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Operation and performance of the ATLAS liquid argon electromagnetic calorimeters at the Large Hadron Collider

The ATLAS experiment is designed to study the proton-proton collisions produced at the Large Hadron Collider (LHC) at CERN. The ATLAS electromagnetic calorimetry consists in liquid argon-lead sampling calorimeters covering the pseudo-rapidity region up to 3.2. They are characterized by an accordion geometry that allows a fast and uniform azimuthal response without any gap. Since the first LHC collisions in 2009, around 27 fb-1 of data have been collected at a centre of mass energy of 7-8 TeV. During all these stages, the calorimeters have been operating almost optimally, with performances very close to the specification ones. The very efficient reconstruction and identification of electrons and photons played especially a key role in the discovery of the Higgs boson announced in 2012, in the framework of the search for a low mass Higgs boson in its most favourable discovery channels, H??? and H?ZZ?4e.
The talk will cover all aspects of these first years of operation of the electromagnetic calorimeters, including the daily operation and the data quality assessment procedure. It will also describe the algorithms used for the reconstruction and identification of electrons and photons. Finally, the calibration of the electron and photon energy scale using simulation and in-situ techniques is discussed, as well as its impact on the Higgs boson mass measurement.

Primary author: Prof. OREGLIA, Mark (University of Chicago (US))

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