

An introduction to ALMA and the AOT

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RadioNet has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730562

ALMA

ALMA is a submm telescope designed to observe at 0.32-9.5mm (31-950 GHz)

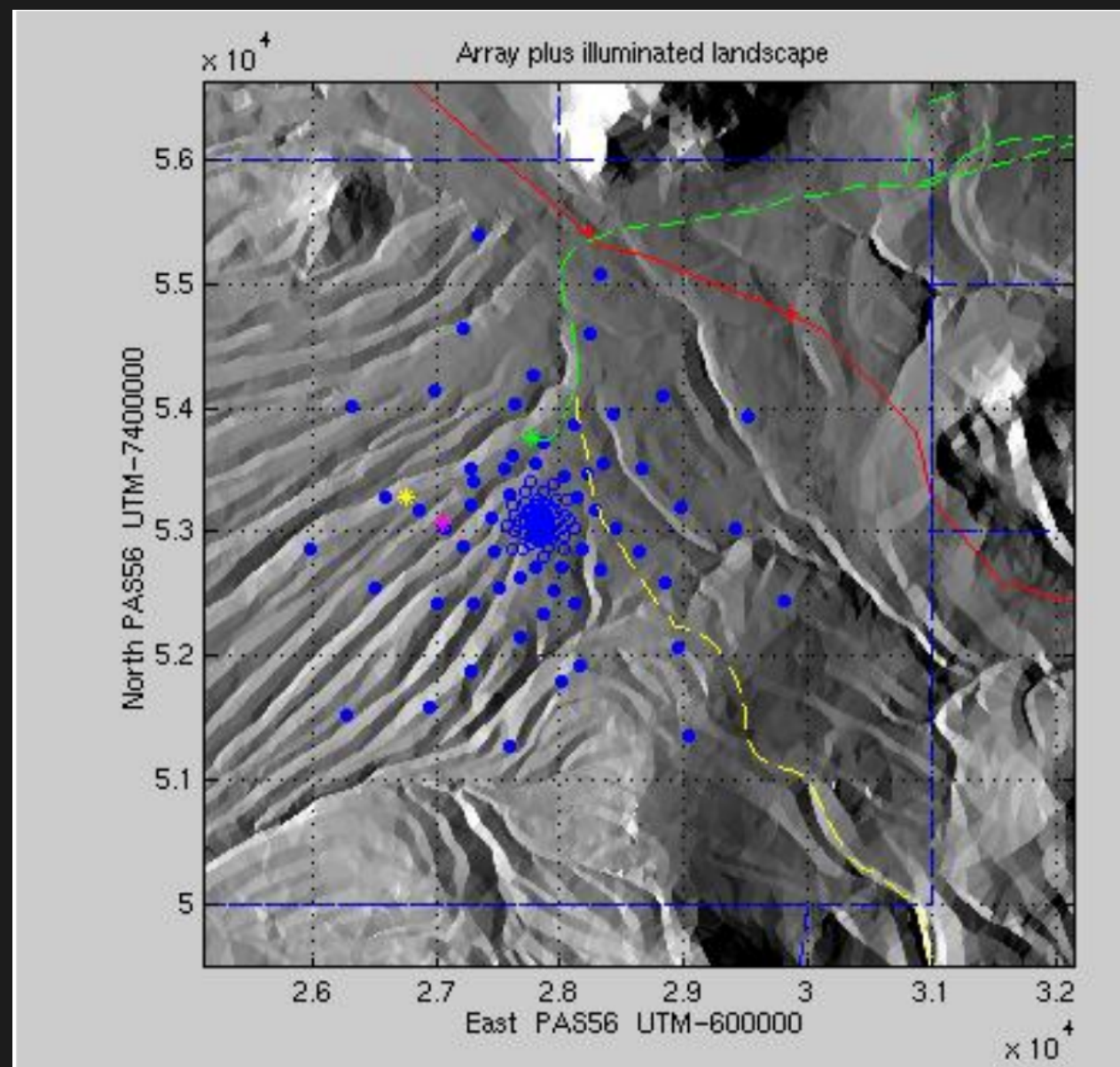
- It is located in Chile at 5000 m of altitude*
- 66 reconfigurable high-precision antennas*
- angular resolution as small as 0.005"*
- velocity resolution 0.008 km/s*



ALMA

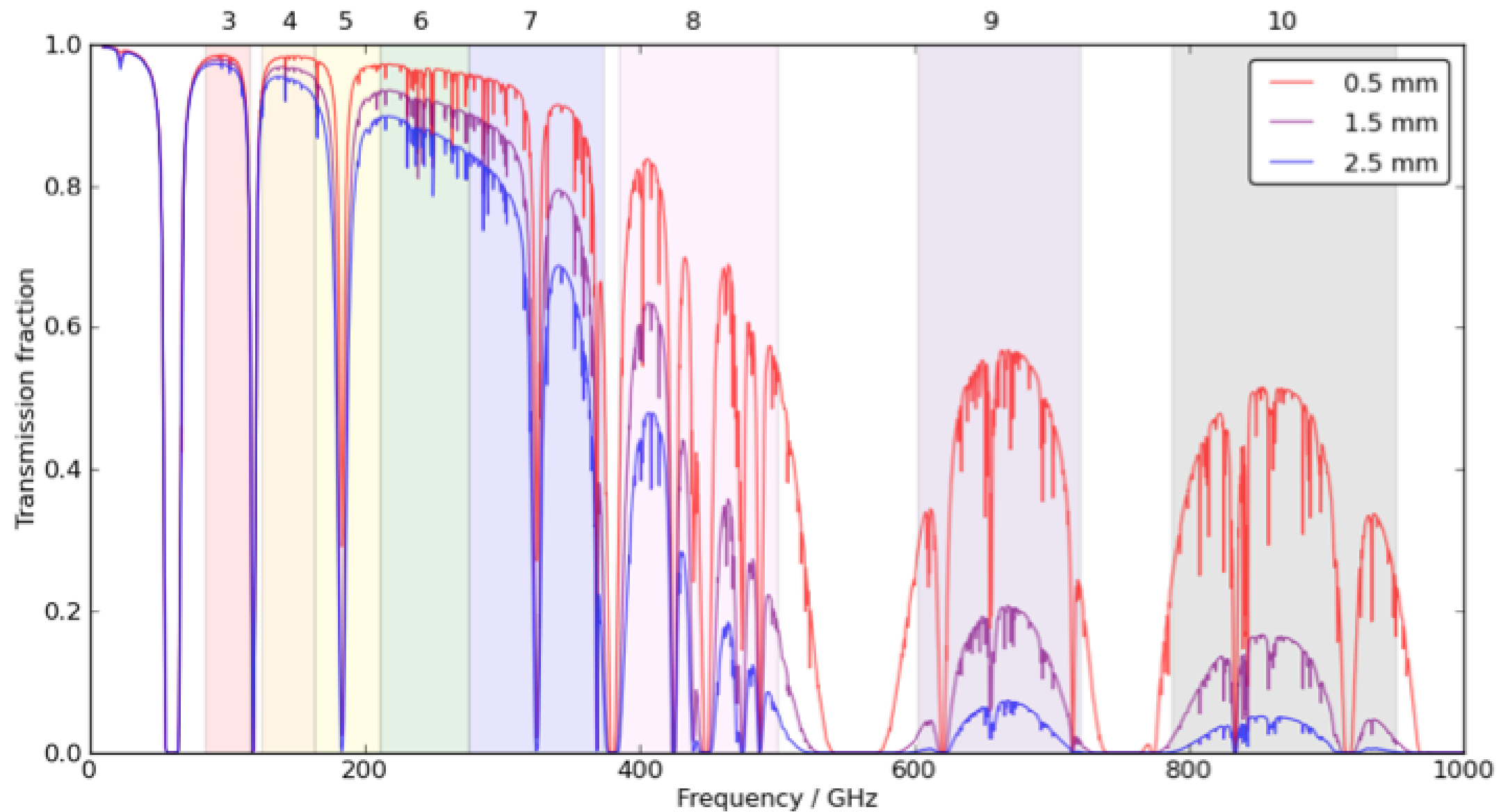
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- It is located in Chile at 5000 m of altitude*
- 66 reconfigurable high-precision antennas*
- angular resolution as small as 0.005"*
- velocity resolution 0.008 km/s*
- maximum baseline from 150 m to 16 km*



ALMA

ALMA is a submm telescope designed to observe at 0.32-9.5mm (31-950 GHz)



ALMA

The design of ALMA has 3 key goals:

1 - The ability to detect spectral line emission from CO or [CII] in a normal galaxy like the Milky Way at a redshift of $z=3$, in less than 24 hours

