

Abstract

The muon trigger for the Backing Calorimeter (BAC) implemented in the ZEUS experiment is presented. The ZEUS experiment operated at the HERA accelerator in the Deutsches Synchrotron (DESY) laboratory in Hamburg. It was designed to study the proton structure and the nature of interaction of its constituents using high energy electron–proton collisions. After introducing the HERA accelerator and the ZEUS detector, the Backing Calorimeter was described in details. BAC was designed and constructed by physicists and engineers from University of Warsaw and AGH University of Science and Technology in Kraków. During the upgrade of the HERA accelerator and its detectors, the Backing Calorimeter was equipped with muon trigger. The motivation leading to this project, the description of the BAC muon trigger system and the detailed analysis of its performance constitutes the main content of this work. Finally, selected physics results obtained by using BAC as a muon detector are presented.