

Baseline monitoring for SBND PDS Trigger

The Short Baseline Near Detector is a Liquid Argon TPC designed to study neutrino physics at a distance of 110 m from the Booster Neutrino Beamline Target. SBND is also uniquely sensitive to Beyond the Standard Model (BSM) physics owing to the proximity to the target. SBND relies on triggers from different components to record interesting physics events inside the detector. SBND has a photon detection system (PDS) that consists of photomultiplier tubes (PMTs) and ARAPUCAS. PMT digitizers output the multiplicity of the PMT pair of channels above a threshold to the Master Trigger Card/Analog which performs the analog sum of the PMT pairs and compares them to some set trigger threshold. Therefore, the MTC/A generates trigger primitives, monitoring the overall light activities inside the detector. This process is crucial for SBND's primary physics trigger pathway. However, determining suitable threshold values for the MTC/A is challenging due to the fluctuating baseline of electronics caused by temperature variations. Consequently, it becomes necessary to monitor the MTC/A baseline to accurately configure the thresholds. This presentation outlines my endeavors in creating a tool capable of real-time baseline monitoring during data acquisition.

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