LBA Update

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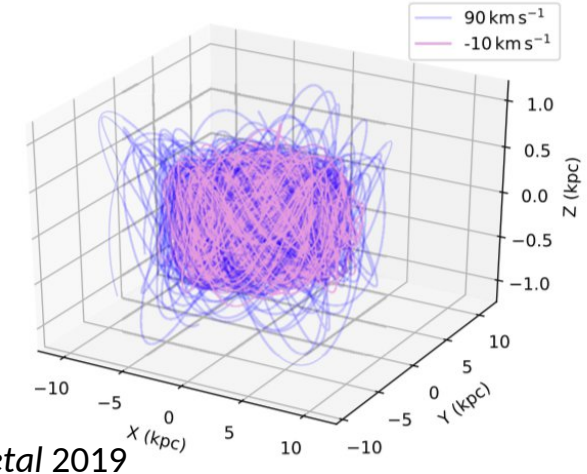
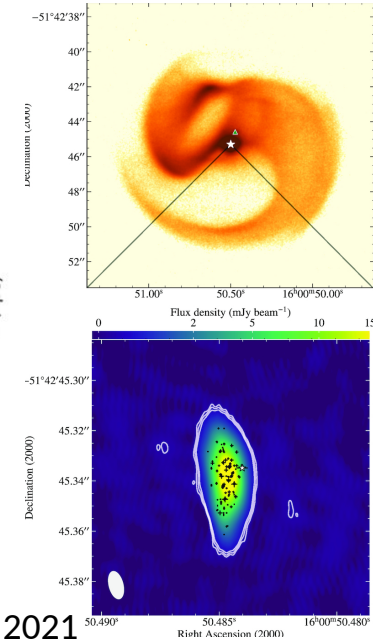
Mt Pleasant Observatory
By "Lovell Blocks"

LBA Highlights (since October 2019)

- 7 LBA sessions
- 860 hrs observing
  - 51 experiments, 10 ”out of session
- Standard x2 oversubscription
- 10 published papers
  - 3 radioastron
  - Atri *etal* 2019. NAPA to observe proper motion of black hole X-ray binary
  - Oosterloo *etal* 2019. 2 GHz VLBI in conjunction with ALMA observations
  - Marcote etal 2021. Colliding-wind binaries – colliding winds from massive stars

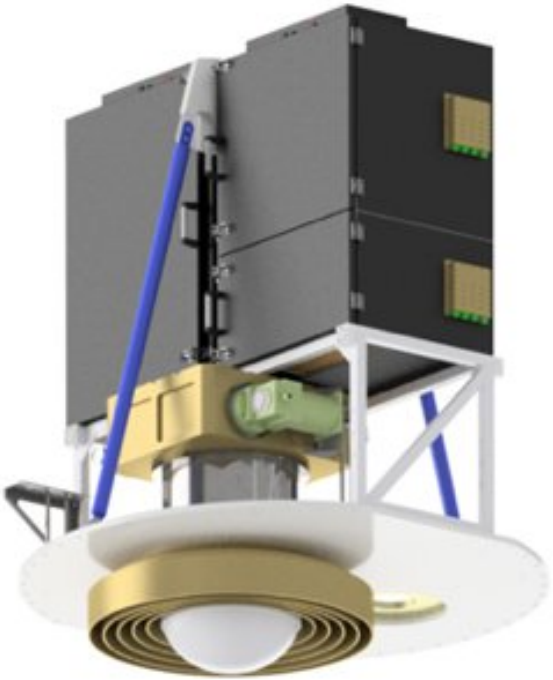


Atri *etal* 2019



Marcote *etal* 2021

Parkes



- UWL is making 1-4 GHz VLBI much more routi
  - Still using legacy LBA backed
  - “Medusa” GPU VLBI works well
    - Not operational, very hands on setup
    - Tsys extraction not working correctly
    - Digital linear-> circular conversion still to happen
  - Recording up to 8 Gbps works well
    - Higher possible in theory, needs careful tuning of recorder
- 4.8 GHz essentially not offered
  - 6.7 GHz (methanol) not used recently

ATCA

- No significant changes
- Routine “bi-static radar” using VLBI backend
  - Interesting discussion on effect of “near field” and position of antenna

