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ENDF/B-VII.1 library - current and future trends in reaction data

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The ENDF/B-VII.0 library, made available in December 2006, has been the first major release of the US nuclear reaction data library in 16 years. Intensive validation proved generally good performance of the library but a number of deficiencies were discerned. In 2008 CSEWG decided to undertake multi-laboratory effort leading to VII.1 version, which is scheduled for release in December 2011. Highlights of the new library include (i) a consistent set of covariance data, for over 180 materials, targeting explicit needs of the Advanced Fuel Cycle Initiative, (ii) new R-matrix based evaluations for several light nuclei, (iii) evaluations for reactions on structural materials in both the fast neutron region and the resonance region, (iv) improvements of resonances regions and thermal cross sections for certain fission products and neutron absorber materials (Cd, Gd), (v) improvements in minor actinide evaluations for isotopes of U, Np, Pu, and Am, (vi) adoption of JENDL4.0 evaluations for the Cm, Bk, Cf, Es, Fm, and some other minor actinides, (vii) fission product yield advances for fission-spectrum neutrons and 14 MeV neutrons incident on ^{239}Pu , and (viii) a new Decay Data sub-library. No significant changes are expected for the major actinides $^{235,8}\text{U}$ and ^{239}Pu , except reverting delayed neutron data to ENDF/B-VI.8 and adding covariances. Current update concerns only the most important neutron, fission yields, and decay data sub-libraries leaving the remaining 11 sub-libraries unchanged. Open issues and trends for the future releases of the ENDF/B will be discussed.