Analysis of nuclear resonance fluorescence excitation measured with LaBr3(Ce) detectors near 2MeV,

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Abstract:

The performance of LaBr3(Ce) to measure nuclear resonance fluorescence (NRF) excitations is discussed in terms of limits of detection and in comparison with high-purity germanium (HPGe) detectors near the 2 MeV region where many NRF excitation levels from special nuclear materials are located. The NRF experiment was performed at the High Intensity γ-ray Source (HIγS) facility. The incident γ-rays, of 2.12 MeV energy, hit a B4C target to excite the 11B nuclei to the first excitation level. The statistical-sensitive non-linear peak clipping (SNIP) algorithm was implemented to eliminate the background and enhance the limits of detection for the spectra measured with LaBr3(Ce). Both detection and determination limits were deduced from the experimental data.

Keywords:

NRF, LaBr3, Nuclear resonance

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