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Optimization of Energy Resolution in the Digital Hadron Calorimeter using Longitudinal Weights J.R. SMITH, UT Arlington, B. BILKI, University of Iowa, K. FRANCIS, J. REPOND, J. SCHLERETH, L. XIA, Argonne National Laboratory, CALICE COLLABORATION — Physics at a future lepton collider requires unprecedented jet energy and dijet mass resolutions. Particle Flow Algorithms (PFAs) have been proposed to achieve these. PFAs measure particles in a jet individually with the detector subsystem providing the best resolution. For this to work a calorimeter system with very high granularity is required. A prototype Digital Hadron Calorimeter (the DHCAL) based on the Resistive Plate Chamber (RPC) technology with a record count of readout channels has been developed, constructed, and exposed to particle beams. In this context, we report on a technique to improve the single hadron energy resolution by applying a set of calibration weights to the individual layers of the calorimeter. This weighting procedure was applied to approximately 1 million events in the energy range up to 60 GeV and shows an improvement in the pion energy resolution. Simulated data is used to verify particle identification techniques and to compare with the data.

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