

CMS ECAL L1 Trigger: Rejection of Anomalous Signals and Effects on e-gamma Candidates

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The CMS electromagnetic calorimeter (ECAL) is the sub-detector which measures the energies of electrons and photons. Particles collide and decay which interact with crystals and those crystals emit light. In the ECAL barrel, avalanche photodiodes (APDs) convert this light into an electronic pulse which is used to recreate the properties of particles such as energy. One of the challenges experienced by ECAL are large amplitude signals, termed spikes, which arise from the direct interaction of hadrons with these APDs which, if untreated, would saturate the bandwidth of the Level-1 Trigger of CMS. I will present a study on a previously unused ECAL hardware-level feature that has the potential to improve the efficiency of the spike killer that is currently applied at Level-1. There are two sets of weights within the ECAL on-detector readout which can be used to reconstruct the amplitude of signals recorded by the APDs, the even and odd weights. Up to now, only the even weights have been applied to data taken with the CMS ECAL. I will be presenting how the even and odd weights can be configured to reject out-of-time signals and potentially improve the rejection of spikes in the Level-1 Trigger.

[in person]

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