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First years of running for the LHCb calorimeter system and preparation for run 2

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The LHCb experiment is dedicated to precision measurements of CP violation and rare decays of B hadrons at the Large Hadron Collider (LHC) at CERN (Geneva). It comprises a calorimeter system composed of four subdetectors: a Scintillating Pad Detector (SPD) and a Pre-Shower detector (PS) in front of an electromagnetic calorimeter (ECAL) which is followed by a hadron calorimeter (HCAL). They are used to select transverse energy hadron, electron and photon candidates for the first trigger level and they provides the identification of electrons, photons and hadrons as well as the measurement of their energies and positions.

The calorimeter has been pre-calibrated before its installation in the pit. The calibration techniques have been tested with data taken in 2010 and used regularly during run 1. For run 2, new calibration methods have been devised to follow and correct online the calorimeter detector response.

The design and construction characteristics of the LHCb calorimeter will be recalled. Strategies for monitoring and calibration during data taking will be detailed in all aspects. Scintillating fibres, plastics and photomultipliers suffer from ageing due to radiation damage or high currents. Different methods which are used to calibrate the detectors and to recover the initial performances will be presented. The performances achieved will be illustrated in selected channels of interest for B physics.

Collaboration

LHCb collaboration

Primary author: PERRET, Pascal (Laboratoire de Physique Corpusculaire)

Presenter: Dr CHEFDEVILLE, maximilien (CNRS/IN2P3/LAPP)

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