

Overview of the Cold Electronics of SBND

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The Short-Baseline Near Detector (SBND) will be one of three liquid argon neutrino detectors sitting in the Booster Neutrino Beam (BNB) at Fermilab as part of the Short-Baseline Neutrino (SBN) Program. SBND is a 112-ton active mass liquid argon time projection chamber (LArTPC) to be located only 110 m from the BNB neutrino source. An important aspect of LArTPC detector design is that the readout and digitization electronics are placed in the liquid argon, directly on the anode planes, because digitizing the signal locally reduces both signal noise and impurities in the liquid argon by reducing the distance that analog signals must be transported and the number of cables and cryostat penetrations that are required to transport signals out of the detector. SBND's "cold electronics" consist of custom ASICs for signal amplification and shaping, commercial ADCs for digitization, and commercial FPGAs for data handling. I will present the SBND front-end electronics system design, show results of system and component performance tests, and describe the status of SBND front-end electronics production and installation.

Primary author: LAZUR, Ryan

Presenter: LAZUR, Ryan

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