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Neutron beam test with 3D-projection scintillator tracker prototypes for long-baseline neutrino oscillation experiments

The long-baseline neutrino oscillation experiments rely on models of neutrino interactions on nuclei. These models constitute an important source of systematic uncertainty, driven in part because detectors to date have been blind to the neutrons produced in neutrino interactions. We are proposing a 3D-projection scintillator tracker as a near detector component in the next generation long-baseline neutrino experiments such as T2K upgrade and DUNE. Such a detector consists of a large number of 1 cm x 1 cm x 1 cm scintillator cubes with three orthogonal optical fibers crossing through each cube. Benefitted by the good timing resolution and fine granularity, this detector will be capable of measuring neutrons. Two prototypes have been exposed to the neutron beamline in Los Alamos National Lab (LANL). This beam test is a critical step in demonstrating the neutron detection potential of this technology.

Mini-abstract

Neutron detection at LANL with a scintillator prototype for long-baseline neutrino experiment

Experiment/Collaboration

LANL neutron beam test

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