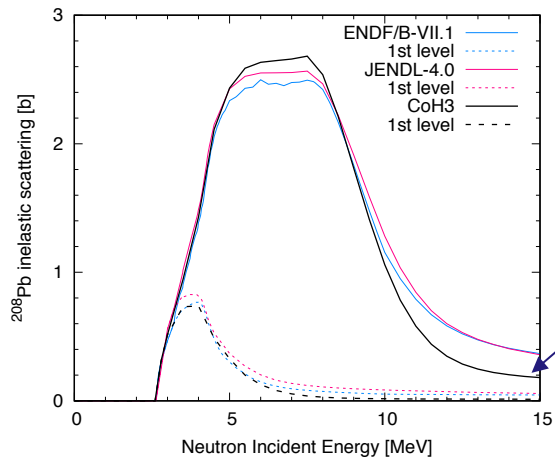


Evaluation updates for ^{208}Pb and $^{234,236}\text{U}$

Ionel Stetcu, T. Kawano, A. Lovell
LANL, T-2

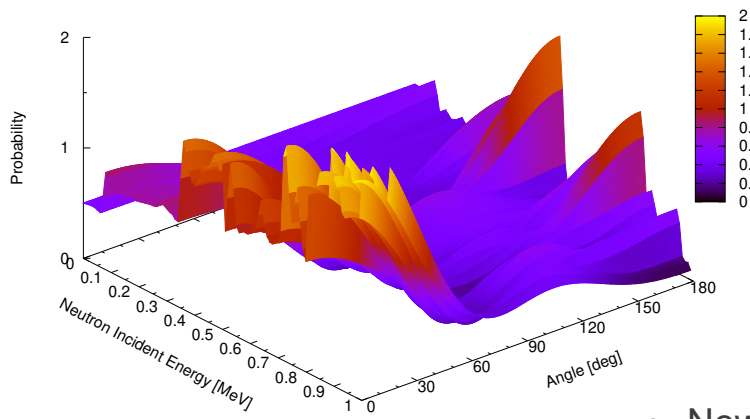
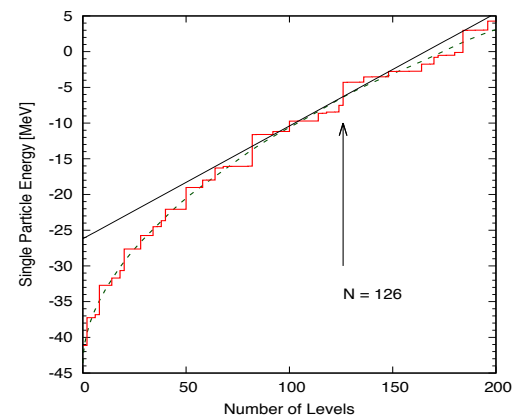
CoH₃ New Evaluation of ²⁰⁸Pb, (n,n'), (n,2n), and (n,3n)



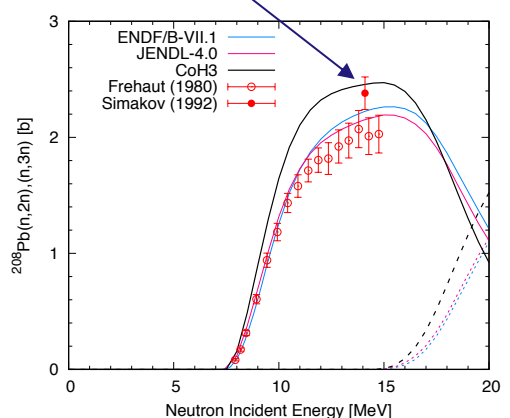
Pre-equilibrium estimated by the single-particle model based on FRDM

