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Recent T2K neutrino-nucleus cross section results

The measurement of CP-violation in the leptonic sector offers an opportunity to probe the physics beyond the Standard Model. Currently this measurement can be achieved by the accelerator long-baseline neutrino experiments like T2K, where the differences between neutrino and antineutrino oscillations are investigated. The oscillation probabilities are measured by comparing the neutrino spectra at the near and far detectors, where the neutrino energies are reconstructed based on the neutrino-nucleus interactions observed in the detectors. However, the neutrino energy reconstruction is usually biased and smeared due to the nuclear effects which occur during the neutrino-nucleus interactions. These effects contribute to the largest systematic uncertainty in the CP-violation measurement.

In this talk, the latest cross section measurements at the T2K near detector ND280 will be presented. Focus will be put on the CCQE-like interactions where no pion and at least one proton observed in the final state in the detector. The main goal is to probe the nuclear effects. This measurement was performed jointly on the carbon and oxygen targets combining with the double differential transverse kinematic imbalances for the first time. Besides, new measurements of neutrino-nucleus interactions with pion or kaon in the final state will also be shown.

Secondary track

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