Evaluations for ENDF/B-VII

- Observations on Data Testing
- Summary of Beta2 to Beta3 changes
- Deficiencies to fix

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+ thanks to the many others who worked hard!

Eval. cross sec changes from beta2 to beta3:

1. 237Np: unresolved resonances from JENDL tweaked to better match new LANSCE data
2. 235U thermal delayed nubar decreased to JENDL 3.3 value, motivated by beta-eff data testing
3. 233U nubar at thermal decreased to standards value (by 0.3%)
4. 90Zr updated by BNL as beta2 version did not perform well for KAPL and Bettis
5. Young tweaked prompt neutron nubar > 6 MeV for major actinides, to use proper Cf standard
6. Chadwick and Trellue updated the LA150 n+56Fe file to better reproduce Haights (n, x alpha) data
7. Young fixed up many non-LANL photonuclear files that had format problems: issues noted by White
8. Implemented Madland-like energy release in actinide fission - positive peer review from Rowlands
9. BNL included covariance data into 89Y and 191,193Ir LANL-BNL evaluations, + Gd updates
10. 208Pb resonances improved by Mughabghab
11. Many more BNL tweaks… details by Mike! Kerma improvements.

12. NJOY changes made to read (over!) LLNL actinide delayed gamma data (now for 235U and 239Pu)
13. NJOY changes made to include Madland-like actinide fission energy release - fixed a bug in old NJOY
14. Other NJOY fixes…

15. No change to Wilson DN, but Alejandro noted some problems in our example-figure, and this led to a discovery that Bill had been mis-representing the performance of old endf/b-vi (bug in his code)
    - applies to just 6-group time-dependence parameters
    - new b-vii data not clearly better than old data
    - but, his b-vii data seem to perform as well as old data

Actinide covariance data into ENDF-A. LANL made progress on ERROR-J with Go Chiba

Observations on Beta 3 data testing validation: Excellent - Better than Beta2

1. 235U thermal delayed nubar decrease (by Cecil, to match JENDL data) appears to improve beta-effectiveVDM testing, as we expected,
2. 233U tweak to lower thermal nubar to the standards value improved testing
   -but Bob M & Russ have identified some likely deficiencies in 233U, and some puzzles.
3. Beta3 Zr performs well for KAPL and Bettis.
   - but some other assemblies involving 233U and Zr have mixed results. Don't know if this is due to Zr, or 233U, or both.
4. Fast nubar tweaks for 235,238,239Pu >6 MeV (to use proper Cf standard) didn't impact good agreements
5. 237Np small change (JENDL resonances adopted, and unresolved parameters tweaked to match LANSCE data) : Np-U crit still modeled better than B-VI. (0.9956 now; B-VI was < 0.99)
6. 9Be. Discovered that whilst some crits improved with our beta3=beta2 changes to elastic, other crits became substantially worse. Need to solve in longer term.
7. LANL's updated fission energy release included in beta3, with NJOY improvements (bug fixed). Like Madland, but not identical to Madland because of ENDF-6 format limitations. Doesn't impact data testing.
8. Reaction rates re-calculated by Holly Trellue. Consistent results except for 238U capture.
9. Morgan White tested g+235U and 181Ta using beta3. Consistent results.

Known deficiencies… to fix for B-VII: NOTE: Must not change beta3 data testing!

- (Another!) Am datafile problem fixed. Little noticed a bug…revised version already sent to BNL.

- Rh-103?

- Young-corrected non-LANL photonuclear files put into B-VII