Comparison of ENDF/B-VII.1, ENDF/B-VIII.0, and JEFF-3.3 as applied to SA&UC of CEFR

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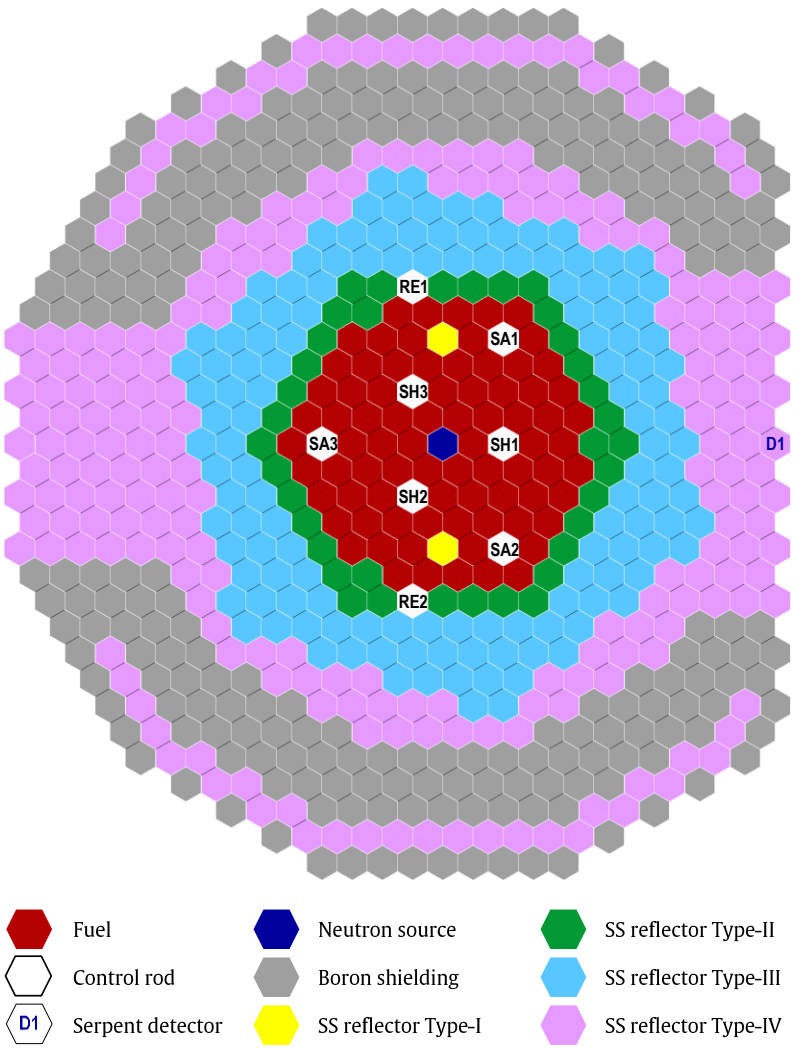
CEFR overview

- CEFR - China Experimental Fast Reactor
- Located at CIAE near Beijing
- First SFR operated in China
- 65MW$_{th}$ pool-type SFR
- 79 fuel sub-assemblies
- 64.4 wt% enriched UO2 fuel



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Methodology

- Automated SA&UQ calculations
- Sensitivity calculations based on a collision history approach
- Uncertainty quantification using ASCII 24-group covariance data
- Derived with NJOY2016

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Data libraries

- ENDF/B-VII.1 (December 2011)
- JEFF-3.3 (November 2017)
- ENDF/B-VIII.0 (February 2018)

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CIELO isotopes

- Collaborative International Evaluation Library Organization project
- Launched to generate new evaluations for most important isotopes

Isotope	CIELO-1 (ENDF/B-VIII.0)	CIELO-2 (JEFF-3.3)
H1	LANL/IAEA	LANL/IAEA
O-16 res.	LANL/JRC–Geel	IRSN/JRC-Geel
O-16 fast	LANL	LANL
Fe-56 res.	IAEA/BNL	IRSN
Fe-56 fast	BNL/IAEA/CIAE	JEFF
U-235 res.	ORNL/IAEA	IRSN/ORNL
U-235 fast	IAEA+LANL	CEA
U-238 res.	JRC-Geel	IRSN/CEA
U-238 fast	IAEA+LANL	CEA
Pu-239 res.	ORNL/CEA	ORNL/CEA
Pu-239 fast	LANL	CEA

