

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

ECAL trigger performance in Run 2 and improvements for Run 3

PAMPA GHOSE, Florida State Univ, CMS EXPERIMENT COLLABORATION —

The CMS electromagnetic calorimeter (ECAL) is a high resolution crystal calorimeter operating at the CERN LHC. It is responsible for the identification and precise reconstruction of electrons and photons in CMS, which were crucial in the discovery and subsequent characterization of the Higgs boson. It also contributes to the reconstruction of tau leptons, jets, and calorimeter energy sums, which are vital components of many CMS physics analyses.

The ECAL trigger system employs fast digital signal processing algorithms to precisely measure the energy and timing information of ECAL energy deposits recorded during LHC collisions. These trigger primitives are transmitted to the Level-1 trigger system at the LHC collision rate of 40 MHz. These energy deposits are then combined with information from other CMS sub-detectors to determine whether the event should trigger the readout of the data from CMS to permanent storage.

This presentation will summarize the ECAL trigger performance achieved during LHC Run 2 (2015-2018). More frequent updates of the ECAL trigger primitives have been required relative to LHC Run 1 (2009-2012), due to the higher luminosities experienced in Run 2, and these will also be described. These updates are needed to account for radiation-induced changes in crystal and photodetector response and to maintain stable trigger rates and efficiencies up to $|\eta|=3.0$.

Pampa Ghose
Florida State Univ

Date submitted: 30 Jan 2020

Electronic form version 1.4