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Measurement of the ν_e component and plans to measure the anti- ν_e component in the T2K beam with the ND280 Tracker

The main irreducible background in the T2K electron-neutrino appearance analysis is the ν_e contamination in the ν_{μ} beam. In order to quantify this background, a selection of ν_e charged-current (CC) interactions in the near detector (ND280) Tracker region was developed by combining the particle identification abilities of the time projection chambers and electromagnetic calorimeters. We measured a data/Monte Carlo ratio of 1.01 ± 0.10 for the electron-neutrino component of the beam providing an important confirmation of our predictions of the expected backgrounds to the oscillation analyses. In 2014 the T2K experiment will reverse the polarity of the magnetic horns and begin running with an anti-neutrino beam for the first time. Differences in the oscillation probabilities between neutrinos and anti-neutrinos may provide insight into charge-parity violation in the leptonic sector. The current ND280 Tracker ν_e CC selection has been used as a starting point for the anti- ν_e CC selection. The additional challenges and selection criteria of the anti- ν_e selection will be presented.

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