



Contribution ID: 475

Type: **Experimental poster**

FELIX-based Data Acquisition System Integration with the NSW Micromegas Electronics and Detector Performance Validation

Thursday, June 10, 2021 6:45 PM (1 hour)

The New Small Wheel (NSW) upgrade is now in its commissioning phase. The future ATLAS detector sub-system will be one of the first to employ the Front-End Link eXchange (FELIX) as its Data Acquisition (DAQ) scheme. Currently, one of the main focus points of the community is to ensure proper acquiring of data from the detector media, besides validating the performance of the detectors themselves. This is being conducted at the BB5 area of CERN, where the Micromegas chambers are subjected to cosmic radiation. In this work, the software and FPGA-based tools that have been developed to aid in satisfying the stringent 2-week turnaround time per detector wedge will be described. These include applications that control the complex DAQ system and validate the data paths of thousands of readout channels and hundreds of high-speed optical links in an automated manner. Another aspect of the work is the description of methodologies that have been developed to validate the chamber's performance under cosmic radiation. Finally, an FPGA system that performs scintillator coincidence trigger filtering will be described. The aforementioned part of the system is used to emulate the deterministic nature of the muons' time-of-arrival during the actual run, in order to perform timing resolution performance profiling of the Micromegas detector.

Primary authors: BAKALIS, Christos (National Technical Univ. of Athens (GR)); ALEXOPOULOS, Theodoros (National Technical Univ. of Athens (GR)); PERGANTI, Maria (National Technical Univ. of Athens (GR))

Presenter: BAKALIS, Christos (National Technical Univ. of Athens (GR))

Session Classification: Poster Session

Track Classification: Upgrade & Future