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Using proton information to constrain T2K fit

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T2K (Tokai to Kamioka) is a long-baseline neutrino oscillation experiment located in Japan. One of the most challenging tasks of T2K is to identify whether CP is violated in the lepton sector, which T2K's recent results favour. By utilizing the near detector (ND280) data, T2K can constrain neutrino interaction and flux uncertainties by fitting a parametrised model to data. This allows a significant reduction of the systematic uncertainties in neutrino oscillation analyses. The fit to ND280 data currently uses several samples which are based on muon kinematics and pion multiplicity. There is ongoing work to expand these samples by incorporating the reconstructed proton multiplicity in order to enhance ND280 sensitivity to the nuclear physics processes which drive current systematic uncertainties. This talk outlines the properties of new ND280 samples and details how they will help reduce uncertainties.

Collaboration name

T2K

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