

WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN



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# Benchmarking JEFF-3.3T<sub>i</sub> and other libraries with some criticality-safety cases

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- Source of the criticality-safety benchmarks for the PSI and Mosteller's suite
- Results JEFF-3.3T3, T2 , T1 and JEFF-3.2 for **PSI** benchmarks
- Results JEFF-3.3T3, T2 , T1 and JEFF-3.2, ENDF/B-VIIIbeta4, ENDF/B-VII.1 and JENDL-4.0 for **Mosteller** benchmarks
- Conclusion and advice: go back to JEFF-3.3T2

- Based on MCNP inputs from S. van der Marck (NDS 113 (2012) 2935), PSI inputs, A. Trkov, O. Cabellos and S. Kahler.
- ACE files from the NEA
- MCNP6
- PSI suite: 178 benchmarks: 35 Fast, 2 intermediate, 141 thermal
- Mosteller suite: 119 benchmarks (still being tested with A. Trkov, includes some differences in input definition and  $\Delta k_{\text{eff}}$ , e.g. for hmf4)

# Results in terms of reduced $\chi^2$ **PSI** suite

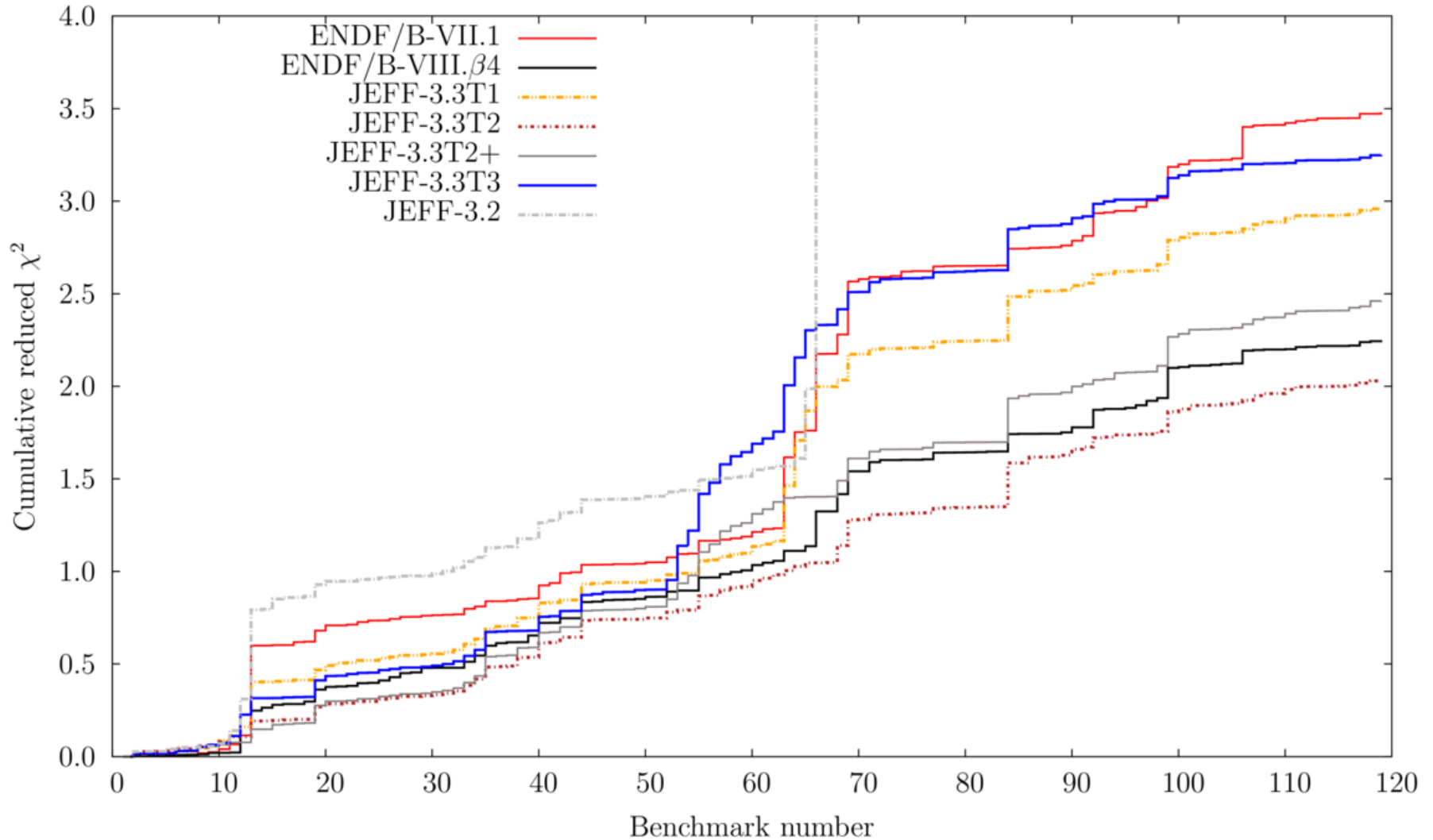
Type	JEFF-3.3T3	JEFF-3.3T2	JEFF-3.3T1	JEFF3.2
<b>178 all</b>	<b>1.19</b>	<b>1.06</b>	<b>1.09</b>	<b>1.04</b>
66 LEU	1.29	1.12	1.21	1.01
41 HEU	0.95	0.89	0.75	0.99
25 PU	1.51	1.28	1.28	1.49
5 U233	0.33	0.15	0.23	0.08
41 Other	1.15	1.12	1.21	0.97
141 Thermal	1.23	1.01	1.08	0.95
2 Inter	1.40	0.90	1.06	0.58
35 fast	0.98	1.29	1.11	1.41

