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Neutrino cross-section results from T2K

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The T2K experiment's primary off-axis near detector, ND280, has the essential role of constraining the main systematic uncertainties that affect neutrino oscillation measurements. Among the leading sources of these uncertainties are neutrino-nucleon interaction cross sections, which must be more precisely understood to fully exploit the potential of current and future long-baseline neutrino experiments. ND280 is a multi-layered magnetised tracking detector with an variety of different target nuclei; it is capable of making precise measurements of cross-section topologies which form the main signal and background channels in T2K's oscillation analysis and is particularly well suited for studying rare interaction channels relevant to the $\nu_\mu \rightarrow \nu_e$ appearance signal. The cross-section measurements obtained at ND280 directly inform the theoretical models of neutrino interactions, helping to refine our understanding of this field and enabling more accurate determinations of oscillation parameters. This talk will present several novel cross-section results from T2K, including new measurements in muon neutrino charged current interactions with and without pions and world-first measurements of neutral-current single pion production and electron neutrino charged-current pion production on carbon.

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