

Single and double differential charged current $\bar{\nu}_\mu$ -Argon cross section without pions in the final state at MicroBooNE

MicroBooNE, an 85-tonne liquid argon time projection chamber (LArTPC) detector is on-axis to the Booster Neutrino Beam (BNB) beamline facility at Fermi National Accelerator Laboratory. MicroBooNE is elucidating neutrino interactions with argon through cross-section measurements to refine interaction models and reduce uncertainties. In this poster, we present the status of the single and double multi-differential charged current (CC) cross section with zero pions in the final state (CC- 0π) as a function of muon momentum ($0.1 < p_\mu < 2.0$ GeV/c) and the cosine of the muon angle ($-1 < \cos \theta_\mu < 1$). We present the details of the event selection and cross section extraction along with a set of tests using fake data to establish the robustness of the analysis methodology. We also discuss prospects for a future combined measurement with the Gd-H₂O target at the ANNIE experiment, to explore MicroBooNE's proton multiplicity alongside ANNIE's neutron multiplicity.

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