The ASKAP Community Workshop 2014: Report and Outcomes

Lisa Harvey-Smith

24th November 2014

ASTRONOMY & SPACE SCIENCE
www.csiro.au

CSIRO acknowledges the Wajarri Yamatji people as traditional owners of the MRO site

ASKAP Community Workshop: 21 October 2014

09:30 Welcome (Lisa Harvey-Smith)
09:35 – 09:40 Opening remarks (Lewis Ball, CASS Chief)
09:40 – 09:50 Project Update (Ant Schinckel)
09:50 – 10:10 BETA performance overview (Dave McConnell)
10:10 – 10:30 Beam forming – status and outlook (Aidan Hotan)
10:30 – 10:50 Wide-field imaging, correlated noise and interleaving (Ian Heywood)
10:50 – 11:00 Contaminants: RFI, solar, cross talk (Lisa Harvey–Smith, Paolo Serra)

Morning Tea

11:30 – 11:50 Data Processing Readiness for Early Science (Ben Humphries)
11:50 – 12:10 ASKAP Data Archive and Readiness for Early Science (Jessica Chapman)
12:10 – 12:30 Discussion of morning presentations, ASKAP early science readiness (Anne Green)

Lunch (Provided in the interaction space)

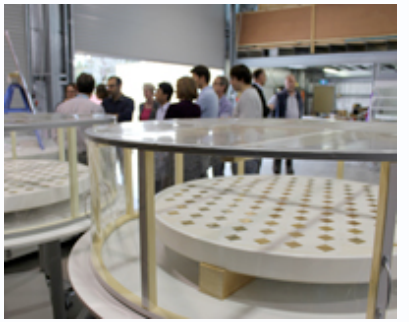
13:30 – 13:45 Delivery Plan/Schedule for ADE PAFs (Adrian Rispler)
13:45 – 14:00 Indicative u,v coverage & point spread function for a number of deployment options (Matt Whiting)

Presentations from ASKAP Science Survey Teams on preferred PAF deployment options

14:00 – 14:15 EMU/POSSUM
14:15 – 14:30 WALLABY/GASKAP
14:30 – 14:45 FLASH
14:45 – 15:00 DINGO
15:00 – 15:15 VAST and CRAFT

Afternoon Tea

15:45 – 16:30 Discussion on deployment options for ASKAP phased array feeds (Anne Green)



Videos, talks and outcomes, actions are available here:

https://pm.atnf.csiro.au/askap/projects/sup/wiki/Wiki_sup_meet_cm2

Summary of ASKAP Community Workshop
Tuesday 21st October 2014

Lisa Harvey-Smith, ASKAP Project Scientist
Aidan Hotan, ASKAP Deputy Project Scientist

Overview

An ASKAP Community Workshop was held on 21st October 2014 at the CSIRO Astronomy & Space Science headquarters in Marsfield, NSW. Aimed at the ASKAP scientific user community, this workshop provided participants with a comprehensive update on BETA commissioning, data processing and the ASKAP data archive.

The afternoon sessions provided astronomers with an opportunity to discuss the options for transitioning from ASKAP-12 (the early science array) to the full ASKAP, including the options for re-deployment of Mk I receivers from BETA.

There were 60 participants from 9 organisations; CASS, The University of Western Australia, Sydney University, Monash University, Swinburne University, The Australian Astronomical Observatory, Astronomy Australia Limited, the Astronomical Society of Australia and the Department of Industry. Some participants also have joint affiliation with ICRAR or CAASTRO.

The agenda, copies of presentations and videos of the sessions are available at the meeting wiki page:
https://pm.atnf.csiro.au/askap/projects/sup/wiki/Wiki_sup_meet_cm2

If you have difficulty accessing this page, please contact the ASKAP Project Scientist (lisa.harvey-smith@csiro.au).

Key Discussion Points

Here we record key questions and discussion points raised during the workshop that may require follow-up and/or further research. The beginnings of new discussion topics are written in bold for ease of reading.

Morning Talks

Ray Norris: **Pointing errors for the early BETA commissioning observations are currently 2'. We will need significantly better for high dynamic range imaging. What are the prospects?**

Dave McConnell: We are taking measurements with BETA at 950 MHz at the moment. We will do better by a factor of 2 at higher frequencies due to the smaller beam. We are still learning to make wide-field images, so expect much better (~ factors of four), followed by more gradual incremental improvements. This may be a long process.