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Results

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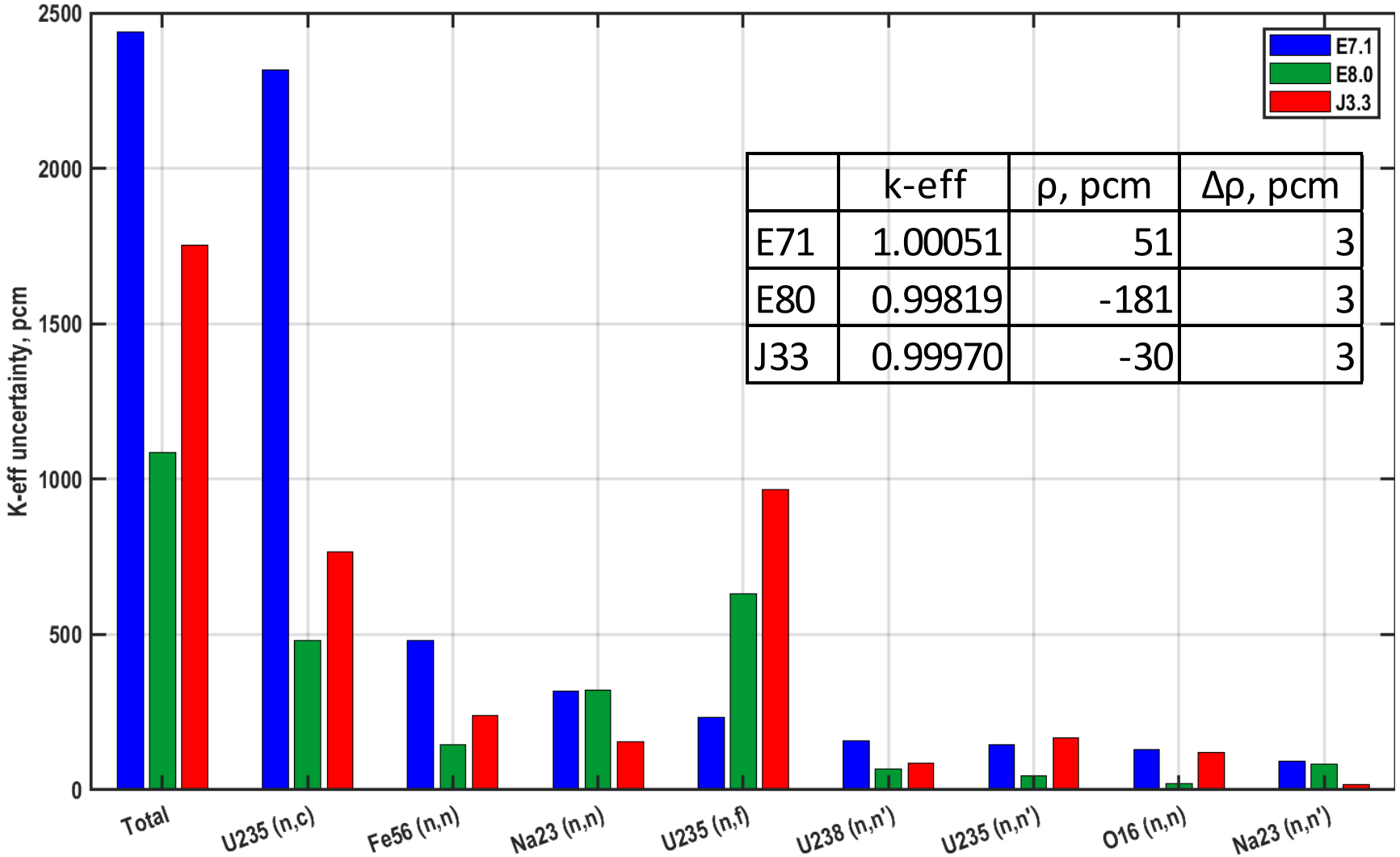
K-eff uncertainty due to the nuclear data