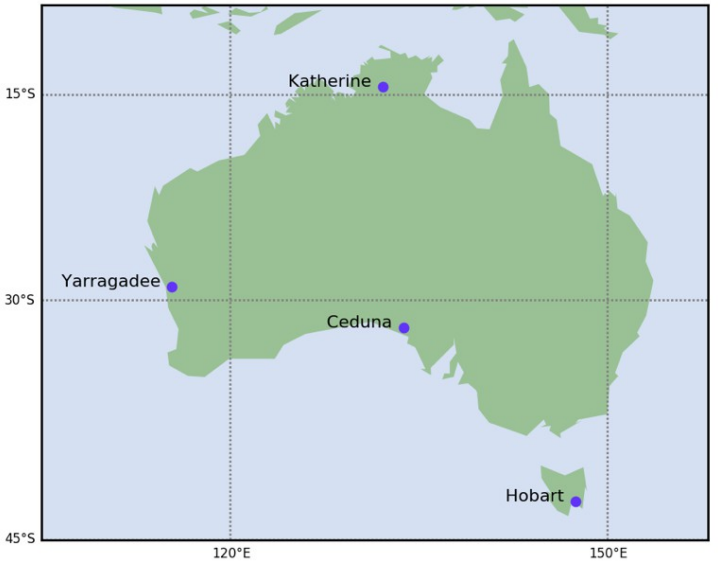
Mopra

- Still no funding
  - UNSW Linkage grant still in the works
    - In conjunction with KASI
  - KASI funds failed to eventuate
    - Have installed Octave and Mark6 (20+ GHz only)

University of Tasmania

- Routine use of Katherine between 2-12 GHz
  - Significantly improves *uv* coverage
- Generally very good reliability
  - Ceduna performance at 22 GHz problema
  - Hobart some failures on “multiband” receiver
  - Geodetic commitments significantly complicating scheduling

Ceduna 30m	1-25 GHz
Hobart 26m	1-25 GHz
Katherine 12m	2-14 GHz
Yarragadee 12m	2-14 GHz



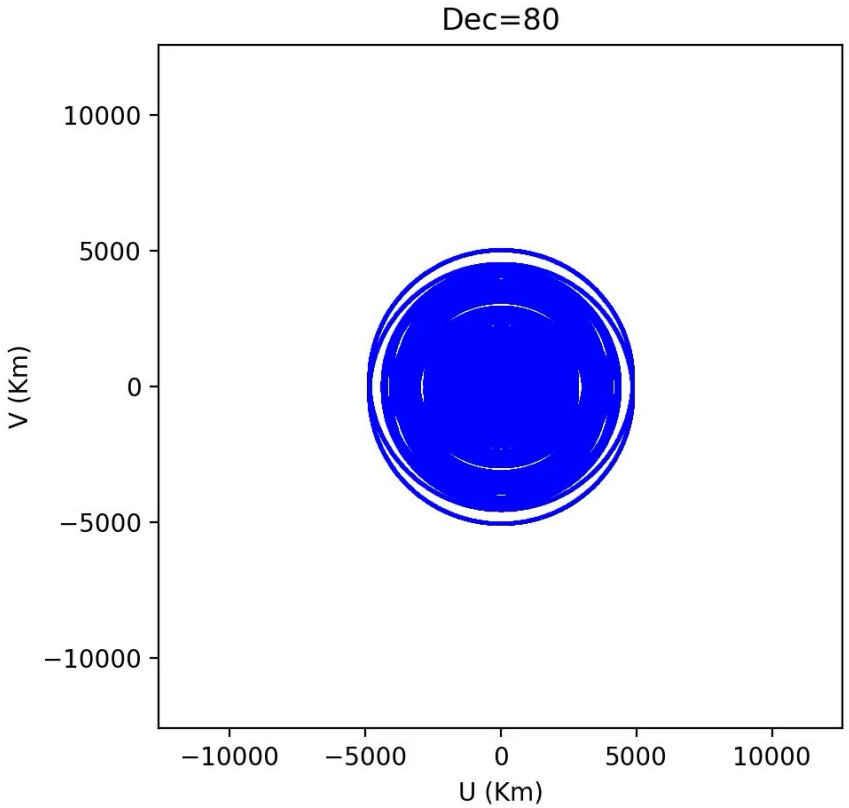
Auckland University of Technology

- Very good reliability
- Discrete receivers on beam waveguide antenna
- New procedure significantly slow receiver changes
  - Need full (business) day for Rx change

Warkworth 30m	4.8,6.7, 8 GHz
Warkworth 12m	2, 8 GHz

East Asian VLBI Network

- Ongoing interest with co-observing with Asian telescopes
  - No formal agreement
- uGMRT very keen to start VLBI
  - 130 – 1450 MHz
  - Fringe test made, analysis not complete
- Thai 40m telescope delayed due to covid
- Some ad-hoc FAST-Shanghai 64m-Parkes-Mopra observations of FRBs



Global VLBI Alliance

- Discussions to create “Global VLBI array”
  - EVN, VLBA, EAVN, LBA
  - IAU working group
- Discussions ongoing….

Known issues

- LBA sensitivity calculator not working
- Parkes UWL linear polarisations
  - Also Katherine, more telescopes in future
- Parkes transition Medusa GPU cluster delayed
- Mopra polarization purity
- Correlator backlog during 2020
  - Due to problems with IMT supplied disk storage
  - Interim Pawsey solution should significantly improve situation
  - Largely caught up now
    - Main issue is Parkes linear polarization (polconvert)

Thank you

Astronomy and Space Science
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