Validation of ENDF/B-VIII.0β4 with Pu, ^{235}U and ^{238}U LLNL Pulsed Spheres

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LLNL Pulsed Spheres are:

- A series of pulsed sphere measurements for materials of H_2O to ^{239}Pu designed for testing of transport codes and nuclear data, e.g., C. Wong et al., UCRL-51144 (1972).
- 14-MeV neutron beam brought to the center of sphere.

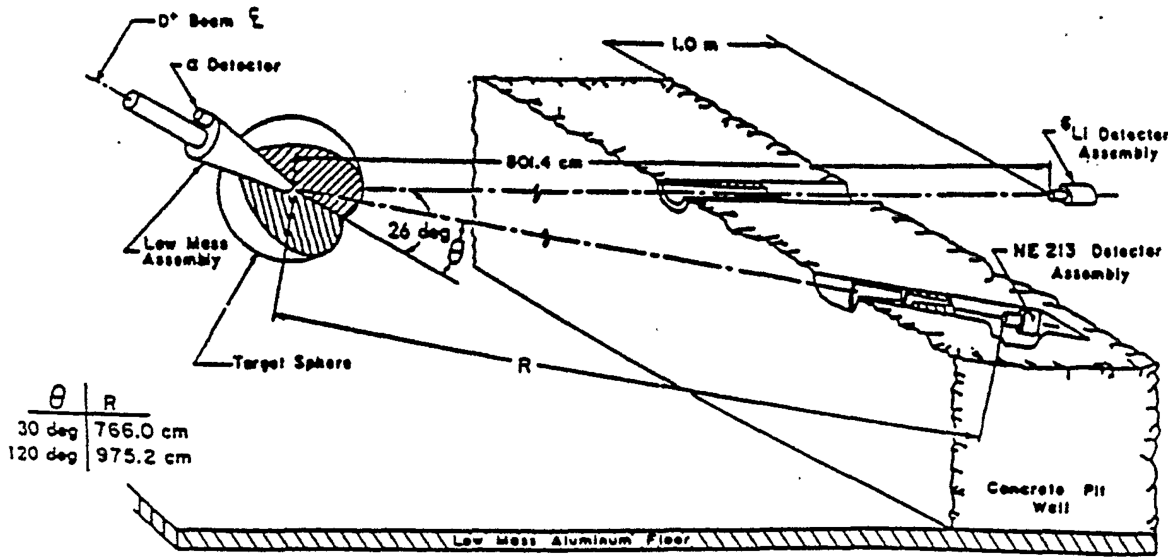
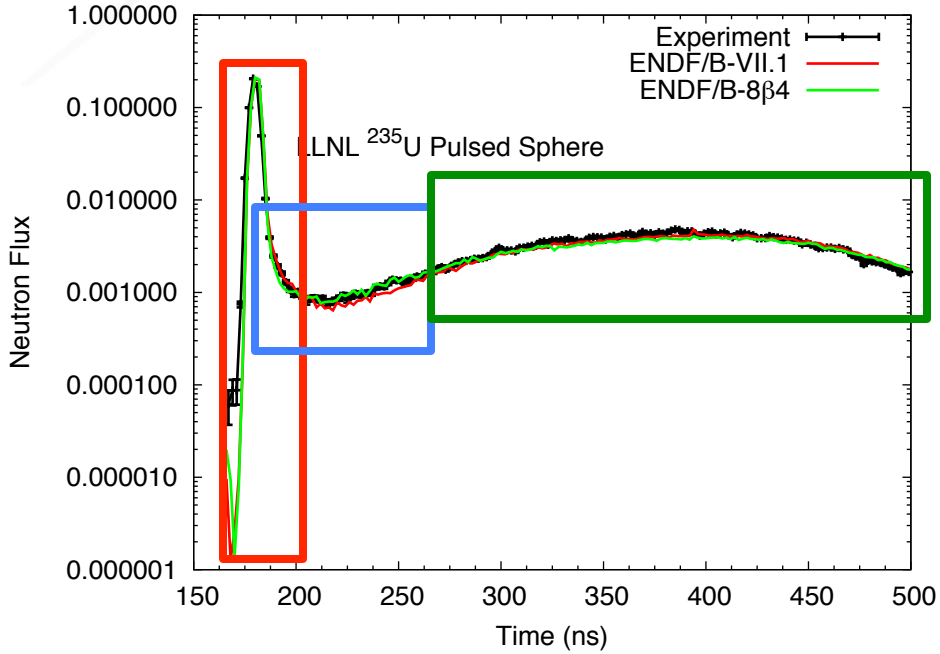


