

Infrared and X-ray study of the Galactic SNR G15.9+0.2

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Abstract

© 2018 The Author(s) Published by Oxford University Press on behalf of the Royal Astronomical Society. G15.9+0.2 is a Galactic shell-type supernova remnant (SNR), which was detected in radio and has been confirmed in X-rays based on Chandra observations. An X-ray point source CXOUJ181852.0-150213 has been detected and suggested to be an associated neutron star. In a recent study, we have confirmed the source to be a central compact object (CCO). We have studied the SNR using high-resolution X-ray data taken with Chandra in combination with infrared (IR) data in order to understand its emission and to derive its physical parameters. This will also help to constrain, e.g. the age of the CCO and the environment in which it was born. The spectral analysis of the X-ray emission using the new Chandra data and the comparison to the IR data have shown that the SNR is relatively young with an age of a few thousand years and that its emission is dominated by that of shocked interstellar medium (ISM). However, the analysis of the spectrum of the bright eastern shell shows that there is an additional emission component with enhanced abundances of a elements and Fe, suggesting ejecta emission. The multiwavelength emission is consistent with SNR G15.9+0.2 expanding in an ISM with a density gradient, while there is also colder material located in front of the SNR, which absorbs its thermal X-ray emission in the softer bands.

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Keywords

Infrared: ISM, ISM: supernova remnants, Shock waves, X-rays: individuals: SNR g15.9+0.2, X-rays: ISM

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