	k-eff	ρ, pcm	Δρ, pcm
E71	1.00051	51	3
E80	0.99819	-181	3
J33	0.99970	-30	3

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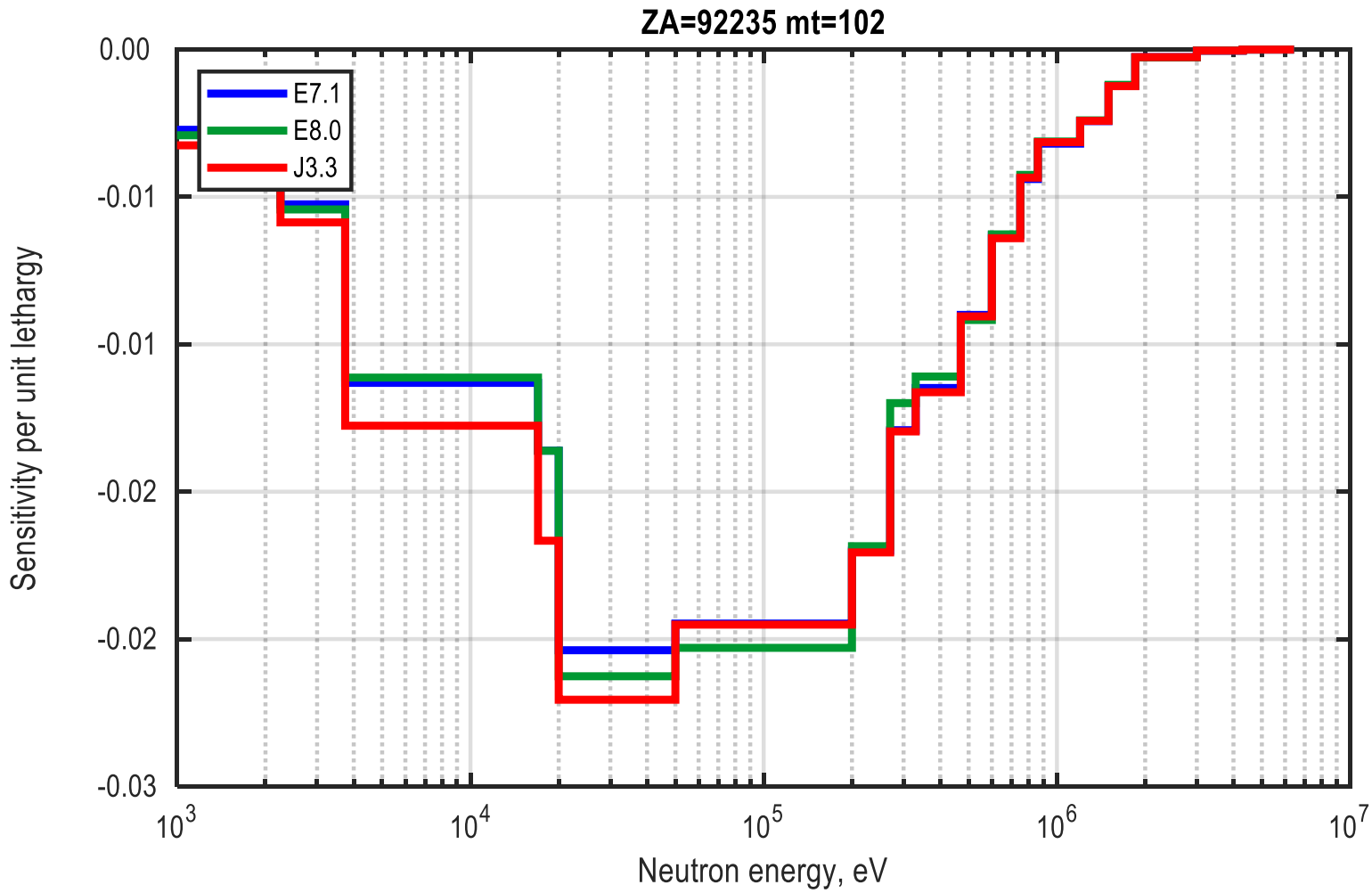
K-eff sensitivity to U235 mt=102