Strutinsky shell correction predicts lower single-particle level density

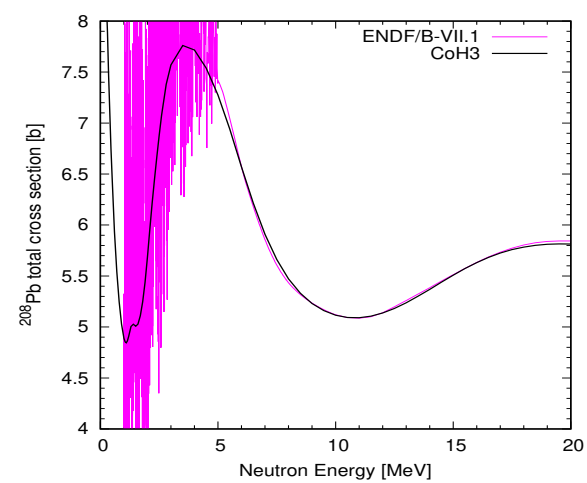
- lowers the pre-equilibrium emission
- increase (n,2n)



Angular distributions

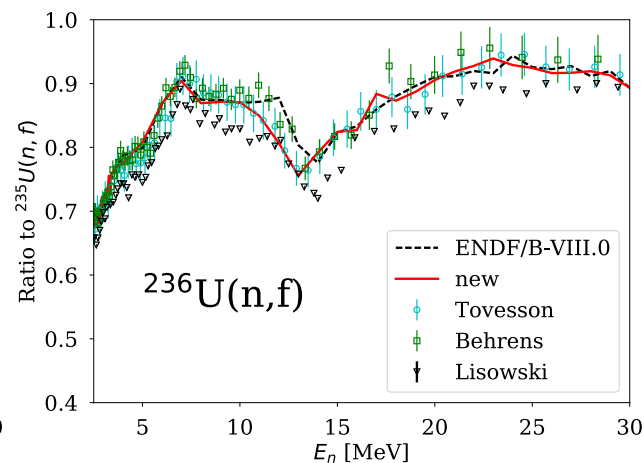
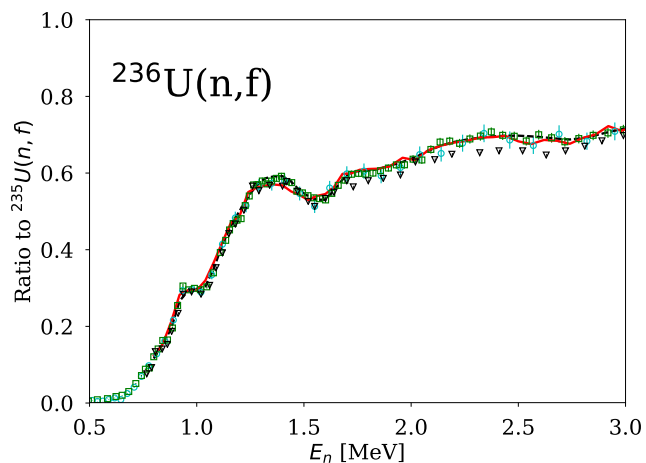


- New evaluation better agrees Simakov data
- Need to re-investigate if Frehaut data should be renormalized



