



Contribution ID: 143

Type: **Experiment**

The ATLAS Tile Calorimeter Calibration and Performance at the LHC

The Tile Calorimeter (TileCal) is the central section of the ATLAS hadronic calorimeter at the Large Hadron Collider. Scintillation light produced in the tiles is transmitted by wavelength shifting fibers to photomultiplier tubes (PMTs). The resulting electronic signals from approximately 10000 PMTs are measured and digitized before being transferred to off-detector data-acquisition systems. It is a key detector for the measurement of hadrons, jets, tau leptons and missing transverse energy. Because of its very good signal to noise ratio it is also useful for the identification and reconstruction of muons.

The calorimeter response is monitored to better than 1% using radioactive source, laser, and charge injection systems. This multi-faceted calibration system allows to monitor and equalize the calorimeter response at each stage of the signal production, from scintillation light to digitization. The performance of the calorimeter has also been established through test beam measurements, cosmic ray muons and the large sample of pp collisions.

Results on the calorimeter performance are presented, including the absolute energy scale, time resolution, and associated stabilities.

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Track Classification: Poster