



Contribution ID: 339

Type: oral presentation

Event reconstruction algorithms for the ATLAS trigger

Monday, September 3, 2007 5:55 PM (15 minutes)

The ATLAS experiment under construction at CERN is due to begin operation at the end of 2007. The detector will record the results of proton-proton collisions at a centre-of-mass energy of 14 TeV. The trigger is a three-tier system designed to identify in real-time potentially interesting events that are then saved for detailed offline analysis. The trigger system will select approximately 200 Hz of potentially interesting events out of the 40 MHz bunch-crossing rate (with $\sim 10^9$ interactions per second at the nominal luminosity).

Algorithms used in the trigger system to identify different event features of interest will be described, as well as their expected performance in terms of selection efficiency, background rejection and computation time per event. The talk will concentrate on recent improvements and on performance studies, using a very detailed simulation of the ATLAS detector and electronics chain that emulates the raw data as it will appear at the input to the trigger system. Checks on the robustness of the algorithms to detector misalignment and miscalibration will also be discussed.

Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

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Session Classification: Online computing

Track Classification: Online Computing