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Performance of the special C10 cells of the Tile Calorimeter of the ATLAS detector during Run 2 data taking period

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The Tile Calorimeter of the ATLAS experiment at the Large Hadron Collider is a hadronic calorimeter that is designed to provide important information for the reconstruction of physics objects like hadrons, jets, tau-particles and missing transverse energy. The calorimeter also plays a role in the identification of muons. It is a hadronic sampling calorimeter that uses scintillating tiles that are sandwiched between slabs of steel that act as an absorber. The light produced by particles traversing through the detector is transmitted by wavelength shifting fibres to photomultiplier tubes. The response of the calorimeter is calibrated to the Electromagnetic scale, which represents a basic unit in the physics object reconstruction procedures.

The performance of the special c10 cells of the Tile calorimeter is studied by their response to muons originating from $W \rightarrow \mu\nu_\mu$ events collected by the ATLAS detector during the Run 2 data taking period. The response is quantified by measuring the amount of energy deposited per unit length of each cell, in both the data and Monte Carlo simulations. The ratio of the response in data and Monte Carlo is used to quantify the calorimeter response, with deviations from unity hinting that there might be poor EM energy scale calibration in the experimental data.

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

Yes

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

PhD

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