

## Neutron beam test with 3D-projection scintillator tracker prototypes for long-baseline neutrino oscillation experiments at Los Alamos National Laboratory

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Long-baseline neutrino oscillation experiments such as T2K (Tokai-to-Kamioka) and DUNE (Deep Underground Neutrino Experiment) rely on models of neutrino interaction on nuclei. A major systematic uncertainty in the model of neutrino interaction comes from the blindness of the detector to the neutrino-induced neutrons in the final state. The 3D-projection scintillator tracker, which consists of a large number of 1 cm x 1 cm x 1 cm plastic scintillator cubes with three orthogonal wavelength shifting fibers crossing through each cube is proposed as part of the near detectors of T2K upgrade and the DUNE. Nanosecond timing resolution and fine granularity will allow to the 3D-projection scintillator tracker the measurement of neutron kinetic energy in the neutrino interaction on an event-by-event basis. Two prototypes have been assembled and exposed to neutron beam test in Los Alamos National Laboratory in December 2019 and 2020 to fully demonstrate the neutron detection capability and optimize the tracker design. In this presentation, the prototype detector assembly, beamline setup and the detector calibration using LED pulses and cosmic muons will be detailed.

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