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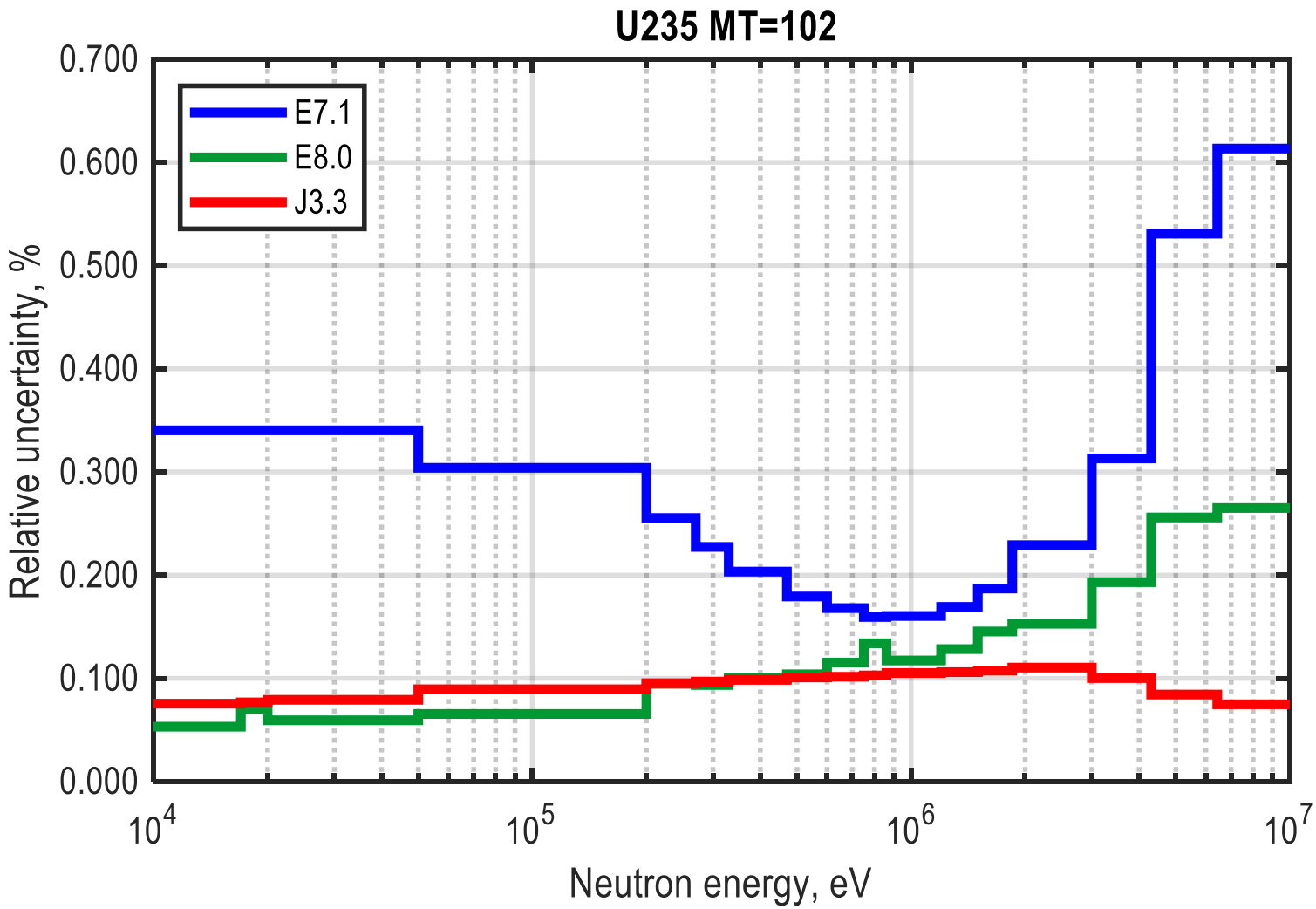
Library uncertainty: U235 mt=102



