



Contribution ID: 208

Type: Poster Presentation

TileCoM Firmware Development for ATLAS Tile Calorimeter Phase-II Upgrade

The High-Luminosity Large Hadron Collider (HL-LHC) necessitates a comprehensive electronics upgrade of the ATLAS Tile Calorimeter (TileCal) to ensure robust operation under increased radiation and data-rate conditions. To address this, the ATLAS TileCal has introduced the Phase-II upgrade, which involves a complete replacement of the existing electronic system. As part of the Phase-II upgrade, the Tile Computer-on-Module (TileCoM) has been developed to enable real-time monitoring and control of the TileCal Preprocessor (TilePPr) sub-modules. Built on the Zynq UltraScale+ MPSoC platform, TileCoM provides a critical interface between the Detector Control System (DCS) and TilePPr modules, including the Compact Processing Module (CPM), Advanced Telecommunications Computing Architecture (ATCA) carrier, and Trigger Data Acquisition Interface (TDAQi). TileCoM's firmware integrates the IPbus protocol for register access, I²C for low-level sensor control, and Gigabit Ethernet for high-throughput data transfer, together with a custom Open Platform Communications Unified Architecture (OPC UA) server. This server ensures secure, standardized access to configuration parameters and sensor data across the TilePPr. Initial validation tests at CERN, conducted using the Avnet Ultra96-V2 development board, successfully demonstrated reliable TileCoM-CPM communication and firmware functionality, marking a key milestone toward current developments.

Apply for student award at which level:

MSc

Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

Primary author: MUNHUNGEWARWA, Brenton (University of Johannesburg)

Co-author: Dr GOLOLO, Mpho (University of Johannesburg)

Presenters: MUNHUNGEWARWA, Brenton (University of Johannesburg); Dr GOLOLO, Mpho (University of Johannesburg)

Session Classification: Poster Session

Track Classification: Track F - Applied Physics