# Results in terms of reduced $\chi^2$ **Mosteller** suite

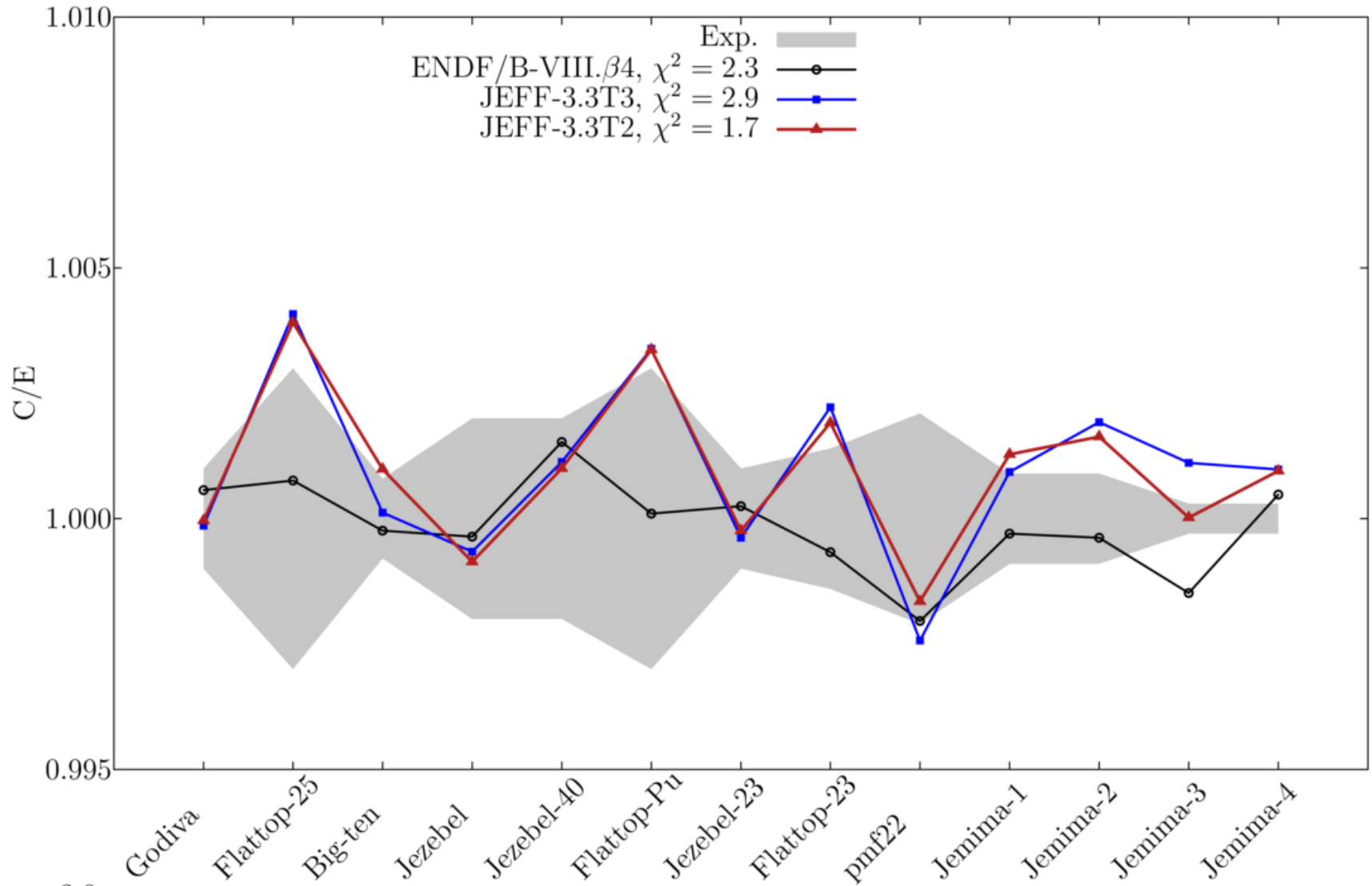
Type	JEFF-3.3T3	JEFF-3.3T2	JEFF-3.3T2p	JEFF-3.3T1	JEFF-3.2	ENDF/B-VII.1	ENDF/B-VIII.beta4	JENDL-4.0
<b>119 all</b>	<b>3.2</b>	<b>2.0</b>	<b>2.6</b>	<b>2.9</b>	<b>5.4</b>	<b>3.5</b>	<b>2.2</b>	<b>10.1</b>
13 LEU	6.5	1.5	4.0	1.4	1.1	1.2	1.4	5.7
39 HEU	3.9	2.1	2.3	4.2	10.7	4.7	2.7	4.4
28 PU	2.4	2.5	2.7	2.5	2.3	2.5	1.9	3.8
19 U233	1.5	1.6	2.1	1.9	1.8	2.0	1.7	1.9
20 other	2.7	2.0	1.8	3.1	5.8	5.4	2.8	40.8
41 Thermal	3.2	1.4	2.5	1.4	1.5	1.7	1.3	3.6
7 Inter	10.3	1.5	0.9	14.6	48.8	16.7	5.3	2.5
71 fast	2.6	2.4	2.6	2.7	3.4	3.1	2.5	14.6

# Results in terms of reduced $\chi^2$ **Mosteller** suite

Benchmark from Mosteller's suite



# Results in terms of C/E for some fast benchmarks



# Results in terms of cumulative chi2 for these benchmarks

