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Measurement of the inelasticity distribution of neutrino interactions for 100 GeV < E□ < 1 TeV with IceCube DeepCore

Saturday, 18 February 2023 15:30 (15 minutes)

We present results of an analysis studying neutrino-nucleon interactions in the energy range between ~100 GeV - 1 TeV by measuring the inelasticity of these interactions with IceCube DeepCore. IceCube is a Cherenkov neutrino telescope consisting of an optical sensor array placed in ice 1.5 - 2.5 km below the geographic South Pole and covering a volume of roughly 1 km3. DeepCore is a densely instrumented sub-array inside IceCube, which allows us to detect and reconstruct neutrinos with energies from ~5 GeV to 1 TeV with greater precision. IceCube has previously reported inelasticity distribution measurement at 1 TeV- 100 TeV and this analysis extends this range to lower energies to fill in the gap with accelerator measurements of differential cross section. We use a low-background sample of fully contained muon-neutrino charged current events to fit the shape of flux-averaged inelasticity distribution. In this talk we will present an updated result taking into account contribution from neutrino induced charm production.

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