

Signal Processing in SBND with WireCell

The Short Baseline Near Detector (SBND), a 112 ton liquid argon time projection chamber (LArTPC), is the near detector of the Short Baseline Neutrino Program at Fermilab. In a LArTPC, ionization electrons from a charged particle track drift along the electric field lines, inducing bipolar signals on the induction planes, and a unipolar signal collected on the collection plane. In this talk, we present the techniques by which the final digitized waveforms, comprising of the original ionization signal convoluted with detector field response and electronics response as well as noise is filtered and processed to recover the original ionization signal. The implementation of a 2D deconvolution (in time and wire dimensions) is introduced as a natural complement to the inter-wire and intra-wire induction field ranges and contours inherent to LArTPC signals.

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