

Observations of Supernova Remnants with the Sardinia Radio Telescope

E. Egron, A. Pellizzoni, S. Loru, N. Iacolina, M. Marongiu, M. Bachetti, R. Concu, A. Melis, A. Trois, M. Pilia (INAF-OAC), S. Righini, R. Ricci (INAF-IRA), S. Mulas, G. Murtas (University of Cagliari, Italy)

In the frame of the Astronomical Validation and Early Science activities for the 64m Sardinia Radio Telescope (SRT, www.srt.inaf.it), we performed 6-22 GHz imaging observations of the complex-morphology SNRs W44 and IC443. We adopted innovative observing and mapping techniques providing unprecedented accuracy for single-dish imaging of SNRs at these frequencies, revealing morphological details typically available only at lower frequencies through interferometry observations. High-frequency studies of SNRs in the radio range are useful to better characterize the spatial-resolved spectra (and then physical parameters) of different regions of the SNRs interacting with the ISM. Furthermore, synchrotron-emitting electrons in the high-frequency radio band are also responsible for the observed high-energy phenomenology as -e.g.- Inverse Compton and bremsstrahlung emission components observed in gamma-rays, to be disentangled from hadrons emission contribution (providing constraints on the origin of cosmic rays).

Mapping techniques:



On The Fly maps along RA and Dec directions.

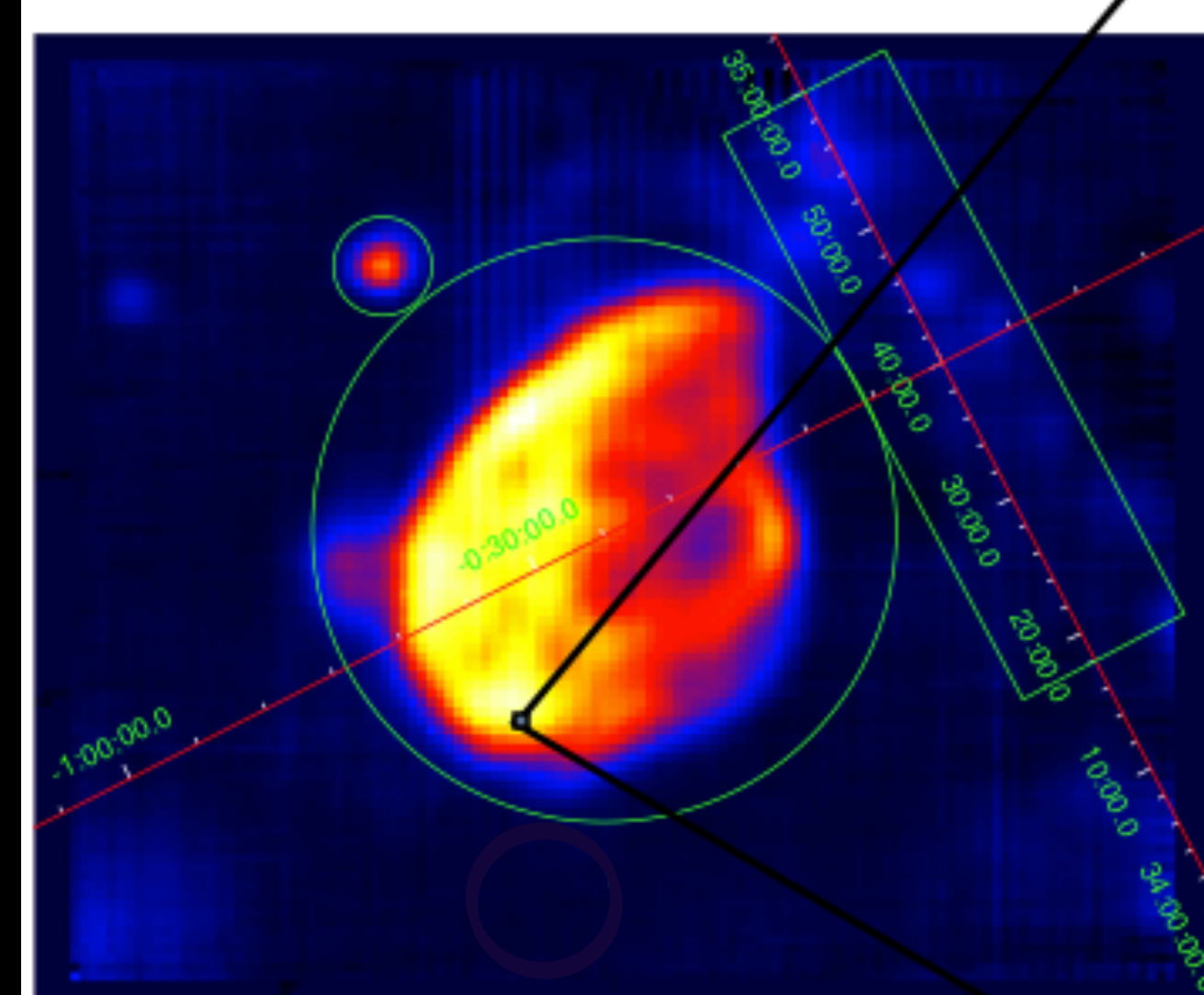
4-5 passages per beam => **oversampling**.

