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ATLAS SoC TDAQ and ATCA OPCUA server implementation on the TileCoM for the ATLAS TileCal Phase-II upgrade

A major upgrade to the High Luminosity Large Hardon Collider (HL-LHC) will increase the instantaneous luminosity by a factor 5 compared to the LHC. A complete redesign of the readout electronics system of the ATLAS Tile Calorimeter (TileCal) is required to cope with the new radiation levels and data bandwidth requirements envisaged for the HL-LHC. Numerous sensors will be used to monitor the status of the upgraded readout electronics system to ensure the proper operation of the detector. This paper presents a real-time monitoring system which will be responsible to read and transfer monitoring data to the ATLAS TileCal during the HL-LHC era. This real-time monitoring system, known as Tile Computer-on-Module (TileCoM), includes an implementation of an OPC server and an ATLAS SoC TDAQ system running on a Xilinx Zynq UltraScale+ MPSoC device. The functionality of the TileCoM has been validated using an Avnet Ultra96-V2 ZYNQ UltraScale+ MPSoC evaluation board and Tile Gigabit Ethernet switch.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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