

Kirsty Duffy – HEP seminar 9/17/2019
FNAL

Latest neutrino cross-section results from MicroBooNE

MicroBooNE, the Micro Booster Neutrino Experiment at Fermilab, is an 85-ton active mass liquid argon time projection chamber (LArTPC) located in the Booster Neutrino Beam at Fermilab. The LArTPC technology with 3mm wire spacing enables high-precision imaging of neutrino interactions, which leads to high-efficiency, low-threshold measurements with full angular coverage. As the largest liquid argon detector worldwide taking neutrino beam data, MicroBooNE provides a unique opportunity to investigate neutrino interactions in neutrino-argon scattering at $O(1 \text{ GeV})$ energies. These measurements are of broad interest to neutrino physicists because of their application to Fermilab's Short Baseline Neutrino program and the Deep Underground Neutrino Experiment (which will both rely on LArTPC technology), as well as the possibility for new insights into A -dependent effects in neutrino scattering on heavier targets such as argon. In this seminar I will present the most recent cross-section results from MicroBooNE, including measurements of inclusive charged-current neutrino scattering, neutral pion production, and low-energy protons. Many of the results I will show represent the first measurements of these interactions on argon nuclei, as well as an exciting demonstration of the potential of LArTPC detector technology to improve our current understanding of neutrino scattering physics.