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Trigger Rate Monitoring Tools at CMS

Tuesday, 25 October 2022 11:00 (30 minutes)

With the start of run 3 in 2022, the LHC has entered a new period, now delivering higher energy and luminosity proton beams to the Compact Muon Solenoid (CMS) experiment. These increases make it critical to maintain and upgrade the tools and methods used to monitor the rate at which data is collected (the trigger rate). Software tools have been developed to allow for automated rate monitoring, and we present several upgrades to these software tools, which maintain and expand on their functionality. These trigger rate monitoring tools allow for real-time monitoring including alerts which go out to on-call experts in the case of abnormalities. Fits are produced from previously collected data and extrapolate the behaviors of the triggers as a function of pile-up (the average number of particle interactions per bunch-crossing). These fits allow for visualization and statistical analysis of the behavior of the triggers and are displayed on the online monitoring system (OMS). The rate monitoring code can also be used for offline data certification and more complex trigger analysis. This presentation will show some of the upgrades to this software with an emphasis on the automation for easier and consistent upgrades and fixes to the software, and the increased interactivity with the users.

Significance

References

Experiment context, if any

High Level Trigger at the Compact Muon Solenoid

Primary author: LAWRENCE, John (University of Notre Dame (US))

Presenter: LAWRENCE, John (University of Notre Dame (US))

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