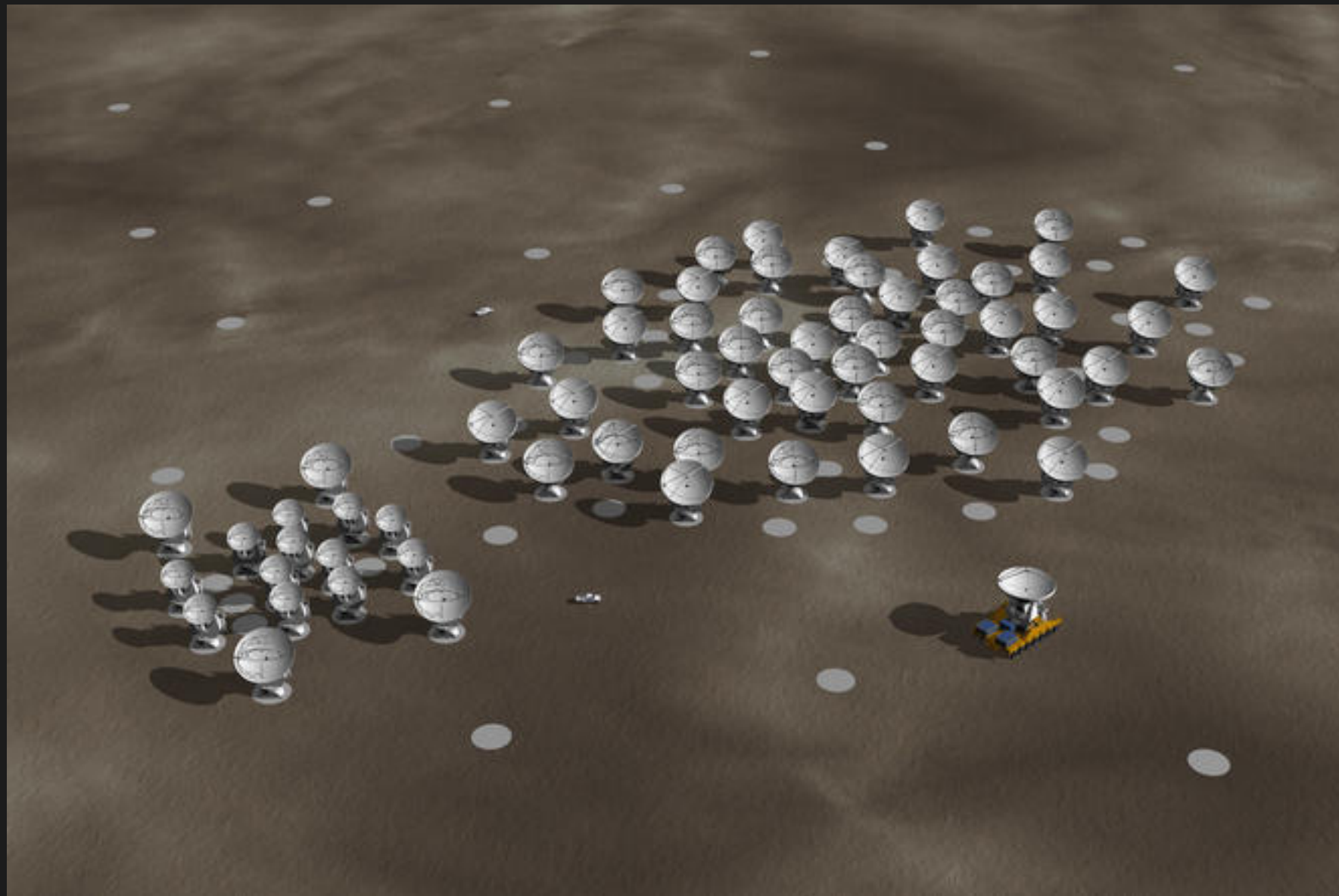
2 - The ability to image the gas kinematics in protostars and in protoplanetary disks around young Sun-like stars in the nearest molecular clouds (150 pc)

3 - The ability to provide precise high dynamic range images at an angular resolution of 0.1 arcsec.

ALMA

ALMA has 3 subarrays with different size structures:

- Main array: 50 ant. with $D = 12\text{ m}$*
- ACA Atacama Compact Array (12 ant. with $D = 7\text{ m}$)*
- The total power antennas (4 ant. with $D = 12\text{ m}$)*



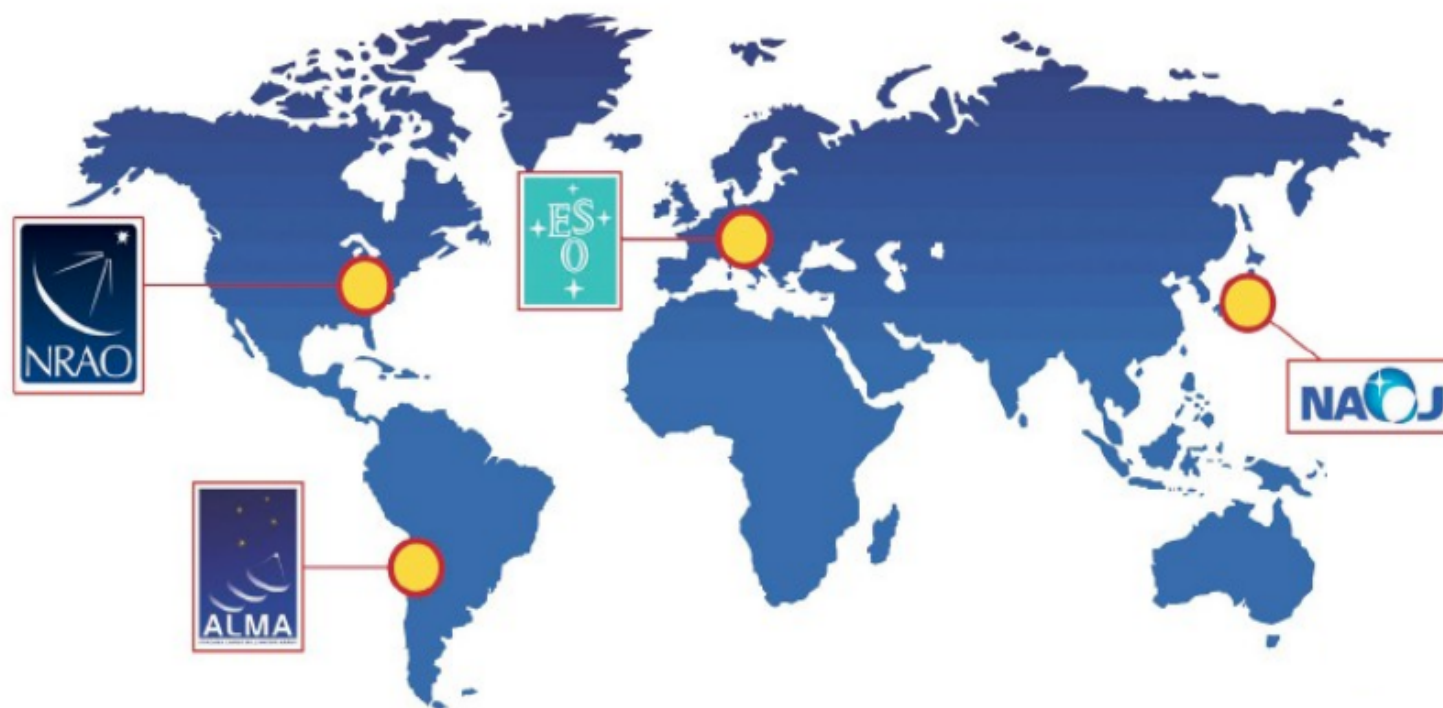
ALMA

The management of ALMA is quite complex because it involves 4 institutions, whose 3 pre-existed before ALMA, and had already their own internal management.

