Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

$\gamma - \gamma$ Angular Correlation Measurements With GRIFFIN[1] ANDREW MACLEAN, University of Guelph, GRIFFIN COLLABORATION — When an excited nuclear state emits successive γ-rays causing a $\gamma-\gamma$ cascade an anisotropy is found in the spatial distribution of γ_2 with respect to γ_1. Defining the direction of γ_1 as the z-axis, the intermediate level, in general will have an uneven distribution of m-states. This causes an anisotropy in the angular correlation of the second γ-ray with respect to the first. These angular correlations are expressed by the $W(\theta)$ that depends on numerical coefficients described by the sequence of spin-parity values for the nuclear states involved, the multipolarities and mixing ratios. Angular correlations can be used for the assignment of spins and parities for the nuclear states, and thus provide a powerful means to elucidate the structure of nuclei far from stability through $\beta - \gamma - \gamma$ coincidence measurements. In order to explore the sensitivity of the new 16 clover-detector GRIFFIN γ-ray spectrometer at TRIUMF-ISAC to such $\gamma - \gamma$ angular correlations, and to optimize its performance for these measurements we have studied a well known $\gamma - \gamma$ cascade from ^{60}Co decay through both experimental measurements and Geant4 simulation. Results will be shown in this talk.

[1]Work supported by the Canada Foundation for Innovation, the Natural Sciences and Engineering Research Council of Canada and the National Research Council of Canada.

Andrew MacLean
University of Guelph

Date submitted: 01 Jul 2015 Electronic form version 1.4