Introduction: Radiation detectors are widely used in homeland security, be it for border protection or airports security. These detectors help in identifying radioactive sources and potentially other harmful materials (HEU, Plutonium etc.).

Detector requirements:
• Large size.
• Easy to manufacture.
• Low Cost.

Traditionally high Z elements are preferred for spectroscopy. These materials are hard to manufacture in large quantities and are relatively expensive. Plastics, on the other hand, are easy to manufacture and are relatively cheap. Plastic Detectors in themselves aren’t great at detecting photopeaks, therefore they are doped with a high Z element (Sn), thereby making plastics a viable option for spectroscopy.

Problem Statement: This work attempts to discriminate pulses from high Z (Sn) and low Z (C and H) elements in a loaded plastic detector using digital pulse shape discrimination algorithms. This discrimination would help in suppressing (spectral Improvement) the large Compton continuum observed in plastic detectors, thereby helping us recover other photopeaks under the continuum.

The scintillator has a cubic geometry with a 13.24 mm side, loaded with 13.2 w/w % Tin (Sn).

Implementation of Pulse Shape Discrimination for Gamma Spectrum Enhancement in a Metal Loaded Plastic Scintillator

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