- CASS to review Mk II deployment plan in light of science advice provided at this workshop as well as engineering and commissioning requirements. CASS will produce a PAF deployment plan. Initial plan presented and discussed at next meetings of the ASKAP Science Survey Teams C&M meeting and ASKAP WG4b (BETA and Commissioning working group). Final plan released by end of March 2015.

- CASS to investigate the RFI impact of daytime observing in terms of solar interference on short baselines and RFI from equipment during times of construction (in progress). Report back to science teams on both these issues.

- CASS to update the on-line ASKAP PSF simulator with more configuration options to assist science teams with simulations (November 2014).

- CASS to develop a highly effective automated calibration and imaging pipeline for early science (ongoing).

- CASS to consider '12 months in the life of early science' (a strawman) to examine the interplay between commissioning, early science and addition of new batches of Mk II PAFs. This will help us to plan early science.

- CASS to consider how different early science programs might be staged depending on whether the configuration and correlator capabilities are suitable for a particular science program.

- CASS to investigate pointing errors, primary beam shape, beam shape constraining beam-forming methods and their effect on dynamic range (ongoing)

- ASKAP Science Survey Teams to investigate options for production and storage of Level 7 data products, in consultation with iVEC and CASS.

Update on CASS Actions

Development of advanced correlator modes

Zoom modes:

- Work will begin on zoom modes in the ADE correlator Jan 2015
- First functionality ready for testing on ASKAP 4/8 in June 2015
- Number of zooms will increase over time, multiple zooms adds s/w complexity
- **Commissioning late 2015, zooms ready for early science**

Fast Transient Mode:

- Firmware and most software ready to be tested
- CASS working with CRAFT to negotiate maximum time captured and cadence, this depends on available memory
- Control software not tested
- **Commissioning will begin after June 2015, when we have 4+ PAFs**

Tied Array Mode

- Tied-array functionality is lower priority than zooms and fast transient modes
- Requires an oversampled FFB, which is not yet integrated or tested
- **Commissioning could begin in late 2015.**

Investigate options for production, storage of Level 7 data products for early science

- Production and storage of ASKAP Level 7 (value added) data is the responsibility of survey science teams
- SSTs need to determine how science data processing will be carried out in a HPC environment
- The ASKAP Project Scientist will work with SSTs to determine which Level 7 data products will require HPC, help co-ordinate questions to iVEC
- Survey science teams will need to build expertise in this area
- Further discussion with SST leaders on Wednesday

Mk II Deployment Plan

- Matt Whiting is simulating a large variety of options for deployment post-ASKAP-12
- Options were discussed at the Community Workshop
- CASS will present a preferred deployment plan at December 16th WG4b meeting.
- Most likely options provide for replacement of PAFs on 2-3 BETA antennas after commencement of early science (not before, since BETA is a valuable test facility)
- Practical considerations, including hardware reliability and sensitivity to solar RFI and cross-talk, may determine which BETA PAFs are replaced.
- Matt Whiting continues to work on the public release of an ASKAP simulation tool:

ASKAP PSF Simulator

Observing/Imaging Parameters

Array:
ASKAP BETA
ASKAP12-A ASKAP12-B ASKAP-12B2
ASKAP-12B3 ASKAP-12B4 ASKAK-12C
Bandwidth:
300 x 1MHz 1 x 1MHz 1 x 18.5KHz
Declination:
-60°
Duration:
+/-4h
Weighting:
Natural Wiener
Robustness:
-1 0 +1 +2
Tapering:
None 10" 30" 90" 180"

PSF Characteristics (XX Polarisation)

Restoring Beam:
78.9" x 68.6", P.A.=-34°
RMS: (see notes below)
0.207 mJy/beam
PSF Min:
-0.130 Jy/beam
PSF Min Location:
(2091, 2013)

View full-resolution image of PSF
Download FITS-format image of PSF

PSF Image **UV Coverage** **ANT Positions**
Surface brightess sensitivity **Point source sensitivity**
Sensitivity percent **Weight distribution**