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Vertex Reconstruction Improvements in SBND

Wednesday, 18 August 2021 09:30 (15 minutes)

The Short Baseline Near Detector (SBND) will be one of the three Liquid Argon Time Projection Chambers (LArTPCs) making up the Short Baseline Neutrino program (SBN) on Fermilab's Booster Neutrino Beam (BNB). SBND will exploit its 112 ton active volume and its position just 110m along the BNB to observe upwards of 6 million neutrino argon interactions over a planned three year exposure. As a result, SBND will be able to perform high statistics inclusive and exclusive cross section measurements, alongside its role in SBN's primary physics goal, the eV-scale sterile neutrino search. SBND's reconstruction uses the Pandora multi-algorithm pattern recognition software. Core to Pandora's workflow is the reconstruction of the neutrino interaction vertex from which a 3D particle hierarchy is built. This talk will detail a series of improvements made to Pandora's vertex reconstruction methods including the deployment of a new vertex refinement algorithm and the potential for exploiting these improvements in the wider liquid argon community.

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