

Calibration and Performance of the ATLAS Tile Calorimeter During the LHC Run 2

Monday, 2 October 2017 17:00 (20 minutes)

The Tile Calorimeter (TileCal) is the hadronic sampling calorimeter of ATLAS experiment at the Large Hadron Collider (LHC). TileCal uses iron absorbers and scintillators as active material and it covers the central region $|\eta| < 1.7$. Jointly with the other calorimeters it is designed for measurements of hadrons, jets, tau-particles and missing transverse energy. It also assists in muon identification. TileCal is regularly monitored and calibrated by several different calibration systems:

a Cs radioactive source that illuminates the scintillating tiles directly, a laser light system to directly test the PMT response, and a charge injection system (CIS) for the front-end electronics. These calibrations systems, in conjunction with data collected during proton-proton collisions, provide extensive monitoring of the instrument and a means for equalizing the calorimeter response at each stage of the signal propagation. The performance of the calorimeter has been established with cosmic ray muons and the large sample of the proton-proton collisions. The response of high momentum isolated muons is used to study the energy response at the electromagnetic scale, isolated hadrons are used as a probe of the hadronic response. The calorimeter time resolution is studied with multijet events. A description of the different TileCal calibration systems and the results on the calorimeter performance during the LHC Run 2 will be presented.

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Session Classification: Calibration & operation