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Detecting electron neutrinos in the T2K near detector

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T2K was the first experiment to show evidence for muon neutrinos oscillating into electron neutrinos. This showed that θ_{13} – one of the mixing angles in the PMNS matrix which describes neutrino oscillations – is non-zero, and 1km-baseline reactor experiments have since precisely measured this parameter. Precision measurements of other neutrino oscillation parameters will arise from combining T2K's results with those of reactor experiments, but full exploitation of these combinations requires further improvement in T2K's $\nu_{\mu} \rightarrow \nu_e$ appearance analysis. The largest background in this measurement comes from intrinsic electron neutrinos in the beam, which can be constrained by measuring the unoscillated spectrum at ND280, the T2K near detector. This talk will detail the improvements I have made to the selection of electron neutrino events, and explain how the measurement will be used to constrain the T2K flux prediction and predicted number of events at Super-Kamiokande, the T2K far detector.

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