

Beta-Delayed Neutron and Gamma Data and FPY Data for ENDF/B-VII.1 sublibraries

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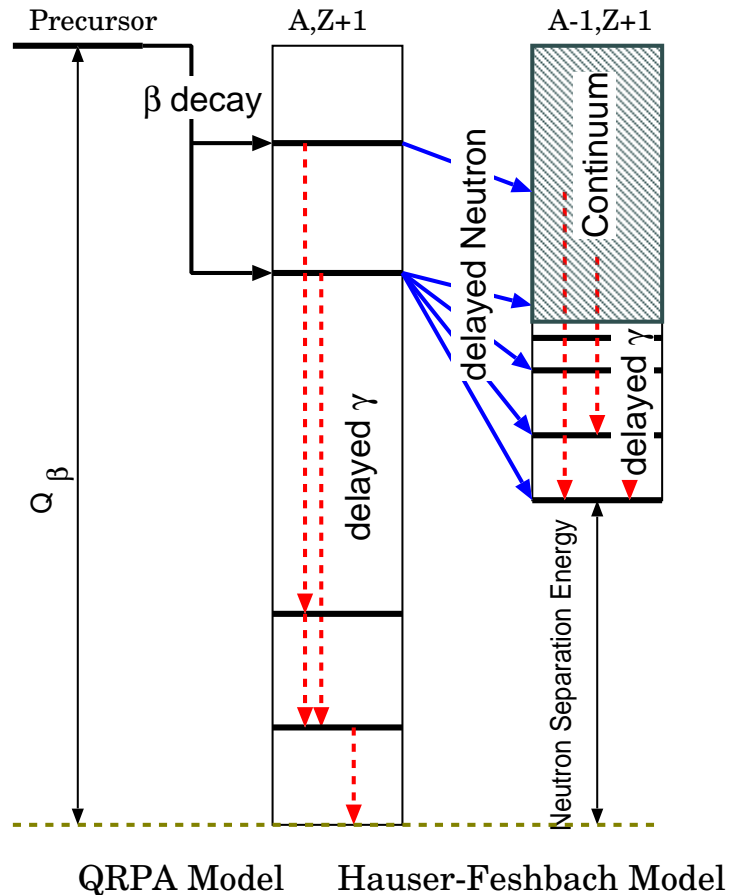
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A. Sonzogni

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Beta-Delayed Neutron And Gamma-Ray Emission

