

Abstract Submitted
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Effects of a Realistic Beam Profile on the Extraction of $\gamma\gamma$ Angular Correlations with GRIFFIN CONNOR NATZKE¹, KYLE LEACH, Colorado Sch of Mines, ADAM GARNSWORTHY, TRIUMF, ANDREW MACLEAN, University of Guelph, JENNA SMITH, Reed College, CARL SVENSSON, University of Guelph, GRIFFIN COLLABORATION — The GRIFFIN spectrometer at TRIUMF-ISAC is a powerful device for measuring gamma-gamma angular correlations following the decay of rare isotopes. GEANT4 simulations are essential in understanding the effects of detector shape, finite source and detector size, and source position. In this work, simulations exploring the sensitivity to a finite source radius and an off-centre source position on GRIFFIN's ability to accurately measure gamma-gamma angular correlations have been performed. The off-centre simulations provide insight into the beta decay of radioactive ions implanted onto a moving tape, which can be constantly moved through the chamber to prevent the build-up of long-lived radioactive daughter nuclei. The simulations indicate that a source radius or displacement of less than 1 cm has a minimal effect on the extracted gamma-gamma angular correlations. However, larger radii or offsets introduce significant deviations in the shape of measured angular correlations. The findings of these investigations will be discussed, along with ongoing simulation work of using the GRIFFIN array for Compton polarimetry measurements.

¹On behalf of the GRIFFIN Collaboration

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