
Interstellar medium studies in direction to gamma-ray sources

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Abstract

Three different pieces of information are essential to explain the origin of galactic Cosmic Rays (CRs): the particle accelerators, the way how the accelerated particles can escape from them, and the propagation of such particles through the Galaxy. For the first aspect, the primary contribution from supernova remnants (SNRs), pulsar winds and young stellar objects, seems to be the answer. To explain the particle escape stage there still subsist important theoretical and observational difficulties, while it is expected that CRs escaping the Galaxy exert a force on the interstellar medium (ISM) directed away from the Galactic disk whose effect should be observed at large scale. The three parts of the problem leave different imprints on the ISM at very dissimilar spatial scales. In this presentation I will discuss ISM studies in the environment of gamma-ray sources positionally close to SNRs, PWNe and of massive stars, analyzing the observational trace that the individual and collective phenomena intervening in the generation and propagation of Galactic CRs may leave. In addition these studies are useful to disentangle the nature of the gamma-ray emitters, set constraints to distances, and can uncover chemical changes induced by CRs.

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