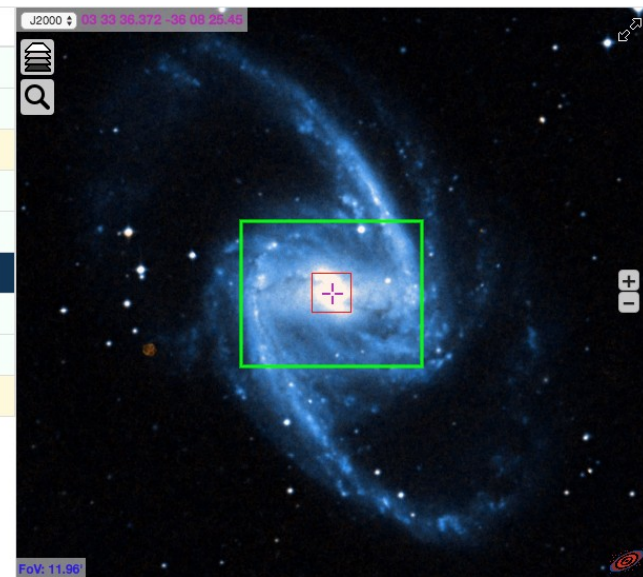
Distribution of ALMA frequencies for sources (2010-2016)



Redshift Velocity (km/s) All Info

Show all data. Initially shown are the data of which the filename ends with ".pbcorr.fits", ".pbcorr.fits", ".image.fits", ".line.fits", ".cont.fits" or ".clean.fits"

#	Fits file	Target	RA	DEC	Cube size	Freq. range	Proj. code	uid
1	Info	NGC1365	03:33:36.38	-36:08:25.70	2916x2560x10	246.011 --- 245.864	2013.1.01161.S	uid://A001/X12f/X321
2	Info	NGC1365	03:33:36.38	-36:08:25.70	2916x2560x30	229.066 --- 229.506	2013.1.01161.S	uid://A001/X12f/X321
3	Info	NGC1365	03:33:36.38	-36:08:25.70	2916x2560x1	228.458 --- 246.218	2013.1.01161.S	uid://A001/X12f/X321
4	Info	NGC1365	03:33:36.38	-36:08:25.70	2916x2560x10	230.572 --- 230.718	2013.1.01161.S	uid://A001/X12f/X321
5	Info	NGC1365	03:33:36.38	-36:08:25.70	2916x2560x11	243.714 --- 243.553	2013.1.01161.S	uid://A001/X12f/X321
6	Info	NGC1365	03:33:36.38	-36:08:25.70	1344x864x500	228.4 --- 230.323	2013.1.01161.S	uid://A001/X12f/X319
7	Info	NGC1365	03:33:36.38	-36:08:25.70	216x216x497	228.444 --- 230.355	2013.1.01161.S	uid://A001/X12f/X31b
8	Info	NGC1365	03:33:36.99	-36:08:36.33	2048x1500x121	229.064 --- 229.523	2013.1.01161.S	uid://A001/X12f/X317
9	Info	NGC1365	03:33:36.99	-36:08:36.33	2048x1296x1	229.837 --- 246.192	2013.1.01161.S	uid://A001/X12f/X317