Fig. from LA-UR-96-2143

LLNL Pulsed Spheres have been used:

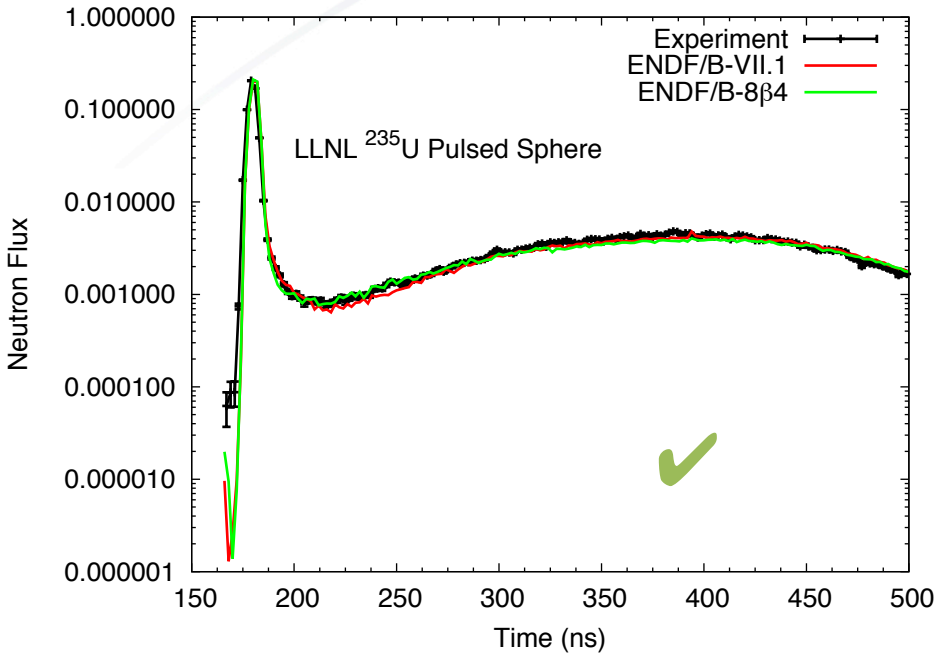
- Extensively for ENDF/B-VI data testing (^{6,7}Li, Be, C, N, O, Mg, Al, Ti, Fe, W, Pb, ^{235,238}U, ^{239}Pu, H_2O, D_2O, CH_2, CF_2, Concrete), see, e.g., R.D. Mosteller, S.C. Frankle and P.G. Young, LA-UR-96-2143.
- as justification to improve ^{235}U and ^{239}Pu (n,xn) cross sections for ENDF/B-VII.0.
- Little for ENDF/B-VII.1 validation (^{235,238}U, ^{239}Pu). Not much change seen compared to ENDF/B-VII.0.

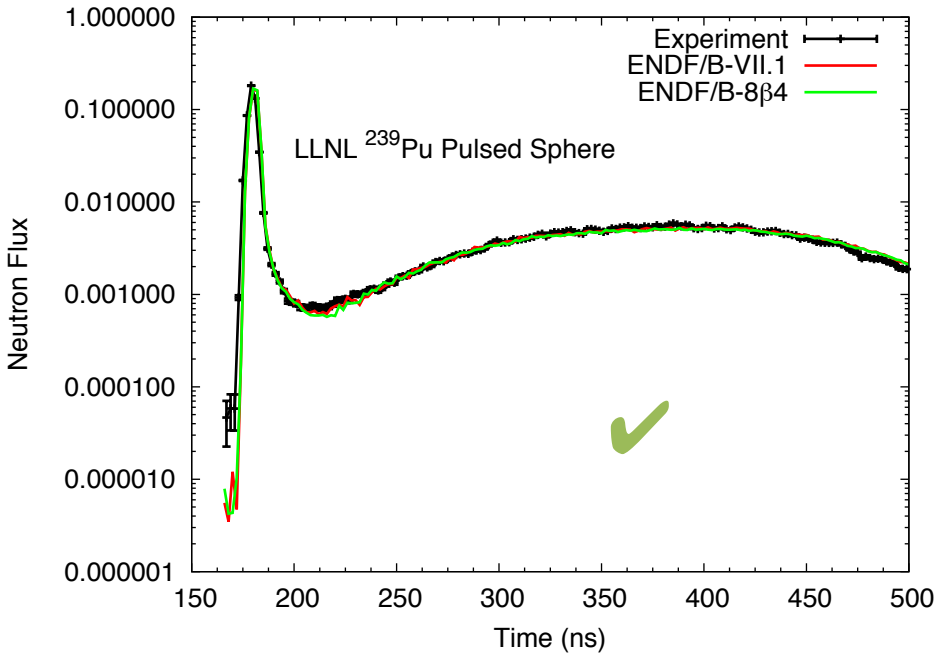
Pu, ^{235}U and ^{238}U LLNL Pulsed Spheres can be used to benchmark:



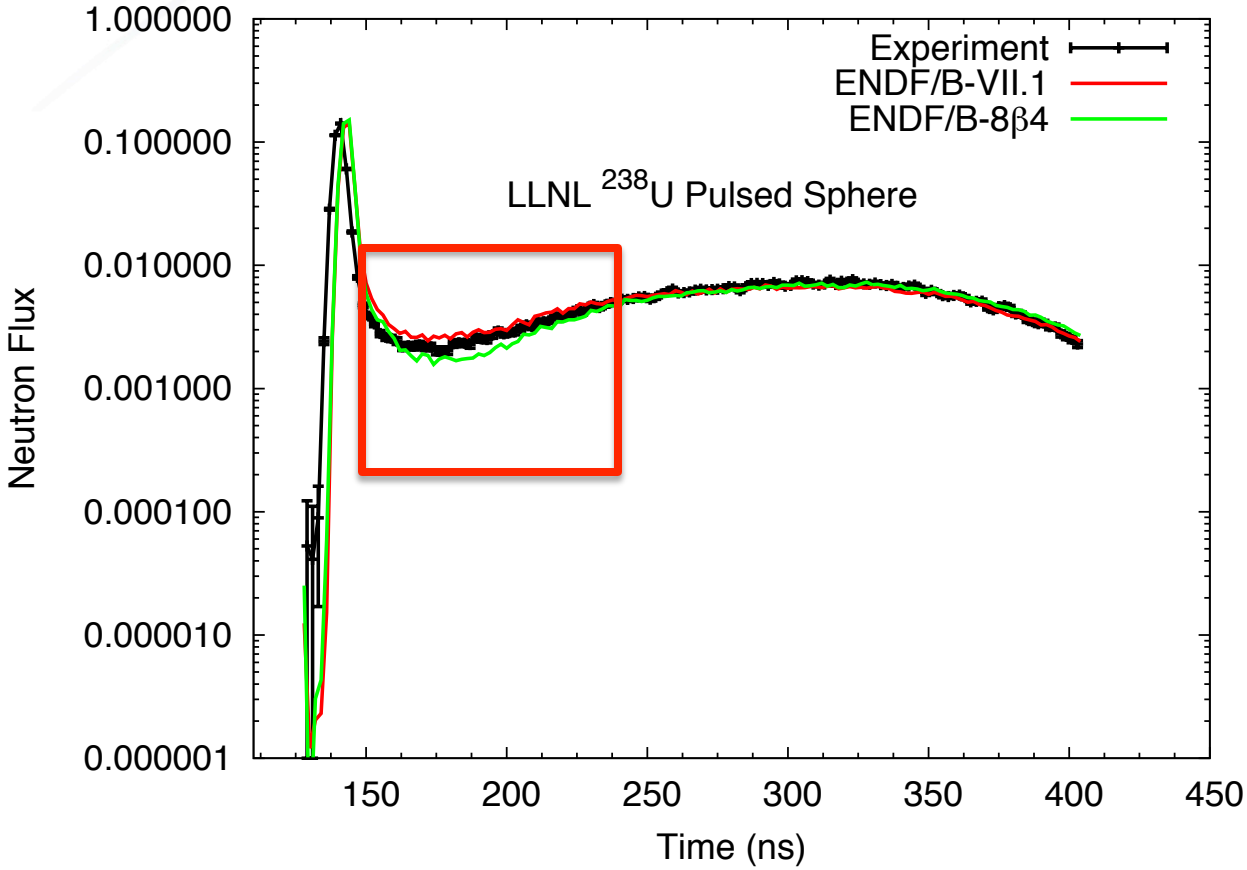
- 14-MeV elastic scattering
- (n,xn) cross sections
- Fission observables
- Most collisions in ^{235,238}U, ^{239}Pu

Pu and ^{235}U LLNL Pulsed Spheres Simulations with VII.1 & VIII.0β4 are fine.





^{238}U LLNL Pulsed Spheres simulated with VII.1 and VIII.0β4: problems for 160-210ns



Problems with inelastic scattering?