Atacama Large Millimeter/
submillimeter Array - ALMA

ALMA Status, Science Operation, and EA Science activities

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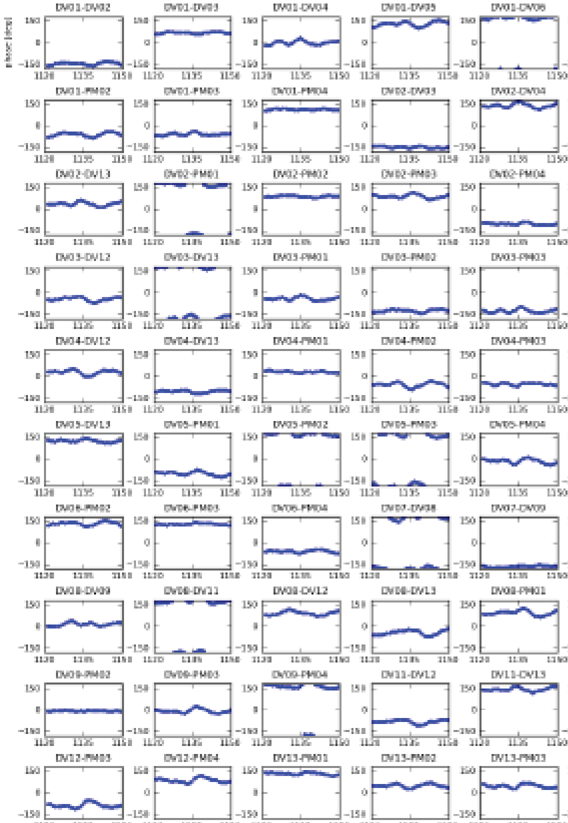
Status

Latest Status

- Array Operation Site (altitude 5000m)
  - 24 antennas on Nov 3, 2011 (see below 22 antennas)
  - ✓ EA: 8 (4x12m, 4x7m), EU:2, NA: 14