Artemix

Home page

Tools ▾

0-10000 ▾

Open

Recent files ▾

Open

About

Help

Admin ▾

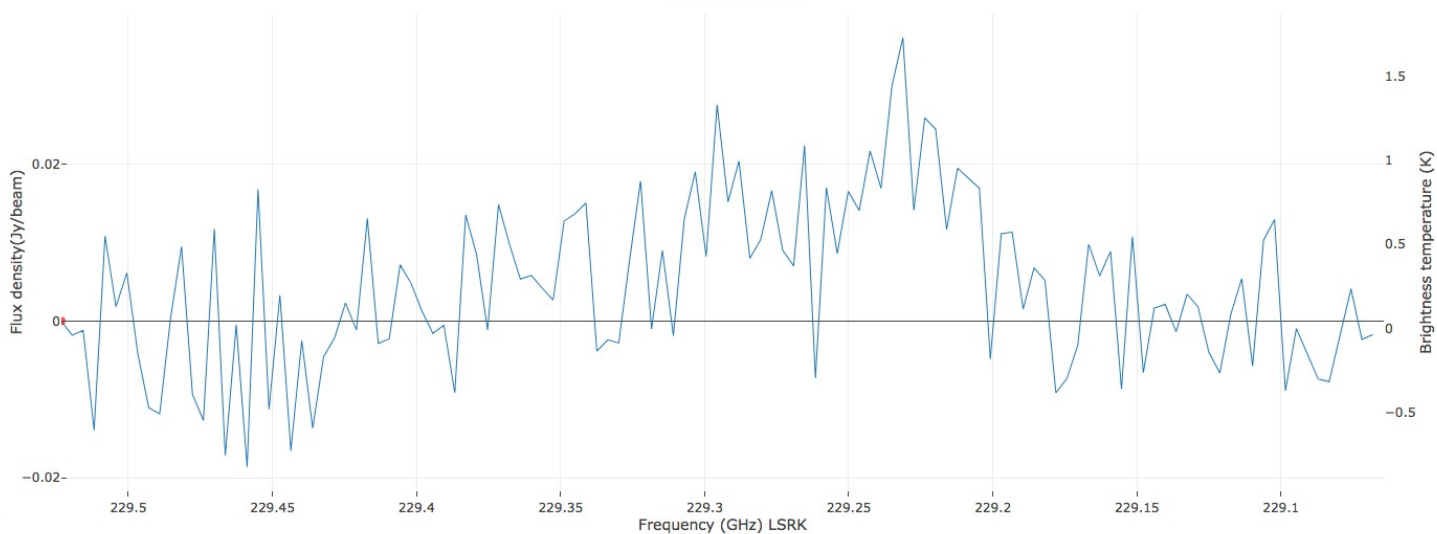
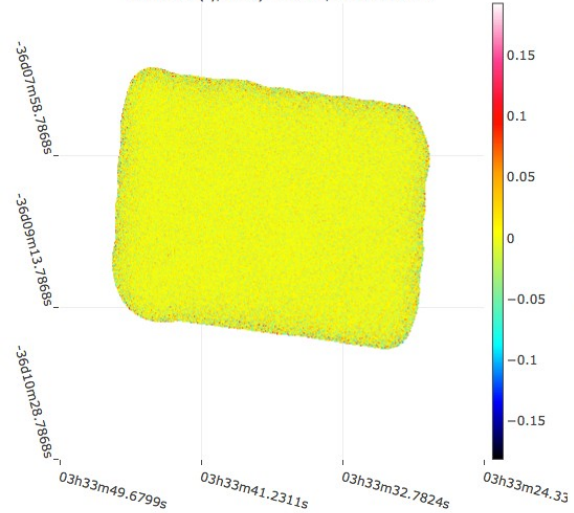
philippe.salome@obspm.fr

Logout

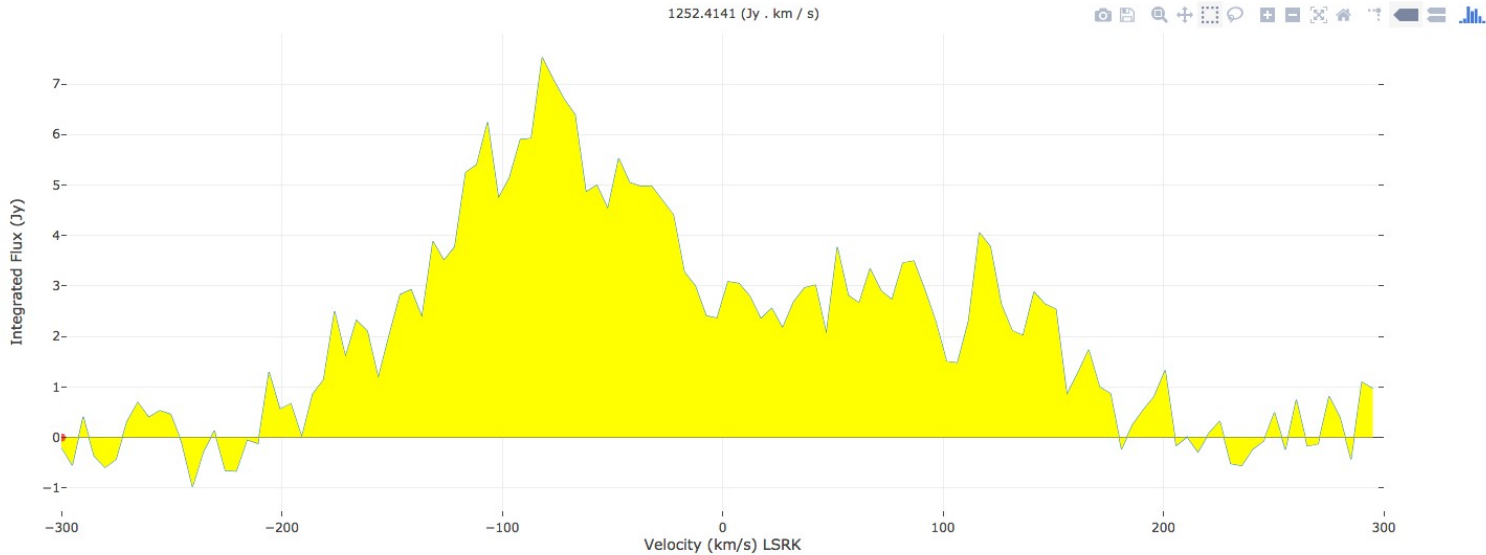
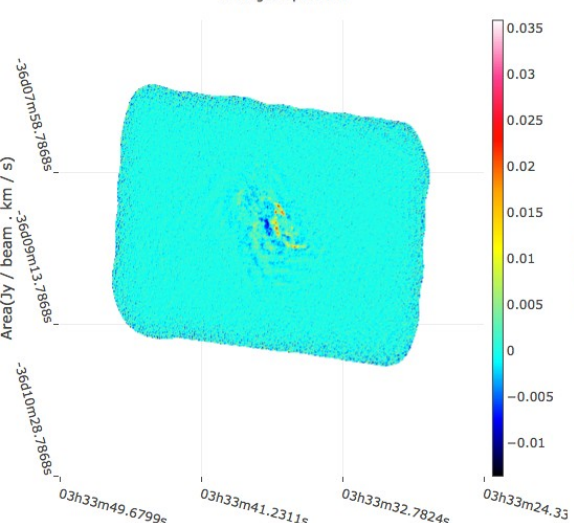
uid_A002_Xa16f89_X2a8c.ms.split.cal.image.spw0.co21.image.pbcor.fits - OBJECT = NGC1365 - NAXIS = 4 - NAXIS1 = 2048 - NAXIS2 = 1500 - NAXIS3 = 121 - NAXIS4 = 1 etc.

