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Quality assurance testing of the ATLAS Tile-Calorimeter Phase-II upgrade low-voltage power supplies

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The start of the operation of the High Luminosity LHC (HL-LHC) is planned for the year 2027. The planned increase in luminosity provides the opportunity for further scientific discoveries within the field of particle physics as well as many technical challenges associated with the new HL-LHC environment. Due to these environmental changes the ATLAS Tile-Calorimeter (TileCal) is to undergo its Phase-II upgrade in 2025 in order to ensure peak performance in the coming years. To this end the University of the Witwatersrand Institute for Collider Particle Physics, iThemba Labs, and SA-CERN, in collaboration with the University of Texas at Arlington, are currently undertaking the development and production of approximately 2300 Low-Voltage Power Supply (LVPS) Bricks. In order to ensure the reliable operation of these Bricks on-detector an extensive quality control procedure is to be implemented. This procedure is two-pronged in its approach. Firstly, initial testing is undertaken to ensure various performance metrics such as the Bricks output voltage are met. After which, the Bricks undergo Burn-in testing which functions to improve the reliability of the components via accelerated aging. Both of these processes require custom test apparatus which take the form of the Initial and Burn-in test stations. This presentation will provide an overview of these test stations including their hardware, software, and the certification of the Bricks before installation within TileCal.

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

Yes

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

MSc

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