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# Dependence of Detection Efficiency and Neutron/Gamma Discrimination Ability on the Volumetric parameters of EJ-301 Liquid Scintillation Detector

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In this work, we investigate the relationship between the volumetric parameters of the cylindrical EJ-301 liquid scintillation detector and its detection efficiency and neutron/gamma discrimination capability. Eight detector configurations corresponding to cylindrical EJ-301 detectors of different length and diameter values connected to a photomultiplier tube have been modeled. Signals corresponding to these models, which were obtained using the Geant4 simulation program, have been analyzed using a neutron/gamma pulse shape discrimination method, i.e., the zero crossing one. The results indicate that the detector's diameter has an important impact on its neutron detection efficiency, whereas its neutron/gamma discrimination ability strongly depends on its length-to-diameter ratio.
**Keywords:** neutron/gamma discrimination, EJ-310 scintillator detector, ZC method, Geant 4 simulation.

## Minioral

No

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No

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Yes

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