

Development of ML FPGA filter for particle identification with transition radiation detector.

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Transition Radiation Detectors (TRD) have the attractive features of being able to separate particles by their gamma factor. A new TRD development, based on a GEM technology, is being carried out as a R&D project for the future Electron Ion Collider (EIC) and for upgrade of the GlueX experiment. This detector combines a high precision GEM tracker with TRD functionality and optimized for electron identification.

Modern concepts of trigger-less readout and data streaming will produce a very large data volume to be read from detectors. From a resource standpoint, it appears strongly advantageous to perform both the pre-processing of data and data reduction at earlier stages of a data acquisition. Following this trend, we began to develop an FPGA based Machine Learning algorithm for a real-time particle identification with GEMTRD. This research is important for streaming readout systems being developed now at JLab for EIC. The report will describe first steps in the development of ML-FPGA filter for GEMTRD.

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