



# LBA Update

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**ASTRONOMY AND SPACE SCIENCE**

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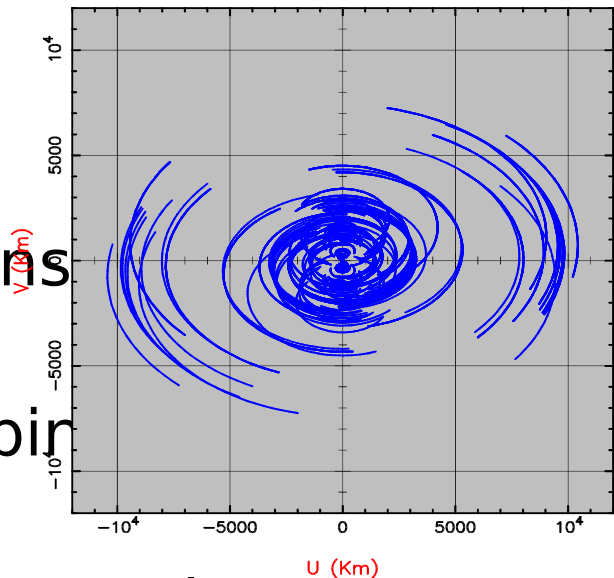
# The Long Baseline Array (LBA)

- VLBI array operated as a National Facility by CSIRO Astronomy & Space Science
- With UTAS, SARA0 (HartRAO) and AUT
- ATCA (5x22m), Mopra (22m), Parkes (64m), Ceduna (12m), Hobart (26m), Hartebeesthoek (26m & 15m)
- Warkworth (12m/30m), Tidbinbilla (70m & 34m), AuScope (3x12m), plus ad hoc arrangements with Korea.



# The Long Baseline Array (LBA)

- Regular observations in 20, 13, 6, 3, 1cm bands
  - 1.4-25 GHz
  - Not all telescopes support all bands
  - ATCA, Mopra 7 & 3mm, Tid 7mm
- 25 days/year typically in 4 sessions
- Flexible for ToO
- Disk-based recorders with e-shipping
- Max bit-rate 1Gbps
- Data correlated on DiFX software correlator at Pawsey



# LBA Status

- No major recent changes
- Proposal pressure last sessions lower than usual
  - Great time to submit LBA proposals!
- Parkes UWB receiver allows VLBI with Parkes 700 MHz-4 GHz “any time”
- Exploring Global VLBI alliance
  - Simpler global VLBI access for astronomers
- East Asian VLBI Network agreement signed between Korea, China and Japan

# ATCA

- Regular bi-static radar asteroid observations
  - Using VLBI backend for “voltage calibration”
- Regular 100 GHz observations with KVN
  - Split frequency sub-arrays
- Waiting on “BIGCAT” upgrade to enable wideband VLBI



# Parkes

- UWB receiver working well with existing VLBI backend
  - Linear polarizations only
  - Software conversion to circular having some issues
- Work started on VLBI mode for UWB GPU backend (Medusa)
  - Hope to retire existing VLBI backend by end of year



# Mopra

- Team Mopra completed CO survey in October 2018
- No new contract in place
- Possible funding to use as part of KVN
  - New VLBI backend purchased by KVN
  - Work started on optics to illuminate all “mm” receivers simultaneously
- UNSW “Linkage” grant in final stage for short term funding
- LBA usage on “best effort” basis





# ASKAP

- No VLBI offered on ASKAP formally
- Ad-hoc experiment this Wednesday using single antenna and “Effelsberg” beamformer firmware to stream single PAF voltage beam to VLBI recorder
  - Red-shifted hydrogen outside normal LBA frequency range





# AuScope

- Upgrading antenna with broadband receivers with Stirling cycle coolers
  - 2-14 GHz continuous frequency coverage
  - UTAS plans 6.7 GHz methanol survey with own telescopes and Warkworth



# Thank you

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