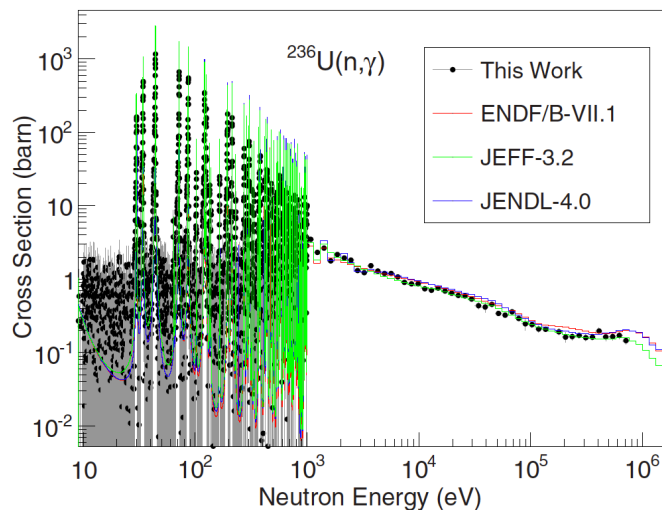
Evaluation of $^{234,236}\text{U}$

- **Extensive and consistent** evaluations based on CoH3 calculations, with parameters adjusted to experimental data (DANCE, WNR)
- All open channels included
- KALMAN-based evaluation for fission channel to include cross section data from WNR
- $^{234,236}\text{U}$: re-evaluation of nubar, consistent PFNS
- PFGS and gamma multiplicity taken from the recent ^{235}U evaluation (we could do better)

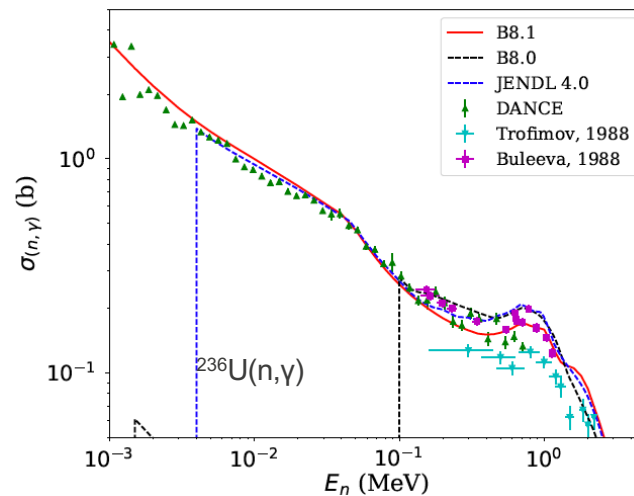


Evaluation $^{234,236}\text{U}$ (capture)

- Resonance parameters for $^{236}\text{U}(n,\gamma)$ refitted to DANCE data, but only for the s wave and in different format than currently in ENDF (not delivered by experimentalist colleagues yet)
- Data for $^{234}\text{U}(n,\gamma)$ will be analyzed ~~this summer (before September?)~~ soon.
- CoH_3 evaluation
 - Width corrections fluctuation of Moldauer, with the Engelbrecht-Weidenmüller transformation (strict treatment of the directly coupled channels in the Hauser-Feshbach theory), the coupled-channels optical potential of Soukhovitskii
 - Same parameters used for the suite of U isotopes



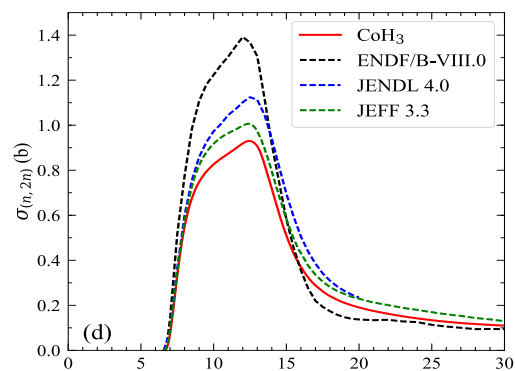
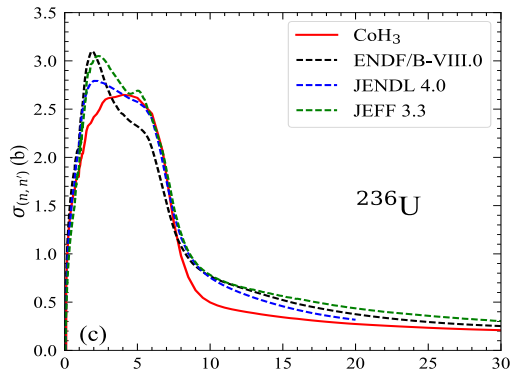
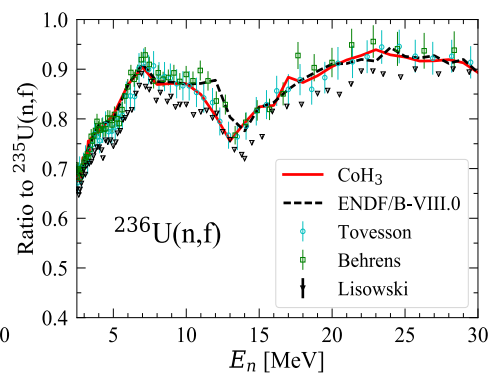
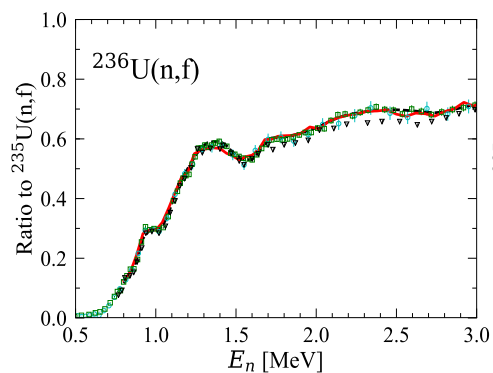
Baramsai et al, PRC **96** (2017) 024619



