Don't stop MeV now: the missing piece in the Galactic Cosmic Ray puzzle

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Abstract

The recent discovery of a growing population of Galactic PeVatron candidates by the LHAASO experiment has opened a new era in the study of the origin of Galactic cosmic-rays. However, despite the detection of gamma-rays extending well beyond 100 TeV, the nature of these accelerators remains largely unconstrained. Ultra-high-energy gamma-rays alone cannot uniquely establish a hadronic origin, while the limited angular resolution of current TeV-PeV instruments often prevents a definitive identification of the emitting source. In this context, the MeV domain represents the missing observational piece. It hosts the characteristic $\pi 0$ − *decay feature, the pion bump, which remains the most robust signature of hadronic particle acceleration. Altho*

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