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The ATLAS Trigger System: Ready for Run-2

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Summary

The ATLAS trigger has been successfully collecting collision data during the first run of the LHC between 2009-2013 at a centre-of-mass energy between 900 GeV and 8 TeV. The trigger system consists of a hardware Level-1 (L1) and a software based high-level trigger (HLT) that reduces the event rate from the design bunch-crossing rate of 40 MHz to an average recording rate of a few hundred Hz.

During the next data-taking period starting in 2015 (Run-2) the LHC will operate at a centre-of-mass energy of about 13 TeV resulting in roughly five times higher trigger rates.

We will briefly review the ATLAS trigger system upgrades that were implemented during the shutdown, allowing us to cope with the increased trigger rates while maintaining or even improving our efficiency to select relevant physics processes.

This includes changes to the L1 calorimeter and muon trigger system, the introduction of a new L1 topological trigger module and the merging of the previously two-level HLT system into a single event filter farm. At hand of a few examples, we will show the impressive performance improvements in the HLT trigger algorithms used to identify leptons, hadrons and global event quantities like missing transverse energy. Finally, we will present the commissioning of the trigger system and its initial performance from the the 2015 run.

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Session Classification: Contributed talks from poster session

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