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Measurement of CCQE cross section with T2K on-axis neutrino detector Proton Module

The T2K (Tokai-to-Kamioka) is a long baseline neutrino oscillation experiment aiming to measure the oscillation parameters associated with muon neutrino disappearance precisely and to search for electron neutrino appearance. A high intensity neutrino beam from J-PARC (Japan Proton Accelerator Research Complex) is measured with the 280m near detector complex (ND280) and the 295km far detector (Super-Kamiokande). For the oscillation analysis of T2K, there is a large systematic error which is attributed to uncertainty of neutrino cross section. So we have constructed a new neutrino detector, "Proton Module" to measure the neutrino cross section precisely and suppress the systematic error. The Proton Module consists of 1204 plastic scintillator bars with Fiber-MPPC (Multi-Pixel Photon Counter) readout. Since it is a fully-active detector, it can reconstruct tracks of various kinds of particles from interaction point. With the tracks information, neutrino interaction mode can be identified. We will report the first result of the measurement of CCQE cross section with the Proton Module.

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