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Performance of the ATLAS Calorimeters in LHC Run-1 and Run-2

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The ATLAS experiment at the Large Hadron Collider (LHC) is equipped with electromagnetic and hadronic liquid-argon (LAr) calorimeters and a hadronic scintillator-steel sampling calorimeter (TileCal) for measuring energy and direction of final state particles in the pseudorapidity range $|\eta| < 4.9$.

The calibration and performance of the calorimetry system was established during beam tests, cosmic ray muon measurements and in particular the first three years of pp collision data-taking. During this period, referred to as Run-1, approximately $27^{\circ} \text{fb}^{-1}$ of data have been collected at the center-of-mass energies of 7 and 8 TeV. Following a period of detector consolidation during a long shutdown, Run-2 started in 2015 with approximately $3.9^{\circ} \text{fb}^{-1}$ of data at a center-of-mass energy of 13° TeV recorded in this year. Results on the calorimeter operation, monitoring and data quality, as well as their performance will be presented, including the calibration and stability of the electromagnetic scale, response uniformity and time resolution. These results demonstrate that the LAr and Tile calorimeters perform excellently within their design requirements. The calorimetry system thus played a crucial role in the Run-1 physics programme, and, in particular, in the discovery of a Higgs boson.

Author: ATLAS, Collaboration (ATLAS)

Presenter: BURGHGRAVE, Blake Oliver (Northern Illinois University (US))

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