



Poster session 3 – Wednesday 6 July

P3.097 Probing Nuclear Effects at the T2K Near Detector Using Transverse Kinematic Variables

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T2K is a long-baseline neutrino oscillation experiment comprised of the J-PARC neutrino beamline, the ND280 near detector complex and a far detector (Super-Kamiokande) located 295 km away from J-PARC. In order to make precision measurements of neutrino oscillations, a detailed understanding of nuclear effects in neutrino scattering is essential. Nuclear effects are comprised of final state interactions (FSI) and initial state effects, including multi-nucleon interactions (such as 2p2h) and Fermi motion. Recent studies have revealed that variables characterising kinematic imbalance in the plane transverse to an incoming neutrino beam can act as a unique probe of these nuclear effects. This work uses the T2K off-axis near detector (ND280) to measure the transverse distributions as an exclusive charged current differential cross-section with no final state pions and at least one final state proton. The sensitivity of the measurement to nuclear effects (such as FSI strength and 2p2h normalisation) is critically analysed. These measurements will allow us to better understand the impact of nuclear effects on the observables in neutrino scattering, providing valuable constraints on the systematic uncertainties associated with neutrino oscillation measurements for both T2K and other accelerator-based neutrino experiments.