

# High precision, low disturbance calibration of the High Voltage system of the CMS Barrel Electromagnetic Calorimeter

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The CMS Electromagnetic Calorimeter utilizes scintillating lead tungstate crystals, with avalanche photodiodes (APD) as photodetectors in the barrel part. The high voltage system, consisting of 1224 channels, biases groups of 50 APD pairs, each at a voltage of about 380 V. The sensitivity of the APD gain to the bias voltage is 3%/V. A stability of better than 60 mV is therefore required to have a negligible impact on the calorimeter energy resolution. Until 2015, manual calibrations were performed once per year during LHC year-end technical stops. A new, less labour-intensive, calibration system was deployed recently, which satisfies the requirement of low disturbance and high precision and permits more frequent checking of the APD bias voltages during the year. The system is discussed in detail and the first operational experience in CMS is presented.

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