Contribution ID: **259**   Type: **Oral**

Atmospheric Neutrino Oscillations with 8 years of data from IceCube DeepCore

Thursday 9 September 2021 12:58 (18 minutes)

The DeepCore sub-array within the IceCube Neutrino Observatory is a densely instrumented detector embedded in the Antarctic ice designed to observe atmospheric neutrino interactions above 5 GeV via Cherenkov radiation. At these energies, Earth-crossing muon neutrinos have a high chance of oscillating to tau neutrinos. These oscillations have been previously observed in DeepCore through both muon neutrino disappearance and tau neutrino appearance channels. DeepCore is able to measure these oscillations with precision comparable to accelerator-based experiments, but it is also complementary to accelerator measurements because it probes longer distance scales and higher energies, peaking above the tau lepton production threshold. This talk will discuss the IceCube Collaboration's latest analyses of the atmospheric neutrino oscillation parameters using 8 years of data. In addition to several more years of data, these analyses benefit from recent significant efforts in improving background rejection, reconstruction techniques, modeling of systematic uncertainties, particle identification, and much more.

Working group

WG1

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Session Classification: WG 1