

Characterization of the PeV astrophysical neutrino energy spectrum using down-going tracks

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The IceCube Neutrino Observatory has observed a diffuse flux of astrophysical neutrinos with energies from TeV to a few PeV. Recent IceCube analyses are not sensitive to PeV neutrinos because their fluxes are attenuated by the Earth and the Extremely High Energy (EHE) result targets cosmogenic neutrinos only above 10 PeV. In this work, we present a new event selection that fills the gap between 1 PeV and 10 PeV. This sample is obtained by selecting high-energy down-going through-going tracks from 8 years of data. To achieve a high signal-to-background ratio, the atmospheric muon backgrounds are reduced by using the stochasticity information of the events and the IceTop surface array as a veto. To characterize the astrophysical neutrino flux and test the existence of a cut-off in the neutrino energy spectrum at a few PeV, a global fit will be performed by combining this sample with results from the 7-year High Energy Starting Events (HESE) analysis.

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Collaboration

IceCube

other Collaboration

Subcategory

Experimental Results

Primary author: LYU, Yang (Lawrence Berkeley National Laboratory)

Presenter: LYU, Yang (Lawrence Berkeley National Laboratory)

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