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Obtaining the ultimate calibration and performance of the CMS Electromagnetic Calorimeter in LHC Run 2

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The electromagnetic calorimeter (ECAL) of the CMS experiment at the CERN LHC, due to its excellent energy resolution, is crucial for many physics analyses, ranging from Higgs measurements to new physics searches involving very high mass resonances. A precise calibration of the detector and all its individual channels is essential to achieve the best possible resolution for electron and photon energy measurements, as well as the measurement of the electromagnetic component of jets and the contribution to energy sums used to obtain information about particles that leave no signal in the detectors, such as neutrinos. To ensure the stability of the energy response over time, a laser monitoring system is employed to measure radiation induced changes in the detector hardware and compensate for them in the reconstruction. This talk will summarize the techniques used for the ECAL energy and time calibrations with the laser system and exploiting the full Run 2 (2015-2018) dataset, and will present the ultimate ECAL performance achieved for the legacy reprocessing of the Run 2 data.

Collaboration / Activity

CMS

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