

Upgrades of the ATLAS Tile Calorimeter Readout Electronics for the High-Luminosity LHC

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The High-Luminosity LHC (HL-LHC) is expected to provide a data set of 4000 fb⁻¹ allowing precision Higgs physics and search for deviations from the Standard Model. The HL-LHC poses new challenges in terms of radiation hardness and requires an unprecedented ability to select interesting collisions (trigger) at the collision frequency with a fully digital trigger.

The ATLAS Hadronic Tile Calorimeter (TileCal) records hadronic shower energy depositions that are used for triggering and physics data analysis. HL-LHC requires a complete replacement of the TileCal readout chain, with new radiation hard electronics compatible with the fully digital trigger architecture.

This flash talk will discuss upgrades to the on-detector TileCal read-out and control board (Daughterboard). The Daughterboard sends continuous high-speed readout of digitized PMT samples, slow control, and monitoring data to and from off-detector electronics. We present a design that minimizes single points of failure with double-redundancy, brings an enhanced timing scheme, improves radiation tolerance by mitigating Single Event Latch-up (SEL) induced errors, and features a more robust power-up and current monitoring scheme.

Abstract Track

Flash talk, LHC

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