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Improved Neutron Capture Gamma-Ray Data and Evaluation[1]

B. SLEAFORD, LLNL, SHAMSUZZOHA BASUNIA, LBNL, F. BECVAR, Charles University, Prague, T. BELGYA, Centre for Energy Research, Hungarian Academy of Sciences, L. BERNSTEIN, LLNL, H. CHOI, Seoul National University, J. ESCHER, Lawrence Livermore National Laboratory, R. FIRESTONE, LBNL, C. GENREITH, Institute for Energy and Climate Research, F. GUNSING, CEA Saclay, A. HURST, LBNL, M. KRTICKA, Charles University, Prague, Z. REVAY, Forschungsneutronenquelle Heinz Maier-Leibnitz (FRM II), M. ROSSBACH, Institute for Energy and Climate Research, N. SUMMERS, LLNL, L. SZENTMIKLOSI, Centre for Energy Research, Hungarian Academy of Sciences — The neutron-capture reaction is of fundamental use in identifying and analyzing the gamma-ray spectrum from an unknown object as it gives a fingerprint of which isotopes are present. Many isotopes have capture gamma lines from 5-10 MeV potentially making them easier to detect against background lines. There are data gaps in the Evaluated Nuclear Data File (ENDF) libraries used by modeling codes (the actinides have no lines for example) and we are filling these with the Evaluated Gamma-ray Activation File (EGAF), using an IAEA atlas of reactor measured lines and cross sections for over 260 isotopes. For medium to heavy nuclei, the unresolved part of the gamma cascades is not measured and are modeled using the statistical nuclear structure code Dicebox [1, 2]. ENDF libraries require cross sections for neutron energies up to 20 MeV and we plan to continue this approach through the resolved resonance region.

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