The ENDL interface

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SLAC

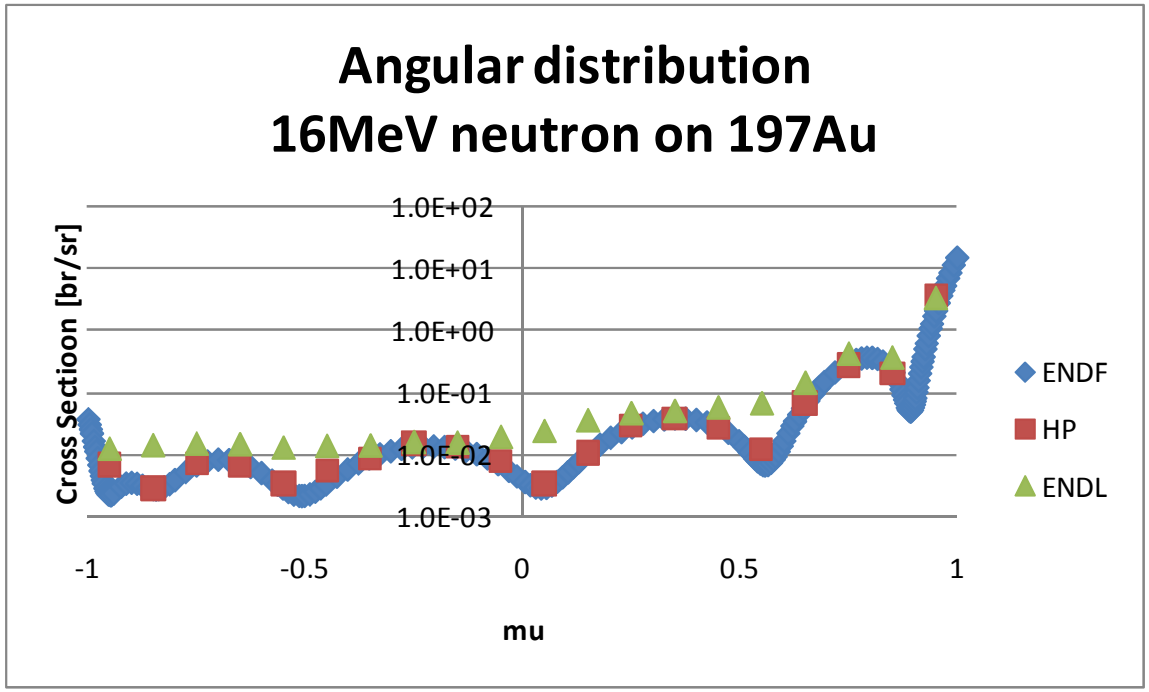
Interface to ENDL

- The evaluated nuclear and atomic reaction databases developed at Lawrence Livermore National Laboratory.
- A collection of flat file databases which represent
  - Binary collision cross sections
  - Particle number multiplicity distributions of reaction products
  - Energy and angular distributions of reaction products
  - Derived calculational constants
- In a point-wise format as a function of incident projectile energy on stationary targets.
- The LLNL Computational Nuclear Physics (CNP) Group translated ENDF/B-VI, ENDF/B-VII, JEFF-3.1, JENDL-3.3 and other neutron incident evaluated reaction data libraries to ENDL.
  - http://nuclear.llnl.gov/CNP/translation/index.html
- ENDL is open to public
- SLAC and LLNL collaboration is developing G4ENDL which is interfacing ENDL from Geant4
- Hope to be a successor of Neutron HP.

List of Isotope data temporal (ENDL99)

0 ~5	6 to 15	16 to 27	28 to 42	47 to 64	67 to 83	90 to 92	93,94	95,96	97,98
n_1	C_12	S_32	Ni_58	Ag_107	Ho_165	Th_231	Np_235	Am_241	Bk_249
H_1	C_13	Cl_natural	Ni_natural	Ag_109	Hf_natural	Th_232	Np_236	Am_242_m	Cf_249
H_2	N_14	Ar_natural	Cu_natural	Cd_natural	Ta_181	Th_233	Np_237	Am_243	Cf_250
H_3	N_15	K_natural	Zn_natural	In_natural	W_natural	Pa_233	Np_238	Cm_242	Cf_251
He_3	O_16	Ca_natural	Ga_natural	Sn_natural	Re_185	U_233	Np_237	Cm_243	Cf_252
He_4	F_19	Ti_natural	As_74	Sb_natural	Re_187	U_234	Np_238	Cm_244	
Li_6	Ne_20	V_51	As_75	I_127	Pt_natural	U_235	Pu_237	Cm_245	
Li_7	Na_23	Cr_natural	Y_88	Xe_134	Au_197	U_236	Pu_238	Cm_246	
Be_7	Mg_natural	Mn_55	Y_89	Xe_natural	Hg_natural	U_237	Pu_239	Cm_247	
Be_9	Al_27	Fe_natural	Zr_natural	Ba_138	Pb_natural	U_238	Pu_240	Cm_248	
B_10	Si_natural	Co_59	Nb_93	Eu_natural	Bi_209	U_239	Pu_241		
B_11	P_31		Mo_natural	Gd_natural		U_240	Pu_242		
							Pu_243		

- ENDL does not do Doppler broadening on flight
- Prepare data for 3 temperatures
  - 3.00E+02, 1.16E+03 and 3.59E+03 [K]
- Require XML parsing of “expat”
- Validations on going
  - If you have specific channel want to investigate then let me know.
  - Mass problem
- How to migrate into Geant4
  - Like GDML?


Angular distribution
16MeV neutron on 197Au
Cross Sectioon [br/sr]
1.0E+02
1.0E+01
1.0E+00
1.0E-01
1.0E-02
1.0E-03
-1
-0.5
0
0.5
1
mu
ENDF
HP
ENDL