# Investigating the effect of scintillator size on the shape of response function of NE102 and NE213 dDetectors for Gamma rays

**Mokhtar Yadollahi Roshan, Mojtaba Tajik***

School of Physics, Damghan University, Damghan, Iran

Received: 14.02.2018 Final revised: 04.06.2018 Accepted: 13.06.2018

## Abstract

The effect of size scintillator on the shape of the response function for cylindrical NE213 and NE102 organic scintillation detectors has been studied. The response functions of scintillators with different size when exposed to $^{137}Cs$, $^{60}Co$ and $^{22}Na$ gamma sources have been simulated using MCNPX-PHOTRACK hybrid code and then measured. Using the simulated and experimental response functions, the influence of the size of scintillator on the shape of the response function, efficiency, energy resolution and energy resolution function of NE102 and NE213 detectors has been calculated. The comparison confirms that the simulated efficiencies and energy resolutions of scintillators represents a promising agreement with experimental data and previously published experiments.

**Keywords:** Response Function, Gamma Ray, Efficiency, Energy Resolution, MCNPX-PHOTRACK

* Corresponding Author: tajik@du.ac.ir