Influence of relative position gamma source–scintillator on response to a large NE102 rectangular detector

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Abstract

In this paper, the effects of a relative position gamma source-scintillator on the efficiency of a large NE102 rectangular plastic scintillator (50 cm ×50 cm × 5 cm) have been simulated and measured. The response functions of the plastic scintillator at different ^{137}Cs gamma source relative scintillator positions using MCNPX-PHOTRACK code have been simulated. The solid angle subtended by the detector at the location of the source for different situations has been analytically calculated, and the effects on the efficiency of changes in the solid angle as a function of distance between the source and detector have been identified. The comparison confirms that the simulated response function represents a promising agreement with experiments.

Keywords: Rectangular Plastic Scintillator; Efficiency; Solid Angle

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