

Contribution ID: 81

Type: Either

Investigating the nature of magnetic turbulence in Tycho's SNR using X-ray observation

Supernova remnants (SNRs) are considered the primary sources of Galactic cosmic ray acceleration. Particles are energized at the shock front of SNR through the diffusive shock acceleration mechanism, gaining energy by repeatedly crossing the shock. Magnetic turbulence plays a crucial role in scattering these particles back and forth; therefore, investigating this turbulence is essential for understanding the acceleration mechanism. The two-point correlation function can be used to study the magnetic energy spectrum using observational data. In this study we have employed poissonian based generalized morphological component analysis method to separate non-thermal emission in the Tycho's SNR and have employed two-point correlation method on the X-ray flux image and X-ray rim thickness around the forward shock which is directly dependent on the magnetic field strength to study the magnetic energy spectrum.

Section

High Energy

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Session Classification: Poster-HE