

## Study on LaBr<sub>3</sub>(Ce) gamma-ray detectors by using Geant4 simulation

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The gamma-ray detector array composed of 24 LaBr<sub>3</sub>(Ce) scintillators is now in preparation for the decay spectroscopy with the fast-timing gamma-ray measurements by the Center for Extreme Nuclear Matters (CENuM) in Korea. Accordingly, the simulation based on the Geant4 framework has been performed for various purposes.

The encapsulated LaBr<sub>3</sub>(Ce) crystal with a size of 1.5-inch diameter was applied to the simulation to reproduce the energy spectra from the experiments with several radiation sources. Moreover, the self-radioactivity of La-138 contained in the crystal was considered to reproduce the background energy spectrum.

From our work on the simulation, the primary goals are as followings: reproducing the expected energy spectra from the specific beta-decay experiments, designing the detector configuration, and the efficiency calculations. In this presentation, we introduce our recent results from the Geant4 simulation of the LaBr<sub>3</sub>(Ce) gamma-ray detectors.

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