

The CMS Electromagnetic Calorimeter Clustering and Energy reconstruction for LHC Run3

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The CMS electromagnetic calorimeter (ECAL) is a high resolution, high granularity scintillating crystal calorimeter. Improvements to the CMS ECAL energy reconstruction algorithms are required to maintain the ECAL performance in the more challenging environment of the upcoming LHC Run 3 (2021-2024). We propose to mitigate the increase in the noise, due to the ECAL barrel front-end readout components ageing and to the crystal transparency loss, by revisiting the clustering algorithm. We will show the results obtained for the simulated reconstruction efficiency of the photons/electrons superclusters, their reconstructed energy, and the resolution obtained for the latter when refining the interplay between the different noise thresholds in the reconstruction of clusters and exploring less conventional methods for the collection of signals contributing to the electromagnetic shower, such as machine learning.

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