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Galactic Neutrino Emission with IceCube

Tuesday 8 July 2025 15:00 (12 minutes)

Gamma-ray emission from the plane of the Milky Way is understood as partly originating from the interaction of cosmic rays with the interstellar medium. The same interaction is expected to produce a corresponding flux of neutrinos. In 2023, IceCube reported the first observation of this galactic neutrino flux, rejecting the null-hypothesis at 4.5σ. The analysis relied on spatial models –based on gamma ray observations –to model the expected neutrino emission from the galactic plane. Three signal hypotheses describing different possible spatial and energy distributions were tested, where the single free parameter in each test was the normalization of the neutrino flux.
The methods which enabled this high significance result will be explained and the implication on the physics will be discussed.
Finally, two different upcoming Galactic Plane analyses from IceCube will be presented. Results of these analyses will be presented at the ICRC the following week.

Author: NESTE, Ludwig (TU Dortmund University)

Presenter: NESTE, Ludwig (TU Dortmund University)

Session Classification: Student Talks