Abstract Submitted
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Nuclear Resonance Fluorescence Measurements on ^{237}Np for Security and Safeguards Applications[1] C.T. ANGELL, T. JOSHI, RYAN YEE, E.B. NORMAN, UC Berkeley, W.D. KULP, GeorgiaTech, G.A. WARREN, PNNL, S. KORBLY, A. KLIMENKO, C. WILSON, Passport Systems, R. COPPING, D.K. SHUH, LBNL — The smuggling of nuclear material and the diversion of fissile material for covert weapon programs both present grave risks to world security. Methods are needed to detect nuclear material smuggled in cargo, and for proper material accountability in civilian fuel re-processing facilities. Nuclear resonance fluorescence (NRF) is a technique that can address both needs. It is a non-destructive active interrogation method that provides isotope-specific information. It works by using a γ-ray beam to resonantly excite levels in a nucleus and observing the γ-rays emitted whose energy and intensity are characteristic of that isotope. ^{237}Np presents significant safeguard challenges; it is fissile yet currently has fewer safeguard restrictions. NRF measurements on ^{237}Np will expand the nuclear database and will permit designing interrogation and assay systems. Measurements were made using the bremsstrahlung beam at the HVRL at MIT on a 7 g target of ^{237}Np with two incident electron energies of 2.8 and 3.1 MeV. Results will be presented with discussion of the relevant nuclear structure necessary to predict levels in other actinides.

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