

Measuring the Neutrino Cross Section Using 8 years of Upgoing Muon Neutrinos

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The IceCube neutrino observatory detects neutrinos at energies orders of magnitude higher than those accessible to current neutrino accelerators. Above 40 TeV, neutrinos traveling through the Earth will be absorbed as they interact via charge current interactions with nuclei, creating a deficit of Earth-crossing neutrinos detected at IceCube. In this analysis we use the Earth as a target to measure the neutrino cross section for muon neutrinos passing through IceCube. The previous published results of this analysis showed the cross section to be consistent with Standard Model predictions for 1 year of IceCube data. In this analysis we extend the studies to 8 years of data, increasing the statistics by an order of magnitude and improving the treatment of systematic uncertainties. We present the updated cross section measurement studies in three decade-wide bins, and compare to previous IceCube cross section results.

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