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P3.035 Resonance production cross-section measurement in neutrino-hydrogen interactions using the T2K Near Detector

D Coplwe

University of Oxford, UK

on behalf of T2K collaboration

Following almost three decades without new measurements of neutrino-hydrogen cross sections, the current status of charged-current resonance production on hydrogen is presented using the T2K near detector, ND280. Performing such measurements is essential for current and future neutrino oscillation experiments as it will aid in reducing uncertainties both from the neutrino energy reconstruction and from the selection efficiencies for the respective signal and background. Muon-neutrino-induced resonance events occurring inside the Fine-Grained detector (FGD), a plastic scintillator target, along with tracks measured in the Time Projection Chamber are selected. This measurement takes advantage of final state kinematics in the plane transverse to the neutrino direction and outgoing lepton's momentum. This enables the subsequent isolation of neutrino-hydrogen interactions from those on other nuclei in the FGD target. Our approach relies on the well-understood neutrino flux of the T2K beam, and exploits the ND280 detector's good momentum reconstruction and tracking.