ALMA organization

ALMA is a world wide collaboration

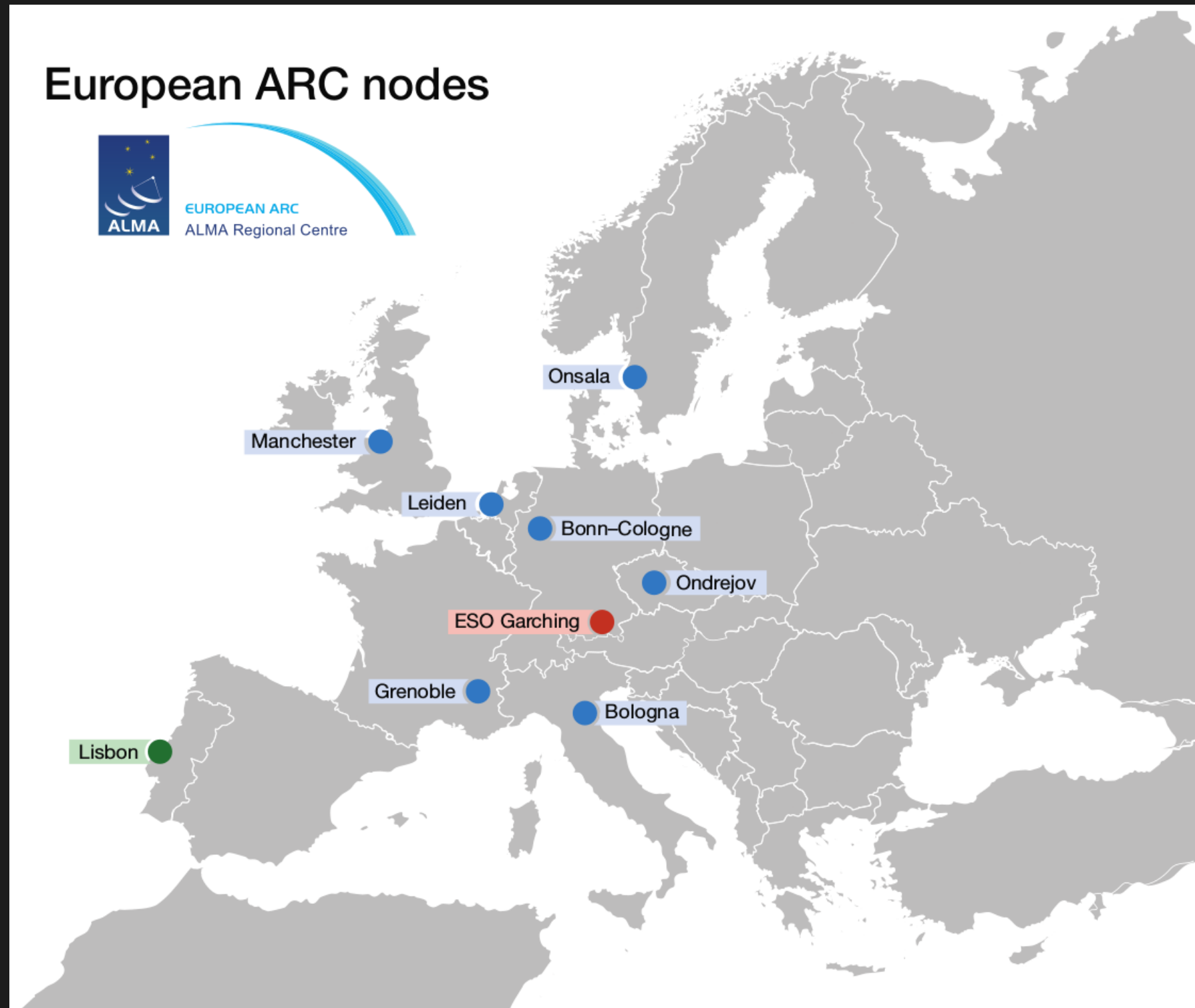
Contributors share the observing time and host a mirror of the archive



- Europe: **ESO** (14 countries) → 30%
- North America: **NRAO** (USA, Canada) → 30%
- East Asia: **NAOJ** (Japan, Taiwan) → 20%
- Chile → 10%

ALMA

In this context Europe, i.e. the ESO, proposed a different approach, building a network of ALMA Regional Center, to optimize the different expertise developed within the different European countries

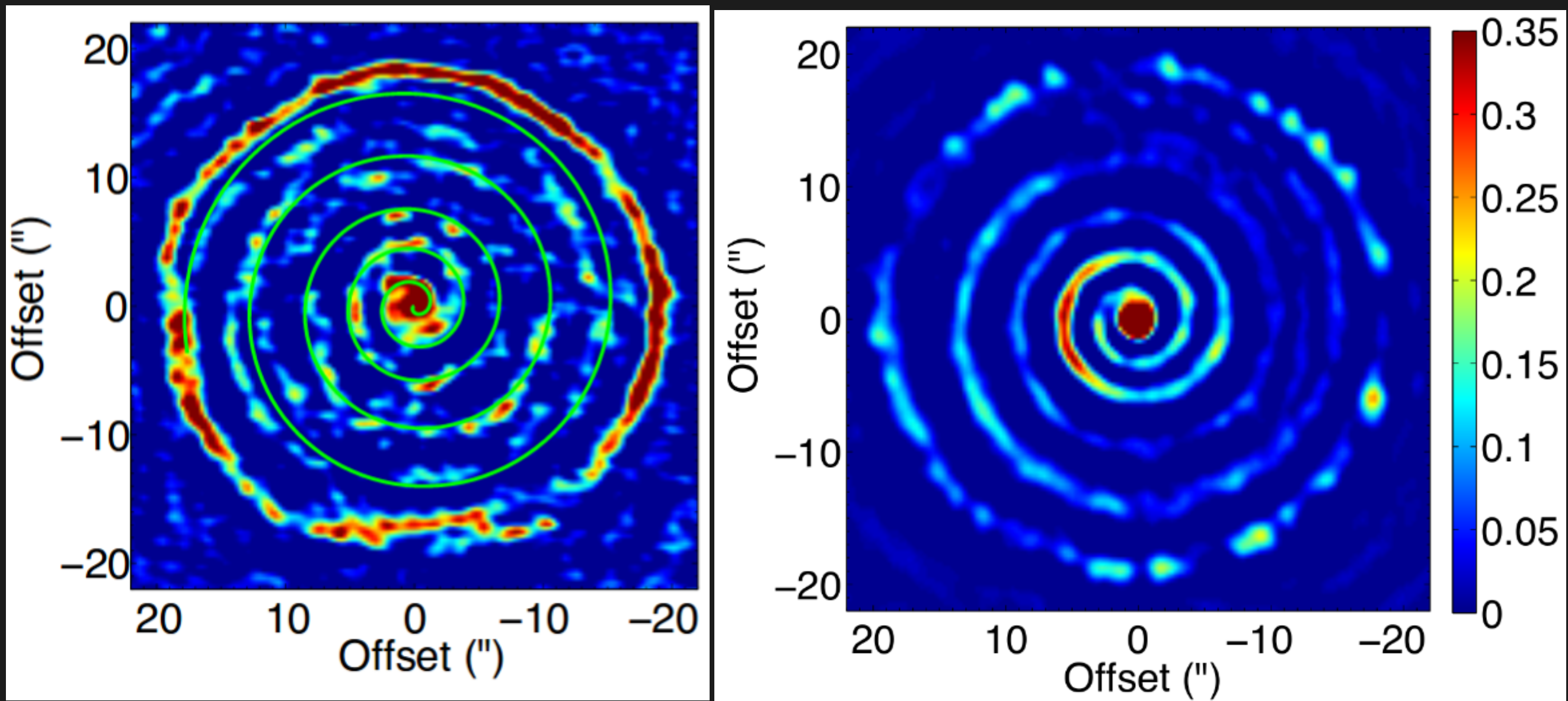


Does it worth the effort?

Highlight from ALMA

AGB star R Sculptoris loses shells of gas and dust during its thermal pulses phase.

