

The ASTRI Mini-Array: in the search for hidden Pevatrons

Despite the enormous efforts done in very recent years, both theoretically and experimentally, the basic three questions about the CR origin remain without clear answers: what are their sources, how are they accelerated, how do they propagate?

Gamma-ray astronomy plays a fundamental role in this field. Both relativistic protons and electrons can emit in the gamma-ray band with different processes but only the detection of hadronic gamma-ray emission can probe the acceleration of Cosmic-Ray

In particular, since the Klein-Nishina suppression of IC emission at the highest energies, the detection of gamma-ray emission above 100 TeV was thought to be a confirmation of its hadronic origin. However, the last results published by the LHAASO collaboration revealed the existence of several PeV sources likely related to PWNae, well known leptonic factories (e.g. the Crab Nebula for all). Consequently, a gamma-ray detection at PeV energies may no longer be the final proof of hadronic acceleration. However, the limited angular resolution of LHAASO makes associations uncertain and more detailed and deeper studies are needed.

In this context, the ASTRI Mini-Array, with its unprecedented sensitivity and angular resolution at $E > 10$ TeV, not only can extend the gamma-ray spectra of candidate pevatrons but could help to distinguish emission regions from PWNae and other LHAASO sources, shedding light on the nature of the highest energies emission.

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