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技术及应用

ST401闪烁探测器γ能量响应的实验研究

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摘要 对脉冲γ射线束测量中常用的一种由塑料闪烁体ST401组成的电流型闪烁探测器的γ能量响应进行了实验研究。利用反应堆、加速器等多种手段产生一系列准单能的γ射线，实验标定了包括^{137}Cs、^{60}Co在内的13个能量点，得到了ST401闪烁体相对灵敏度随入射γ射线能量的变化曲线。实验值与理论计算结果进行了比较，二者在不确定度范围内基本一致。

关键词 ST401闪烁体 电流型探测器 能量灵敏度 反应堆 加速器 准单能γ射线

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Experimental Study on Energy Sensitivity of ST401 Scintillation Detector to Gamma Ray

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Abstract The energy sensitivities of a current detector made up of ST401 plastic scintillator widely used in the field of pulse gamma rays measurements were studied experimentally. By means of pulse reactor and accelerator, a series of gamma rays with single or quasi-single energy were produced for calibration. The detector was calibrated by thirteen gamma energies including ^{137}Cs and ^{60}Co. The curve of relative energy sensitivities of the detector to incident gamma rays was obtained. The experimental result was compared with the theoretical calculation and they are in agreement within uncertainty.

Key words ST401 plastic scintillator current detector energy sensitivity reactor accelerator quasi-single energy gamma ray

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