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Radioactive Decay Calculations from the Independent Fission Product Yield

Thursday, 13 October 2022 14:00 (30 minutes)

This talk will give a brief introduction of radioactive decay calculations. We developed a Python package for radioactive decay calculations from the independent yields, Y_I(Z,A,M), by keeping track of the inventory including isomeric states, M.

It supports decay chains of radio nuclides, metastable states, and branching decays. By default it reads the ENDF-6 format decay data and convert into simple text or JSON format, and then create a decay chain from a particular fission product. The code solves the Bateman equation analytically. To undergo from Y_I(Z,A,M) to the cumulative yields, Y_C(Z,A,M), a time-independent calculation is performed. The outputs are Y_C(Z,A,M), decay heats from gamma and beta ray components, and delayed neutron yield. The code includes a plot method for drawing decay chain diagrams.

We also developed a web tools for the nuclear data visualizations, which is mostly for the cross sections, but also fission product yields.

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