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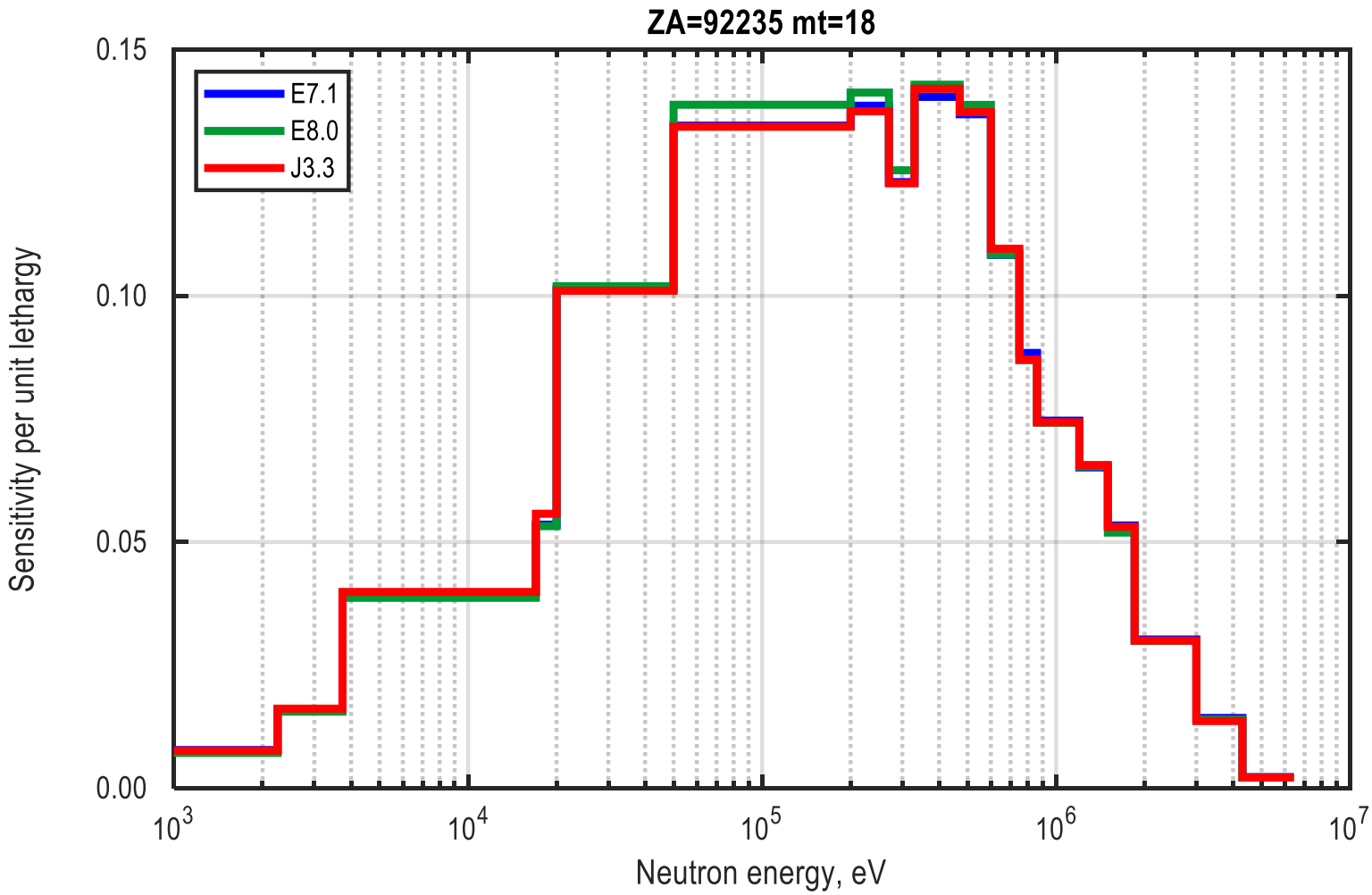
K-eff sensitivity to U235 mt=18



