

Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Characterization of GEM Digital Hadron Calorimeter with 13bit KPiX Readout System Using Particle Beams¹ SAFAT KHALED, DANRAE PRAY, SEONGTAE PARK, JAEHOON YU, ANDREW JONES, NAM TRAN, BENJAMIN BLOOM, ANDREW WHITE, CHANGHIE HAHN, University of Texas at Arlington, UNIVERSITY OF TEXAS AT ARLINGTON HEP TEAM — The High Energy Physics Group at the University of Texas at Arlington has been developing a digital hadron calorimeter (DHCAL) for future linear colliders using double-layer Gas Electron Multiplier (GEM) detector in the sensitive gap. The group has built prototype double GEM detectors in several sizes and have exposed four 30cm x 30cm prototype GEM detectors to particle beams at Fermi National Accelerator Laboratory. One of these detectors utilized a 13bit KPiX chip and its accompanying read out system developed at the Stanford Linear Accelerator Center. This talk will present the results of the beam test data analysis to understand the characteristics and performance of the prototype detectors. More specifically, it will present the measured gain, response, and efficiency of the detectors as well as the dependence of these quantities on the ambient pressure, position at which the particle passes through the detector and the applied high voltage.

¹This work is supported by the U.S. Department of Energy.

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Date submitted: 06 Jan 2012

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