Contribution ID: **343** Type: **Poster high energy neutrinos & cosmic rays**

Improving Astrophysical Tau Neutrino Identification with IceCube Waveforms

IceCube has discovered a diffuse astrophysical neutrino flux. The significant numbers of tau neutrinos expected due to neutrino mixing from traversing astronomical distances have yet to be observed. Since high-energy (>100 TeV) tau neutrino production in the Earth's atmosphere is negligible, a tau detection confirms the astrophysical origin of the observed neutrino signal and helps improve the precise measurement of astrophysical neutrino flavor ratios. A tau neutrino undergoing charged current interaction in IceCube could produce double pulses in the sensor waveforms when the created tau reaches decay lengths of more than a few meters. A reoptimization of a double pulse tau neutrino filter requiring adjacent sensors to have double pulse waveforms improves the signal efficiency by 50% while maintaining similar level of backgrounds. The performance of this improved method and the resulting sensitivity to the astrophysical tau neutrino flux with 8 years of IceCube data will be presented.

Authorship annotation

for the IceCube Collaboration

Session and Location

Wednesday Session, Poster Wall #176 (Ballroom)

Poster included in proceedings:

yes

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Presenter: MEIER, Maximilian

Track Classification: Poster (not participating in poster prize competition)