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Photonuclear Physics Applications for Isotopic Detection and Assay¹ M.S. JOHNSON, LLNL, SJSU, J.M. HALL, D.P. MCNABB, LLNL, J.J. GONZALEZ, SJSU — National security and international safeguards programs are interested in new technologies that utilize gamma-ray sources to detect special nuclear materials (SNM) and/or assay isotopes of interest in a variety of shielded configurations. There are many constraints and caveats that must be addressed such as fast scan times to avoid commercial backlogs. Other challenges include determining the total mass of minute traces of certain isotopes in thick, highly radioactive, nuclear fuel assemblies. This presentation will focus on a high-altitude view of how processes such as nuclear resonance fluorescence (NRF) and photo-fission can function in a variety of applications. We will present an overview of performance estimates for a wide-range of applications. We will also present results from recent validation measurements.

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