
Contribution ID: **420** Type: **Parallel Talk**

# ATLAS Calorimeter: Run-2 performance and Phase-II upgrade

*Friday, 7 July 2017 09:34 (17 minutes)*

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 instantaneous luminosities up to $10^{34}\mathrm{cm}^{-2}\mathrm{s}^{-1}$. A liquid argon (LAr)-lead sampling calorimeter is employed as electromagnetic calorimeter and hadronic calorimeter, except in the barrel region, where a scintillator-steel sampling calorimeter (TileCal) is used as hadronic calorimeter.
This presentation will give first an overview of the detector operation and data quality, as well as the achieved performance of the ATLAS calorimetry system. Additionally, the upgrade projects of the ATLAS calorimeter system for the high luminosity phase of the LHC (HL-LHC) will be presented. For the HL-LHC, the instantaneous luminosity is expected to increase up to $\mathrm{L} \simeq 7.5 \times 10^{34}\mathrm{cm}^{-2}\mathrm{s}^{-1}$ and the average pile-up up to 200 interactions per bunch crossing.

The major R&D item is the upgrade of the electronics for both LAr and Tile calorimeters in order to cope with longer latencies of up to 60 us. The expected radiation doses will exceed the qualification range of the current readout system. The status on the R&D of the low-power ASICs (pre-amplifier, shaper, ADC, serializer and transmitters) and readout electronics for all the design options will be discussed.

Moreover, a High Granularity Timing Detector (HGTD) is proposed to be added in front of the LAr calorimeters in the end-cap region (2.4 <$|\eta|$< 4.2) for pile-up mitigation at Level-0 trigger level and offline reconstruction. The HGTD will correlate the the energy deposits in the calorimeter to different proton-proton collision vertices by using TOF information with high time resolution (30 pico-second per readout cell) based on the Silicon sensor technologies. The current test beam results will be presented as well.

## Experimental Collaboration

ATLAS

**Primary author:** BOUMEDIENE, Djamel Eddine (Univ. Blaise Pascal Clermont-Fe. II (FR))

**Presenter:** BOUMEDIENE, Djamel Eddine (Univ. Blaise Pascal Clermont-Fe. II (FR))

**Session Classification:** Detectors and data handling

**Track Classification:** Detector R&D and Data Handling