Data reduction and analysis with the **Single Dish Imager software** (Pellizzoni et al., in prep), which includes the baseline subtraction, RFI rejection, and calibration.

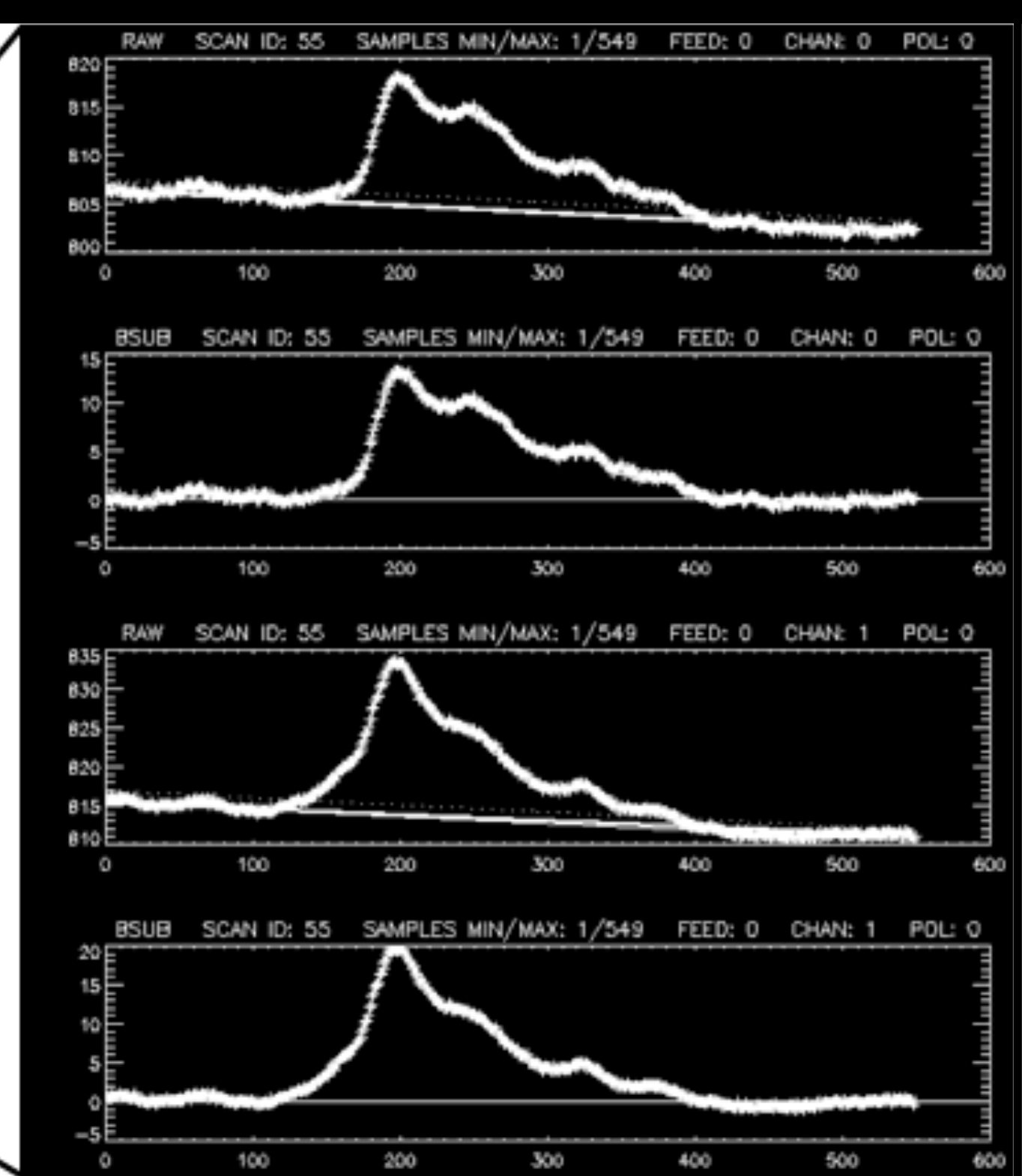
Aims:

- High-resolution maps
- Accurate evaluation of flux errors
- Efficient rejection of RFI

SRT map of W44 at 7.2 GHz
(1.2°x1°)



Egron et al. in prep



High-resolution map of IC433:

Comparison of the map of IC433 performed with SRT at 7.24 GHz (Fig. A), with the combined map obtained with the VLA and Arecibo at 1.4 GHz (Fig. B):

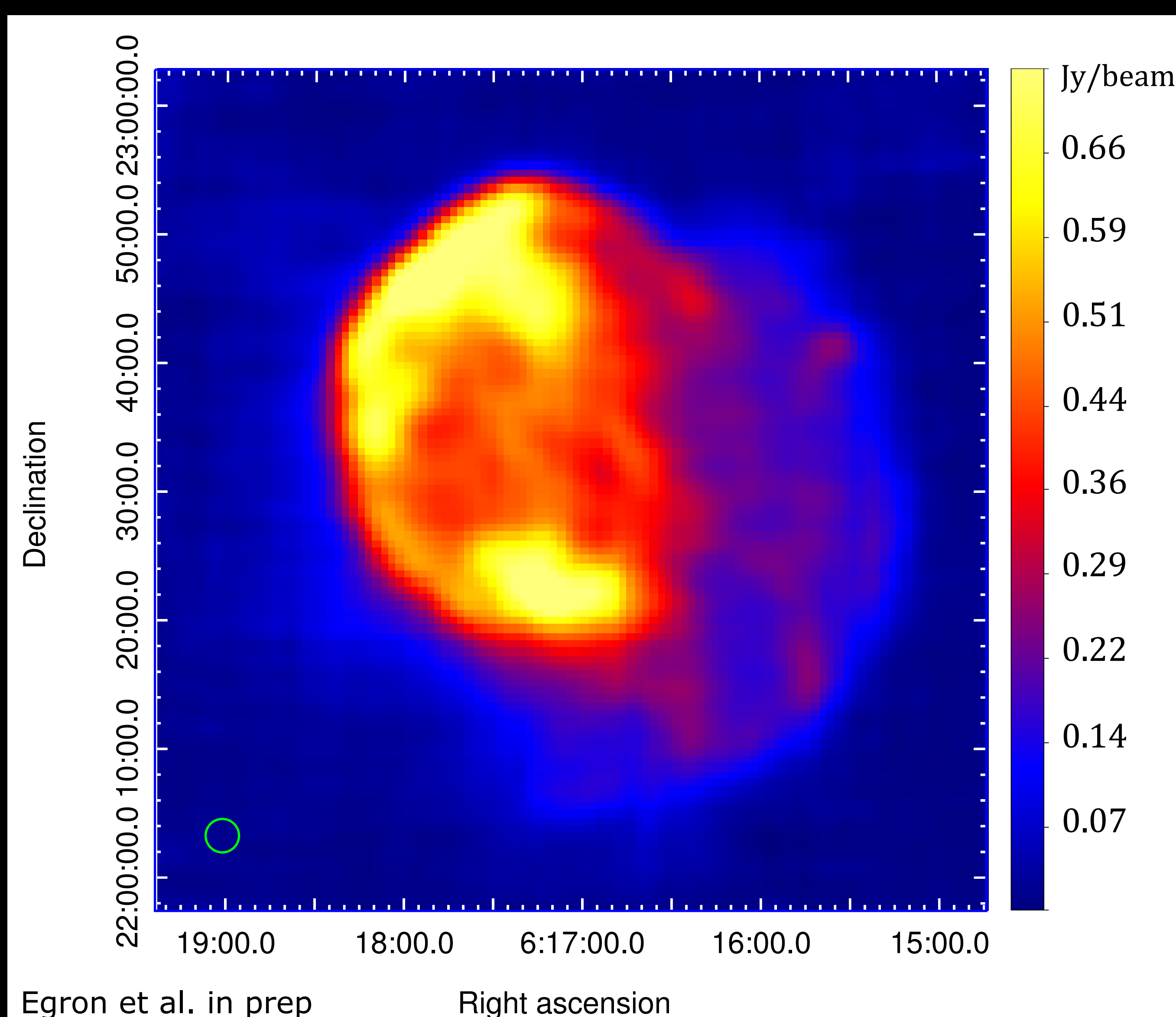


Fig. A: Single-dish 7.24 GHz calibrated image obtained with the SRT (2.6' resolution; image rms 10 mJy/beam for a total observing time of 12.8 hours).