CoH_3 evaluation

Evaluation of $^{234,236}\text{U}$ (fission cross section)

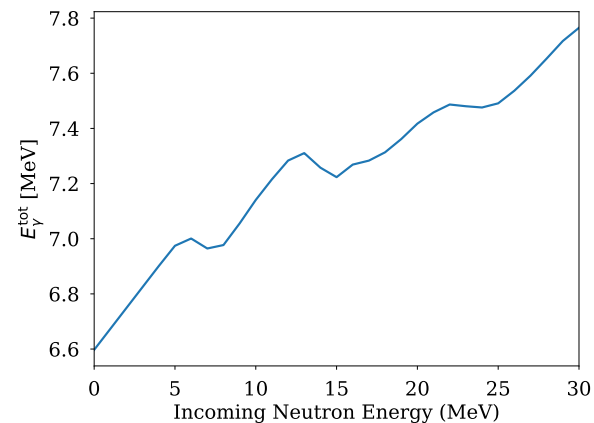
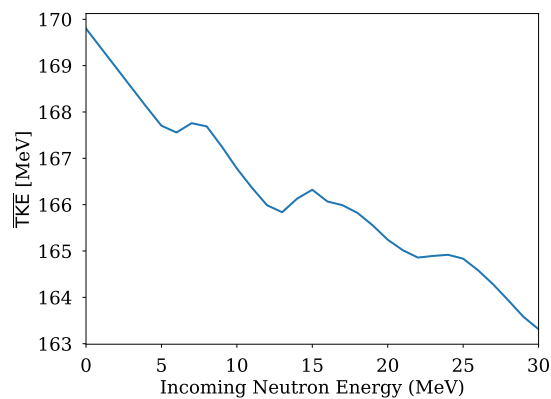
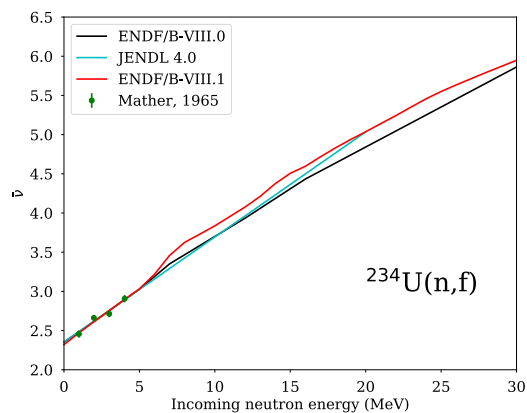
- ❑ Added in the fit data by Lisowski and Tovesson
- ❑ Small changes from ENDF/B-VIII.0
- ❑ CoH3: the fission barriers and transmission coefficients in different fission channels are adjusted to reproduce exactly the evaluated fission data.