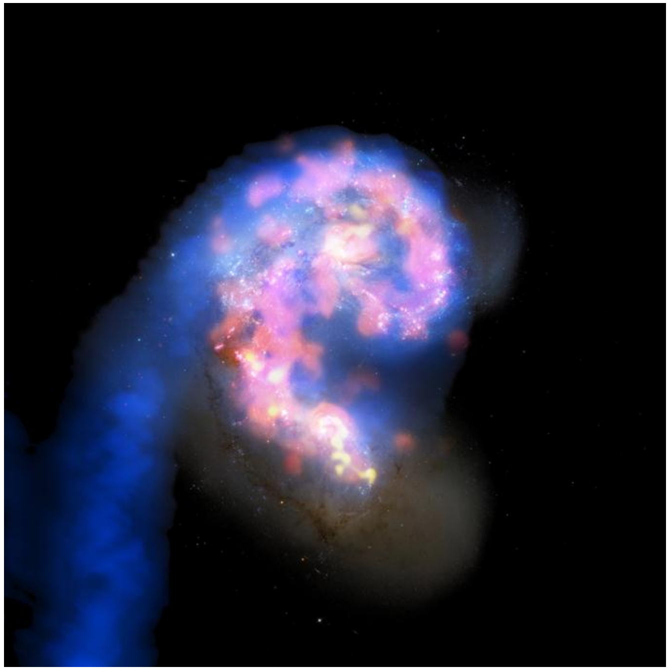
Commissioning Science Verification

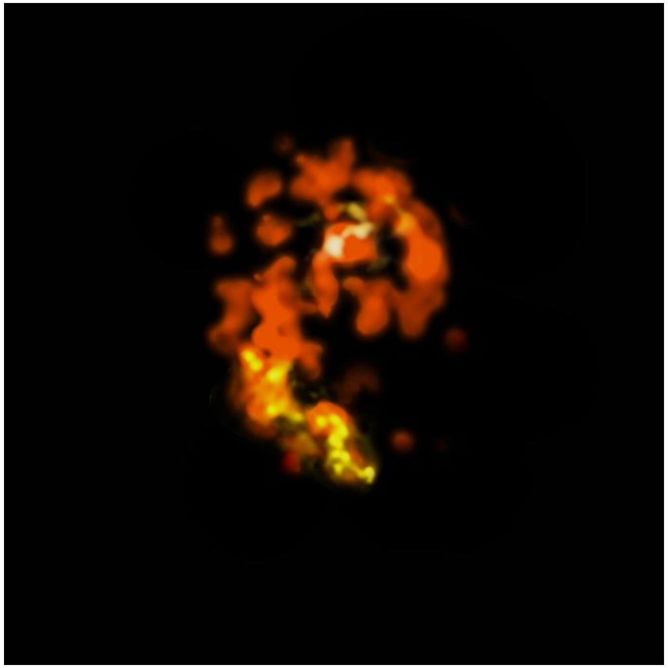
- 06 Aug, 2011: 120-Baseline Fringes with 16 antennas
  - 3C 279 (30-sec Integ.)



Demonstration Science

- Antennae Galaxies (NGC4038/4039)

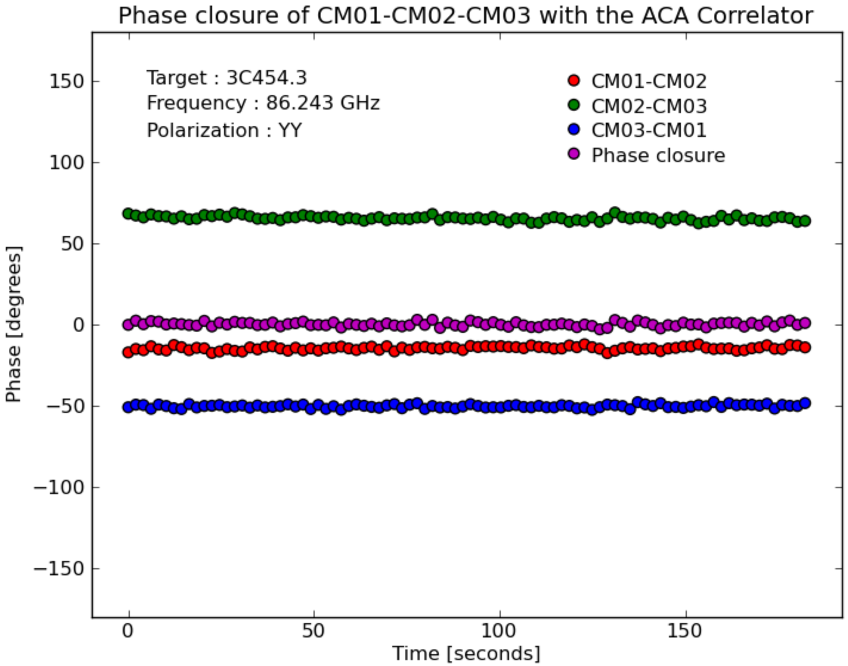




  - Orange ALMA (J=1-0 CO), Yellow ALMA (J=3-2 CO) with 12 ant.
  - Blue VLA radio, Stars & H+ from Hubble & CTIO

Commissioning Science Verification

- Status related to Japanese 7-m antennas
  - On **October 23**, an interferometer test was conducted using **three Japanese 7-m antennas and a Japanese correlator** installed at the Array Operations Site (AOS) at 5000 m asl, and interference fringes were successfully obtained.



Science Operation

Start Early Science Operation

on September 30, 2011

NEWSFOCUS

ASTRONOMY

First Global Telescope Opens An Eye on the Cold Universe

Within days, astronomers will start peering into the coolest corners of the cosmos using a partially completed array of antennas in the deserts of northern Chile

High and dry. How the complete ALMA will look (above) and antennas awaiting installation (top).

On the move. A transporter repositions a 100-ton antenna as workers (some wearing oxygen cylinders) look on.