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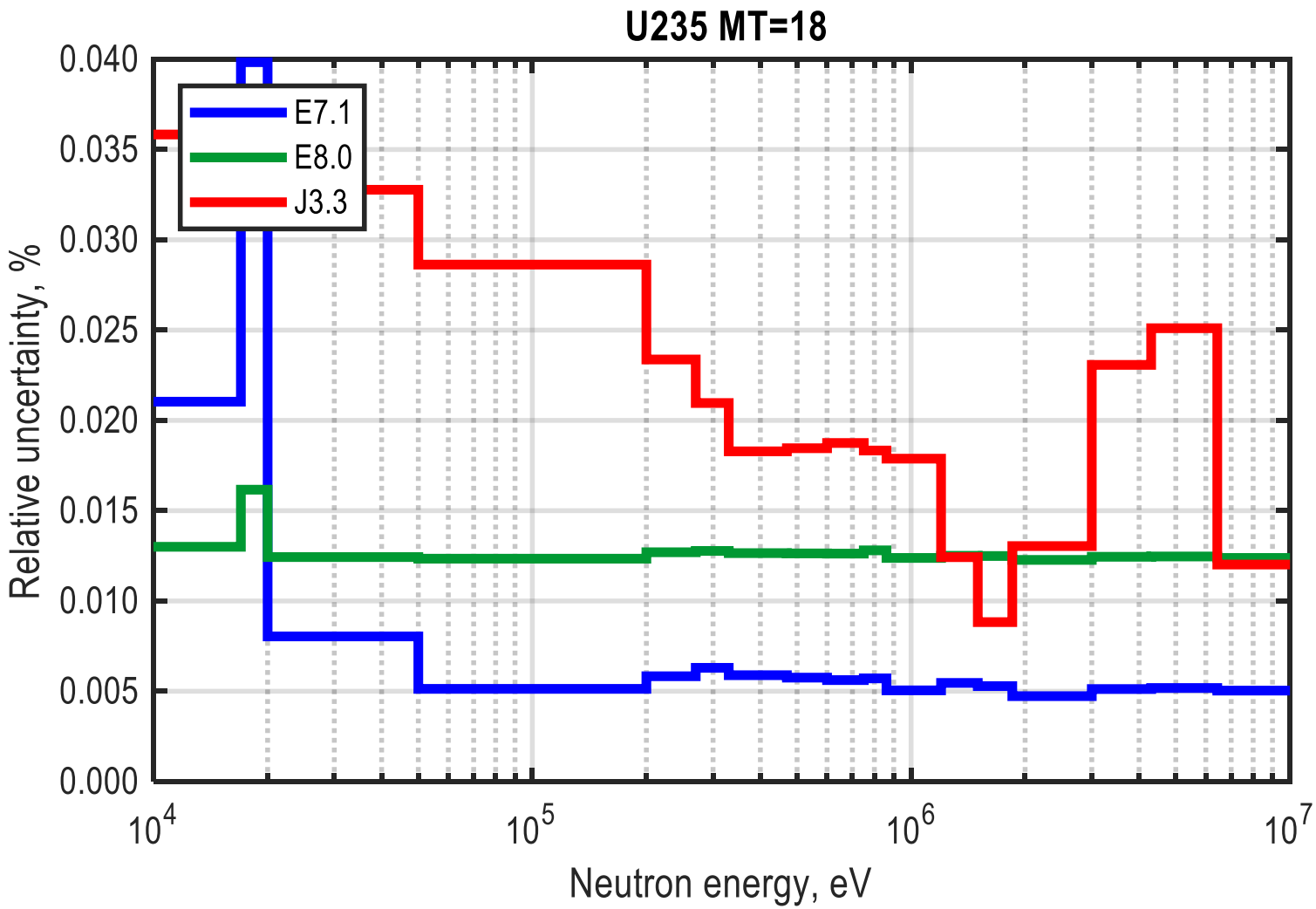
Library uncertainty: U235 mt=18



