



Contribution ID: 89

Type: not specified

### **An overview of the test station involved in the production of the LVPS for the Phase II upgrade of the Tile Calorimeter.**

The Phase II upgrade at CERN represents a significant advancement in preparing for the High Luminosity Large Hadron Collider (HL-LHC) era. This upgrade includes substantial enhancements to the detector systems, particularly the integration of radiation-resistant transformer-coupled buck converters, referred to as LVPS bricks. A thorough quality assurance process is being implemented to improve the reliability of the Low-Voltage Power Supply (LVPS) bricks within the ATLAS Hadronic Tile-Calorimeter (TileCal). In partnership with the University of the Witwatersrand and iThemba LABS, more than a thousand LVPS bricks will be developed. These bricks are essential for converting 200V direct current (DC) power into the 10V DC power needed for detector operation. Extensive initial testing of these bricks is critical to ensure their reliability and performance under the challenging conditions anticipated in the HL-LHC era, including high radiation levels, increased trigger rates, and substantial pile-up. The next phase will involve gathering and analyzing test data using advanced machine learning techniques. This data-driven approach will offer deeper insights into the bricks' behavior under extreme conditions, enabling the optimization of their design and performance to meet the demanding requirements of the HL-LHC upgrade.

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**Session Classification:** WG6: Future Experiments

**Track Classification:** Future Experiments