



Contribution ID: 46

Type: **Short talk (15min. + 5 min. Q/A)**

PMT Timing Calibration in Large Liquid Scintillator Detectors with In Situ Radioactive Backgrounds

Thursday 30 October 2025 13:35 (15 minutes)

Event reconstruction in large liquid scintillator neutrino detectors, such as SNO+, rely on hit times from large numbers of photomultiplier tubes (PMTs). Standard methods of PMT timing calibrations involve dedicated hardware with deployed or in situ light sources. A calibration using in situ radioactive backgrounds present in regular physics data would allow vastly more frequent calibrations without the use of dedicated calibration hardware or the risk of radioactive contamination from deployed sources. We present a novel method that uses a basic scintillator emission timing distribution to simultaneously train a position reconstruction neural network and a simple PMT timing calibration model on radioactive backgrounds. We show that this calibration method applied to SNO+ data is comparable to a standard calibration.

Presenter: DEGRAW, Scott

Session Classification: AI//ML for Detector Physics Modeling