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MicroBooNE's cross-section program for future long-baseline oscillations

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Making high-precision measurements of neutrino oscillation parameters requires an unprecedented understanding of neutrino-nucleus scattering. This is especially urgent for upcoming experiments like DUNE and Hyper-K. To help fulfill this need, MicroBooNE has produced an extensive set of neutrino cross-section results that probe both the leptonic and hadronic components of the interaction. This talk will present our recent results in channels that are critical for a variety of oscillation measurements on argon, including DUNE. They include our first measurements of ν_eCC interactions on argon with a single charged pion in the final state, which are dominant interaction modes in the energy range for DUNE. These, combined with additional MicroBooNE ν_eCC measurements can also help shed more light on the ν_e/ν_μ cross-section ratio which is an important systematic uncertainty for ν_e appearance searches. In addition, we present new results in the quasielastic-like 1mu1p channel which can more directly inform sub-GeV atmospheric neutrino oscillation measurements at DUNE. These results are able to probe the extent to which the interaction model influences the reconstruction of the neutrino direction, given our fixed beam orientation, thus highlighting its sensitivity to various nuclear effects and modeling of final state interactions.

Neutrino Properties

Neutrino Cross-Section Studies

Neutrino Telescopes & Multi-messenger

N/A

Neutrino Theory & Cosmology

N/A

Data Science and Detector R&D

N/A

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