

## Simulation of Performance of LaBr<sub>3</sub> (Ce) Using GEANT4

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**Abstract :** Cerium-doped lanthanum bromide, LaBr<sub>3</sub> (Ce), scintillator shows attracting properties for spectroscopy that makes it a suitable solution for security, medical, geophysics and high energy physics applications. Here, the performance parameters of a cylindrical LaBr<sub>3</sub> (Ce) scintillator was investigated. The first aspect is the determination of the efficiency for  $\gamma$  - ray detection, measured with GEANT4 simulation toolkit from 10keV to 10MeV energy range. The second is the detailed study of background radiation of LaBr<sub>3</sub> (Ce). It has relatively high intrinsic radiation background due to naturally occurring <sup>138</sup>La and <sup>227</sup>Ac radioisotopes.

**Keywords :** LaBr<sub>3</sub>(Ce), GEANT4, efficiency, background radiation

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