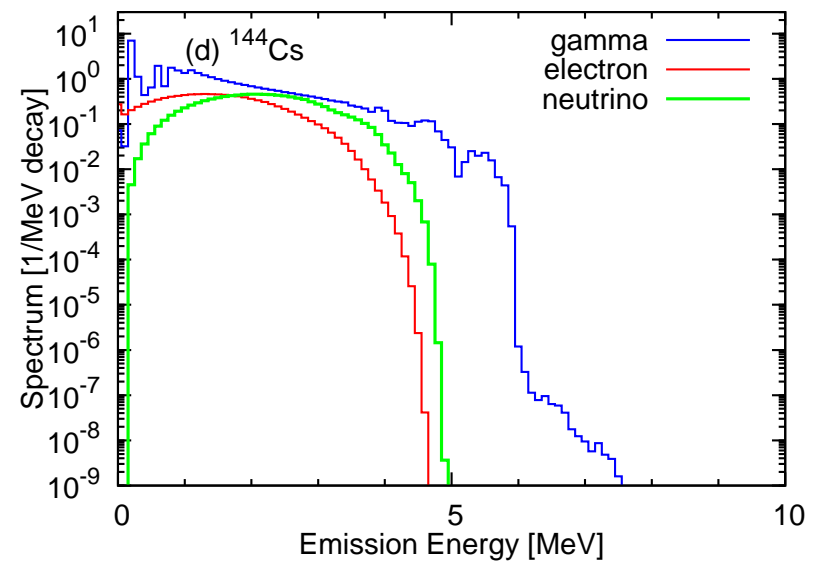
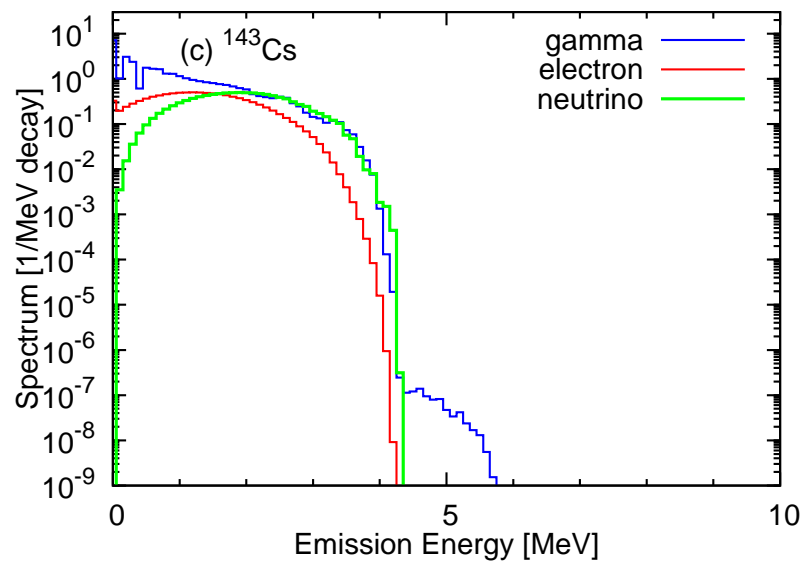
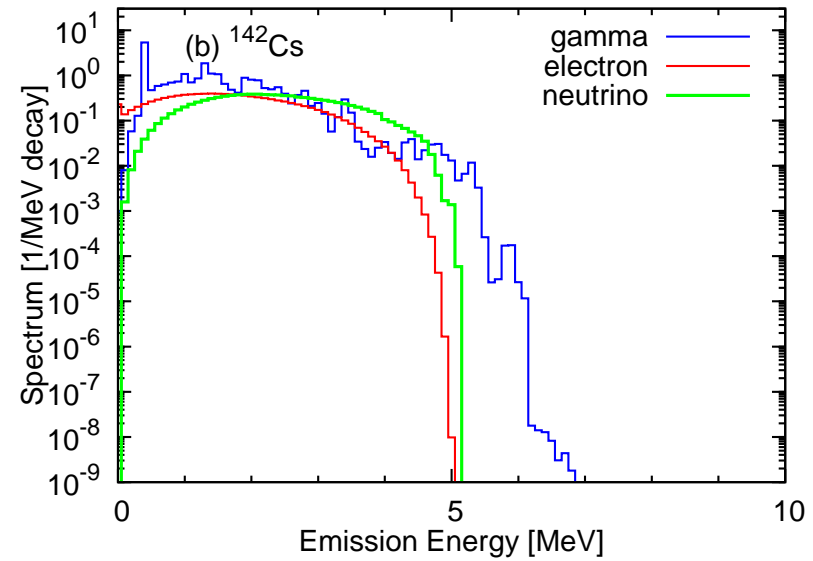
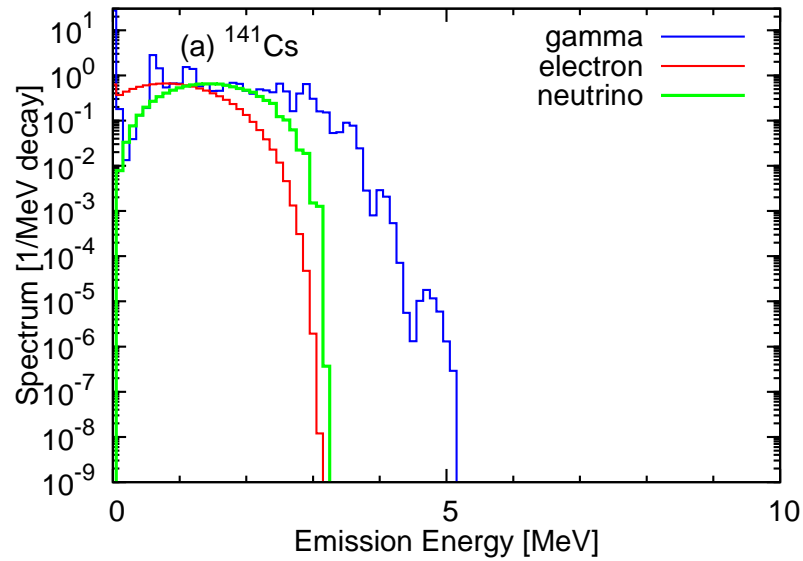
Statistical Hauser-Feshbach Model for Beta-Decay



