

The role of the diffuse gamma-ray emission in the study of the Galactic Centre region

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Our Galaxy is known to be a strong source of gamma-ray emission. Besides the active objects liable for the persistent and variable high and very-high energy photons, the interplay between the interstellar matter and cosmic rays is of crucial relevance, as it assumes the role of a passive source of gamma rays. Indeed, the collisions of extremely energetic charged particles with the gaseous environment of the Milky Way result in a diffuse emission permeating the Galaxy itself, especially along the Galactic Plane. This specific kind of emission has a critical role in the analysis of gamma-ray data since it represents the background emission above which we can solve and detect sources. A complete and deepen understanding of the spectral and morphological nature of the large-scale background diffuse emission is fundamental for providing increasingly realistic models to collaborations in order to perform consistent and coherent analysis.

In this contribution some phenomenological models computed to reproduce such diffuse gamma-ray emission are scrutinized against currently available measurements. The choice of a specific parametrization of cosmic-ray transport equations affects the spectrum of the related diffuse gamma-ray emission, as it leads to a variety of potential estimations which play a key role in this context, along with a realistic description of the gas distribution in our Galaxy. In view of the Cherenkov Telescopes Array era, the analysis and comparisons reported in this contribution are of pivotal relevance for the study of the galactic gamma-ray emitters, particularly in complex scenarios like the Galactic Centre.

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