PAPER

Beam test of n-type Silicon pad array detector at PS CERN

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Abstract

This work reports the test of an n-type silicon pad array detector at the CERN PS in the context of the future Forward Calorimeter (FoCal) detector. FoCal is a proposed upgrade in the ALICE detector operating within the pseudorapidity range of $3.2 < \eta < 5.8$. It aims to measure direct photons, neutral hadrons, vector mesons, and jets for the study of gluon saturation effects in the unexplored region of low momentum fraction x ($\sim 10^{-5}$–10^{-6}). The prototype is a 8×9 n-type Si pad array detector with each pad occupying one cm^2 area, fabricated on a 6-in, 325 ± 10 μm thick, and high-resistivity ($\sim$ 7 kΩ cm) Si wafer, which is readout using the HGCROCv2 chip. The detector is tested using pion beams of energy 10 GeV and electron beams of energy 1–5 GeV. The measurements of the Minimum Ionizing Particle (MIP) response of pions and the shower profiles of electrons are reported.

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