- γ -ray emission takes place in both daughter and grand-daughter nuclei.
- To calculate the delayed γ spectra, we need to follow all γ -ray cascade.
 - Individual low-lying transitions are important.
 - The evaluated structure data in ENSDF are incorporated;
 - β -decay to discrete levels
 - γ -ray branching ratios
- The whole decay process, including γn , is calculated with the Hauser-Feshbach model.
- Multiple-neutron emission considered for neutron-rich nuclei.

The results were compiled into ENDF-6 format at BNL/LANL for the ENDF/B-VII.1 decay data library

Cs Isotopes



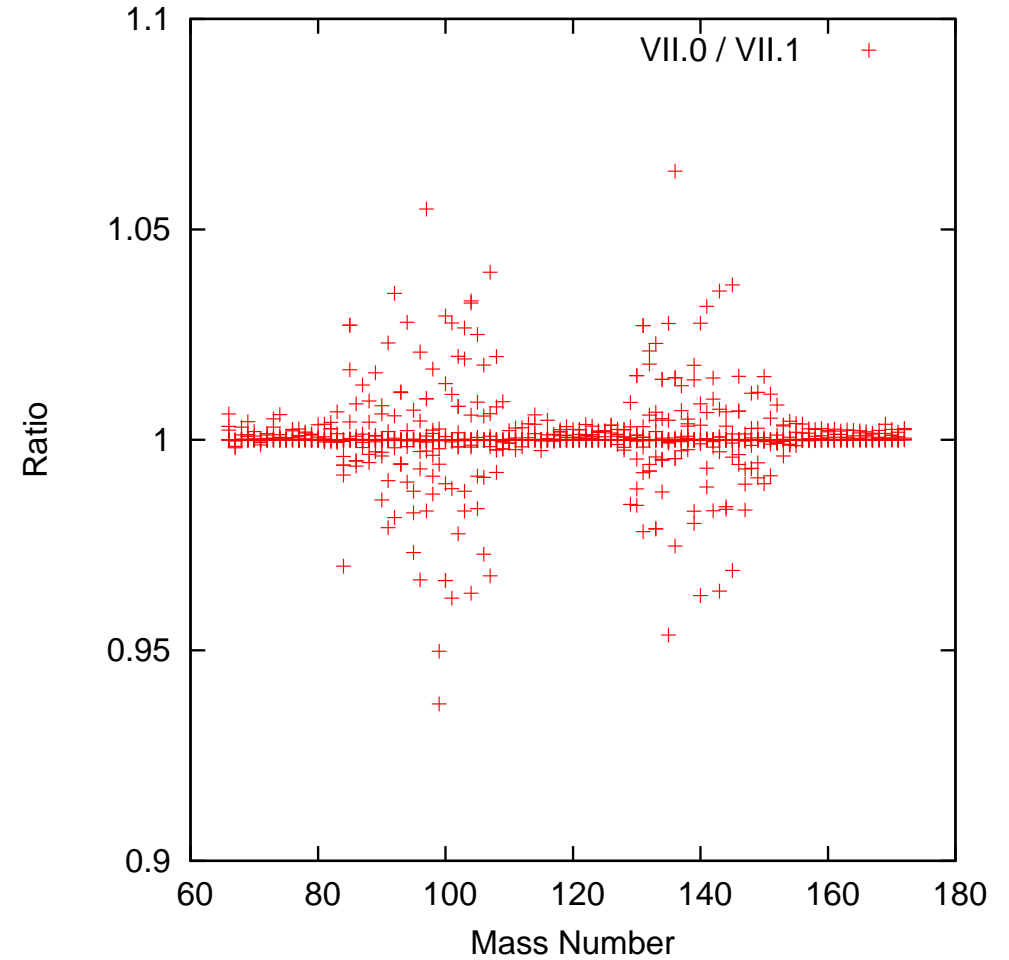
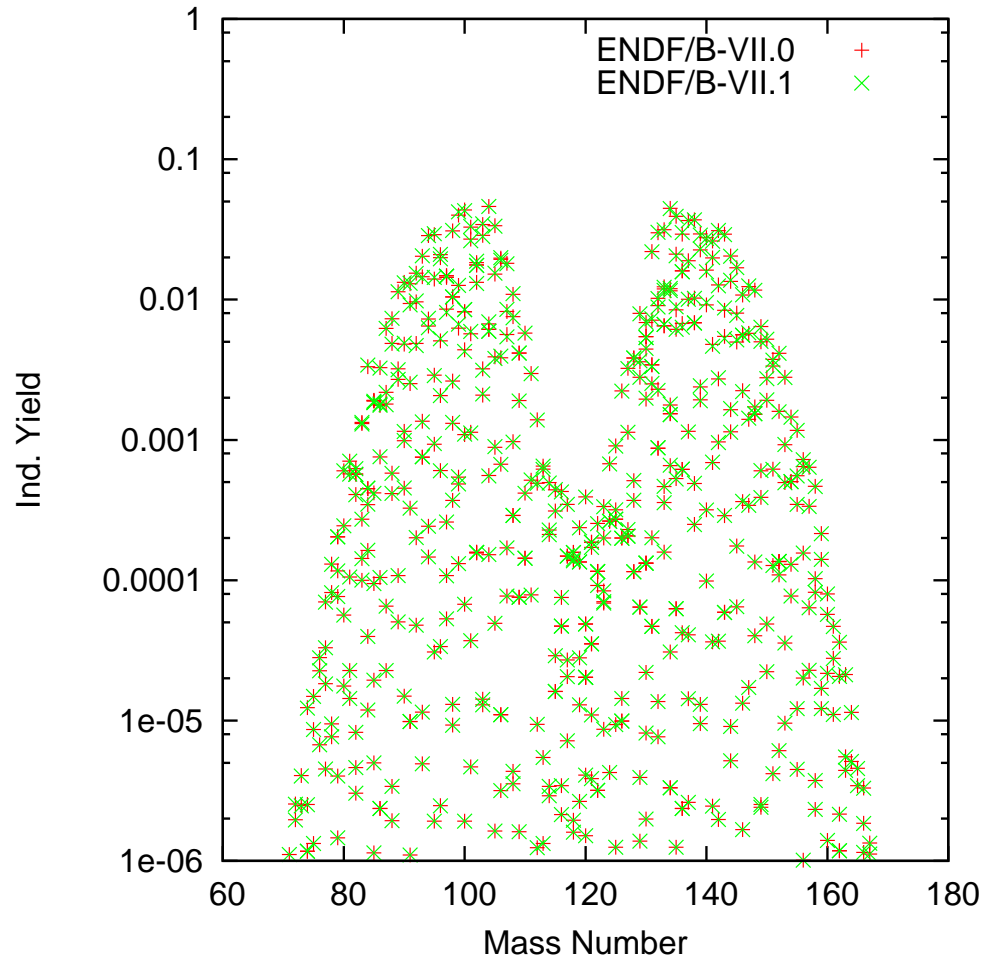
New FPY Evaluation for Pu-239 at LANL

- Re-analysis of chain yields by Chadwick et al. (NDS **111**, 2923 (2010))
- Energy dependence considered
 - FPY data given at the thermal (same as before), 0.5 MeV, 2 MeV, and 14 MeV
- Require both cumulative yields and independent yields that are consistent with the evaluated chain yield
- We employed an adjustment technique with the KALMAN code
 - calculate decay chain from IY to CY using the decay data in CINDER2008
 - calculate sensitivities of the individual FP to the chain yield
 - apply KALMAN to update the IY, including constraint;

$$\sum Y_i = 2, \quad \sum Y_i A_i = 240 - \bar{\nu}, \quad \text{and} \quad \sum Y_i Z_i = 94$$

- calculate decay chain again to obtain CY

Independent Yields at 500 keV



Cumulative Yields at 500 keV