B: 0.8x0.6 PA -88°

Channel 0 (Jy/beam) -300 km/s 229.5232 GHz



Averaged Spectrum



Absolute coordinates

Artemix

- Prototype, under development
- Need to create an user account
- Web-based tool, no local download
 - Rapid check of the archive
- No reprocessing :
 - Only the images done in QA2 (not all spw in early science)
 - Could be affected by errors (e.g. wrong frame for the oldest images)
 - do not hesitate to give feedback

<http://artemix.obspm.fr/>



CASA-GILDAS filler



CASA-GILDAS filler

To have a gateway to be able to :

- **View and analyze** images
 - from CASA into GILDAS
 - from GILDAS into CASA
- Make operations on **visibilities**
 - from CASA with GILDAS (not straightforward)
 - From GILDAS with CASA
- Thanks to (UV)FITS
- Calibration is done in the corresponding software (CASA for ALMA, GILDAS/CLIC for NOEMA)

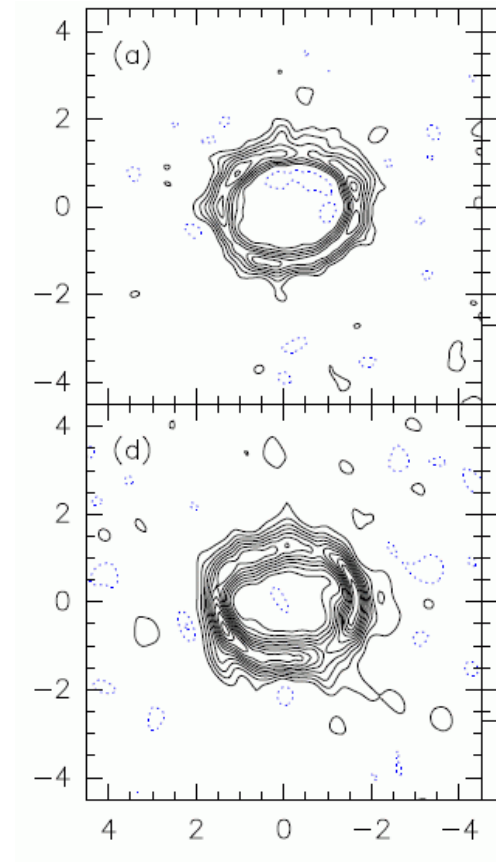
CASA-GILDAS filler

Import/export images

Import/export calibrated uv-data for imaging

Why in GILDAS?

- Analysis of data coming from different instruments
- Imaging faster (and better in some cases)
- Access to specific data reduction and analysis tools
- Short-spacing inclusion: 30m+ALMA
- Publication-quality plots



GG Tau
0.45 mm ALMA, 1.3 mm PdBI
Dutrey et al. Nature, 2015

CASA-GILDAS filler

IRAM Memo 2014-?

From CASA to GILDAS I - GILDAS Data Format Version 2

S. Guilloteau¹, E. Chapillon^{1,2}, F. Gueth², G. Dumas²,
A. Lopez Sepulcre², K.T. Wong²
1. LAB (Bordeaux) 2. IRAM (Grenoble)

January 5, 2018– version 2.2

Abstract

With the advent of ALMA, IRAM users may prefer at some point to handle their ALMA data in GILDAS rather than in CASA¹, vice versa to handle IRAM data into CASA. This document describes the different ways to do so, and what are the benefits and limitations of the process. This document describes calibrated data with UV

CASA-GILDAS filler

- Documentation:

IRAM ARC node website :

www.iram.fr/IRAMFR/ARC

www.iram.fr/IRAMFR/ARC/documents/filler/casa-gildas.pdf

- Contact : arc@iram.fr

Do not hesitate to contact us