Contribution ID: **1982** Type: **Oral**

Selection of Neutrino Charge-Current Single Pion Interactions in the Upgraded Near Detector ND280 of the T2K Experiment

Tuesday 28 October 2025 12:00 (15 minutes)

T2K is a long-baseline accelerator neutrino experiment in Japan. It is aimed at high-precision measurements of the neutrino oscillation parameters and as well probes CP violation in the lepton sector with a high-purity muon (anti)neutrino beam. The leading systematic uncertainties arise from the description of the neutrino-nucleus interactions and are largely constrained by the measurements with the near detector ND280. In 2024 the upgrade of the detector was finished and will significantly enhance its tracking capabilities. The core of the upgrade is a novel 3D Super Fine-Grained Detector (SuperFGD) surrounded by two Time-Projection Chambers and Time-of-Flight panels. This talk will focus on a selection strategy for ν_μCC1π^+ interactions in SuperFGD, which will improve the acceptance of the kinematic phase space. The work represents an overall analysis of developments aimed at further reducing systematic uncertainties and, therefore, improving the overall precision of neutrino oscillation studies at T2K.

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Session Classification: Elementary Particle Physics and High-Energy Heavy Ion Physics

Track Classification: Elementary Particle Physics and High-Energy Heavy Ion Physics