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First mmCABB Results

Prepared by Kate Brooks
for ATUC CABB Science Day
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mmCABB: First look towards star formation

- Data taken during Science Commissioning Week by James Urquhart, Elizabeth Mahony, Maxim Voronkov, Anita Titmarsh and Kate Brooks
- Observations made over 3 x ~14 hr runs on 19, 20, & 21 April 2009 in H168 configuration
  - Day 1 @ 7-mm (46100/44100 MHz)
  - Day 2 @ 3-mm (95900/97900 MHz)
  - Day 3 @ 12-mm (23000/249900 MHz)
- 3 science targets observed each day (all massive star-forming regions)
  - NGC 6334I
  - G345.5472-00.0801
  - SFO79

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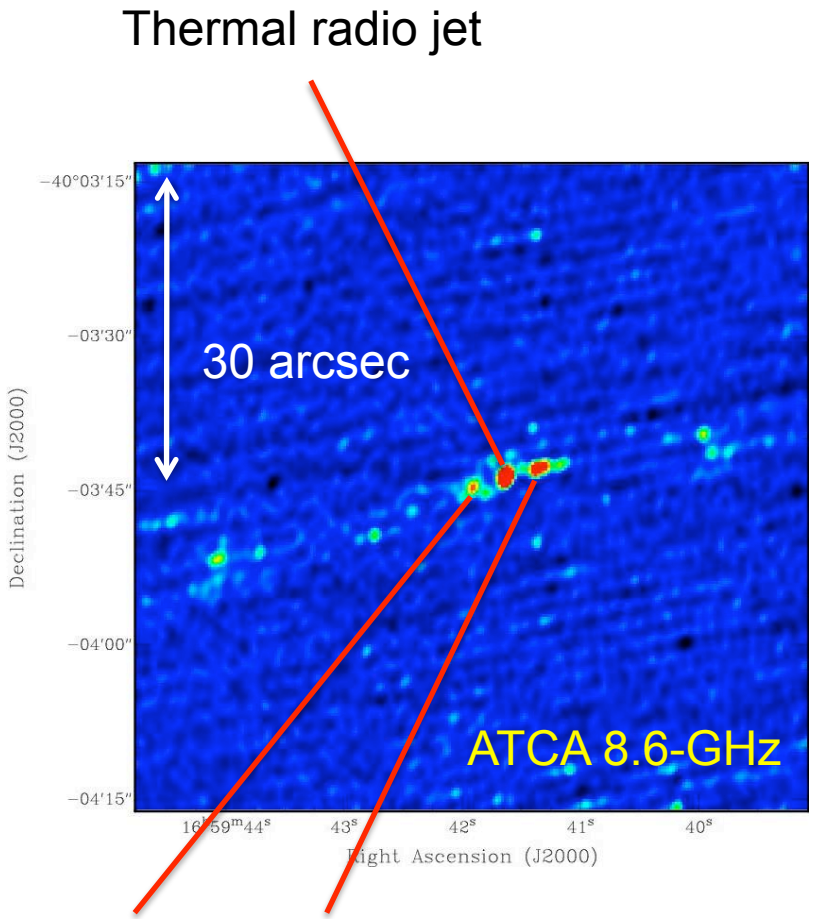
New radio jet found towards G345.5-00.08

- G345.5-00.08 is a luminous IRAS object (6.2×10^4 L_{sun}) at a distance of 1.7 kpc. The source is thought to be a very young, massive star and associated with a thermal radio jet.
- The radio jet has recently been discovered by ATNF/UChile PhD student Andres Guzman using cmATCA. The radio jet is one of only a dozen jets identified towards young massive stars. Of these dozen stars, G345.5-00.08 is the most luminous found so far (~ O8 or later).



