

Abstract Submitted  
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**Modeling the Efficiency of a Germanium Detector** KEITH HAYTON, MICHELLE PREWITT, C.A. QUARLES, Texas Christian University — We are using the Monte Carlo Program PENELOPE and the cylindrical geometry program PENCYL to develop a model of the detector efficiency of a planar Ge detector. The detector is used for x-ray measurements in an ongoing experiment to measure electron bremsstrahlung. While we are mainly interested in the efficiency up to 60 keV, the model ranges from 10.1 keV (below the Ge absorption edge at 11.1 keV) to 800 keV. Measurements of the detector efficiency have been made in a well-defined geometry with calibrated radioactive sources: Co-57, Se-75, Ba-133, Am-241 and Bi-207. The model is compared with the experimental measurements and is expected to provide a better interpolation formula for the detector efficiency than simply using x-ray absorption coefficients for the major constituents of the detector. Using PENELOPE, we will discuss several factors, such as Ge dead layer, surface ice layer and angular divergence of the source, that influence the efficiency of the detector.

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