The ALMA Regional Centre (ARC) activities over the last 12 months

Paola Andreani

ESO, ALMA Regional Centre
Users’ support in Europe: The ESO ARC and the EU nodes

• ESO ARC main activities:
  
  Ø ESO member countries’ users support

  Ø Manage the EU ARC network

  Ø Support Commissioning and Operations activities in Chile

  Ø APEX user support and Project Scientist
APLEX data flow
(only refers to ESO data)

Phase 3
Archive Science Group, APEX Operations Group

Data shipment preparation
APEX SciOps

Observations
APEX SciOps, APEX Operations Group

Phase 1
OPO, APEX Operations Group

Phase 2
APEX Operations Group, APEX SciOps

Archiving & delivery
Archive Content Handling group, APEX Operations Group

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Manage the EU ARC network

User support is spread in EU

- **Provide face to face support**
  - Proposal preparation
  - Contact scientists
  - SBs preparation together with PIs
  - Help in quality assessment
  - Data reduction

- **Participate in the ALMA helpdesk**

- **Participate in Commissioning**

- **Develop/suggest new SW and data reduction technique**

- **Community outreach and tutoring**

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Status of ALMA observations: cycle 1

• Cycle 1 PI observing was originally planned to start in January 2013 and to span 10 months
• Priority to commissioning/improvements to infrastructure and overall system stability
  – extension of Cycle 1 from end Oct 2013 to end May 2014
• Reprioritization efforts were largely successful:
  – Cycle 1 software for the 12-m Array and 7-m Array accepted by October 2013
  – Significant progress on array infrastructure and stability
• The observatory experienced 4 significant, i.e., extended or multiple, unplanned power outages, with up to 3-4 weeks to recover all array elements each time
• Completion percentage of Cycle 1 High Priority projects ~60% (compared to ~80% for Cycle 0) with projects requiring high frequencies and/or the most extended configurations remaining mostly incomplete
  – High Priority projects eligible for transfer into Cycle 2, should they remain incomplete at the end of Cycle 1
Status of cycle 1 observations

Cycle 1 Observing progress: number of successful executions obtained for each observing session (both 12-m Array and 7-m Array observations)

Green originally expected rate of observing, prior to the “reprioritization” period. Red expected rate needed to finish all HP projects, after the reprioritization.
Cycle 1 Observing session summary

Summary for 12m array observations

<table>
<thead>
<tr>
<th>Block</th>
<th>Dates</th>
<th>Allocated time (h)</th>
<th>Successful executions (h)</th>
<th>Calibration (h)</th>
<th>Technical Down time (h)</th>
<th>Execution efficiency (%)</th>
<th>Average number of antennas</th>
<th>Approximate Configuration</th>
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<td>6.1</td>
<td>14.0</td>
<td>60.7</td>
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<td>7.4</td>
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<td>69.5</td>
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<tr>
<td>22</td>
<td>Dec 11-17</td>
<td>99.3</td>
<td>40.2</td>
<td>2.4</td>
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<td>43.0</td>
<td>27.7</td>
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<tr>
<td>23</td>
<td>Dec 25-31</td>
<td>99.1</td>
<td>31.2</td>
<td>1.4</td>
<td>9.4</td>
<td>32.9</td>
<td>26.8</td>
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<td>Jan 8-14</td>
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<td>15.8</td>
<td>7.7</td>
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<td>0.0</td>
<td>62.5</td>
<td>27.0</td>
<td>C32-2</td>
</tr>
</tbody>
</table>

March 5-12

~100
~60
~8
~5
~68

27
C32-3

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**Cycle 1 Observing session summary**

