

Abstract Submitted  
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**Measuring the Muon Neutrino Cross Section Using Earth Absorption**<sup>1</sup> NATALIE JONES, University of California, Berkeley, ICECUBE COLLABORATION — The IceCube Neutrino Observatory has observed neutrinos with energies up to 10 PeV. High-energy neutrinos may be absorbed by the Earth during deep inelastic scattering (DIS) with nuclei. This creates a deficit in Earth-transiting neutrinos, which can be detected by IceCube. Earth's absorption of neutrinos at high energies can therefore be used to determine the neutrino-nucleon cross section as a multiple of the Standard Model value. A current analysis attempts to measure the muon neutrino cross section using 8 years of data and a maximum likelihood fit for the transmission rate of through-going muon neutrinos. Studies on systematic uncertainties are important. In particular, studies on the atmospheric and astrophysical neutrino fluxes have shown that the cross section depends on assumptions about these fluxes.?[U+2028]The ongoing analysis could have important ramifications. Through investigation of systematic uncertainties, IceCube will produce one of the most accurate neutrino-nucleon cross section measurements to date. An unexpected cross-section could indicate beyond-the-standard-model physics.

<sup>1</sup>Measuring the Muon Neutrino Cross Section Using Earth Absorption

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