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Neutrino Interaction Measurements with the SBND Experiment

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The Short-Baseline Near Detector (SBND) is a 112-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 collecting neutrino beam data. Located only 110 m from the neutrino production target, SBND is 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, enables a wealth of cross section measurements to be made 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 motivate the SBND cross-section physics program, present ongoing measurement efforts, and discuss prospects for the rich program ahead.

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