

Collision muons analysis using the Tile Calorimeter of the ATLAS detector

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The Tile Calorimeter (TileCal) of ATLAS is a hadronic calorimeter system placed in the central region of the detector. Muons deposit energy according to a well known distribution as ionization, which makes them ideal particles for energy calibration. The study is performed using muons produced in decays of W bosons in LHC Run-2 data at $\sqrt{s} = 13$ TeV recorded by the ATLAS detector. The energy loss over path length of muons traversing each TileCal cells is measured and compared with simulation. The response uniformity over the azimuthal angle ϕ is also measured to detect any ϕ -modules that are deviating from the average. This is important since the jet energy scale calibration assumes calorimeter's uniform response in ϕ . The study shows a good agreement of response between data and simulation, and also a good uniformity over ϕ . It is also shown that the method is sensitive enough to detect individual cells with special geometry.

Abstract Track

Flash talk, LHC

Author: ANDREAN, Stefio Yosse (Stockholm University (SE))

Presenter: ANDREAN, Stefio Yosse (Stockholm University (SE))

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