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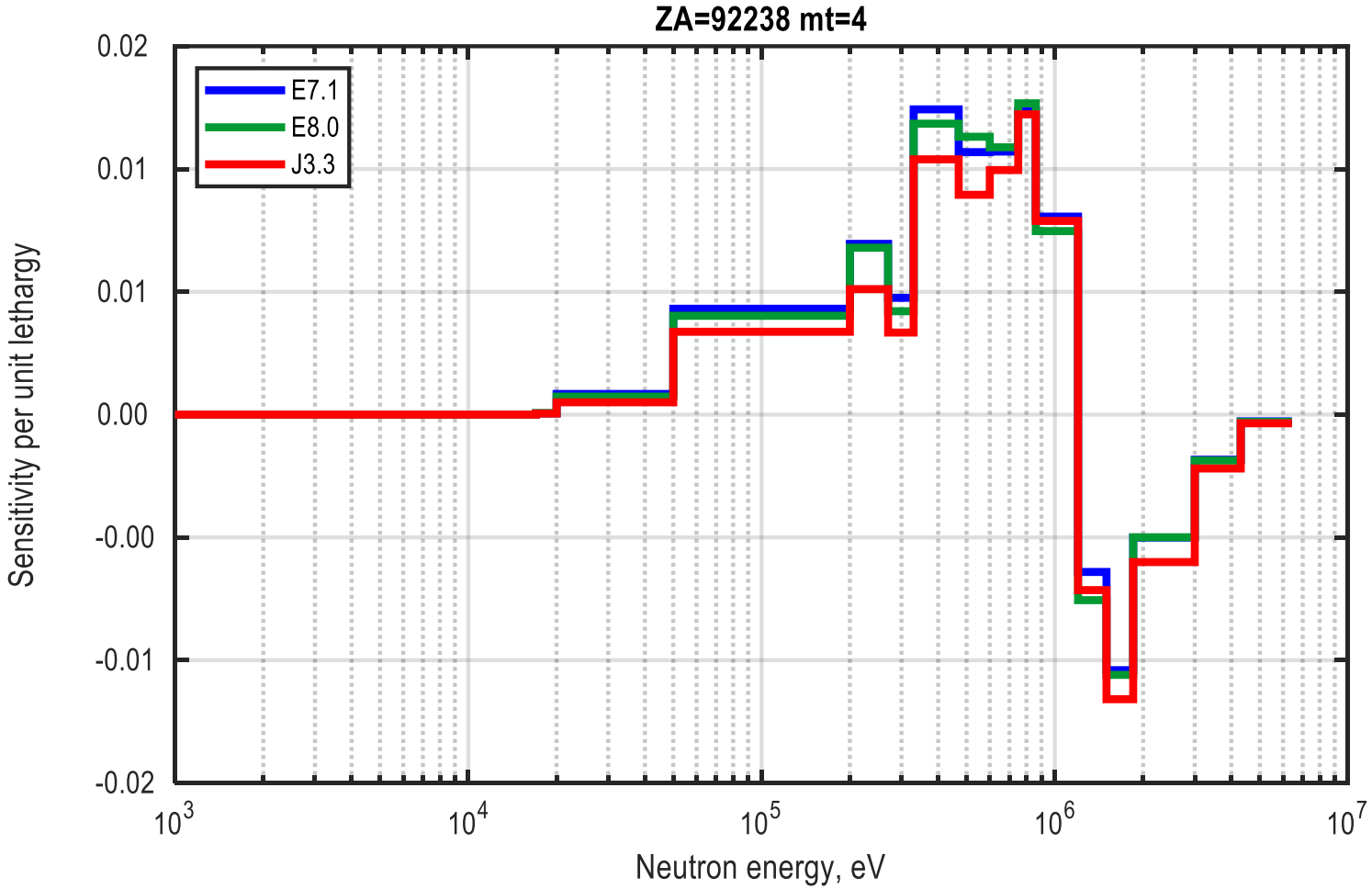
K-eff sensitivity to U238 mt=4



