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## **Test of a Digital Hadron Calorimeter (DHCAL) prototype with muons**

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We report on the preliminary results of the CALICE Digital Hadron Calorimeter (DHCAL) prototype from test beam with muons, as well as the noise measurement during the test beam. The DHCAL prototype is a sandwich calorimeter, using 38 2cm-thick iron plates as absorbers and Resistive Plate Chambers (RPC) between the absorber plates as the active medium. The calorimeter has extremely fine segmentation, with readout pads of the size of 1x1cm<sup>2</sup> in each layer and readout layer by layer. The DHCAL uses a digital readout scheme, which records only hit pattern of showers without knowing the detailed energy deposition within each hit. The prototype was tested at Fermilab Test Beam Facility (FTBF) in October 2010 and January 2011 with muons. We present the preliminary results on measuring front-end board alignment, RPC efficiency, hit multiplicity and DHCAL calibration constant, with the muon data. We simulated the muon responses with GEANT4, for particle interaction with the DHCAL, and with RPCsim, a standalone program that simulate the RPC response. We present the current status of the simulation and tuning according to muon data. We also present the preliminary results on DHCAL noise performance.

**Author:** REPOND, Jose (ANL)

**Presenter:** REPOND, Jose (ANL)

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