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Determining Scintillator Nonlinearity using the Wide Angle Compton Coincidence Technique[1] ANNA BEGGS, ELIZABETH GEORGE, PAUL VOYTAS, Wittenberg University — At some level, scintillator materials have an energy response that can be nonlinear. The Wide Angle Compton Coincidence (WACC) technique provides some advantages to finding the nonlinearity of a detector by using Compton scattering from this detector into another detector known to be linear, in this case a High Purity Germanium (HPGe) detector. The detectors are in a close geometry and so the Compton scattering that happens in the tested detector over many angles gives an energy response over a range of energies. From the known gamma ray energy and the HPGe photon energy detected, the analysis of a 2D histogram of the scattering detector response vs. the HPGe response provides a means of measuring the scattering detector's nonlinearity. I will describe our implementation of the WACC technique to measure the nonlinearity of scintillators used for a precision measurement of the ^{20}F beta spectrum shape as a search for physics beyond the standard model.

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