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Estimating the Secondary Interaction Systematic From Neutrino-Induced Pion Production in T2K MATTHEW HOGAN, Colorado State Univ, T2K COLLABORATION — Tokai-to-Kamioka (T2K) is a long-baseline neutrino experiment with a narrow band neutrino energy spectrum that is peaked at 600 MeV. The Pi-Zero detector (POD) is a plastic scintillator-based detector located in the off-axis near detector complex 280 meters from the beam origin. It is designed to constrain neutral-current induced π^0 production background at the far detector using the water target that is interleaved between scintillator layers. A POD-based cross-section measurement of muon neutrino charged-current (CC) single charged pion ($1\pi^+$) interaction channel is being developed to measure the kinematic phase space of the outgoing muon. The selection and reconstruction of neutrino-induced $1\pi^+$ in the POD is affected by hadronic, secondary interactions (SI) of pions. This work describes techniques for estimating the systematic uncertainty from SI and the impact on the CC$1\pi^+$ cross-section measurement.

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