Downs and ups

—DENNIS NORMILE AND DANIEL CLERY

Science 333, 1820

Start Early Science Operation

on September 30, 2011

- Japanese EPO Activities
  - The news programs on ALMA filmed at the OSF were broadcasted by NHK (Japan Broadcasting Corporation) on October 3 and 19. These programs were received favorably by the viewers and helped increase name recognition.

On October 19, new documentary focused on ALMA

Cycle 0 Capability

- CfP 2011 Mar 30, proposal deadline 2011 Jun 30
- 2011 Sep 30 to 2012 Jun 30 (9 months)
- Allocate 550 hours of array time
- 16 x 12m antenna array
- 18-125m, 36-400m baselines, 2 configurations
- Single field imaging and Mosaics up to 50 fields
- Frontend
  - Band 3 (2SB: 84GHz - 116GHz)
  - Band 6 (2SB: 211GHz - 275GHz)
  - Band 7 (2SB: 275GHz - 373GHz)
  - Band 9 (DSB: 602GHz – 720GHz)
- Set of ~14 spectral modes (same setting for all baseband)
- No single dish, No polarization, No special modes
- Amp Calibration good to 5% (band 3) and less accurate at high frequencies. The goals are: better than 10% in bands 6 and 7, and better than 20% in band 9.

All risk shared!
Not yet Data Quality Control

Cycle 1 Capability (TBD)

We will announce the final Cycle 1 capability on next Dec.

- CfP 2012 Feb 1, proposal deadline 2012 Mar 27(currently)
- 2012 Aug 1 to 2013 Apr 30 (9 months)
- Be anticipated that 1300 hours of array time
- 32 x 12m antenna array + 6 x 7m antennas (ACA)
- 18-750 m baselines, continuous configurations
- Single field imaging and Mosaics up to 150 fields on ACA only
- Frontend
  - Band 3 (2SB: 84GHz - 116GHz)
  - Band 6 (2SB: 211GHz - 275GHz)
  - Band 7 (2SB: 275GHz - 373GHz)
  - Band 9 (DSB: 602GHz - 720GHz)

