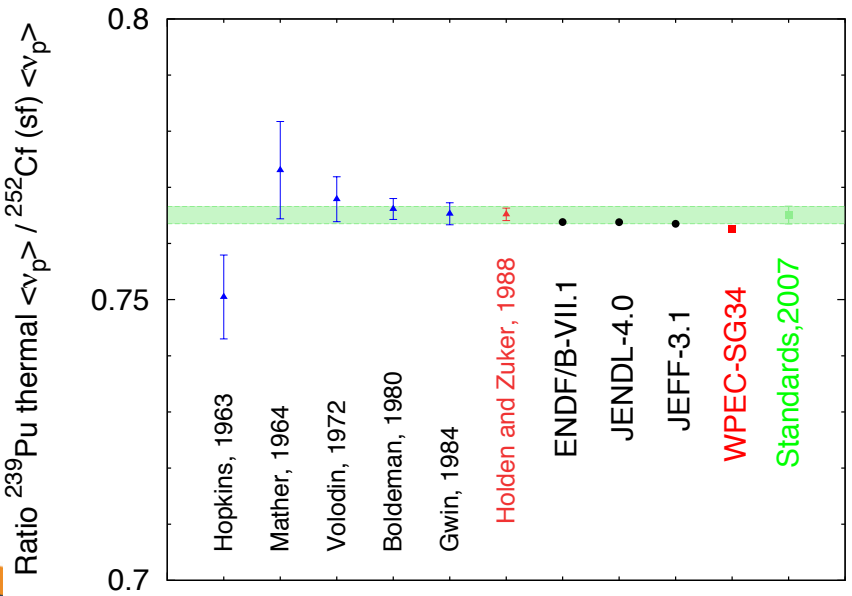
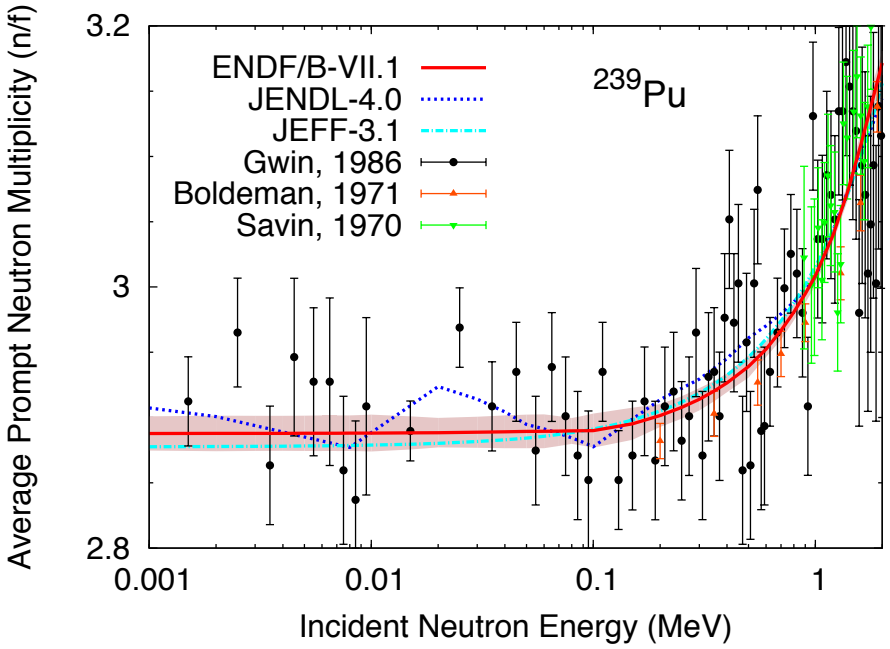
Average neutron multiplicity, ^{239}Pu

- Thermal $\langle\nu_p\rangle$, latest WPEC-SG34 vs. Standards'07
- Fluctuations in the RRR
- Re-evaluation needed in the fast energy range?
- Fixed the B-VII.1 covariance matrices for $\langle\nu_p\rangle$ for both ^{235}U and ^{239}Pu (submitted to NNDC in Aug. 2014)

