



MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

Contribution ID: 451

Type: **Poster**

ProtoDUNE Trigger Study

Monday, 31 July 2017 19:12 (1 minute)

DUNE is an experiment aimed at determining the mass hierarchy of neutrinos and measuring parity violation in the neutrino sector. The ProtoDUNE detector is a prototype Liquid Argon (LAr) TPC for the DUNE far detector and will be operated at CERN to primarily study hadronic interactions in LAr at the few GeV energy scale.

Due to the operation of ProtoDUNE in a beamline near the surface, the detector will need to be able to discern between the intended beam particles and background events arising primarily from cosmics and beam byproducts such as halo muons and other contaminants. Thus, in order to reduce the data rates to manageable levels, ProtoDUNE will employ the use of triggers.

The Central Trigger Board (CTB) was designed to make use of the the available information from the Cosmic Ray Tagger, Beam Instrumentation, and Photon Detection System to generate triggers for ProtoDUNE. The CTB itself is a custom Printed Circuit Board which houses an FPGA (Xilinx Zynq 7Z020), where the trigger logic is implemented in firmware, and an embedded processor running a Linux distribution. In this poster we discuss possible trigger schemes and their viability based on timing simulations.

Primary authors: RIVERA, David (University of Pennsylvania); SENSENIG, Jonathon (University of Pennsylvania)

Co-authors: ZHANG, Lige (University of Pennsylvania); BARROS, Nuno (University of Pennsylvania)

Presenters: RIVERA, David (University of Pennsylvania); SENSENIG, Jonathon (University of Pennsylvania)

Session Classification: Poster Session and Reception

Track Classification: Neutrino Physics