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Anomalous Signal Reduction in the CMS ECAL Trigger GAGE DEZOORT, TUTANON SINTHUPRASITH, CHRIS NEU, University of Virginia — Of the millions of collisions/s produced by the Large Hadron Collider (LHC), only around 1000 events/s can be stored offline. The proper classification of events within the Compact Muon Solenoid (CMS) Experiment's trigger system is therefore crucial in performing standard model measurements and searching for new physics. Occasionally, hadrons produced in the LHC's p-p collisions strike the CMS Electromagnetic Calorimeter (ECAL) barrel APDs, directly ionizing the silicon within them. This process is observed to cause false isolated signals, or spikes, that correspond to a high apparent energy in the detector. The rate of ECAL spike occurrence is proportional to the current LHC luminosity, as well as the number of charged tracks. Therefore, as the LHC pushes into more energetic regimes, these anomalous signals must be removed from the trigger decision. In order to identify and mitigate spikes, a full emulation of the ECAL L1 Trigger was constructed. In our studies, we tuned specific parameters of this L1 emulation in order to study the identification and reduction of anomalous signals, as well as their impact on the trigger rate.

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