

T2K recent results and future prospects

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T2K (Tokai to Kamioka) is a Japan based long-baseline neutrino oscillation experiment designed to measure (anti-)neutrino flavor oscillations. A neutrino beam peaked around 0.6 GeV is produced in Tokai and directed toward the water Cherenkov detector Super-Kamiokande, which is located 295 km away. A complex of near detectors is located at 280 m and is used to constrain the flux and cross-section uncertainties. In 2014, T2K has started a campaign to measure the phase δ_{CP} , an unknown element of the Pontecorvo-Maki-Nakagata-Sakata matrix, that can provide a test of the violation or conservation of the CP symmetry in the lepton sector. To achieve this goal, T2K is taking data with a neutrino and antineutrino enhanced beam investigating asymmetries in the electron neutrino and antineutrino appearance probabilities. The most recent results showed that the CP-conserving cases are excluded at 90% confidence level. One of the largest systematic uncertainties affecting neutrino oscillation measurements comes from limited knowledge of (anti-)neutrino-nucleus interactions. The T2K experiment has a wide range of programs measuring neutrino interaction cross-section using detectors in its near detector complex. In this talk an overview of the latest T2K neutrino oscillation and cross-section measurements are presented. An intense program of upgrades is ongoing and promises to improve the sensitivities of the experiment. It will be discussed in some detail along with the future prospects of the experiment.

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