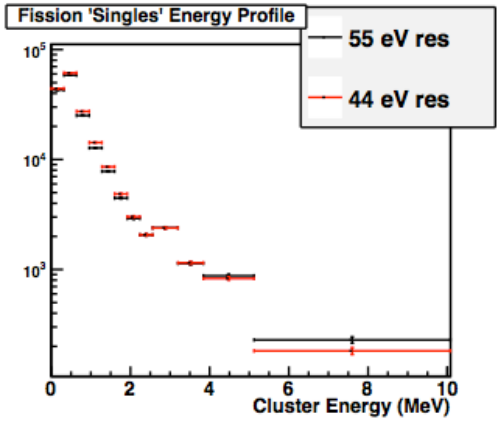


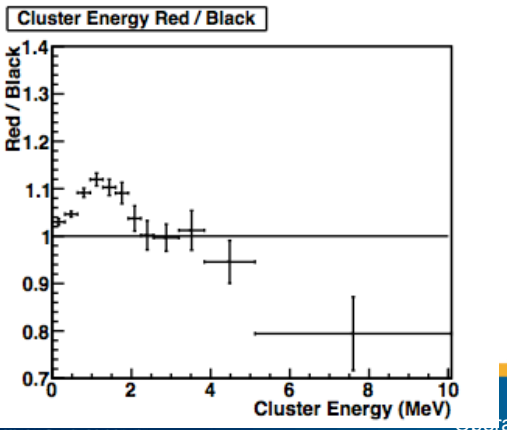


Average neutron multiplicity, ^{239}Pu

Fluctuations in the RRR

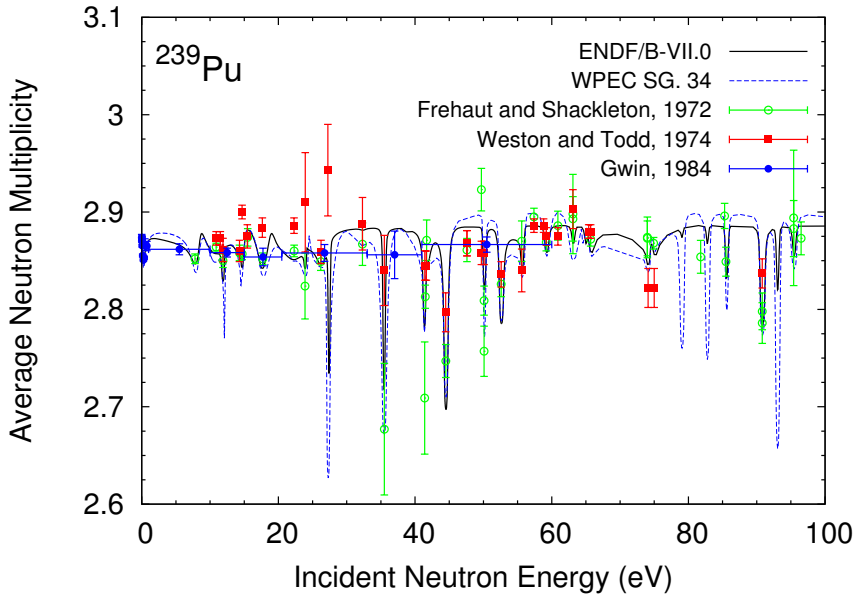
- Physics: (n,γf) or/and Y(A,Z,TKE)?
- Impact on applications?

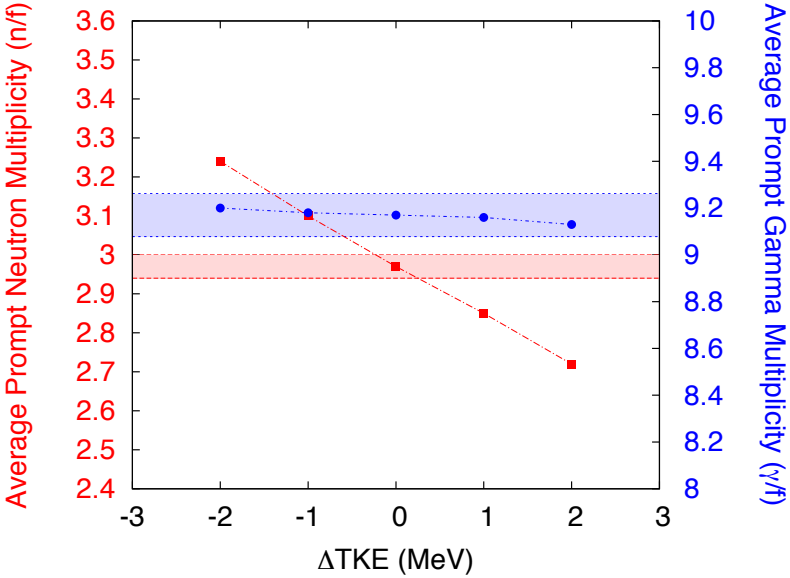




DANCE γ-ray data (Mosby, Couture)