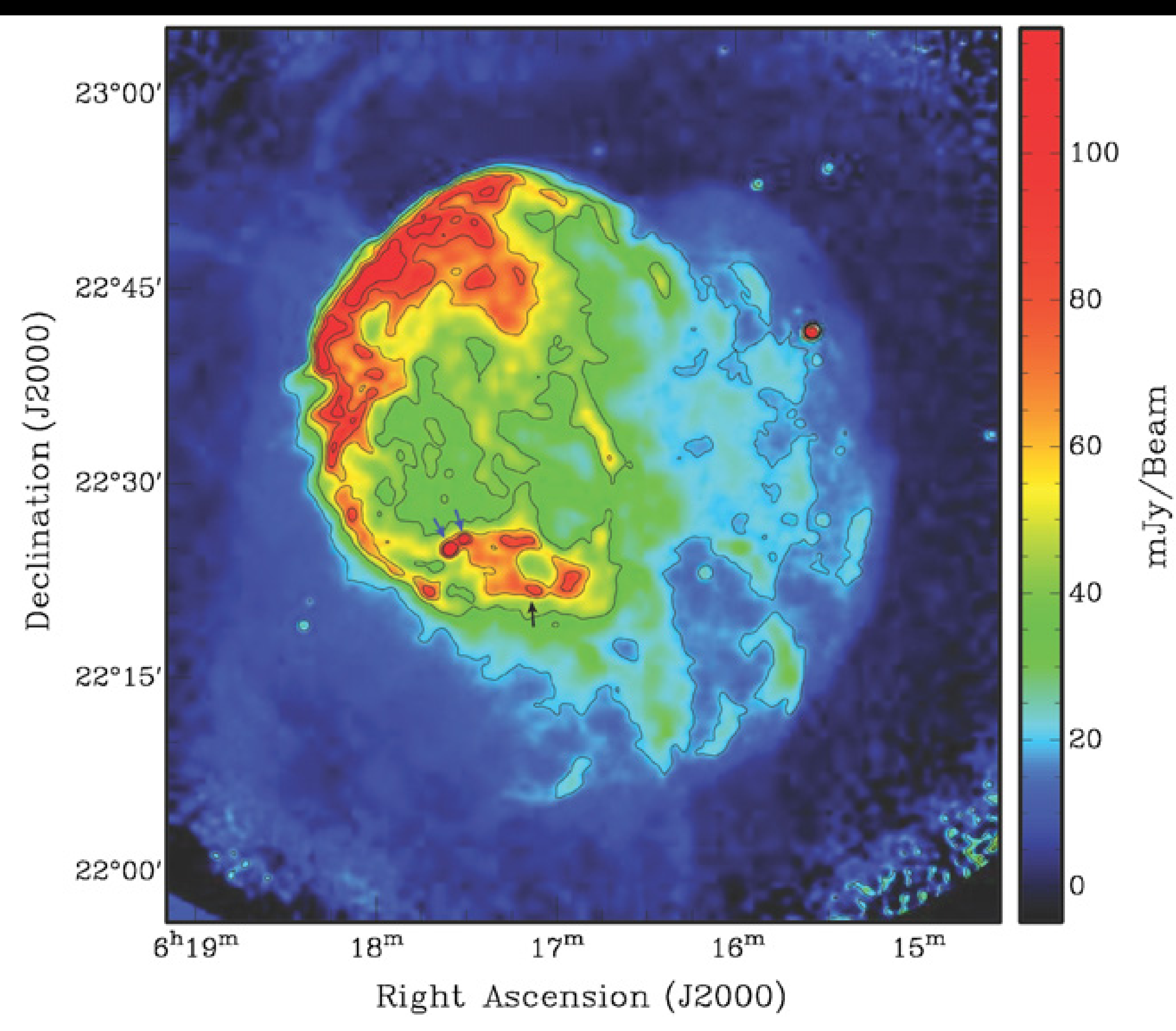


Fig. B: 1.4 GHz continuum 7-pointings mosaic obtained with the VLA (40'' resolution) in combination with Arecibo (3.9' resolution) data to provide sensitivity to extended low surface brightness emission (total observing time 6.3 hours).