



Contribution ID: 613

Type: Oral presentation

Streaming Data Acquisition for a 12 GeV CEBAF and Future Electron Ion Collider

Tuesday 12 June 2018 08:30 (40 minutes)

Jefferson Lab has recently completed the upgrade of CEBAF to 12 GeV. This project included improvements to, or rebuilding of, existing detectors and adding a fourth major detector, GlueX. Over the next ten years further detector upgrades and new detectors are planned to take advantage of the high luminosity and energy of CEBAF. In parallel a new accelerator, the Electron Ion Collider is being planned for construction in the late 2020's. A detector for the future Electron-Ion Collider will be one of the few major collider detectors to be built from scratch in the 21st century.

Micro-electronics and computing technologies have made order-of-magnitude advances in speed and bandwidth in the last decades. Projecting these trends through the time period spanning the CEBAF 12 GeV era and a possible EIC we predict that we can operate these detectors using a streaming readout model. Several existing NP and HEP experiments are upgrading their existing triggered data acquisitions to operate in this mode. We have the opportunity to design integrated detector and data acquisition designed from ground-up for streaming readout. This promises to further improve the efficiency and speed of the scientific work-flow and enable measurements not possible with traditional schemes. This talk will present our thoughts in this area, work that is currently in progress, and plans for the future.

Minioral

Description

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Session Classification: Invited talk Electron Ion Collider