



Contribution ID: 55

Type: **Contributed Parallel Talk**

Probing Nuclear Effects in QE-like Neutrino Scattering at MINERvA

Tuesday, 24 October 2023 09:20 (20 minutes)

The MINERvA experiment at Fermilab presents results from quasielastic-like (QE-like) ν_μ interactions on a variety of nuclear targets in the medium energy ($\langle E_\nu \rangle \sim 6$ -GeV) NuMI neutrino beam. In the analysis described here, events are used where protons are cleanly reconstructed. Cross section and cross section ratio results from events produced on C, CH, H₂O, Fe, and Pb targets are presented as a function of muon, proton, and transverse kinematic imbalance variables. These variables are sensitive to nuclear effects. All of the presented observations are compared to predictions from a series of widely used neutrino event generators with different options and tunes. Qualitatively, the spread of simulated results tends to cover the data. However, none of the simulations consistently describe the data. While some of the trends and comparisons will be discussed, an important aim of this talk is to demonstrate for the neutrino community the breadth of these results and their potential utility for constraining models.

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Session Classification: Neutrino Properties

Track Classification: Neutrino Properties