

New Perspectives



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The UV Laser Calibration System for measuring the electric field in the SBND Liquid Argon Time Projection system

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The Short-Baseline Near Detector (SBND) is a LArTPC located approximately 110 meters from the target in Fermilab's Booster Neutrino Beam (BNB). It will measure neutrino cross sections and the un-oscillated neutrino flux to reduce uncertainties in the aid searches for anomalous oscillations.

The electric field inside the SBND TPC may have distortions for several reasons, such as the space charge effect. The space charge effect comes from the abundant cosmic rays that ionize the argon, producing copious positive argon ions. A precise determination of the electric field distortion inside the TPC volume is required along a procedure to compensate for the distortion in the spatial coordinate. These spatial distortions, if not understood, would affect both the topological and calorimetric reconstruction of events in the detector. The UV calibration system is the detector system that will perform this measurement. In this talk, I will briefly overview the UV laser calibration system for SBND, the progress, the methodology for deriving spatial distortion and electric field, and how to correct them in data analysis.

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