

Trigger Rate Monitoring Tools at CMS

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One of the major challenges for the Compact Muon Solenoid (CMS) experiment, is the task of reducing event rate from roughly 40 MHz down to a more manageable 1 kHz while keeping as many interesting physics events as possible. This is accomplished through the use of a Level-1 (L1) hardware based trigger as well as a software based High-Level-Trigger (HLT). Monitoring and understanding the output rates of the L1 and HLT triggers is of key importance for determining the overall performance of the trigger system and is intimately tied to what type of data is being recorded for physics analyses. We present here a collection of tools used by CMS to monitor the L1 and HLT trigger rates. One of these tools is a script (run in the CMS control room) that gives valuable real-time feedback of trigger rates to the shift crew. Another useful tool is a plotting library, that is used for observing how trigger rates vary over a range of beam and detector conditions, in particular how the rates of individual triggers scale with event pile-up.

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