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Gamma-ray observations of nearby HII regions

Monday, 4 July 2022 18:00 (15 minutes)

I present the analysis of the Fermi-LAT data in the region of the Vela Molecular Cloud Ridge (VMR). The latter is a dense region of gas located at approximately 1 kpc from us and it is the closest region that hosts intermediate-mass- and massive-star formation. Associations of massive stars have been proven to be powerful particle accelerators and are consequently expected to be bright gamma-ray sources. However, the gamma-ray emission associated with these sources is often of controversial origin, due to the superposition of multiple sources. Massive stars can be traced by observations of their surrounding HII regions. The latter are regions of gas which is ionized due to the strong radiation fields of the stars themselves. HII regions are identified by infrared observations and several of them have been recognized within the VMR. For the first time, we detected high-energy emission spatially coinciding with a few of these HII regions, which leaves no doubt about the identification of gamma-ray emission with massive stars. I will present the result of the morphological and spectral analysis of these sources and I will discuss the origin of their emission and their possible contribution to the large-scale diffuse emission.

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