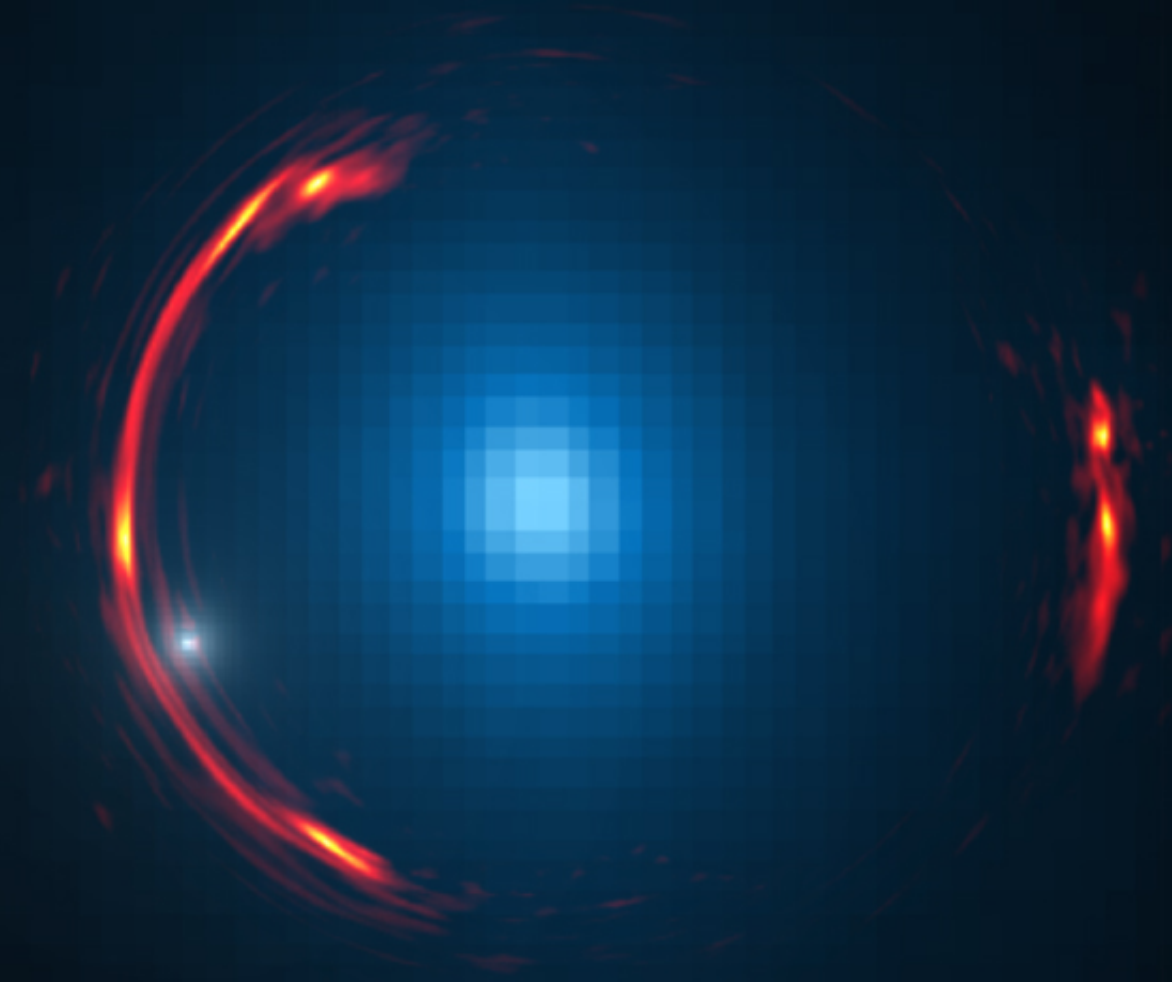
15 ant. - 4 hs - Band 7 (CO 3-2) - Res 1.3''



Highlight from ALMA

Lensed submm galaxy at $z = 3.042$ (lens at $z = 0.299$)

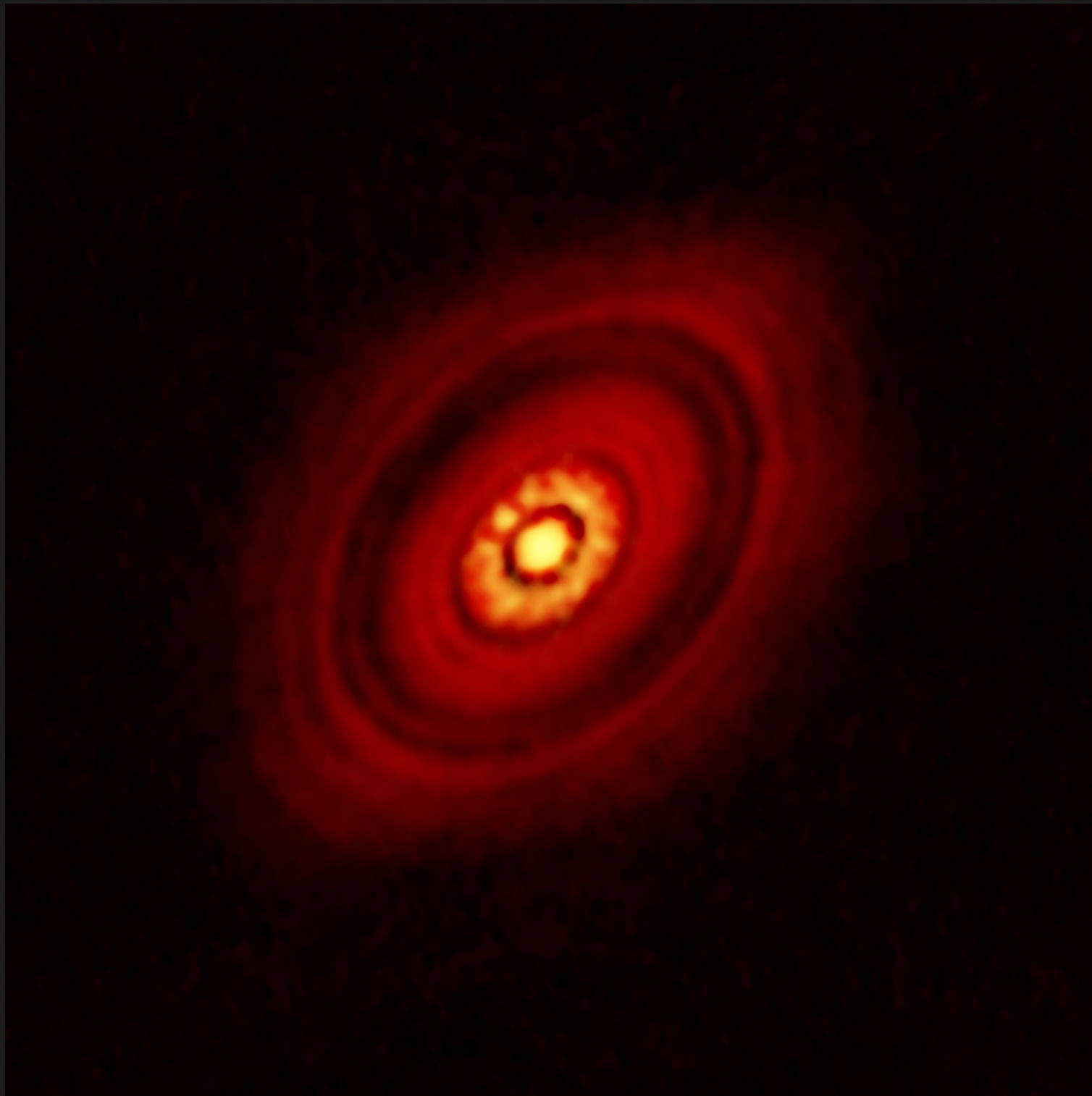
Long Baseline campaign - 31×23 mas = 10-20 pc - Band 6



Highlight from ALMA


HL- Tau – Young T-T star

Long Baseline campaign – 30 x 19 mas – Band 3, 6, 7 continuum



ALMA website

almascience.org



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

ESO NRAO NAOJ

Log in | Register | Reset Password | Forgot Account

About ALMA

ALMA Science

Call for Proposals

ALMA Data

Documents & Tools


Knowledgebase/FAQ

User Services at ARCs

- Helpdesk
- EU ARC
- NA ARC
- EA ARC

You are here: Home

Welcome to the Science Portal at ESO



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 will be 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. 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.

ALMA Newsletter

Newsletter No. 9
May 23, 2012
More...

General News

ALMA Early Science Cycle 1:
Outcome of the Proposal
Review Process
Nov 27, 2012

New release of ALMA
Science Verification data
Oct 23, 2012

Announcement of intent to
release a new installment of
Science Verification data
Oct 16, 2012