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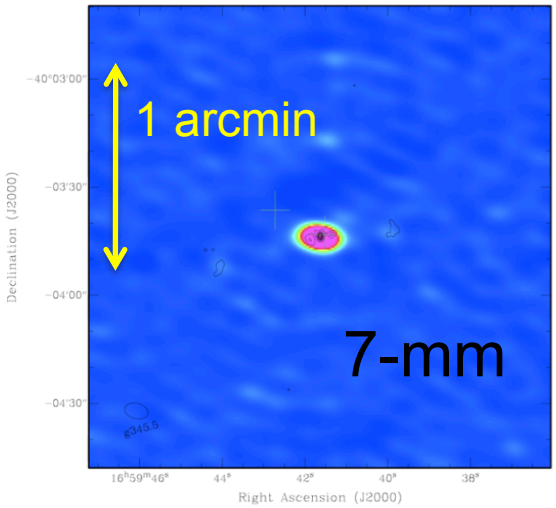
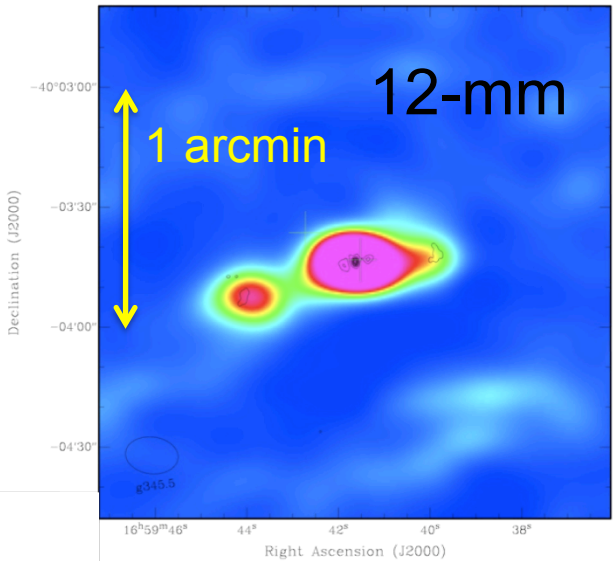
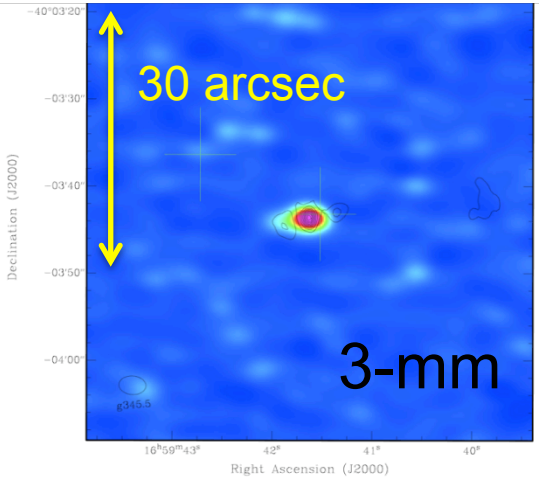
mmCABB: First results for G345.5-00.08







Colour: mmCABB
Crosses: OH masers
Contours: ATCA 8.6-GHz

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mmCABB: Absolute Flux Calibration

- Preliminary data reduction was done using the complete 2-GHz band.
- In all three bands the peak flux of the detected central source in G345.5-0.08 is ~ 60 mJy.
- For the 12- and 7-mm observations, data were taken on both 1934-638 and Uranus. Reducing the data using each of these sources as the primary flux calibrator yields a flux discrepancy of ~2. (Uranus yields the higher flux and is probably the more correct.)
- Recommendation: For the time being (until a model for 1934-638 is updated in Miriad) take data for both 1934-638 and Uranus but in the offline data reduction use Uranus as the primary flux calibrator.

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ATCA study of protoplanetary disks in rho-Oph star-forming regions at 3mm (C2063)

Luca Ricci (student at ESO), Leonardo Testi & Antonella Natta (Acreti Observatory), Kate Brooks (local ATNF contact)

PROJECT AIM: To observe the circumstellar accretion disks in low-mass young stellar objects (YSOs) at different wavelengths to constrain the physical properties of the dust in the disks in order to get more accurate disk mass estimates.

METHOD: Observe a sample of YSOs in Taurus (IRAM PdB) and ρ-Oph (ATCA) at millimetre wavelengths

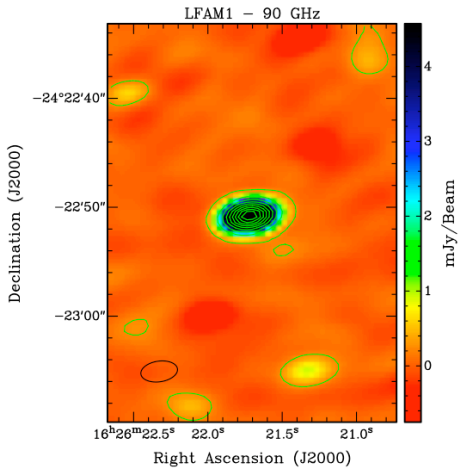
ATCA OBSERVATIONS:

