

NuDot: Double-Beta Decay with Direction Reconstruction in Liquid Scintillator

Authorship annotation

for the NuDot collaboration

Session and Location

Monday Session, Poster Wall #53 (Auditorium Gallery Right)

Abstract content

As neutrinoless double- β decay searches seek to reach into and beyond the inverted hierarchy regime, new strategies are needed to reject backgrounds. In monolithic liquid-scintillator-based detectors, otherwise-irreducible backgrounds could be identified by their event topology and novel deep-learning-based algorithms. NuDot is a 1-ton prototype that aims to demonstrate Cherenkov signal reconstruction of ~ 1 MeV β particles. In the FlatDot test-stand, the NuDot collaboration has demonstrated timing-based Cherenkov/scintillation light separation, validating the approach planned for use in NuDot. FlatDot has also allowed for tests of novel liquid scintillator cocktails, including the use of quantum dots as wavelength shifters. The NuDot detector is currently under construction and is moving towards surface operation demonstrating direction reconstruction of calibration source β events, followed by an underground measurement of two-neutrino double- β decay with direction reconstruction.

Poster included in proceedings:

yes

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