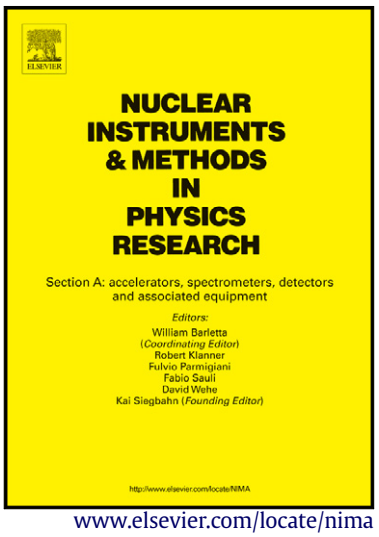

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M. Calvi[a,b], L. Cassina[a,b], A. Giachero[a,b], C. Gotti[a,b], M. Maino[a,b], C. Matteuzzi[a,b], G. Pessina[a,b]

[a] *INFN, Sezione di Milano Bicocca, Piazza della Scienza 3, 20126, Milano, Italy*
[b] *Dipartimento di Fisica G. Occhialini, Università degli Studi di Milano Bicocca, Piazza della Scienza 3, 20126, Milano, Italy*

Abstract

The characterization of the new Hamamatsu *R11265-103-M64* multi-anode photomultiplier tube is presented. The sample available in our laboratory was tested and in particular the response to single photon was extensively studied. The gain, the anode uniformity and the dark current were measured. The tube behaviour in a longitudinal magnetic field up to 100 G was studied and the gain loss due to the aging was quantified. The characteristics and performance of the photomultiplier tube make the *R11265-103-M64* particularly tailored for an application in high energy physics experiments, such as in the LHCb Ring Imaging Cherenkov (RICH) detector at LHC.

Keywords: RICH, Particle Identification, Photodetectors, Cherenkov radiation

1. Introduction

The Hamamatsu *R11265-103-M64* MaPMT is a 64-channel head-on photomultiplier tube able to detect single photons in the wavelength range from 185 to 650 nm. The device provides a fast response and an extremely high sensitivity to single photons. The *R11265-103-M64* is particularly suitable to be used in high energy physics experiments, such as in the LHCb Ring Imaging Cherenkov (RICH) detector at LHC, thanks to it's large active area (larger than 77%), the very low dark current, the negligible crosstalk and the pixel size of approssimately 2.9 x 2.9 mm^2.

The LHCb [1] detector at the LHC has shown a very successful operation in the last three years [2]. The data already collected are being used to pursue