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Readout Electronics Systems for Liquid Argon TPCs in Neutrino Experiments

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R&D studies of readout electronics systems for accelerator based neutrino experiments have been carried out since 2008. The CMOS based cryogenic readout electronics is the enabling technology for giant ($> 10\text{kT}$) LAr TPC (Liquid Argon Time Projection Chamber) in neutrino experiments, which also has potential to be used in other noble liquid TPC based experiments (dark matter search, neutrino- less double beta decay, etc.). The readout integrated with active detector is an important concept being followed in the development of readout electronics systems in LAr TPC experiments.

The readout electronics system for neutrino experiments in Short Baseline Neutrino Program (MicroBooNE and SBND) and Long Baseline Neutrino Program (DUNE) will be presented, where CERN Neutrino Platform has significant involvement in both programs. The readout electronics system for ProtoDUNE-SP currently being installed in EHN1 at CERN will be described in detail. Performance studies of cryogenic readout electronics systems will be presented.

Summary

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