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Energy Release per Fission Format Change (File 1, Section 458)

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- File 1/458 currently consists of a initial “CONT” record, an 18 element “LIST” record (NPL=18, N2=9, L1=L2=0) and a “SEND” record.
 - The 18 element “LIST” records contains nine values and their uncertainties, X and ΔX , for
 - ET = Total energy release per fission;
 - EFR = Kinetic energy of the fragments;
 - ENP = Kinetic energy of the prompt neutrons;
 - END = Kinetic energy of the delayed neutrons;
 - EGP = Prompt photon energy;
 - EGD = Delayed photon energy;
 - EB = Delayed Beta decay energy;
 - ENU = Neutrino energy;
 - ER = Total “useful” energy, $ET - ENU$.

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- Dave Madland, in “Total Prompt Energy Release in the Neutron-Induced Fission of ^{235}U , ^{238}U and ^{239}Pu ”, Nucl. Phys. A772 (2006)113, provides energy dependent polynomial fits for some of these data.
- Therefore, consider past data to simply represent the zeroth order term (and its uncertainty) in an N^{th} order polynomial.

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- Expand the definition of the LIST control record so that L2 specifies the order of the subsequent polynomial for all energy components.
 - L2 = polynomial order (zero in all existing files);
 - N2 = $9 * (L2+1)$ = number of polynomial coefficients;
 - NPL = $2 * N2$ = number of data items (coefficients plus uncertainties).
- For example, EFR and Δ EFR expand to become EFR_0 , EFR_1 , ..., Δ EFR₀, Δ EFR₁, ... where
 - Fission Fragment energy = $EFR_0 + EFR_1 * E + \dots$

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