



Contribution ID: 122

Type: not specified

# South Africa's Contribution to the Upgrade of the ATLAS TileCal low voltage power supply for the HL-LHC

Wednesday 26 March 2025 09:22 (22 minutes)

The start of the operation of the High Luminosity LHC (HL-LHC) is planned for the year 2030. The associated increase in luminosity provides an opportunity for further scientific discoveries as while also introducing many technical challenges for the systems of the ATLAS experiment. The HL-LHC environment has necessitated the Phase-II upgrade of the ATLAS hadronic Tile-Calorimeter (TileCal) which will ensure its peak performance in the coming decades. The upgrade will take place during the third long shutdown of the LHC. It will encompass the replacement of both on- and off-detector electronics, the implementation of new on-detector mechanics as well as the replacement of Photo-multiplier tubes located in the most exposed regions of the detector. The on-detector electronics of the TileCal are powered by 256 adjacent Low-Voltage Power Supplies (LVPS) which themselves each contain eight transformer-coupled buck converters known as Bricks. These Bricks function to step-down power received from off-detector bulk power supplies to that required by the front-end electronics. The South African cluster, headed by the University of the Witwatersrand, is responsible for the research and development, production, quality assurance testing and integration of half of the required Bricks for the Phase-II Upgrade. This presentation will provide an overview of the South African cluster's contributions to the development and production of the LVPS Bricks for the ATLAS Tile-Calorimeter Phase-II Upgrade. It will highlight the current project milestones, including research, development, and quality assurance achievements, and conclude with a forward-looking perspective on the remaining activities critical for ensuring the success of the project.

**Authors:** GOLOLO, Mpho Gift Doctor (University of Johannesburg (ZA)); MCKENZIE, Ryan Peter (University of the Witwatersrand (ZA))

**Co-authors:** MELLADO GARCIA, Bruce (University of the Witwatersrand); PILUSA, Thabo (University of the Witwatersrand (ZA)); CHABALALA, Vongani Cyril (University of the Witwatersrand (ZA))

**Presenter:** GOLOLO, Mpho Gift Doctor (University of Johannesburg (ZA))

**Session Classification:** WG6: Future Experiments

**Track Classification:** Future Experiments