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Predicting Neutrino Emission for the Sources in the H.E.S.S. Galactic Plane Survey

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The H.E.S.S. Galactic Plane Survey has detected very-high-energy (VHE) gamma-ray emission from 78 sources in the Milky Way. These sources belong to different object classes (pulsar wind nebulae, supernova remnants or binary systems) and some of these sources remain unidentified. The gamma-ray emission of these objects may be of leptonic or hadronic origin and gamma-ray observations alone cannot distinguish between these two scenarios. The detection of neutrino emission would provide evidence for a hadronic scenario in these objects.

Based on the observed gamma-ray spectra we predict the neutrino emission of these sources under the hypothesis that the emission is solely of hadronic origin. This prediction relies entirely on observation and is independent of the source class, the distance or the ambient target material. We use these predictions to create an empirical model for the neutrino emission of the Milky Way. This model can be used to search for neutrino emission from individual gamma-ray sources as well as testing for neutrino emission from potential source populations in the Milky Way.

Keywords

gamma rays; neutrinos; Milky Way

Collaboration

other Collaboration

Subcategory

Theoretical Results

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