Contribution ID: **151**   Type: **Oral**

The Upgrade of the ATLAS First Level Calorimeter Trigger

Thursday, 28 May 2015 18:25 (15 minutes)

The Level-1 calorimeter trigger (L1Calo) operated successfully during the first data taking phase of the ATLAS experiment at the LHC. Based on the lessons learned, a series of upgrades is planned for L1Calo to face the new challenges posed by the upcoming increases of the LHC beam energy and luminosity. The initial upgrade phase in 2013-15 includes substantial improvements to the analogue and digital signal processing to cope with baseline shifts due to signal pile-up. Additionally a newly introduced system will receive real-time data from both the upgraded L1Calo and L1Muon trigger to perform trigger algorithms based on entire event topologies. During the second upgrade phase in 2018-19 major parts of L1Calo will be rebuilt in order to exploit a tenfold increase in the available calorimeter data granularity compared to that of the current system.

In this contribution we present the lessons learned during the first period of LHC data taking. Based on these we discuss the expected performance improvements together with the upgraded hardware and firmware implementations. The status of the prototypes, integration and commissioning efforts are reviewed.

Collaboration

ATLAS Collaboration

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Session Classification: Front end, Trigger, DAQ and Data Management

Track Classification: S5 - Front End, Trigger, DAQ and Data Management