Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

Depth of Gamma Ray Interaction in a Planar Ge Double-sided Strip Detector via Digital Signal Processing[1] T. HARRINGTON, J. THOMAS, S. LAKSHMI, P. CHOWDHURY, U. Mass. Lowell, C.J. LISTER, Argonne National Lab — Using a 1 GHz Lecroy Digital Oscilloscope to digitize waveforms, C++ programs and analysis software were developed for various digital signal processing (DSP) applications. In this research, we have focused on the DSP applications using a 16x16 planar high purity germanium double-sided strip detector, which measures 92x92x20mm. Using a ^{137}Cs source, electron and hole current signals were collected for photopeak events using one strip from both the front and back of the detector. The time resolution was measured by performing a custom constant fraction discrimination (CFD) routine on the waveforms and histogramming the time differences. The optimum time resolution was investigated by adjusting the CFD parameters. By analyzing the time differences between the electron and hole current signals, the possibility of determining the depth of a gamma ray's interaction point within the germanium detector was examined. The method used to determine time resolution, the optimization of the constant fraction discrimination parameters, and analysis techniques will be presented.

[1]Work Supported by the Department of Energy.

Thomas Harrington
U. Mass. Lowell

Date submitted: 29 Jun 2011 Electronic form version 1.4