**Summary for 7m array observations**

Table 2: Cycle 1 Observing Session summary for the 7-m Array

<table>
<thead>
<tr>
<th>Block</th>
<th>Dates</th>
<th>Allocated time (h)</th>
<th>Successful executions (h)</th>
<th>Calibrations (h)</th>
<th>Technical Down time (h)</th>
<th>Execution efficiency (%)</th>
<th>Average number of antennas</th>
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<tbody>
<tr>
<td>19</td>
<td>Oct 30-Nov 5</td>
<td>96.0</td>
<td>62.0</td>
<td>0.8</td>
<td>3.9</td>
<td>65.4</td>
<td>9.1</td>
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<tr>
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<td>Nov 13-20</td>
<td>114.4</td>
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<td>4.6</td>
<td>57.0</td>
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<td>21</td>
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<td>16.4</td>
<td>0.8</td>
<td>56.2</td>
<td>8.0</td>
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<tr>
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<td>Dec 11-17</td>
<td>91.8</td>
<td>40.9</td>
<td>2.7</td>
<td>0.4</td>
<td>47.5</td>
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<td>23</td>
<td>Dec 25-31</td>
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<td>33.7</td>
<td>2.1</td>
<td>5.4</td>
<td>37.0</td>
<td>8.5</td>
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<tr>
<td>24</td>
<td>Jan 8-14</td>
<td>84.9</td>
<td>31.1</td>
<td>1.7</td>
<td>1.6</td>
<td>38.6</td>
<td>9.8</td>
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<tr>
<td>25</td>
<td>Jan 22-28</td>
<td>56.7</td>
<td>6.8</td>
<td>4.7</td>
<td>0.2</td>
<td>23.6</td>
<td>9.7</td>
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</table>

March 5-12: ~50 * ~25 ~2 ~10 ~54 9.5

*because of TP acceptance testing*
New operations model

Implemented from April 1st

<table>
<thead>
<tr>
<th>Focus</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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<td>16-hr</td>
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<tr>
<td>Ext/Opt</td>
<td>16-hr</td>
<td>Share ICT relocate</td>
<td>16-hr relocate</td>
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<tr>
<td>Science</td>
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<tr>
<td>Ext/Opt</td>
<td>16-hr</td>
<td>Share ICT relocate</td>
<td>16-hr relocate</td>
<td>16-hr relocate</td>
<td>16-hr relocate</td>
<td>16-hr relocate</td>
<td>Share ICT</td>
</tr>
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</table>
Data Quality assurance at the ESO ARC

Total processed: 44+30 = 74 SBs (76+58 = 134 EBs)
Total delivered: 44 SBs (76 EBs)
Observed between 2013/01/24 and 2014/03/11.
Net analysis time range 1-39
average: 8.4 working days
Time from observation to delivery range 3-72,
average 22.9 working days
(includes delays due to work at JAO of up to 21 working days, average 0.9 wd)
Immediate Plans for Commissioning: Extension and Optimisation of Capabilities (EOC)

• From March 21, 2014:
  – New EOC Program Scientist : Anthony Remijan
  – EOC Deputy Program Scientist : Catherine Vlahakis

• Program plan for characterising the main array during daytime observations

• High Frequency Observing Campaign Jun-Aug 2014
  – Lead: Takahashi Satoko
  – types of observations needed for the Band 9 and 10 observations
  – Plan will be discussed at the ObsMode meeting in Socorro, 14-16 April 2014

• Long Baseline Observing Campaign: Sept-Nov 2014
  – Lead: Ed Fomalont
  – An initial test plan in place
  – Ed will been working with an international consortium
  – The consortium meets in Grenoble the first week in June to review the plan and to provide work assignments.
Immediate Plans for Commissioning: Implications for the ARC

- Increasing number of AoD shifts and/or turnos during the ES weeks from 14 to 16 for EU and NA and from 11 to 13 for EA
- To free up additional ES support staff with CSV experience for the EOC weeks.
- Assistance with the upcoming observing campaigns, especially with data reduction and analysis (with long stays in Chile)
- Science Verification will remain under EOC for at least another year:
  - requires support from the ARCs in processing SV data for release to the community
  - EOC management provide an approximate work effort for each SV project and propose that some of the effort be provided from the ARCs.
Cycle 2 is coming!

