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Marc Louis Klasky* (mklasky@lanl.gov), Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545, and **Michelle Espy** and **David Moir**. *Determination of Photon Energy Spectra using Compton Spectrometer.*

The determination of the photon energy spectrum produced by radiographic systems is important in performing radiographic analyses at Los Alamos National Laboratory. Recently, a Compton Spectrometer has been fielded to perform measurements at both the Dual Axis Hydrodynamic Radiographic Test Facility as well as the Los Alamos Microtron. These experiments involve the production of electrons, via a Compton scattering interaction on a convertor target, that are then focused with a magnetic field onto an phosphor image plane. Previously to infer the incident photon spectra assumptions were made regarding the localization of the electrons attributed to a particular photon energy on the image plane. Furthermore, multiple scattering interactions and pair production interactions on the convertor target were ignored. In this presentation we will present a much more powerful method of solving this Inverse Problem utilizing point spread functions calculated with MCNP incorporating the magnetic fields. Application of the point spread functions then allows for the construction of a linear set of equations to be obtained. A simple least squares solution may then be utilized to reconstruct the incident photon energy spectra. (Received February 28, 2017)