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FELIX: the new detector readout system for the ATLAS experiment

Starting during the upcoming major LHC shutdown from 2019-2021, the ATLAS experiment at CERN will move to the the Front-End Link eXchange (FELIX) system as the interface between the data acquisition system and the trigger

and detector front-end electronics. FELIX will function as a router between custom serial links and a commodity switch network, which will use industry standard technologies to communicate with data collection and processing

components. The FELIX system is being developed using commercial-off-the-shelf server PC technology in combination with a FPGA-based PCIe Gen3 I/O card hosting GigaBit Transceiver links and with Timing, Trigger and Control

connectivity provided by an FMC-based mezzanine card. FELIX functions will be implemented with dedicated firmware for the Xilinx FPGA (Virtex 7 and Kintex UltraScale) installed on the I/O card alongside an interrupt-driven Linux

kernel driver and user-space software. On the network side, FELIX is able to connect to both Ethernet or Infiniband network architectures. This presentation will describe the FELIX system design as well as reporting on results of

the ongoing development program.

Experimental Collaboration

ATLAS

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