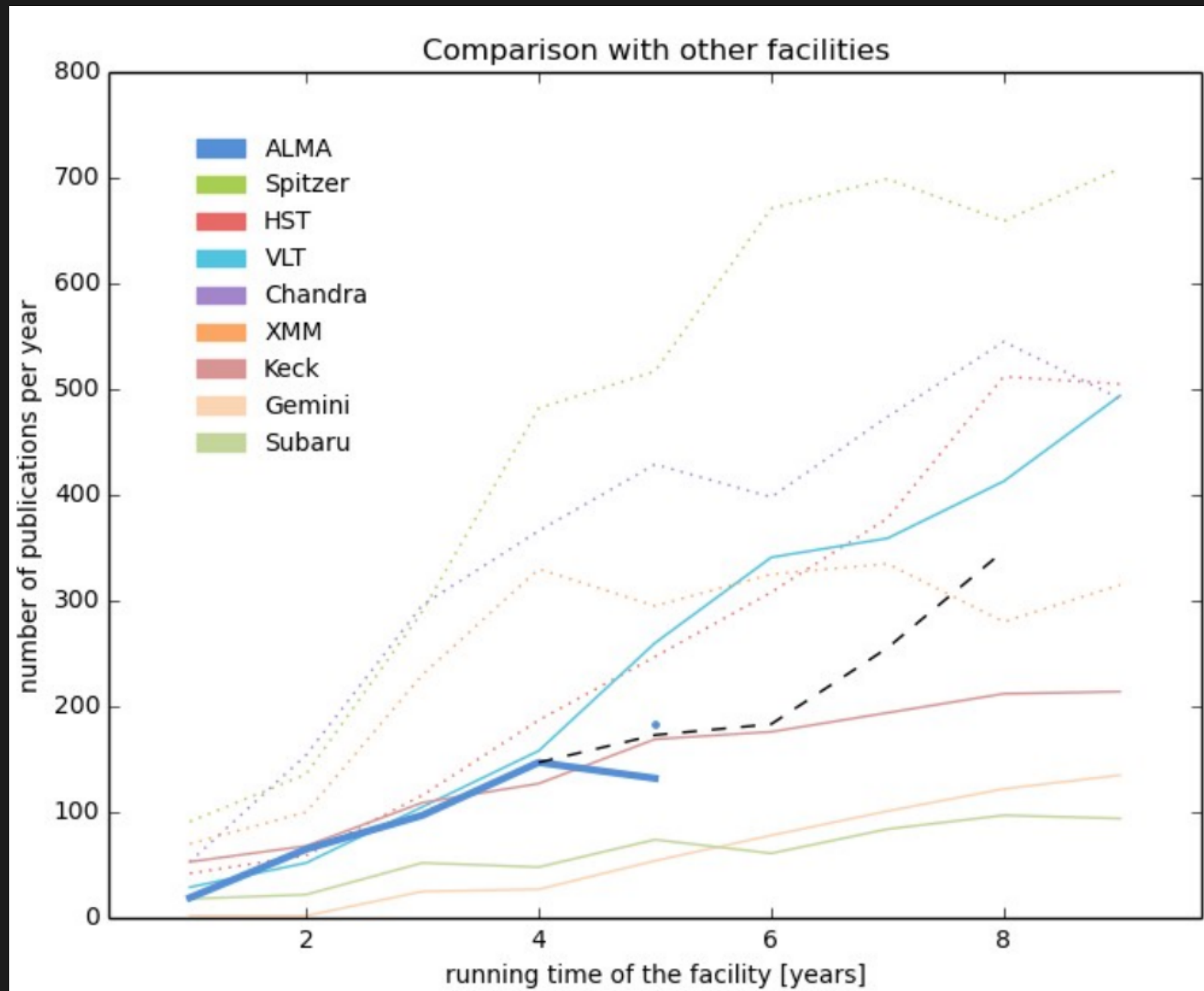
Update on ALMA Cycle 0
observations
Oct 08, 2012
More...

Local News

Cycle 1 preparation
workshops throughout

ALMA Archive

The ALMA archive is growing and the more and more scientists are using this huge data set for their investigation.



ALMA Archive

To have a preliminary introduction:

<https://almascience.eso.org/alma-data/archive>

For the access:

<https://almascience.eso.org/aq/>

ALMA Archive

ALMA Science Archive Query

Query Form

Results Table

Search

Reset

[Query Help](#)

Position

Source name (Resolver)

Source name (ALMA)

SDC335.579-0.292

RA Dec

Angular resolution

Largest angular scale

Energy

Frequency

Bandwidth

Spectral resolution

Band

Time

Observation date

Integration time

Polarisation

Polarisation type

Observation

Water vapour

Project

Project code

Project title

PI name

Project abstract

Publication count

Publication

Authors

Title

Abstract

Options

View:

☒ raw data

☐ project

☐ publication

☐ public data only

☒ science observations only

ALMA Archive

ALMA Science Archive Query

Query Form

Results Table

[Submit download request](#)[Results Bookmark](#) [Export Table](#) [Results Help](#)

Showing 3 of 3 rows.

[More columns](#)[illegible]

ALMA Schedule

Mid-March: Call for Proposals

Mid-April: deadline

August: Proposal Review

September: Submission Phase 2


End of September: End of the observations for the previous cycle

October: New Cycle




NB = All the proposals must be submitted electronically using the ALMA Observing Tool software (AOT)

Download ALMA AOT

Two flavours: webstart and tarball. Warmly suggested to use webstart



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



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DDT proposals

Observing Tool

Troubleshooting

OT Video Tutorials

Observing

Data

Documents & Tools

Knowledgebase/FAQ

User Services at ARCs

▪ Helpdesk

▪ ALMA Calendars

▪ ELL ARC

You are here: [Home](#) / [Proposing](#) / Observing Tool

Observing Tool

The ALMA Observing Tool (OT) is a Java application used for the preparation and submission of ALMA Phase I (observing proposal) and Phase II (telescope runfiles for accepted proposals) materials. It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals. The current Cycle 3 release of the OT is configured for the Early Science Capabilities of ALMA as described in the [Cycle 3 Call For Proposals](#). Note that in order to submit proposals you will have to register with the ALMA Science Portal beforehand.

Note that preparation of Cycle 2 Phase II and DDT proposals needs to be done using the Cycle 2 version of the Observing Tool. This version of the OT can be found in the [DDT page](#), or the Phase II menu.

Download & Installation

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

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

The **tarball** version must be installed manually and will not automatically update itself, however there should be no installation issues. For Linux users, we also provide a download complete with a recommended version of the Java Runtime Environment. Please use this if you have any problems running the OT tarball install with your default Java.

Webstart

Tarball

Documentation

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

- If you are a novice OT user you should start with the [OT Quickstart Guide](#), which takes you through the basic steps of ALMA proposal preparation.
- Audio-visual illustrations of different aspects of the OT can be found in the [OT video tutorials](#). These are recommended for novices and advanced

ALMA AOT

The screenshot displays the ALMA AOT (ALMA Online Tool) interface, which is divided into several functional panes. The interface includes a standard menu bar (File, Edit, View, Tool, Search, Help) and a toolbar with various icons. The main workspace is divided into three primary sections: the Project Structure Pane on the left, the Editor Pane in the center, and the Feedback Pane at the bottom. The Project Structure Pane shows a tree view of the project hierarchy, including 'Unsubmitted Proposal', 'Project', and 'Proposal'. The Editor Pane is used for defining the setup, with tabs for 'Spectral', 'Spatial', and 'Project'. The Feedback Pane provides validation feedback, with tabs for 'Validation', 'Validation History', and 'Log'. An Overview Pane at the bottom right provides information only, showing a flowchart of the 'Phase I: Science Proposal' process. A Contextual Help pane is also visible, providing instructions on how to create a new proposal.

Menu

Toolbar

Expand/collapse project tree

Project Structure Pane

Navigate the project tree

Editor Pane

Define the Setup

Feedback Pane Validation feedback

Overview Pane

Information only

Contextual Help

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

Phase I: Science Proposal

New Science Proposal → Create Science Goals → Validate Science Proposal → Submit Science Proposal

Click on the overview steps to view the contextual help

Importing And Exporting | Template Library | Need More Help? | View Phase 2 Steps

ALMA AOT

Start: Project PI and add a science goal

File Edit View Tool Search Help Perspective 1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

Project Structure

Proposal Program

Unsubmitted Proposal

Bother the aliens

Proposal

Planned Observing

Editors

Spectral Spatial Proposal

Proposal Information

Proposal Title: Bother the aliens

Proposal Cycle: 2013.1

Survey on the different method to bother an alien

Abstract (max. 1200 characters)

Launch Editor

Proposal Type

☒ Standard ☐ Target Of Opportunity

Scientific Category

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

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

Keywords (max. 2 keywords)

