

”Measurement of the intrinsic electron neutrino and electron anti-neutrino components in the T2K beam with the ND280 Tracker”

The main irreducible background in the T2K electron-neutrino appearance analysis is the electron-neutrino contamination in the muon-neutrino beam. In order to quantify this background, a selection for charged-current electron-neutrino 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/MC ratio of 1.01 ± 0.10 for the electron-neutrino component of the beam which is an important confirmation of our predictions of the expected backgrounds. In 2014 the T2K experiment reversed the polarity of the magnetic horns and began 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 electron-neutrino charged-current selection has been used as a starting point for the electron anti-neutrino charged-current selection. The additional challenges and selection criteria of the electron anti-neutrino selection will be presented.

WG3: Accelerator Physics (Yes/No)

No

WG2: Neutrino Scattering Physics (Yes/No)

Yes

WG4: Muon Physics (Yes/No)

No

WG1: Neutrino Oscillation Physics (Yes/No)

Yes

Type of presentation

Poster

Author: SOUTHWELL, Luke (Lancaster University)