



Contribution ID: 496

Type: **Talk**

Measurement of the Three-Flavor Composition of Astrophysical Neutrinos with Contained IceCube Events

Tuesday 22 July 2025 17:20 (15 minutes)

The IceCube Neutrino Observatory at the South Pole detects neutrinos from the entire sky, both of astrophysical and atmospheric origin, via the Cherenkov light emitted when these neutrinos interact in the ice, giving rise to rapidly moving charged particles. Neutrino events with vertices contained within the detector volume are useful for studying the neutrino flavor ratio, as they allow for a better reconstruction of the event morphology. The Medium Energy Starting Events (MESE) data sample selects events with vertices contained inside the detector volume, also known as starting events, with energies of at least 1 TeV. This sample naturally includes electron-, muon-, and tau-neutrino events, processed consistently. We use it to constrain the flavour ratio of astrophysical neutrinos at Earth, which in turn informs us of the flavour composition at the source itself. In this talk, we will present the results of this study, which uses 11.4 years of IceCube data.

Collaboration(s)

IceCube

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Session Classification: NU

Track Classification: Neutrino Astronomy & Physics