Debris disks

Disks around low-mass stars

Disks around high-mass stars

Exo-planets

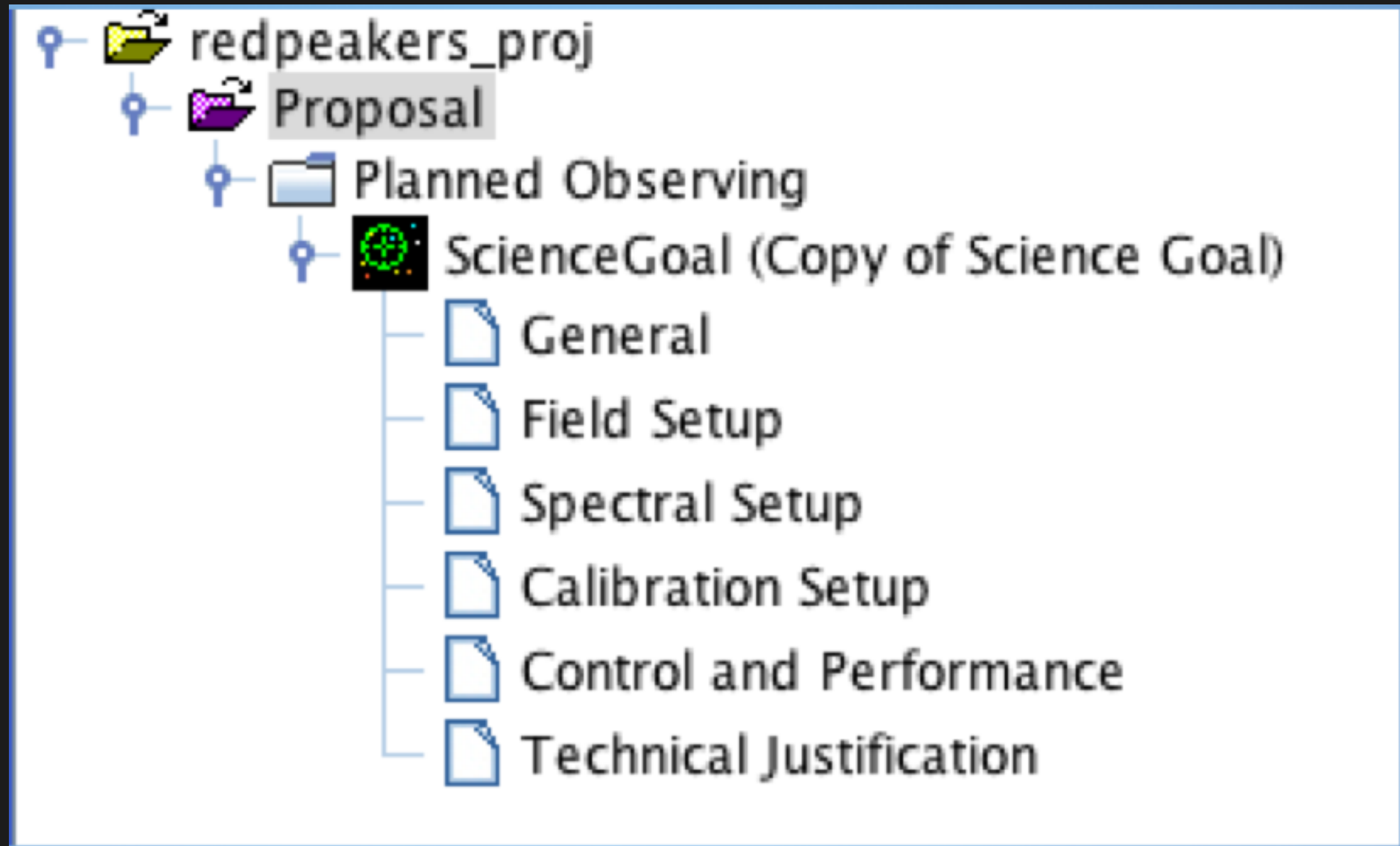
Solar system - Comets

Student project ☐ Continuation ☐ (Not Applicable)

Related Proposals

ALMA AOT

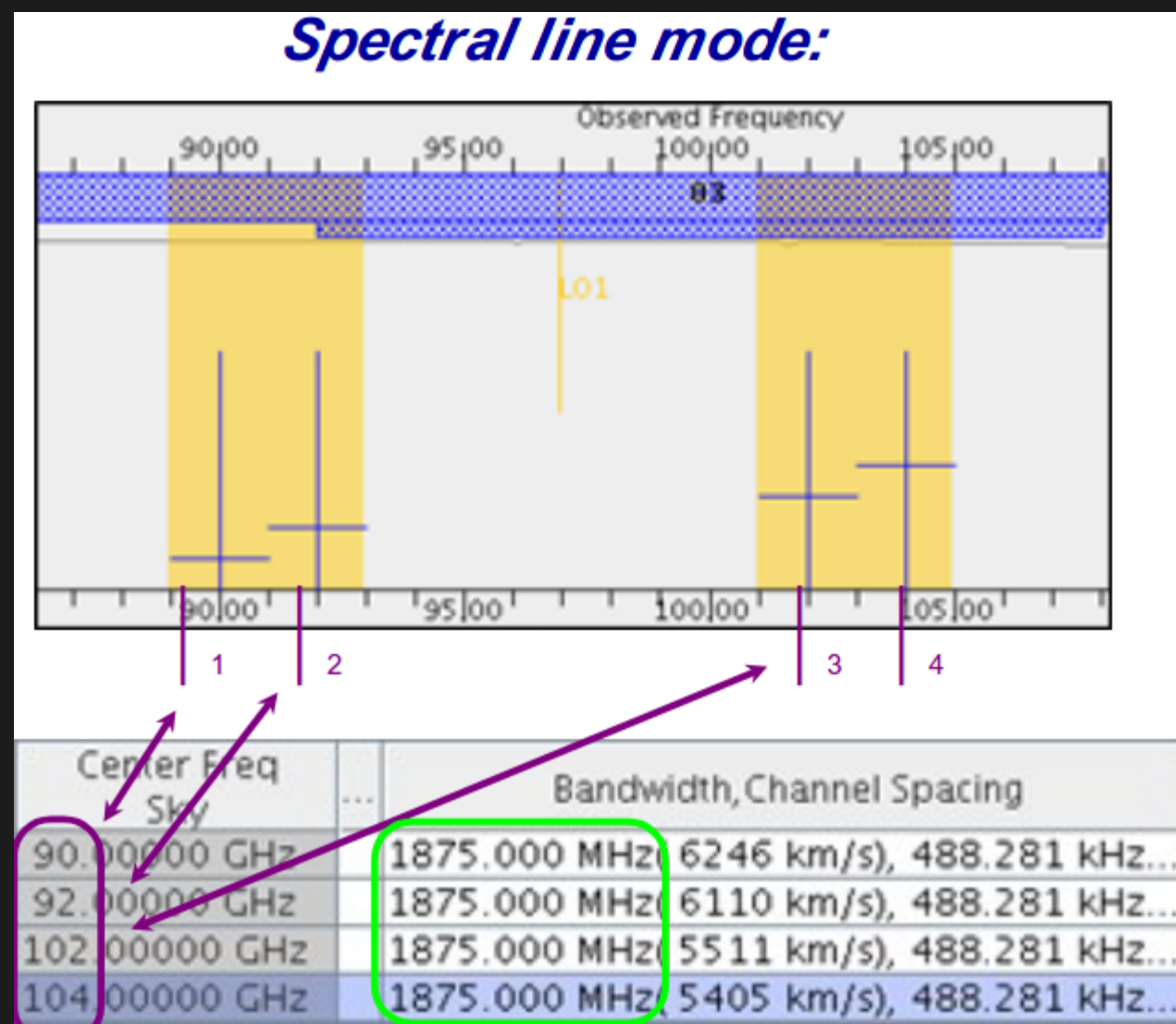
A Science goal contains all the necessary fields to perform an observations



ALMA Spectral Setup

The PI defines the spectral setup according to the specifications of the ALMA receiver:

Once defined the frequency range to observe up to four 2GHz wide Basebands can be placed. Within each Basebands it is possible to place up to 4 spectral windows, with bandwidth from 59.59 MHz up to 1.875 GHz



ALMA AOT

In spectral setup the PI put details about the band and the resolution.

Project Structure

- redpeakers_proj
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of Science
 - General
 - Spectral Setup**
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral | **Spatial** | **Spectral Setup**

In the table below, it is possible to define up to 16 spectral windows, 4 per baseband as long as the total Fraction per baseband is no more than 1. Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution. Note that for bands 3, 4, 6, 7 and 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Spectral Type

Spectral Type: ☐ Spectral Line ☐ Single Continuum ☒ Spectral Scan

Polarization products desired: ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Errors

Spectral Scan

Requested start frequency (sky): 84.00000 GHz

Requested end frequency (sky): 114.50000 GHz

Requested range (rest): 84.5549 GHz - 115.2564 GHz

Achieved scan range (sky): 84.0625 GHz - 114.8125 GHz

Bandwidth, Resolution (Hanning smoothed): 1875.000 MHz(5664 km/s), 7.813 MHz(23.598 km/s)

Spectral averaging: 16

Representative frequency (sky): 99.43800 GHz

The representative frequency defined in the observed frame is used in conjunction with the sensitivity entered on the 'Control and Performance' page to estimate the required observing time and to set the size of the antenna beam shown in the 'Spatial Visual' editor. The representative frequency defaults to the average mid-frequency of the achieved scan range but may be subsequently set by the user to any frequency within the achieved scan range.

