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Triggering on hadronic tau decays in ATLAS: algorithms and performance

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This contribution will summarize the algorithms and performance of the ATLAS tau trigger system during the 2011 data taking period. The use of resources and implementation of trigger algorithms in the ATLAS trigger architecture will be shown in detail. Moreover, comparisons of data and simulation results, studies of the correlation of the variable definitions at different trigger stages as well as efficiency versus rate analyses are the key elements to describe the performance of the tau trigger. Finally, in light of the vast statistics collected in 2011, future prospects for triggering on hadronic tau decays in this exciting new period of increased instantaneous luminosity will be presented.

Summary

Hadronic tau decays play a crucial role in taking Standard Model measurements as well as in the search for physics beyond the Standard Model. However, hadronic tau decays are difficult to identify and trigger on due to their resemblance to QCD jets. Given the large production cross section of QCD processes, designing and operating a trigger system with the capability to efficiently select hadronic tau decays, while maintaining the rate within the bandwidth limits, is a difficult challenge.

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