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A new near neutrino detector SuperFGD for the T2K experiment

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The main goal of the long-baseline experiment T2K is a search for CP violation in neutrino oscillations. To obtain a better sensitivity, T2K upgraded the near neutrino detector. A novel 3D highly granular scintillator detector called SuperFGD of a mass of about 2 tons was built, installed into ND280 magnet and commissioned with the neutrino beam. It will serve as a fully-active neutrino target, a 4\pi detector of charged particles and neutrons from neutrino interactions. SuperFGD consists of about two million small optically-isolated plastic scintillator cubes with a 1 cm side. Each cube is read out in the three orthogonal directions with wavelength shifting fibers coupled to compact photosensors, micro pixel photon counters (MPPCs). The fully equipped SuperFGD successfully took physics data with muon neutrinos in June 2024. In this talk, the main SuperFGD parameters, detection and reconstruction of neutrino events, and its performance in the neutrino beam will be presented.

Working Group

WG 6: Detectors

Primary authors: MATSUBARA, Tsunayuki (KEK); Prof. KUDENKO, Yury (Institute for Nuclear Research, Moscow); DOYLE, Tristan (Stony Brook University)

Presenter: DOYLE, Tristan (Stony Brook University)

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