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## Enhancement of Peak to Compton Ratio (P/C) using a New Array Design for Safeguards Applications

This paper focuses on installation of a new geometry and array of detectors to investigate reduction and suppression of unwanted noises and background to enhance P/C ratio. This objective is positively affecting the accuracy of safeguarded nuclear materials assay. The new array consists of three sodium iodide (NaI) detectors; one of them is in annular perpendicular position and the others are guards surrounding the main Hyper Pure Germanium Detector (HpGe). The optimum configuration for the array was selected to maximize P/C ratio and minimize the noises and Compton continuum that produced at higher-energy gamma-rays. The enhancement of the Peak-Compton (P/C) ratios was investigated using the radioactive source  $^{137}\text{Cs}$ . It was observed that the new array configuration enhanced the P/C ratios compared to single HPGe detector in range  $387.6 \pm 6.12$  to  $1001.12 \pm 7.4$ . The design was also investigated and applied on standard nuclear materials (SNM) at the photo peak 185.7 KeV of  $^{235}\text{U}$ . The system gave great value in the net area for photo peak 185.7 KeV for investigated SNMs samples. Since, The maximum difference was found to be 17.6%. The results are given, discussed and interpreted

### Which "Key Question" does your Abstract address?

TEC2.6

### Topics

TEC2

### Which alternative "Key Question" does your Abstract address? (if any)

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