

Prospects for Observing Galactic Sources of Cosmic Neutrinos

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We evaluate the prospects for detecting the neutrino emission from sources in the Galactic plane assuming that the highest energy photons originate from the decay of pions, which yields a straightforward prediction for the neutrino flux from the decay of the associated production of charged pions. Four promising sources are identified based on having a large flux and a flat spectrum. We subsequently evaluate the probability of their identification in IceCube data as a function of time. We show that observing them over the twenty-year lifetime of the instrumentation is likely, and that some should be observable at the 3σ level with six years of data. In the absence of positive results, we derive constraints on the spectral index and cut-off energy of the sources, assuming a hadronic acceleration mechanism. Moreover, we address the complex nature of neutrino emission from the Galactic disk and explore the prospects for observation of Galactic neutrinos emitters in light of HAWC's recent observations.

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