

Performance test of LaBr₃(Ce) detectors for fast-timing gamma-ray measurements

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In nuclear physics, the precise measurement on the lifetime of the quantum state is essential to understand the many-body quantum system. Specifically, the lifetime information of first 2+ level in even-Z even-N nucleus provides crucial information on the nuclear structure. As the rare-isotope beams could be produced, the nuclear shell or shape evolution toward the drip-line has become significant to understand the interactions of nucleons in the extreme environment.

A fast-timing gamma-ray detector system composed of the LaBr₃(Ce) scintillators are now under the development by the Center for Extreme Nuclear Matters (CENuM) in Korea to investigate the fundamental nuclear structure study on the very unstable nuclei far off the stability region. For the performance test, the bench tests of two LaBr₃(Ce) scintillators with the size of 1.5 inch diameter attached to the R13408 PMTs are carried out. In this talk, the results from the performance tests of the LaBr₃(Ce) detectors will be introduced.

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