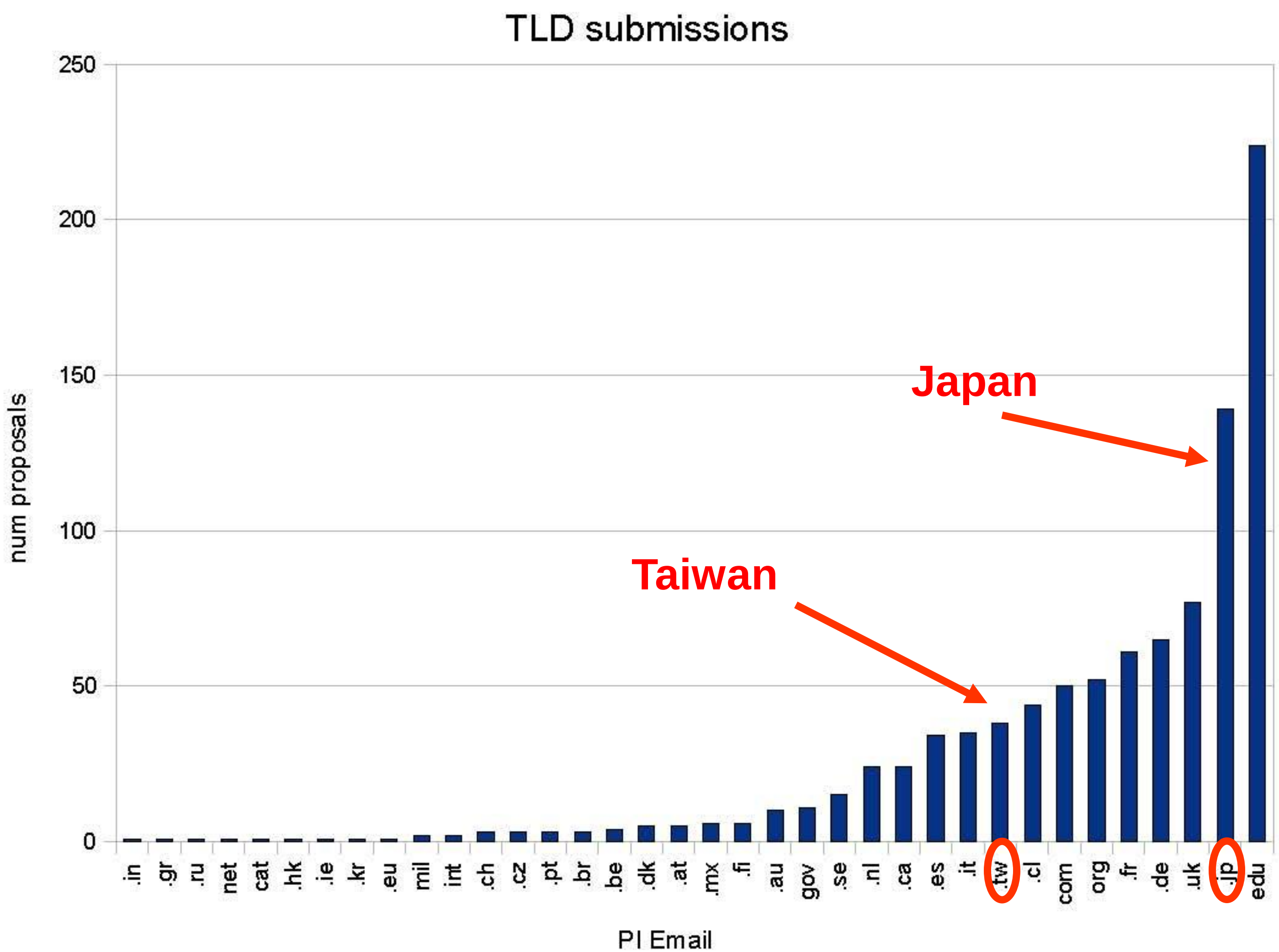
  Band 4 (2SB: 125GHz - 163GHz)
  Band 8 (2SB: 385GHz - 500GHz)
  Demonstration science based on Proposal?
- Set of ~many spectral modes (different setting for each baseband)
- Single dish (line), Linear polarization, Solar Observations

  Demonstration science based on Proposal?
- Amp Calibration better than Cycle 0

Risk shared
Not yet Data Quality Control

EA Science activities

First Call for Proposal (Cycle0)
Submitted proposals

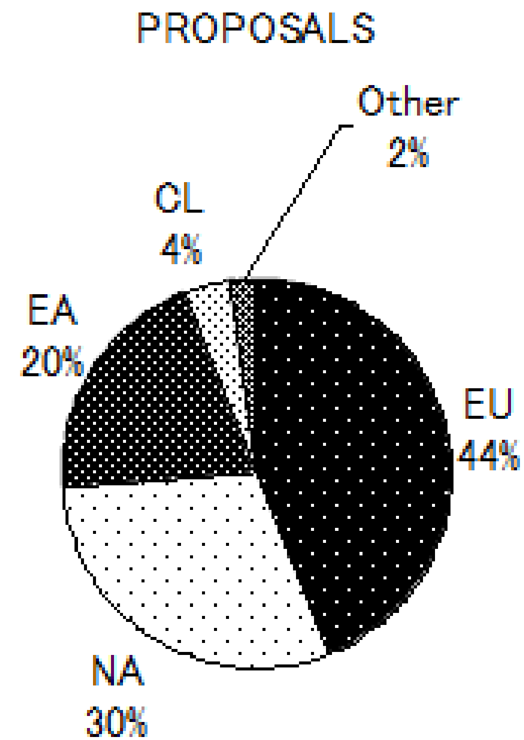


Submitted proposals (Cycle0)

- Total 923 proposals (5 July)
  - EU 404 (44%)
  - NA 279 (30%)
  - EA **184 (20%)**
  - CL 35 (4%)
  - Others 21 (2%)

