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The γ-ray emission produced by protons that escape from supernova remnant G349.7+0.2

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G349.7+0.2 is an interacting supernova remnant (SNR) expanding in a dense medium. Recently, a very strong γ-ray source coincident with this SNR has been revealed by Fermi-LAT and H.E.S.S. observation which shows a broken power-law-like spectrum. An escaping-diffusion model, including the power-law and δ-function injection, is applied to this source which can naturally explain the spectral feature in both the GeV and TeV regime. We use the Markov Chain Monte Carlo method to constrain the model parameters and find that the correction factor of slow diffusion around this SNR, $\chi \sim 0.01$ for power-law injection and $\chi \sim 0.1$ for δ-function injection, can fit the data best with reasonable molecular cloud mass. This slow diffusion is also consistent with previous results from both phenomenological models and theoretical predication.

Biography

Xiao Zhang mainly studies the gamma-ray emission from supernova remnants (SNRs) and obtained his Doctor degree in 2016 at Nanjing University. He is interested in energetic phenomena in supernova remnants and relevant physical processes. It is usually believed that galactic SNRs are the main accelerators of cosmic rays. At present, he focuses on interacting SNRs that interact with molecular clouds and identifies the hadronic gamma-rays to find evidence of proton accelerations.

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