Berkeley Nuclear Database Projects: Neutron Capture

In the presentation two databases developed at UC Berkeley related to thermal neutron capture are described:

pyEGAF: A Python package [1] enabling access, manipulation, analysis and visualization of thermal neutron-capture gamma-ray data from the Evaluated Gamma-ray Activation File (EGAF). The package is bundled with the complete library of all 245 EGAF datasets in the original ENSDF and translated RIPL and JSON formats. A brief overview of its utility including methods related to statistical-model applications will be presented in addition to the general handling of the EGAF data.

APGAA: Analytical attenuation in Prompt Gamma Activation Analysis (PGAA); a program implemented in C++ to calculate the attenuation integrated over the sample thickness for elemental and compound sample materials utilized in PGAA measurements [2]. The package comes complete with the XMuDat database of mass-attenuation coefficients for 100 elements. A brief introduction to the project will be presented.

[1] A.M. Hurst, R.B. Firestone, E.V. Chimanski, Nucl. Instrum. Methods Phys. Res. Sect. A **1057**, 168715 (2023); <https://pypi.org/project/pyEGAF/>

[2] A.M. Hurst, N.C. Summers, L. Szentmiklosi, R.B. Firestone, M.S. Basunia, J.E. Escher, B.W. Sleaford, Nucl. Instrum. Methods Phys. Res. Sect. B **362**, 38 (2015);

<https://github.com/AaronMHurst/attenuation_integration>