

Abstract Submitted  
for the DNP19 Meeting of  
The American Physical Society

**Data Acquisition and Triggering for the NuDot Experiment**

MANUEL MORALES, Massachusetts Institute of Technology, NUDOT COLLABORATION — In the search for neutrinoless double-beta decay, progress is being made towards kiloton-scale detectors with lower backgrounds. NuDot is a 1-ton liquid scintillator detector prototype designed to identify previously irreducible backgrounds like  $^8\text{B}$  solar neutrino scattering. Using Cherenkov light signals for path reconstruction of 1 to 2 MeV beta particles, NuDot aims to demonstrate this background reduction technique. NuDots DAQ system is complex in how it merges faster and slower signals. For high light-collection efficiency, 59 8 PMTs are split across 4 slow boards operating at 250 MS/s. To ensure fast timing, 152 2 PMTs are divided across 5 fast digitizer boards operating at 5 GS/s. When an event is detected by any of the 8" PMTs, a trigger is sent to all the boards housing 2" PMTs. Due to the limited waveform storage of the fast boards, triggers have to be sent in less than 200 ns to record the high-frequency data before it is overwritten. A variety of tests were performed to ensure this and other aspects of DAQ performance. Furthermore, all 9 boards are chained together in order to synchronize start time and utilize a shared clock timestamp. These processes facilitate the stitching together of event waveforms and further data analysis.

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Date submitted: 24 Jul 2019

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