



Contribution ID: 63

Type: **Poster Presentation**

A Burn-in test station for the ATLAS Phase-II Tile-calorimeter low-voltage power supply transformer-coupled buck converters

The upgrade of the ATLAS hadronic tile-calorimeter (TileCal) Low-Voltage Power Supply (LVPS) falls under the high-luminosity LHC upgrade project. This presentation serves to provide a detailed overview of the development of an endurance (Burn-in) test station for use on an upgraded LVPS component known as a Brick. These Bricks are radiation hard transformer-coupled buck converters that function to step-down bulk 200 VDC power received from technical cavern USA15 to 10 VDC on-detector. This 10 VDC is then converted again by Point-of-Load (POL) regulators to the voltages required by the front-end electronics of TileCal. To ensure the reliability of the Bricks, once installed within TileCal, an electronic accelerated aging (Burn-in) test station has been designed and built. The Burn-in test-station functions to shift newly produced electronics out of the infant-mortality failure region, thereby improving the reliability of the components once installed. This is achieved by exposing the Bricks to operating conditions that exceed those of typical use. This results in components that would fail prematurely within TileCal failing instantly thereby allowing for their replacement. The Burn-in station is of a fully custom design in both its hardware and software. Both of these topics will be explored in detail with the presentation culminating in a discussion of the Burn-in test procedure.

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

Yes

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

MSc

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Session Classification: Applied Physics

Track Classification: Track F - Applied Physics