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Mitigation of Beta-Gamma Summing in a Planar Germanium Double-Sided Strip Detector NICOLE LARSON, SEAN LIDDICK, CHRISTOPHER PROKOP, SCOTT SUCHYTA, JEROMY TOMPKINS, Michigan State University/NSCL — Beta-decay spectroscopy experiments at fragmentation facilities are typically performed using a position-sensitive solid-state detector as a stopping medium for radioactive ion implantation. Subsequent beta decays are detected and correlated to the previously implanted ions based on position and time information. The results from these beta-decay spectroscopy experiments are pertinent to nuclear structure and astrophysics applications. To maximize the beta-decay detection efficiency a novel planar germanium double-sided strip detector (GeDSSD) has been implemented at the National Superconducting Cyclotron Laboratory. While the GeDSSD offers a beta-decay detection efficiency that will be close to 90%, the detector also has a very high efficiency for low-energy gamma rays (15.7% at 250 keV, for example). This leads to a large percentage of events in which the simultaneous energy deposition from the beta decay and gamma ray sum together in the GeDSSD. In order to mitigate the beta-gamma summing effects and recover the high gamma-ray detection efficiency, an algorithm has been developed in an attempt to separate the energy deposition of beta-decay electrons from gamma-rays. Results of the algorithm in both GEANT4 simulation and experimental data will be presented.

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