

Title: SBND Detector Status and First Results

Abstract:

Neutrinos are the most abundant particle in the universe, though their elusive nature makes them extremely difficult to detect. Part of the Short-Baseline Neutrino (SBN) Program, the Short-Baseline Near Detector (SBND) is one of three liquid argon time projection chambers (LArTPCs) aimed at detecting neutrinos from the Booster Neutrino Beam (BNB) at Fermilab. In conjunction with the TPC charge readout, SBND has a full photon detection system, including the instrumentation of the novel X-ARAPUCA photodetectors.

Located just 110 m downstream of the beam target, SBND has collected an unprecedented sample of over 6 million neutrino interactions in the first two years of running. Initial data has demonstrated superb performance of the detector's subsystems, enabling precise timing, tracking, and calorimetric reconstruction of events. With the large statistical data set, SBND is performing multi-dimensional cross section measurements, looking for new physics beyond the Standard Model, and searching for sterile neutrino oscillations as a joint effort across the SBN Program. In this talk, I will present the current status of SBND, first results from SBND's physics program, and the performance of the X-ARAPUCA subsystem.