Contribution ID: **113** Type: **Poster**

Automatic quality check system of scintillator cubes using image analysis technique for T2K near detector upgrade

Monday, 25 May 2020 23:53 (5 minutes)

T2K is a long-baseline neutrino experiment in Japan that aims to observe CP violation in neutrino oscillations. The upgrade of the T2K near detector (ND280) is ongoing now.
In the ND280 upgrade, a new detector, SuperFGD, that reconstructs the tracks of charged particles from neutrino-nuclear interactions with very fine granularity is planned to be introduced. It consists of two million plastic scintillator cubes, 60 thousand wavelength shifting fibers and photodetectors to readout the scintillation lights in three directions.
There is a large manufacturing variation of the scintillator cubes, and it prevents cubes from being assembled properly. Therefore, we developed a system to automatically check the quality of the cubes and reject bad ones by taking and analyzing their pictures. In this talk, we will report the performance demonstration of this system and its application to our prototype detector.

Funding information

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Session Classification: Poster

Track Classification: Experiments: Trackers