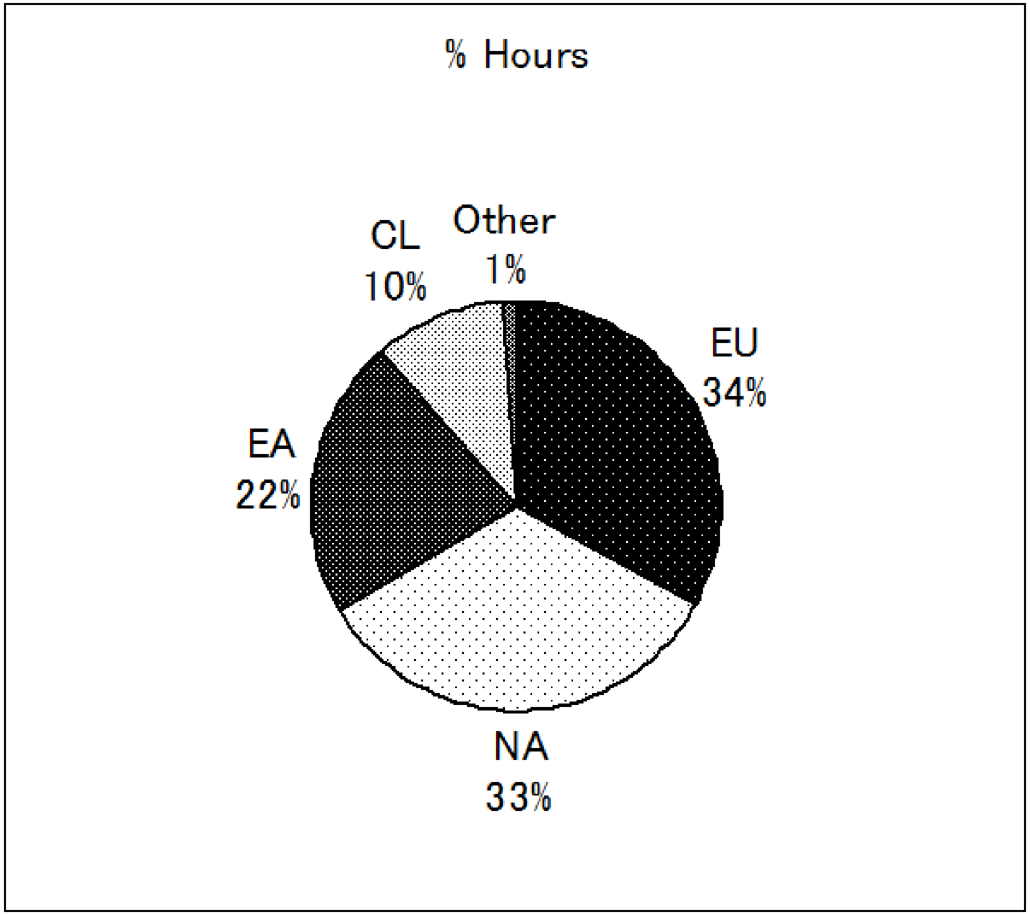
- Total registration 2898 (1 July)
  - EU 1260
  - NA 980
  - EA **400**
  - CL 52
  - Others 206

