

Development of a 3D highly granular scintillator neutrino detector for the T2K experiment

An essential component of the T2K near detector upgrade is a highly segmented scintillator detector, acting as a fully active target for the neutrino interactions.

The baseline concept for it is a novel device, called SuperFGD (arXiv:1707.01785), with dimensions of $\sim 200 \times 180 \times 60$ cm³. It consists of about 2×10^6 small scintillator cubes each of 1 cm³. The signal readout from each cube is provided by 3 WLS fibers. We have demonstrated that this detector, providing three 2D projections, has excellent tracking performance, including a 4π angular acceptance. Interest in this detector has been expressed by groups of the DUNE and ESS-nu collaboration.

A small prototype of this detector composed of 125 cubes was tested in a beam of charged particles at CERN in 2017. The detector response of this prototype, will be presented. The progress in the R&D of this detector, future plans and results of simulations will be also reported.

Session and Location

Wednesday Session, Poster Wall #41 (Auditorium Gallery Right)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)