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ATLAS High Level Calorimeter Trigger Software Performance for Cosmic Ray Events

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The ATLAS detector is undergoing intense commissioning effort with cosmic rays preparing for the first LHC colisions next spring. Combined runs with all of the ATLAS subsystems are being taken in order to evaluate the detector performance. This is an unique opportunity also for the trigger system to be studied with different detector operation modes, such as different event rates and detector configuration.

The ATLAS trigger starts with a hardware based system which tries to identify detector regions where interesting physics objects may be found (eg: large energy depositions in the calorimeter system). An approved event will be further processed by more complex algorithms at the second level where detailed features are extracted (full detector granularity data for small portions of the detector is available). Events accepted at this level will be reprocessed at the so-called event filter level. Full detector data at full granularity is available for offline like processing with complete calibration to achieve the final decision.

This year we could extend the experience by including more algorithms at the second level and event filter calorimeter trigger. Clustering algorithms for electrons, photons, taus, jets and missing transverse energy are being commissioned during this combined run period. We report the latest results for such algorithms. Issues such as hot calorimeter regions identification, processing time for the algorithms, data access (specially at the second level) are being evaluated. Intense usage of online and quasi-online (during offline reconstruction of runs) monitoring helps to trace and fix problems.

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