

# ATCA 12mm System and SNRs

12mm systems currently installed on CA02, CA03 and CA04

Available frequency ranges 16.1-18.9 GHz and 20.1-22.5 GHz

(Requires module swap to change bands)

At conclusion of MNRF I :

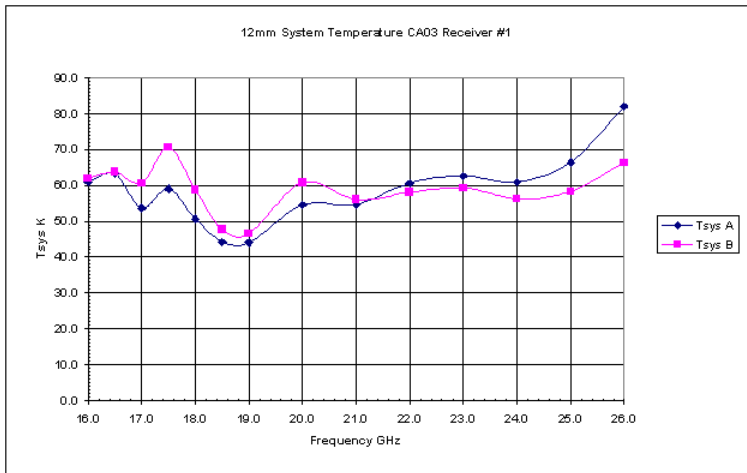
- 12mm on all six CA antennas
- Maximum baseline 6 km
- 16.0 – 26.0 GHz

(May term 2003)



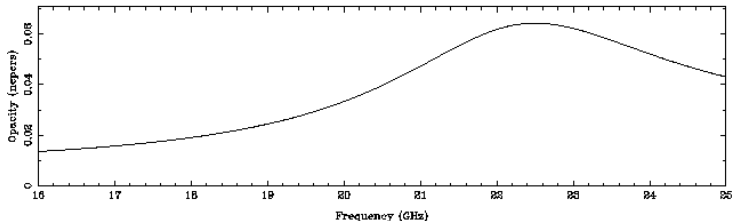
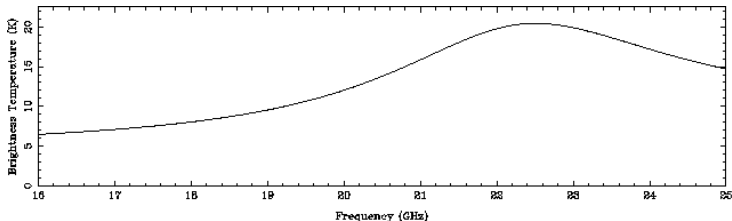
# Measured System Temperature

Polarisations A and B on CA03 at zenith



# Atmospheric antenna temperature and opacity

(for good conditions at Narrabri: clear, humidity 20%)



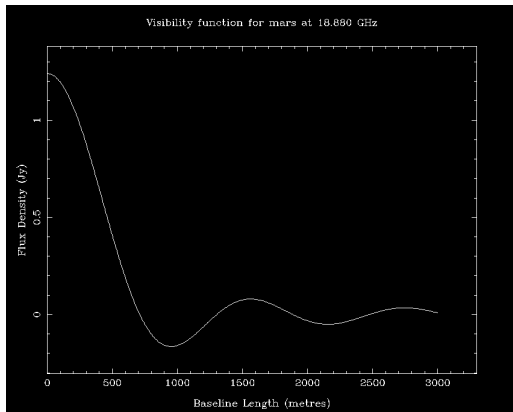
# Calibration

## Phase:

- Potential calibration sources being investigated by Bob Sault et al..
- ~1800 sources with  $S_{20} > 400$  mJy.
- Most vary in flux density, some resolved on long baselines.

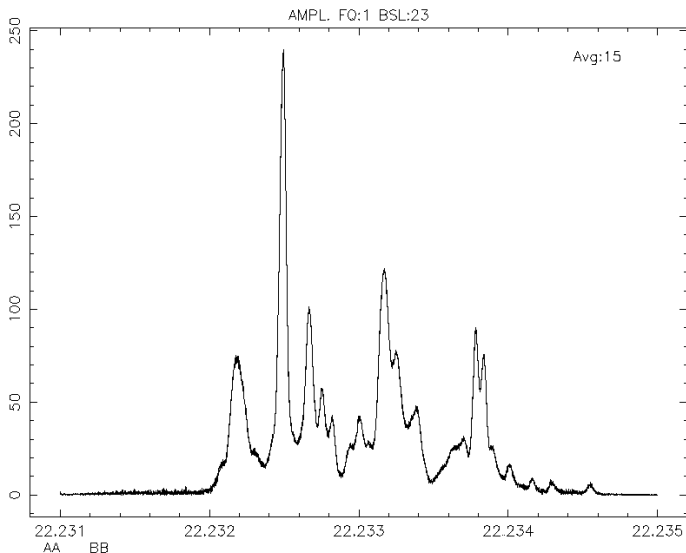
## Amplitude:

- Few if any unresolved sources known
- Most reliable calibration from planets, especially Mars and Uranus – MIRIAD tasks **PLPLOT** and **PLBOOT**

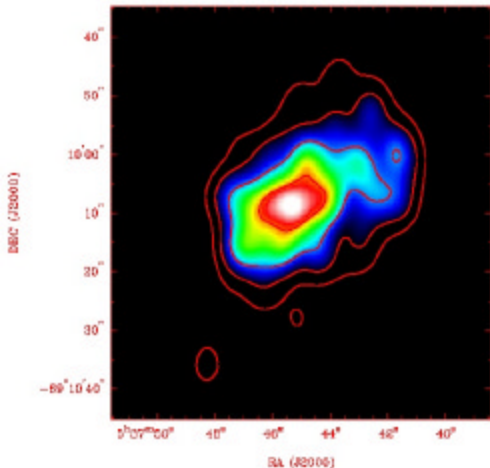


# $\text{H}_2\text{O}$ Maser in VX Sgr

4 MHz bandwidth – 2.5 minutes integration



# First 12mm Image



N157B      SNR in LMC

22.6 GHz

Arrays:

210m & 375m arrays

Baselines (m):

31, 46, 107, 153, 245, 275

Synthesised beam:

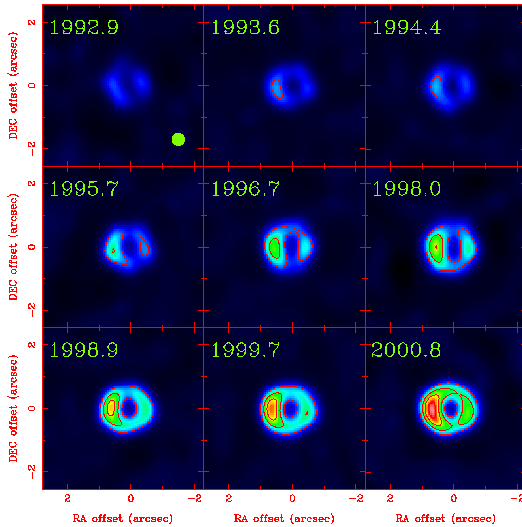
$7.6'' \times 5.6''$

Peak brightness:

51 mJy/beam

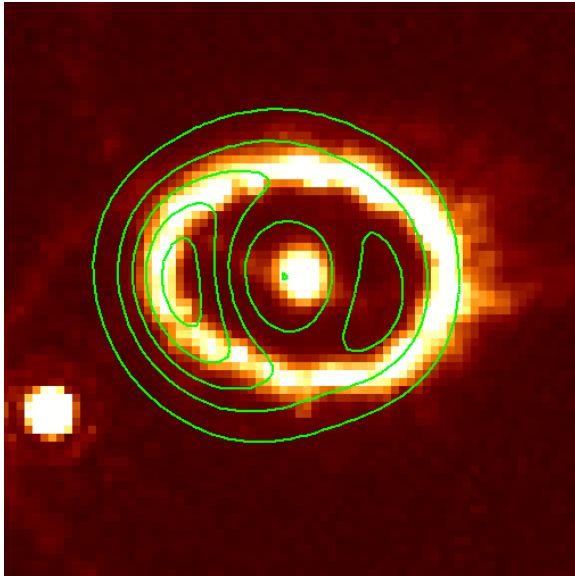
(Ravi Subrahmanyan, Dave McConnell & Jim Caswell - February 2000)

# SNR 1987A: 3cm imaging at ATCA



(Manchester et al., PASA , 2001, in press)

