

Abstract Submitted
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Neutron Beam Test of a Novel 3D Projection Scintillator Detector at Los Alamos National Lab¹ ABRAHAM TEKLU, Stony Brook University, T2K COLLABORATION — Long baseline neutrino experiments, T2K and DUNE, have introduced a novel three-dimensional projection scintillator tracker as part of the near detector system. SuperFGD (for T2K) and 3DST (for DUNE) have eminent ability to detect neutron kinetic energy, on an event by event basis, which is an important missing piece in the GeV level neutrino experiments. Such a scintillator detector consists of 1 cm x 1 cm x 1 cm cube skewered with three XYZ fibers in each cube. Benefited by the fast timing and low readout threshold, neutron kinematic energies in the neutrino interactions can be measured with the time-of-flight technique. In order to fully demonstrate the neutron detection with such a scintillator detector, two prototypes have been exposed to the neutron beam test facility in the Los Alamos National Lab (LANL). The neutron energy spectrum we can resolve is up to 800 MeV. This is the first-ever test of efficiency of a plastic scintillator detector with pseudo-3D readout in a neutron beam. In this talk, the neutron beam test setup for these prototypes will be described and also the neutron detection performance of the scintillator detector will be shown.

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