Need to improve



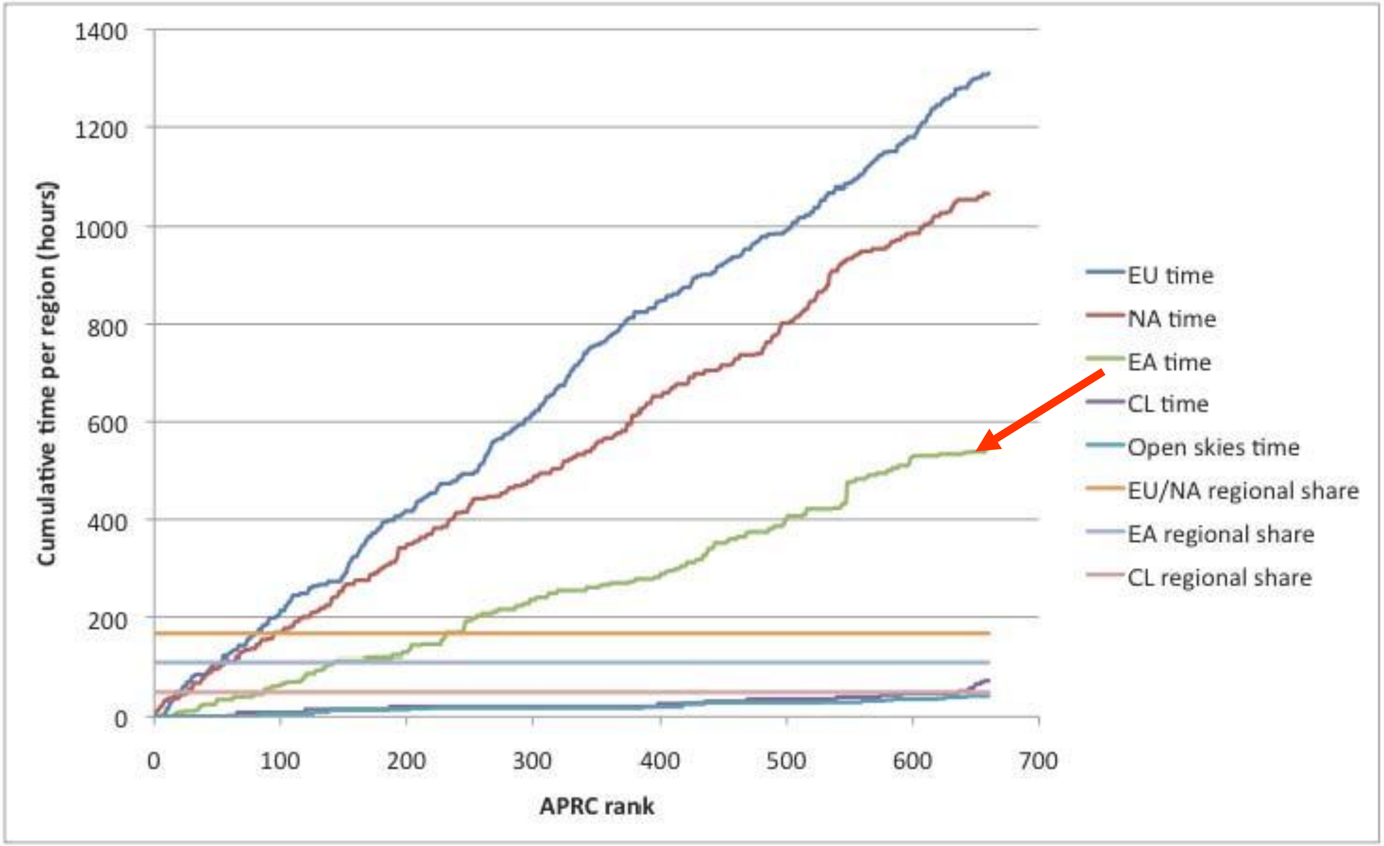
Accepted proposals (Cycle0)

- Total 112 proposals ("highest priority";505.5 h)
  - EU 35 (167.5 h)
  - NA 38 (168.5 h)
  - EA **27** (111.3 h)
  - CL 11 (52.3 h)
  - Others 1 (5.9 h)



- Top 100 proposals
  - EU 43
  - NA 38
  - EA **16**
  - CL 2
  - Others 1

Proposal Review for Cycle 0
Accepted proposals



We need to submit more proposals to increase the top-100 ranks from EA.

www.almaobservatory.org

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership among Europe, North America and East Asia in cooperation with the Republic of Chile. ALMA is funded in Europe by the European Organization for Astronomical Research in the Southern Hemisphere (ESO), in North America by the U.S. National Science Foundation (NSF) in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC) and in Japan by the National Institutes of Natural Sciences (NINS) in cooperation with the Academia Sinica (AS) in Taiwan. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI) and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.