

Beam Test Results with Highly Granular Hadron Calorimeters for the ILC

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To evaluate technologies for ILC calorimetry, the CALICE collaboration has constructed a prototype of a highly granular analogue hadron sampling calorimeter with small scintillator cells, individually read out by silicon photomultipliers. This detector has been tested extensively in particle beams at DESY, at CERN and at Fermilab. A digital hadron calorimeter based on RPC read-out, is currently under construction, with first test beam results from small prototypes already available. The imaging capabilities of these calorimeters provide three dimensional information of hadronic showers with unprecedented resolution and will thus help to constrain hadronic shower models in simulation codes. The high granularity also opens up the possibility for improved energy resolution achieved with energy weighting algorithms and allows for novel calibration methods using minimum ionizing tracks identified within hadronic showers. We present results from the analysis of electromagnetic and hadronic events. Studies ranging from longitudinal and transverse shower profiles, compared to simulations with a variety of different models, to the investigation of the energy resolution and the linearity of the detector response, will be discussed.

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