



Contribution ID: 73

Type: Oral

The Phase-1 Upgrade of the ATLAS First Level Calorimeter Trigger

Tuesday, 3 June 2014 17:10 (20 minutes)

The level1 calorimeter trigger (L1Calo) of the ATLAS experiment has been operating effectively since the start of LHC data taking, and has played a major role in the discovery of the Higgs boson. To face the new challenges posed by the upcoming increases of the LHC proton beam energy and luminosity, a series of upgrades is planned for L1Calo. An

initial upgrade (Phase0) is scheduled to be ready for the start of the second LHC run in 2015, and a further more substantial upgrade (Phase1) is planned to be installed during the LHC shutdown expected in 2018. The calorimeter trigger aims to identify electrons, photons, taus and hadronic jets. It also determines total and missing transverse energy and can further analyse the event topology using a dedicated system incorporating information from both calorimeter and muon triggers.

This paper presents the Phase1 hardware trigger developments which exploit a tenfold increase in the available calorimeter data granularity when compared to that of the current system. The calorimeter signals will be received via optical fibers and distributed to two distinct processing systems. Those systems implement sliding window algorithms and quasi offline algorithms to achieve object reconstruction and identification. The algorithms are implemented on high density electronics boards which make use of recent developments in high speed data transmission and FPGA technology. The presentation reviews the physics impact along with the current status of the hardware design and early prototypes and demonstrator boards.

Primary author: HRISTOVA, Ivana Radoslavova (Humboldt-Universitaet zu Berlin (DE))

Presenter: HRISTOVA, Ivana Radoslavova (Humboldt-Universitaet zu Berlin (DE))

Session Classification: III.b Trigger & DAQ

Track Classification: Data-processing: 3b) Trigger and Data Acquisition Systems