Tipp 2014 - Third International Conference on Technology and Instrumentation in Particle Physics



Contribution ID: 231 Type: Poster

The CALICE Digital Hadron Calorimeter: Calibration and Response to Pions and Positrons

The large CALICE Digital Hadron Calorimeter prototype (DHCAL) was built in 2009 - 2010 and was tested in the Fermilab and CERN test beams. The DHCAL uses Resistive Plate Chambers (RPCs) as active media and is read out with 1 x 1 cm2 pads and digital (or 1 - bit) resolution. With a world record of nearly 480k readout channels, the DHCAL offers the possibility to study hadronic interactions with unprecedented spatial resolution. Here we report on the results from the analysis of pion and positron events of momenta between 2 to 60 GeV/c collected in the Fermilab test beam. Particular emphasis is given to the intricate calibration procedure. The analysis demonstrates the unique utilization of detailed event topologies.

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Track Classification: Sensors: 1a) Calorimetry