ID: Type: **Poster**

'CARD': Characterization of Adjoint Response for Ge Detectors

Gamma ray spectroscopy is an important tool in ensuring treaty verification and compliance. In employing this tool, it has proven useful to completely characterize the detector efficiency that is yielded via deterministic adjoint radiation transport analysis of typically fielded germanium gamma detectors. The adjoint transport methodology can be readily utilized to produce a high fidelity mapping of the precise detector efficiency for any gamma ray striking a detector originating from any location surrounding the detector at any specific gamma energy. This mapping can prove to be very important in understanding the subtle effects of source placement and sample geometry on the detector efficiency, and thus the overall sensitivity of the detector measurement and detectable quantities being measured, etc. In this paper, we computed the detector efficiency using the 3-D deterministic Sn code PENTRAN to solve the adjoint form of the Boltzmann radiation transport equation over a high resolution space-angle-energy grid (the "phase space") used to accurately describe a shielded 2" x 2" coaxial Germanium detector. Overall, we will demonstrate how a complete computational adjoint characterization of a radiation detector's response over the space-angle-energy grid minimizes the uncertainty in counting any sample.

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