

# First Measurements of Differential Cross Sections In Kinematic Imbalance Variables With The MicroBooNE Detector

Making high-precision measurements of neutrino oscillation parameters requires an unprecedented understanding of neutrino-nucleus scattering. In this presentation, we present the first muon neutrino charged current double-differential cross sections in kinematic imbalance variables. These variables characterize the imbalance in the plane transverse to an incoming neutrino. We use events with a single muon above 100 MeV/c, a single final state proton above 300 MeV/c, and no recorded final state pions. Thus, these variables act as a direct probe of nuclear effects such as final state interactions, Fermi motion, and multi-nucleon processes. We also present a complementary ongoing analysis using electron neutrinos. This channel is of the utmost importance for the extraction of neutrino oscillation parameters by making high-precision measurements. Our measurements allow us to constrain systematic uncertainties associated with neutrino oscillation results performed by near-future experiments of the Short Baseline Neutrino (SBN) program, as well as by future large-scale experiments like DUNE.

**Primary authors:** MOUDGALYA, Maitreyee (The University of Manchester); ON BEHALF OF THE MICRO-BOONE COLLABORATION

**Presenter:** MOUDGALYA, Maitreyee (The University of Manchester)

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