# ATCA 3cm image (2000.8) overlaid on HST [OIII] image





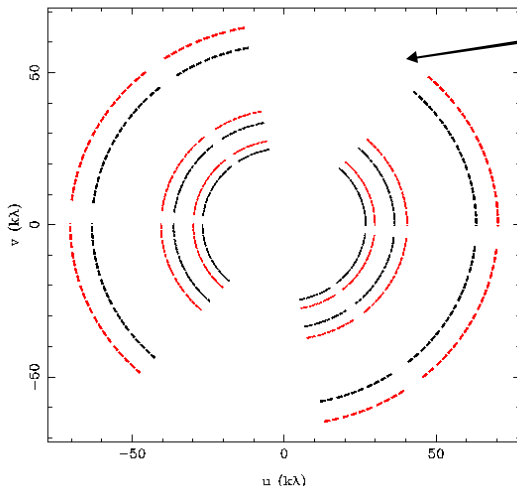
# ATCA 12 mm Observations of SNR 1987A

October 26, 2001 - 12h observation

1.5D array – baselines 474m, 643m, 1117m

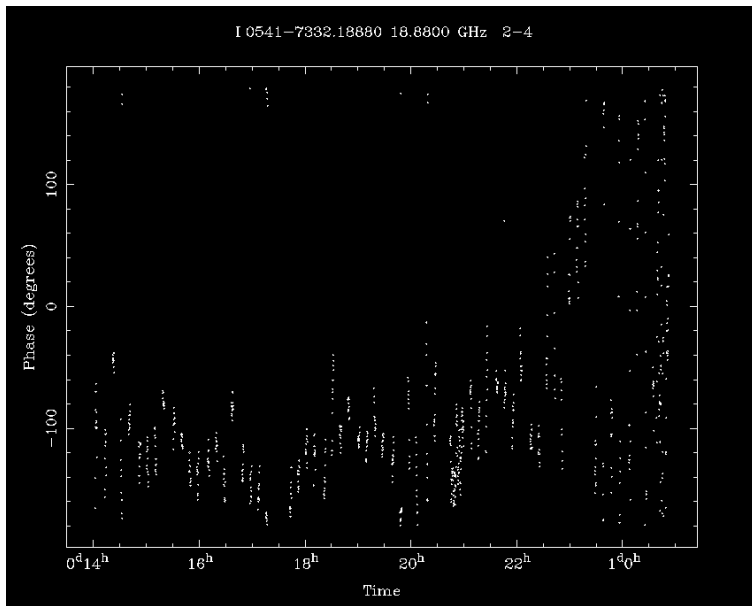
Two frequencies – 16.960 GHz, 18.880 GHz

I 16.9600 GHz



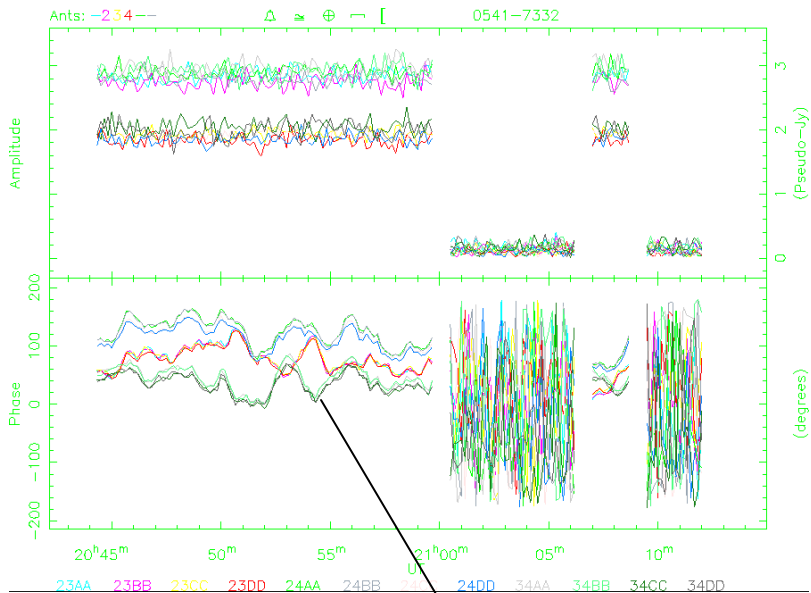
Bad phases  
after 8:30am.  
(Sunrise at  
6am, thick fog  
till 8:30am)

# Phases for 0541-7332 (0.95 Jy) at 19 GHz on a 1.1km baseline



26 October, 2001

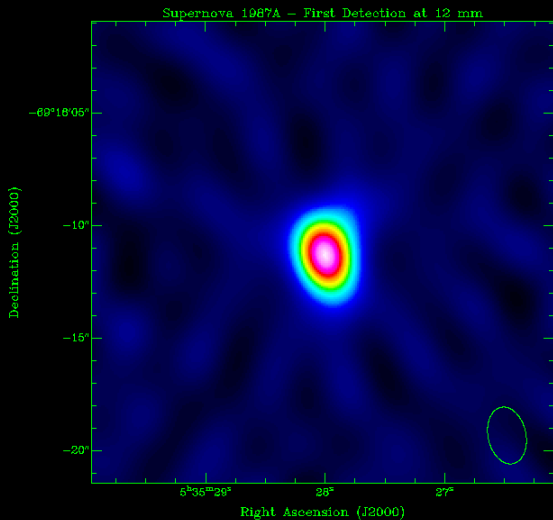
## 12mm visibilities – 0541-7332



Baselines: 475, 643, 1117 m

Rms phase  $\sim 23$  deg

# SNR 1987A at 12 mm – First Detection



Slightly extended:  
2.8 x 1.8 arcsec.

Flux density:

17 GHz: 20 +/- 1 mJy

19 GHz: 18 +/- 1 mJy

6D observation

24 November, 2001

Max baseline 2.1 km

- Weather bad!

# SNR 1987A Spectrum: 1.4 – 19 GHz

