

Simulation of Performance of LaBr₃ (Ce) Using GEANT4

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Abstract : Cerium-doped lanthanum bromide, LaBr₃ (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 LaBr₃ (Ce) scintillator was investigated. The first aspect is the determination of the efficiency for γ - ray detection, measured with GEANT4 simulation toolkit from 10keV to 10MeV energy range. The second is the detailed study of background radiation of LaBr₃ (Ce). It has relatively high intrinsic radiation background due to naturally occurring ¹³⁸La and ²²⁷Ac radioisotopes.

Keywords : LaBr₃(Ce), GEANT4, efficiency, background radiation

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