
Investigating the high-frequency spectral features of SNRs W44 and IC443 with the Sardinia Radio Telescope.

Sara Loru^{*1}

¹INAF - Osservatorio Astronomico di Cagliari – Via della Scienza 5, 09047 Selargius, Italy, Italy

Abstract

The radio continuum spectra of Supernova Remnants is characterised by a simple synchrotron emission. However, spectral slope changes connected to the age and the evolution of the source in the interstellar medium, could characterise the high frequency radio spectra of evolved SNRs .

In order to disentangle possible electron acceleration mechanisms, we carried out multi-feed imaging observations of W44 and IC443 at 21.4 GHz with the Sardinia Radio Telescope, providing a morphological and spectral description of these complex SNRs at radio frequencies that are so far unexplored.

Although comparable in age, our observations show different cut-off energies in the synchrotron spectra of W44 and IC443.

For the first time, we observed a synchrotron spectral break in SNR W44 at a frequency of 14 GHz. This result provides a direct estimate of the maximum energy of accelerated cosmic-ray electrons of about 10 GeV, which is consistent with indirect evidence from AGILE and Fermi-LAT gamma-ray observations.

With regard to IC443, our results confirm the presence of a bump in the integrated spectrum around 20–70 GHz that could result from a spinning dust emission mechanism. Our high-resolution images allows us to study the spectral index associated with different peculiar regions of the SNRs.

^{*}Speaker