Takahiro Sudo – HEP Seminar – March 21, 2023
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Title :

Where are Milky Way's Hadronic PeVatrons?

Abstract :

Observations indicate the existence of natural particle accelerators in the Milky Way, capable of producing PeV cosmic rays ("PeVatrons"). Observations also indicate the existence of extreme sources in the Milky Way, capable of producing gamma-ray radiations above 100 TeV. If these gamma-ray sources are hadronic cosmic-ray accelerators, then they also are neutrino sources. However, no neutrino sources have been detected. We discuss how we can consistently understand these multi-messenger observations. We introduce a new population-based approach to probe Milky Way hadronic PeVatrons, demanding consistency between PeV-range data on cosmic rays, gamma rays, and neutrinos. We quantify present constraints and future prospects, discussing how to reveal the nature of Milky Way's PeVatrons.