



Contribution ID: 24

Type: **Presentation**

The SBND High Efficiency Light Collection System

Saturday, 23 September 2017 15:00 (15 minutes)

The SBND detector is a Liquid Argon Time Projection Chamber (LArTPC) being constructed on the Booster Neutrino Beamline at Fermilab as a part of the Short Baseline Neutrino Programme, which aims to definitely resolve the question of the existence of light sterile neutrinos. SBND's goals also include the development of liquid argon technology for future large scale detectors such as DUNE. One of the key areas of this development is the detection of scintillation light, specifically demonstrating how a high efficiency light detection system (LDS) could enhance the physics capabilities of LArTPCs for neutrino physics. The SBND LDS will contain a large array of PMTs and light guide bars as detectors located behind the APAs. We have also investigated possible further enhancement with reflective foils coated in wave-length shifter installed on the cathode plane. We will present the current status of the SBND light collection system as well as the result of simulations that demonstrate the performance of this system in enhancing the overall performance of the LArTPC in terms of timing, calorimetry and position resolution.

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Session Classification: Saturday Afternoon

Track Classification: Light/charge readout (PMTs, SiPM, WLS, electronics, etc.)