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Sensitivity of GEB function of MCNP pulse height spectra on CLYC7 scintillator detector

The $\text{Cs}_2\text{LiYCl}_6\text{:Ce}$ or CLYC crystal is an inorganic scintillator which has been developed for the γ -ray and neutron measurement with the high detection efficiency, high resolution, no need unfolding technique. To enhance the measurement of the fast neutron, the CLYC with ^7Li -enrichment (hereafter referred to as CLYC7) scintillator are developed. In this work, the response of the CLYC7 detector to γ -ray is obtained using ^{137}Cs γ -ray calibration source and calculated using Monte Carlo N-Particle transport code (MCNP). A comparison of measured and calculated γ -ray spectra is complicated by the fact that physical radiation detectors have finite energy resolution. In this study, we treated detector energy resolution effect by Gaussian energy broadening (GEB) in MCNP pulse height spectra simulation. We observe the parameters in the GEB function that provided a spectrum that matches the experimental spectrum, especially on the photopeak region. The detail sensitivity of GEB function on CLYC7 scintillator detector will be presented in this work.

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