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Multimessenger constraints on the origin of IceCube high-energy neutrinos

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In baseline scenarios, energetic astrophysical neutrinos are produced in decays of charged pions, which in turn originate from proton-proton or proton-gamma collisions. Neutral-pion decays produce an accompanying gamma-ray flux, and observational data on gamma rays and cosmic rays impose serious constraints on scenarios explaining the origin of IceCube high-energy events. I review these constraints, present some promising models and discuss prospects of their testing in the yet-unexplored field of (sub)-PeV gamma-ray astronomy.

Summary

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