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Sub-segment interaction-point determination for 32-fold segmented high-purity Germanium detectors D.-C. DINCA, C.M. CAMPBELL, T. GLASMACHER, Department of Physics and Astronomy and National Superconducting Cyclotron Laboratory, Michigan State University, East Lansing, MI 48824, USA — Sub-segment position resolution of the gamma-ray interaction points has been demonstrated for the cylindrically-symmetric 32-fold segmented HPGe detectors of the NSCL/MSU Segmented Germanium detector Array (SeGA) using digital electronics. Waveforms of the real charge signals from segments that contain interaction points and induced charge signals from neighboring segments were digitally recorded in 100 MHz ADCs. Integrated quantities are extracted from the waveforms. By analyzing the asymmetry of the induced signals we could determine the proximity of the interaction point to segments without net-charge deposition, attaining sub-segment position resolution along the crystals symmetry axis and for the azimuthal angle. The radial position of the interaction point was determined through an analysis of the rise times of the real charge signals. Although less precise than other methods involving complete waveform analysis, the use of integrated quantities makes the problem of sub-segment interaction position estimation simpler.

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