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ATLAS LAr Calorimeter Performance and Commissioning for LHC Run-2

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The ATLAS detector was designed and built to study proton-proton collisions produced at the LHC at centre-of-mass energies up to 14 TeV and at instantaneous luminosities up to $10^{34} \text{ cm}^{-2}\text{s}^{-1}$. Liquid argon (LAr) sampling calorimeters are employed for all electromagnetic calorimetry in the pseudorapidity region $|\eta| < 3.2$, and for hadronic calorimetry in the region from $|\eta| = 1.5$ to $|\eta| = 4.9$. In the first LHC run a total luminosity of 27 fb^{-1} has been collected at center-of-mass energies of 7-8-TeV with very high operational efficiency of the LAr Calorimeters and excellent performance. The well calibrated and highly granular detector achieved its design values both in energy measurement as well as in direction resolution, which was a main ingredient for the successful discovery of a Higgs boson in the di-photon decay channel.

The talk will give an overview of the procedures applied to calibrate the 180.000 read-out channels electronically as well as from using reference physics signals. The data quality parameters influencing the detector resolution and their monitoring are presented. The recent detector status will be reported from the re-commissioning of the LAr Calorimeters for the upcoming 13-14-TeV LHC Run-2, where the luminosity and the trigger rate are foreseen to be further increased.

Collaboration

ATLAS Liquid-Argon Calorimeter Group

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