<table>
<thead>
<tr>
<th>ALMA region</th>
<th>Total</th>
<th>Percentage</th>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
<th>Category 4</th>
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<td>561</td>
<td>40.6%</td>
<td>129</td>
<td>144</td>
<td>136</td>
<td>80</td>
<td>72</td>
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<tr>
<td>NA</td>
<td>417</td>
<td>30.2%</td>
<td>83</td>
<td>104</td>
<td>103</td>
<td>99</td>
<td>28</td>
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<tr>
<td>EA</td>
<td>273</td>
<td>19.8%</td>
<td>48</td>
<td>78</td>
<td>97</td>
<td>34</td>
<td>16</td>
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<tr>
<td>CL</td>
<td>95</td>
<td>6.9%</td>
<td>25</td>
<td>16</td>
<td>23</td>
<td>25</td>
<td>6</td>
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<td>OTHER</td>
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<td>10</td>
<td>14</td>
<td>5</td>
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<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1382</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>295</strong></td>
<td><strong>356</strong></td>
<td><strong>364</strong></td>
<td><strong>241</strong></td>
<td><strong>126</strong></td>
</tr>
</tbody>
</table>

Table 1 – Number of submitted proposals per science category and per region.

- **Technical assessments:**
  988 proposals assessed. 45 Unfeasible.
- 3-4 % rejected on technical grounds
- 2000 person-hours of work.
- **Science assessments done March 10-14:** results out today!
Technical Assessment (TA) Process

- Assessed 988 proposals of 1381.
  - ~37 proposals per assessor.
  - 27 assessors. 2 Assessors with half work load.
- Deadline for the Assessments: March 3, 2014, 12:00 UT
- **Concern**: ARCs/JAO CANNOT assess more than this! → no hope of assessing the whole bunch of ALMA proposals
EU ARC events in the past year

- 28-31 January 2013: Astrochemistry in the ALMA era
- 19-20 March 2013: Science with ALMA band 11
- 24-29 June 2013: CESRA 2013 Meeting with ALMA session
- 14-17 January 2013: Solar ALMA workshop
- 1-5 July 2013: ALMA at the NAM
- 21-22 February 2013: Cycle 1 PI CASA tutorial
- 14 November: Cycle 2 Proposal Preparation
- 31 October – 27 November: Cycle 2 talk tour
- 29-31 May 2013: Nordic Science with ALMA
- 25-28 June 2013: Polarization with ALMA
- 19-20 November: ESO Cycle 2 Community Days
- 5-6 November: German Community Days
ARC network activities

• ARC ‘all-hands’ meeting on Isle of Skye, June 10-12
  – Meeting with all ARC network staff to discuss policies, exchange information between ESO and ARC nodes, discuss technical issues, quality assurance, etc.

• European Contact Scientists are in the ARC nodes. Main contacts between ALMA observatory and ALMA users

• ARC nodes fully involved in Quality Assurance (QA2). ARC nodes contribute ~70% to European Cycle 1 QA2 effort

• ARC nodes fully involved in development of QA2 procedures, writing and editing of Technical Handbook, feedback on CASA development, data policies, testing of OT, CASA and other tools

• Planning of ARC nodes contribution to “Extension and Optimization” started in earnest. People scheduled to go to Chile for high frequency and long baseline work starting in June.
APEX highlights

• APEX agreement formally extended till end of 2017.
• Over 400h/month of science integration time over last 2 years.
• ESO time most highly oversubscribed amongst APEX partners.
• Data is now available from ESO archive <2 days after observations.
• 3 poor PWV large programmes allow for a good use of these weather conditions, previously undersubscribed.
• Artemis ESO PI instrument had first science results in 2013. Now offered to ESO community without any restrictions (instrument team receiving limited GTO).
• New PI instruments Supercam (64pixel 345 GHz heterodyne array) offered in P94.