Awarded time on 28 & 29 April (2 x 6 hr runs) in H168 array

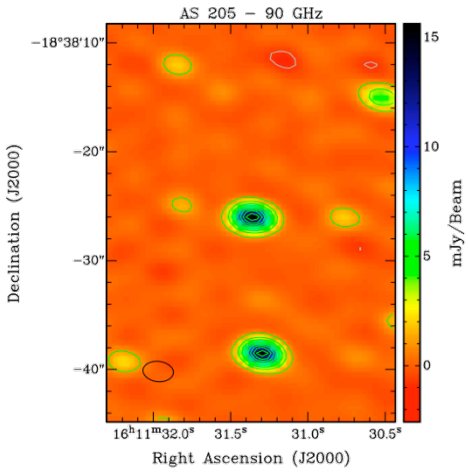
Six sources observed at 90 GHz, all with clear detections

Additional observations scheduled for June (H75 array)

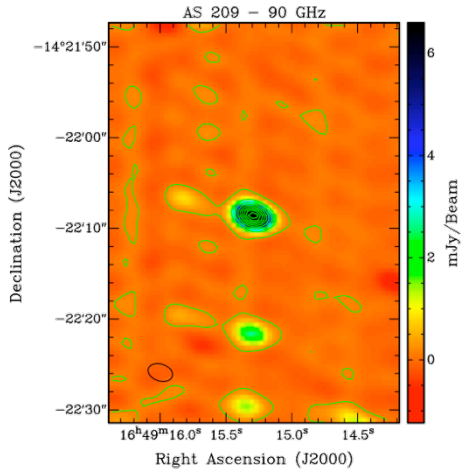
Protoplanetary disks in rho-Oph at 3mm (C2063, P.I.: Ricci L.)



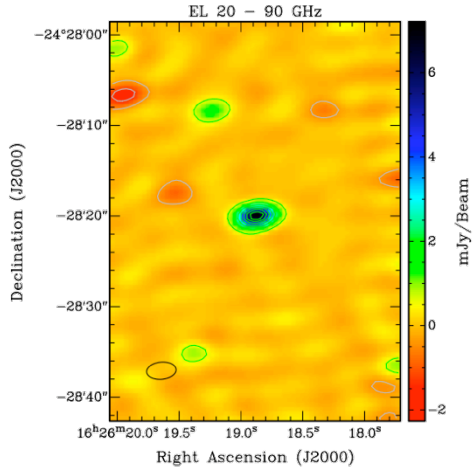
Flux (integrated) = 15.2 mJy
Rms = 0.15 mJy (40 min on source)
Sensitivity calculator = 0.6 mJy



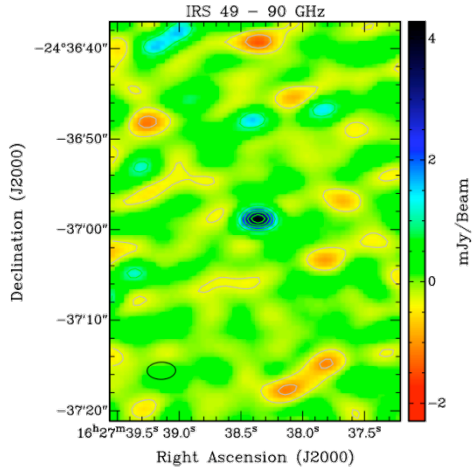
Flux = 17.8 mJy
Rms = 0.25 mJy (28 min)
Sensitivity calculator = 0.7 mJy



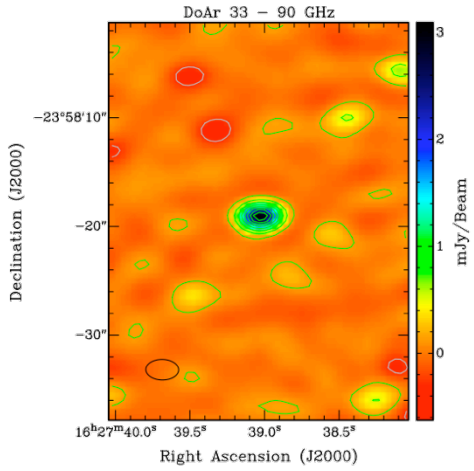
Flux = 15.8 mJy
Rms = 0.20 mJy (28 min)
Sensitivity calculator = 0.7 mJy



Flux = 7.6 mJy
Rms = 0.25 mJy (20 min)
Sensitivity calculator = 0.8 mJy



Flux = 3.0 mJy
Rms = 0.15 mJy (30 min)
Sensitivity calculator = 0.6 mJy



Flux = 2.5 mJy
Rms = 0.15 mJy (40 min)
Sensitivity calculator = 0.6 mJy