

Near Detector Constraint for SBND to reduce uncertainties in SBN Oscillation analysis

Tuesday, 17 September 2024 16:55 (20 minutes)

The Short-Baseline Near Detector (SBND) is a crucial component of the Short-Baseline Neutrino (SBN) Program, situated 110 meters from the Booster Neutrino Beam (BNB) target. This 112-ton Liquid Argon Time Projection Chamber (LArTPC) Near Detector is optimally positioned to investigate the potential existence of an additional flavor of neutrino through neutrino oscillation. Due to its proximity to the BNB target, the SBND is uniquely positioned to receive a high rate of un-oscillated neutrino events. This setup offers a valuable opportunity to examine exclusive channels, thereby enhancing our understanding of various neutrino interaction modes, aiding in the understanding and mitigation of various sources of uncertainties. By fully utilizing the detector's capabilities, we aim to mitigate significant uncertainties in neutrino oscillation studies, primarily those related to neutrino interactions and flux. Achieving a deeper understanding of these uncertainties and controlling them with near detector data is essential. In this talk I will present the SBND event selection to control these uncertainties for the SBN oscillation analyses.

Working Group

WG 1: Neutrino Oscillation Physics

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Session Classification: Parallel: WG1

Track Classification: WG1: Neutrino Oscillation Physics