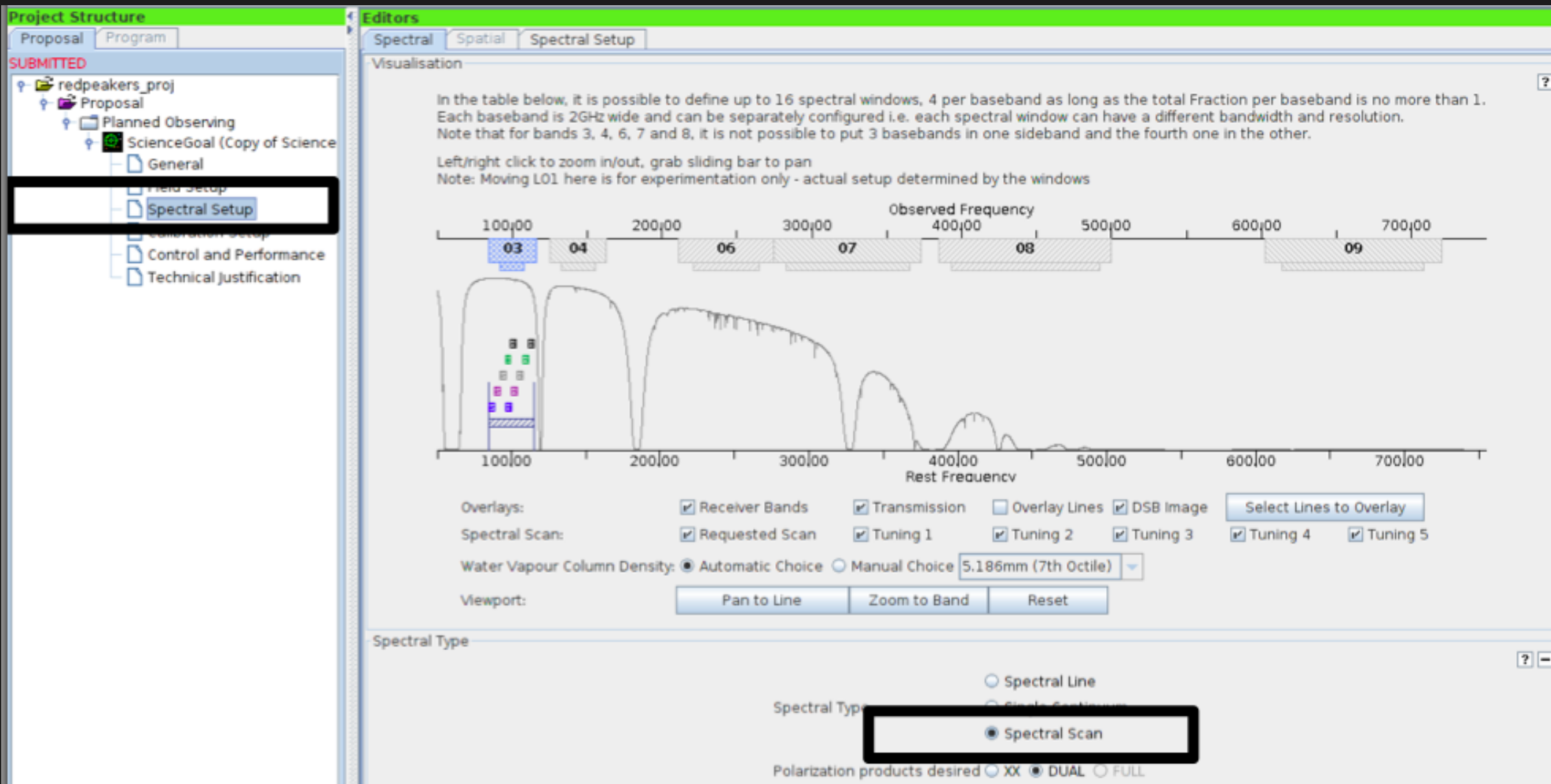
Tuning (Max. 5)	SPW 1 (GHz)	SPW 2 (GHz)	SPW 3 (GHz)	SPW 4 (GHz)
1	85.0000 GHz	86.8750 GHz	97.0000 GHz	98.8750 GHz
2	88.7500 GHz	90.6250 GHz	100.7500 GHz	102.6250 GHz
3	92.5000 GHz	94.3750 GHz	104.5000 GHz	106.3750 GHz
4	96.2500 GHz	98.1250 GHz	108.2500 GHz	110.1250 GHz
5	100.0000 GHz	101.8750 GHz	112.0000 GHz	113.8750 GHz

Targets

Source Name	Velocity	System	Representative Frequency (Sky)
ngc 4535	1974.0 km/s	hel	99.4380 GHz
rp2	0.0 km/s	lsrk	99.4380 GHz
rp4	0.0 km/s	lsrk	99.4380 GHz
rp6	0.0 km/s	lsrk	99.4380 GHz

ALMA AOT

In spectral setup the PI put details about the band and the resolution.



ALMA AOT

In spectral setup the PI put details about the band and the resolution.

Project Structure

ProposalProgram

SUBMITTED

redpeakers_proj

Proposal

Planned Observing

ScienceGoal (Copy of Science

General

Spectral Setup

Control and Performance

Technical Justification

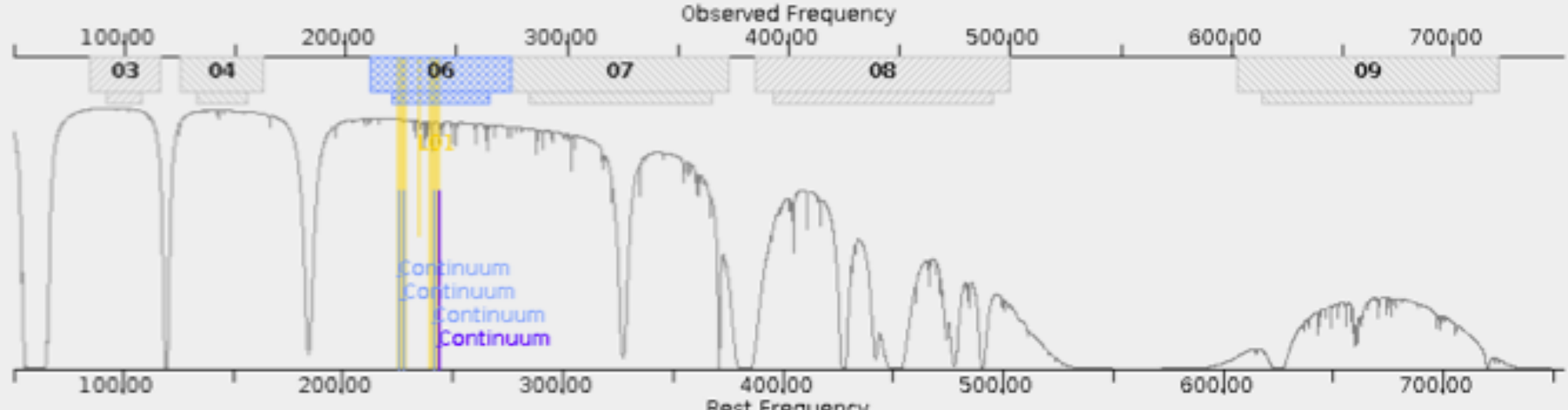
Editors

SpectralSpatialSpectral 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, 4, 6, 7 and 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



Overlays:

☒ Receiver Bands☒ Transmission☒ Overlay Lines☒ DSB Image

Select Lines to Overlay

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

Viewport:

Spectral Type

Spectral Type

☒ Single Continuum

☐ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

ALMA AOT

In spectral setup the PI put details about the band and the resolution.

The screenshot displays the ALMA AOT Spectral Setup interface. On the left, the 'Project Structure' pane shows a tree view with 'redpeakers_proj' as the root, containing 'Proposal' and 'Planned Observing'. Under 'Planned Observing', 'ScienceGoal (Copy of Science)' is expanded, showing 'General', 'Spectral Setup' (highlighted with a black box), 'Control and Performance', and 'Technical Justification'. The main 'Editors' pane has tabs for 'Spectral', 'Spatial', and 'Spectral Setup'. The 'Spectral Setup' tab is active, showing a 'Visualisation' section with a frequency plot. The plot has two x-axes: 'Observed Frequency' (top) and 'Rest Frequency' (bottom), both ranging from 100,000 to 700,000. The plot shows several spectral lines and shaded regions representing receiver bands, labeled 03, 04, 06, 07, 08, and 09. Below the plot, there are checkboxes for 'Overlays': 'Receiver Bands' (checked), 'Transmission' (checked), 'Overlay Lines' (checked), and 'DSB Image' (checked). A 'Select Lines to Overlay' button is to the right. Below this, 'Water Vapour Column Density' is set to 'Automatic Choice' with a dropdown menu showing '5.186mm (7th Octile)'. The 'Viewport' section has buttons for 'Pan to Line', 'Zoom to Band', and 'Reset'. At the bottom, the 'Spectral Type' section has radio buttons for 'Spectral Line' (selected), 'Single Continuum', and 'Spectral Scan'. The 'Polarization products desired' section has radio buttons for 'XX', 'DUAL' (selected), and 'FULL'.

