جـــامعة الفـــيوم
Fayoum University

STUDY OF RESISTIVE PLATE CHAMBER PERFORMANCE IN THE CMS EXPERIMENT ON THE LHC BEAMS AND IN A LOCAL COSMIC HODOSCOPE

By
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A thesis submitted in partial fulfillment
Of
The requirements for the degree of
Master of Science

In
Physics Science
(High Energy Physics)

Physics Department
Faculty of Science, Fayoum

FAYOUM UNIVERSITY

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Bachelor of science ٢٠٠٨

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Abstract

This thesis is focused on RPC performance by studying the ٢٠١١ CMS data. The main aims of this study to make sure of all parameters like efficiency, noise rate and cluster size are in the safety ranges.

This thesis is organized as follows. Chapter one gives a general introduction about the main characteristics of detectors and then focuses on gaseous detectors and some of its applications. Chapter two describes the LHC and the CMS-detector with its subsystems. More emphases is given to the muon system. The RPC chambers are described in detail: their basic design, working principle and requirements for CMS. Chapter three discusses some of the important parameters of RPC operation like noise rate, dark current and temperature. Detailed study for RPC efficiency, its measurement and monitoring, and cluster size is given in chapter four. Setting up of the cosmic hodoscope for testing RPC chambers is presented in chapter five.