Contribution submission to the conference Aachen 2019

Gain Calibration and SiPM Saturation studies with the CALICE AHCAL — •Olin Lyod Pinto for the CALICE-D-Collaboration — Deutsches Elektronen-Synchrotron (DESY), Notkestraße 85, 22607 Hamburg Hamburg — Universität Hamburg, Mittelweg 177, 20148 Hamburg

ABSTRACT: An analog hadron calorimeter (AHCAL) prototype of $\sim$ 4 nuclear interaction length thickness has been developed and constructed by members of the CALICE Collaboration. The prototype consists of a 38-layer sampling structure of steel absorber plates and highly segmented active layers consisting of $21,888$ channels of $30 \times 30 \times 3$ mm^3 scintillator tiles read out by Silicon Photomultipliers (SiPM). The prototype is equipped with a LED system capable of determining SiPM quantities. The LED signals are used to determine the gain of the SiPMs. With the gain measurements, the homogeneity of the detector is studied, the stability and temperature dependence during the testbeam periods are monitored. The amplitudes measured in physics events need to be corrected for the non-linear behavior of the SiPMs due to their limited number of pixels. This saturation effect is studied compared to the data. The study is performed using data collected with the AHCAL at CERN SPS test beams 2018.

Part: T
Type: Vortrag;Talk
Topic: 3.05 Kalorimeter; 3.05 Calorimeters
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