Performance of scintillator tiles with different doping concentrations after irradiation

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Abstract

The performance of plastic scintillator degrades when exposed to radiation. We present results on degradation of the light output of scintillator tiles when irradiated by a ^{60}Co source for a variety of concentrations of the primary and secondary dopant. Tiles made from a blue scintillator with blue-to-green wavelength shifting fiber and for green scintillator with green-to-orange wavelength shifting fiber are presented.

Keywords: organic scintillator, radiation hardness, calorimetry

1. Introduction

Sampling calorimeters using plastic scintillator tiles with wavelength-shifting (WLS) fibers as the active element have been part of hadron collider experiments since the mid 1990's, when the CDF plug calorimeter was constructed[1]. Both the CMS Barrel[2] and Endcap[3] calorimeters use a similar design. During running of the LHC from its commissioning through 2012, the CMS detector was exposed to an integrated luminosity of XXX. Parts of the CMS endcap calorimeter are estimated to have received doses of

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2. Conclusions

3. Acknowledgements

This work was supported in part by U.S. Department of Energy Grant DESC0010072.

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