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Neutrino Interaction Measurement Capabilities of the SBND Experiment

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The Short-Baseline Near Detector (SBND) is a 100-ton scale Liquid Argon Time Projection Chamber (LArTPC) neutrino detector positioned in the Booster Neutrino Beam at Fermilab, as part of the Short-Baseline Neutrino (SBN) program. The detector is currently under construction and is anticipated to be filled with liquid argon in fall 2023. Located only 110 m from the neutrino production target, it will be exposed to a very high flux of neutrinos and will collect millions of neutrino interactions each year. This huge number of neutrino interactions with the precise tracking and calorimetric capabilities of LArTPC will enable a wealth of cross section measurements with unprecedented precision. In addition, SBND has the unique characteristic of being remarkably close to the neutrino source and not perfectly aligned with the neutrino beamline, in such a way that allows sampling of multiple neutrino fluxes using the same detector, a feature known as SBND-PRISM. SBND-PRISM can be utilized to study distinctive neutrino-nucleus interactions channels. This talk will present the current status of the experiment along with expectations for a rich cross section program ahead.

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