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The CMS Electromagnetic Calorimeter Pre-calibration with Cosmic Rays

The electromagnetic calorimeter of the CMS experiment at the new CERN proton Collider (LHC) consisting in about 75000 scintillating PWO crystals, is at an advanced stage of construction. The use of cosmic rays allows intercalibration of all the channels before the final installation in CMS. It also provides an extensive test, essential for the commissioning of the detector. The data collected are well described by Monte Carlo simulation based on the GEANT4 toolkit. The inter-calibration procedure has been proven to reach a statistical accuracy at the level of 2% within 10 days of data taking and the comparison with the reference inter-calibration based on electron test-beam data shows an overall agreement of ~ 2%. A necessary condition for optimal performance is a precise channel-to-channel inter-calibration. While the ultimate calibration of the detector is expected to rely on physics data, the cosmic muon inter-calibration will provide a reasonable performance already at the start-up.

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