Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Examining Signal Decomposition in Ge Tracking Detectors through Source-Based Coincidence Measurements[1] M. CROMAZ, C.M. CAMPBELL, R.M. CLARK, H.L. CRAWFORD, P. FALLON, I.Y. LEE, A.O. MACCHIAVELLI, A. WIENS, Lawrence Berkeley National Laboratory, L. RILEY, Ursinus College, R. TANIUCHI, University of Tokyo — The performance of a gamma-ray tracking detector, such as those used in the GRETINA spectrometer [1], is dependent on its ability to accurately locate multiple interaction points in the Ge crystal. Interactions are located by observing both net and induced charge as a function of time on the detectors segmented contact. As multiple interactions are likely, linear combinations of basis signals, a set of simulated signals with unit charge deposited on a grid that spans the detector volume, are fit against the observed signal yielding the interaction positions. While the location of the primary interaction point was found to be good ($\sigma_{pos} \leq 2$mm) the location of secondary, lower energy interactions appear less reliable. To investigate this issue, we carried out a series of source-based coincidence measurements. These employed a collimated source and a secondary detector by which we could select single interaction events. Given these events originate from known positions, we can take them in combination to directly test the efficacy of the signal decomposition procedure. We will present a description of the method and preliminary results with a GRETINA quad detector. [1] S. Paschalis, I.Y. Lee, et. al., Nucl. Inst. and Meth. in Phys. Res. A, 709 (2013) 44

[1]This work is supported by the U.S. Department of Energy under Contract No. DE-AC02-05CHI1231.

M. Cromaz
Lawrence Berkeley National Laboratory

Date submitted: 08 Jan 2016 Electronic form version 1.4