ALMA AOT

In spectral setup the PI put details about the band and the resolution.

Transition Filter
e.g. CO*2-1* or *oxide*

☒ Include description

Frequency Filters
ALMA Band
1 2 3 4 5 6 7 8 9 10

Sky Frequency (GHz)
Min 31.3 Max 950

Receiver/Back End Configuration
☒ Hide unobservable lines
☐ Filtering unobservable lines

Maximum Upper-state Energy (K)
0 20 40 60 80 100 ∞

Molecule Filter / Environment
Show all atoms and molecules

Can't find the transition you're looking for in the offline pool? Find more in the online Splatalogue.

Find More...

Reset Filters

Transitions matching your filter settings:
(double-click column header for primary sort, single-click subsequent columns for secondary sorting. Single clicks will reverse sort order of already selected columns.)

Transition	Description	Rest Frequency	Sky Frequency	Upper-state Energy	Lovas Intensity	Sij μ^2	Catalog
CH3OH v t=0 19(2,17)-18(-3,16)	Methanol	84,574 GHz	84.019 GHz	463.489 K		0.424 D ²	Offline
C6H J=61/2-59/2, Q=3/2, l=f	1,3,5-Hexatriynyl	84,575 GHz	84.02 GHz	63.675 K	0.03	1867.562 D ²	Offline
29SiO v=2 2-1	Silicon Monoxide	84,575 GHz	84.02 GHz	3505.399 K	0.07	19.687 D ²	Offline
t-CH3CH2OH 4(2,3)-4(1,4)	trans-Ethanol	84,596 GHz	84.041 GHz	13.41 K	0.06	4.328 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=2-2	Methylamine	84,598 GHz	84.042 GHz	10.875 K		0.246 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=3-2	Methylamine	84,598 GHz	84.042 GHz	10.875 K		0.055 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=1-2	Methylamine	84,598 GHz	84.042 GHz	10.875 K		0.053 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1	Methylamine	84,598 GHz	84.043 GHz	10.875 K		1.065 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=2-3	Methylamine	84,598 GHz	84.043 GHz	10.876 K		0.055 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=3-3	Methylamine	84,598 GHz	84.043 GHz	10.876 K		0.442 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=2-1	Methylamine	84,599 GHz	84.044 GHz	10.876 K		0.053 D ²	Offline
CH3NH2 2(1)E1+1-2(0)E1+1, F=1-1	Methylamine	84,599 GHz	84.044 GHz	10.876 K		0.16 D ²	Offline
U-84608	UNIDENTIFIED	84,608 GHz	84.053 GHz		0.12		Offline
U-84616	UNIDENTIFIED	84,616 GHz	84.061 GHz		0.1		Offline
U-84628	UNIDENTIFIED	84,628 GHz	84.073 GHz		0.08		Offline
CH3OCH3 3(2,1)-3(1,2) AE	Dimethyl ether	84,632 GHz	84.076 GHz	11.091 K		16.386 D ²	Offline
CH3OCH3 3(2,1)-3(1,2) EA	Dimethyl ether	84,632 GHz	84.077 GHz	11.092 K	14	10.904 D ²	Offline
CH3OCH3 3(2,1)-3(1,2) EE	Dimethyl ether	84,634 GHz	84.079 GHz	11.09 K	0.09	43.696 D ²	Offline
CH3OCH3 3(2,1)-3(1,2) AA	Dimethyl ether	84,637 GHz	84.081 GHz	11.09 K		27.31 D ²	Offline
c-HCCCH v=0 3(2,2)-3(1,3)	Cyclopropenylidene	84,728 GHz	84.172 GHz	16.135 K	0.04	11.332 D ²	Offline
U-84738	UNIDENTIFIED	84,738 GHz	84.182 GHz		0.02		Offline
CH3OH v t=0 19(4,15)-18(5,14)	Methanol	84,744 GHz	84.188 GHz	536.742 K		5.192 D ²	Offline
30SiO v=0 2-1	Silicon Monoxide	84,746 GHz	84.19 GHz	6.1 K	0.08	19.196 D ²	Offline
NH2D 12(8,5)0a-13(5,9)0s	Ammonia	84,767 GHz	84.21 GHz	1630.117 K		0.009 D ²	Offline
13CH3OH v t=0 15(-3,13)-16(2,14)	Methanol	84,807 GHz	84.251 GHz	334.682 K		0.1 D ²	Offline
NH2CHO 4(2,3)-3(2,2)	Formamide	84,808 GHz	84.251 GHz	22.099 K	0.18	39.225 D ²	Offline
C7H J=97/2-95/2, Q=1/2, F=49-48, l=e	2,4,6-Heptatriynylidyne	84,82 GHz	84.263 GHz	100.72 K	0.08	1731.529 D ²	Offline
C7H J=97/2-95/2, Q=1/2, F=48-47, l=e	2,4,6-Heptatriynylidyne	84,82 GHz	84.263 GHz	100.72 K	0.08	1696.016 D ²	Offline
O13CS 7-6	Carbonyl Sulfide	84,865 GHz	84.308 GHz	16.292 K	32	3.581 D ²	Offline
NH2CHO 4(3,2)-3(3,1)	Formamide	84,889 GHz	84.332 GHz	37.005 K	0.08	22.883 D ²	Offline
NH2CHO 4(3,1)-3(3,0)	Formamide	84,891 GHz	84.334 GHz	37.005 K		22.883 D ²	Offline
H (60) γ	Hydrogen Recombination Line	84,914 GHz	84.357 GHz	0 yK			Offline
13CH3OH v t=0 15 (5,11)-16 (4,12)	Methanol	84,93 GHz	84.372 GHz	408.436 K		3.834 D ²	Offline
CH3OH v t=1 13(10,3)-13(11,2)	Methanol	84,94 GHz	84.383 GHz	1123.91 K		4.005 D ²	Offline
He (60) γ	Helium Recombination Line	84,949 GHz	84.391 GHz	0 yK			Offline
C (60) γ	Carbon Recombination Line	84,957 GHz	84.399 GHz	0 yK			Offline
NH2D 10(6,5)0s-11(3,9)0a	Ammonia	84,963 GHz	84.405 GHz	1101.647 K		0.008 D ²	Offline
13CH3OH v t=0 8(0,8)-7(1,7) ++	Methanol	84,97 GHz	84.413 GHz	81.524 K		7.206 D ²	Offline

Add to Selected Transitions

Selected transitions

Transition	Description	Rest Frequency	Sky Frequency
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Remove from Selected Transitions

Cancel Ok

ALMA AOT

In spectral setup the PI put details about the band and the resolution.

Project Structure

Proposal | Program

SUBMITTED

- redpeakers_proj
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of Science
 - General
 - Field Setup
 - Spectral Setup
 - Control and Performance**
 - Technical justification

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.

Control and Performance

Configuration Information

Antenna Beamsize ($1.2 * \lambda / D$)	12m	27.606 arcsec	7m	47.324 arcsec
Number of Antennas	12m	34	7m	9
			TP	2
	Most extended 12m configuration		Most compact 12m configuration	
Longest baseline (L_{max})	1.508 km		0.166 km	
Synthesized beamsize (λL_{max})	0.183 arcsec		1.667 arcsec	
Shortest baseline (L_{min})	0.041 km		0.014 km	
Maximum recoverable scale ($0.6 \lambda L_{min}$)	4.079 arcsec		11.673 arcsec	

Desired Performance

Desired Angular Resolution: 3.75400 arcsec

Largest Angular Structure in source: ☒ Point Source ☐ Extended Source

Desired sensitivity per pointing: 1.00000 mJy equivalent to 0.00173 K

Bandwidth used for Sensitivity: AggregateBandWidth Frequency Width 7.500000 GHz

Do you request complementary ACA Observations? ☐ Yes ☒ No

Science goal integration time estimate

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

Are the observations time-constrained? ☐ Yes ☒ No

ALMA Product

ALMA delivers data cubes, of which the third axis is frequency. In this sense, the final data products are very much like that of an integral field unit with up to a million Spectral Pixels.