

Lepton-Hadron Correlations in QE-like Neutrino Scattering at MINERvA

Wednesday 26 October 2022 09:00 (25 minutes)

This talk will cover two different analyses of muon neutrino charged current interactions on a CH target, as recorded by MINERvA in the NuMI Medium Energy beam. The first analysis focuses on the 0-pion data set which has the advantage that the recoil energy in this set is dominated by the sum of the kinetic energies of the protons that are ejected from the target nucleus. Because of the unprecedented size of this data set the correlations between the lepton and hadronic system can be used to identify and characterize different nuclear effects in exquisite detail. In addition, these events can be used to compare the neutrino energy estimator used by calorimetric (i.e. NOvA and eventually DUNE) detectors and by Cerenkov (i.e. T2K and Hyper-K, and MiniBooNE) detectors. The second analysis focuses on a slightly more expanded data set, where all charged current events at low recoil are examined as a function of momentum and energy transfer. This kinematic space, historically used by electron scattering experiments, can elucidate multi-nucleon effects and the role they can play on both quasielastic scattering and pion production.

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