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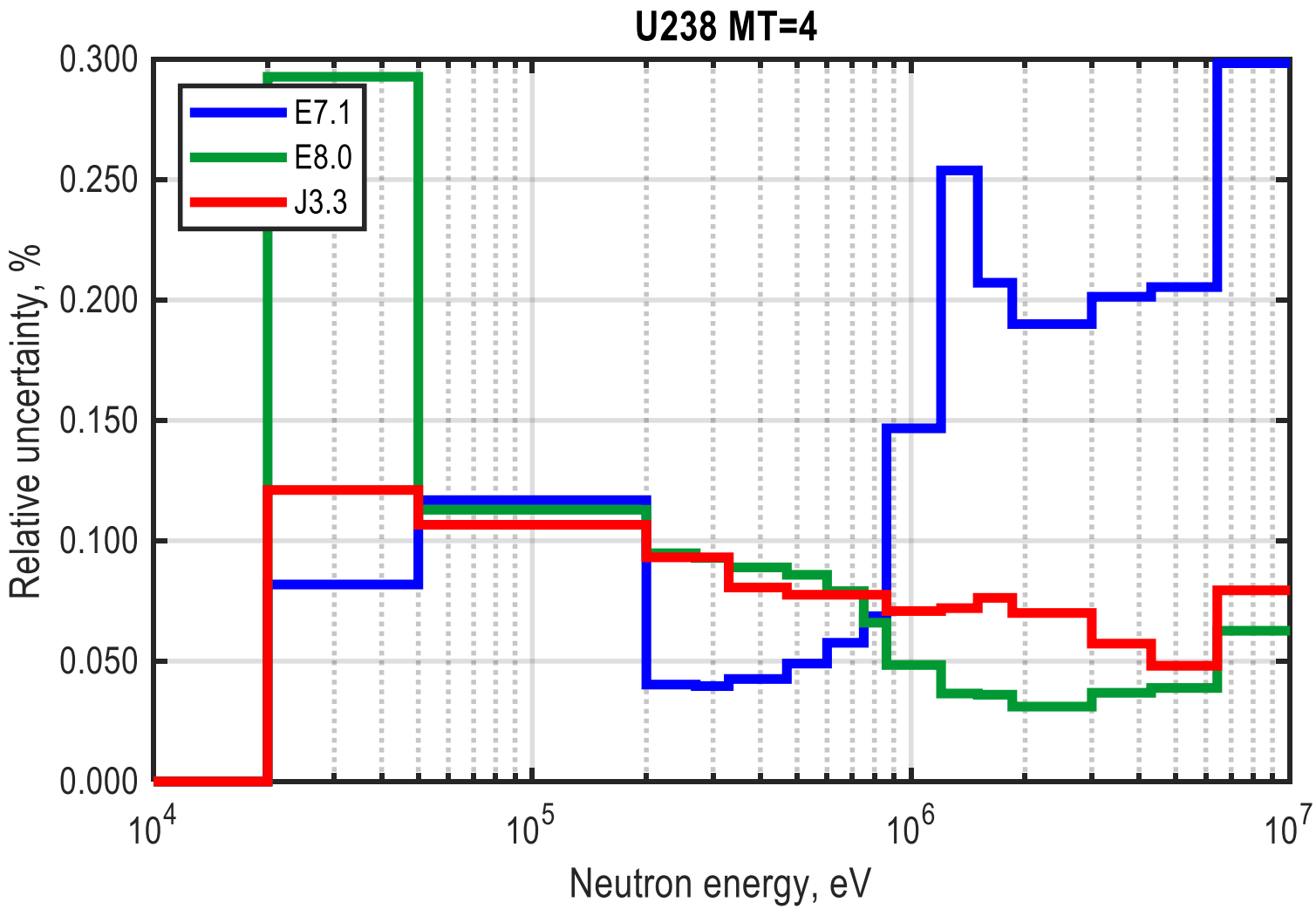
Library uncertainty: U238 mt=4



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Thank you for your attention!

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