

Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Empirical Determination of Effective Germanium Detector Efficiency for Use in Sample Assays BENJAMIN H. LAROQUE, LANL, UNC Chapel Hill, S.R. ELLIOTT, V.E. GUISEPPE, LANL, R.A. JOHNSON, Univ. of Wash., MAJORANA COLLABORATION — The MAJORANA project is an experiment which uses gamma ray detectors made of enriched Ge-76 to detect neutrinoless double-beta decay, a process which would indicate that the neutrino is its own antiparticle. Studies of such a rare decay process require very low background levels, making contamination by neutrons at the Earth's surface potentially significant. To quantify this contamination, a piece of enriched germanium was exposed to a high-intensity, broad-spectrum neutron beam before being assayed using a low background gamma ray spectrometer. The analysis of the assay data is dependent on knowing the detector's efficiency at the sample gamma energies. Those values can be interpolated from an empirically determined efficiency curve but producing such a curve is nontrivial because efficiency values are also needed to correct for the coincidence summing effects from gamma cascades and positron annihilations. The process of generating a partial efficiency curve will be presented along with the analysis used to account for coincidence summing and the results of the sample assay.

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Date submitted: 30 Jul 2009

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