Monte Carlo Hauser-Feshbach calculations with Y(A,Z,TKE+ΔTKE)





Average neutron multiplicity, ^{235,238}U

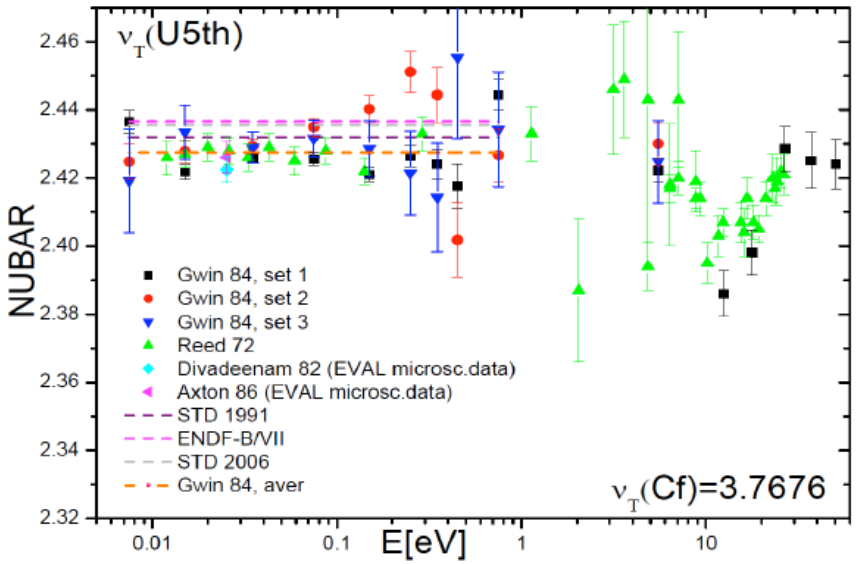
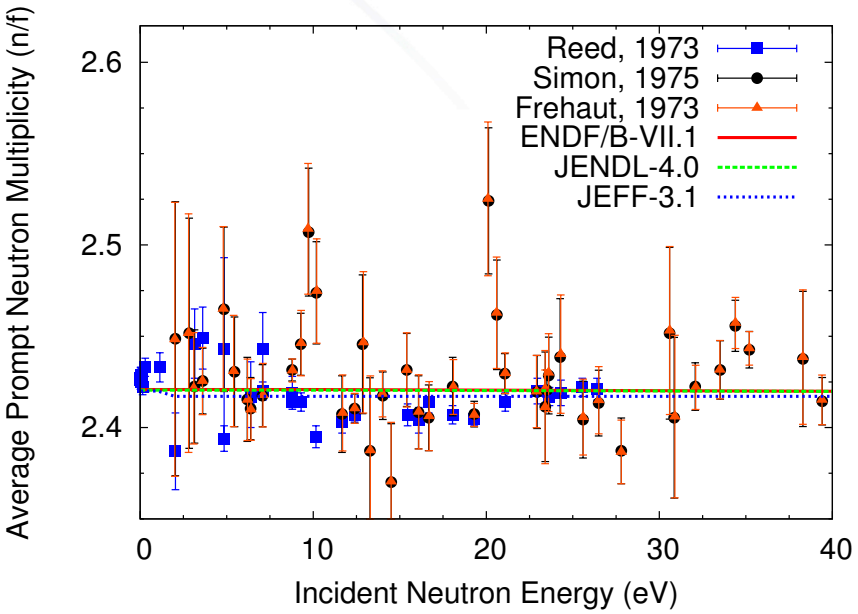


Figure 3: Comparison of energy-dependent measured values of nu-bar and some "Standards" and their evolution with time.



From Trkov, Capote (2014)

Lack of accurate experimental data

Neutron Multiplicity Distribution P(ν)

- Experiment:
  - very little data, esp. at higher energies
- Modeling:
  - new capabilities with Monte Carlo codes: CGMF, FREYA, FIFRELIN GEF, …
  - Systematics based on Terrell's formula, and compared to limited data by Frehaut

$$\sum_{n=0}^{\nu} P_n = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{(\nu-\overline{\nu}+1/2+b)/\sigma} exp(-t^2/2)dt$$