One needs to compare with other isotopes

$\bar{\nu}$ evaluations

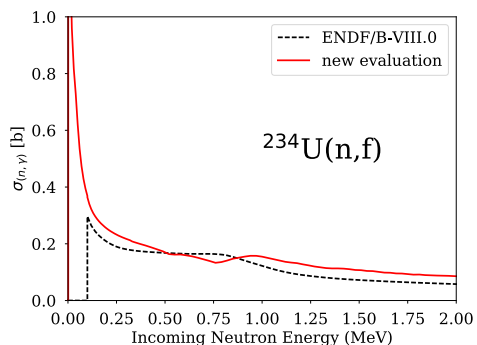
- Neutron emissions strongly influenced by TKE
- No measurements for TKE in minor actinides
- Extend using the multichance fission probabilities above the threshold for multichance fission



Weak constraints on the fit

Select ICSBEP benchmarks

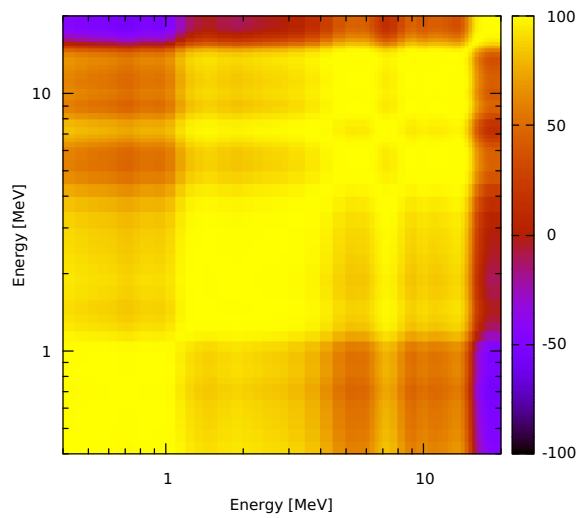
Benchmark	B-VIII.0	B-VIII.0+U6	B-VIII.0+U4	B8+U4+U6	Exp
HEU-MET-FAST-007-001	0.99327	0.99308	0.99328	0.99308	0.9950(24)
HEU-MET-FAST-007-002	0.99855	0.99877	0.99876	0.99875	0.9964(14)
HEU-MET-FAST-078-027	0.99513	-	0.99540	-	1.000(3)
HEU-MET-FAST-087-001	1.00013	-	1.00006	-	0.9987(13)
HEU-MET-FAST-092-001	1.00141	-	1.00149	-	0.9989(13)



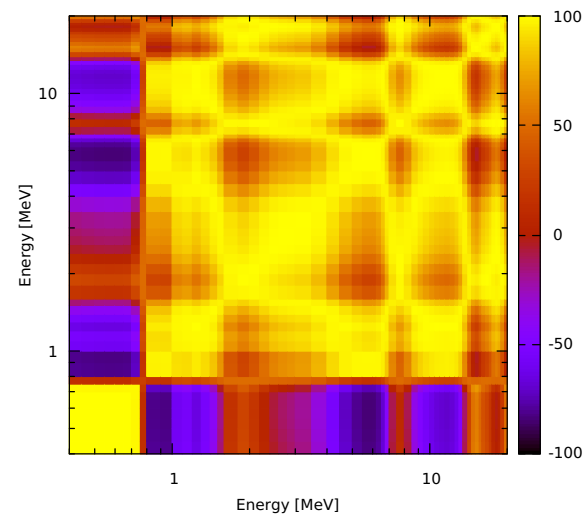
Important to check the capture in ^{234}U against experimental data

Covariances

$^{236}\text{U}(n,g)$



$^{236}\text{U}(n,f)$



Work in progress