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Status of CEA Activities in SG33

Revised Results on :

Initial Covariances

Benchmark calculations

Adjustment

Uncertainty Propagation

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Benchmarks calculations (new in RED)

- Neutronic Codes : ERANOS/PARIS → Ecco+Sn2d + with Jeff3.1.1
- Sensitivities to Cross Sections, Nu_t and Chi
- Benchmark C/E-1
- Experimental uncertainties from literature :With/Without Correlations
- No Analytical modelling covariances used

Adjustment Procedure

- Made in the Conrad framework → classical multigroup adjustment
- Allows initial cross correlations between isotopes/reactions/experiments

SG33 format

- Almost all dedicated SG33 format plugged in CONRAD output

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Initial Covariances set

- 1st Set (CEASG33→see May-11 presentation)
- 2nd set COMMARA
- 3rd set JENDL4
  - (small pb with Cr52 → no covariance at high energy) → TENDL10 taken for Cr
- Most of the Matrix are not positive definite …..

Set	CEASG33	COMMARA	JENDL4
With χ , υ	X	X	X
Without χ , υ	X		
With Exp. Corre	X*		
ADJUSTMENT GRID (* to come)			

CEA Activities in SG33 : Revised Results

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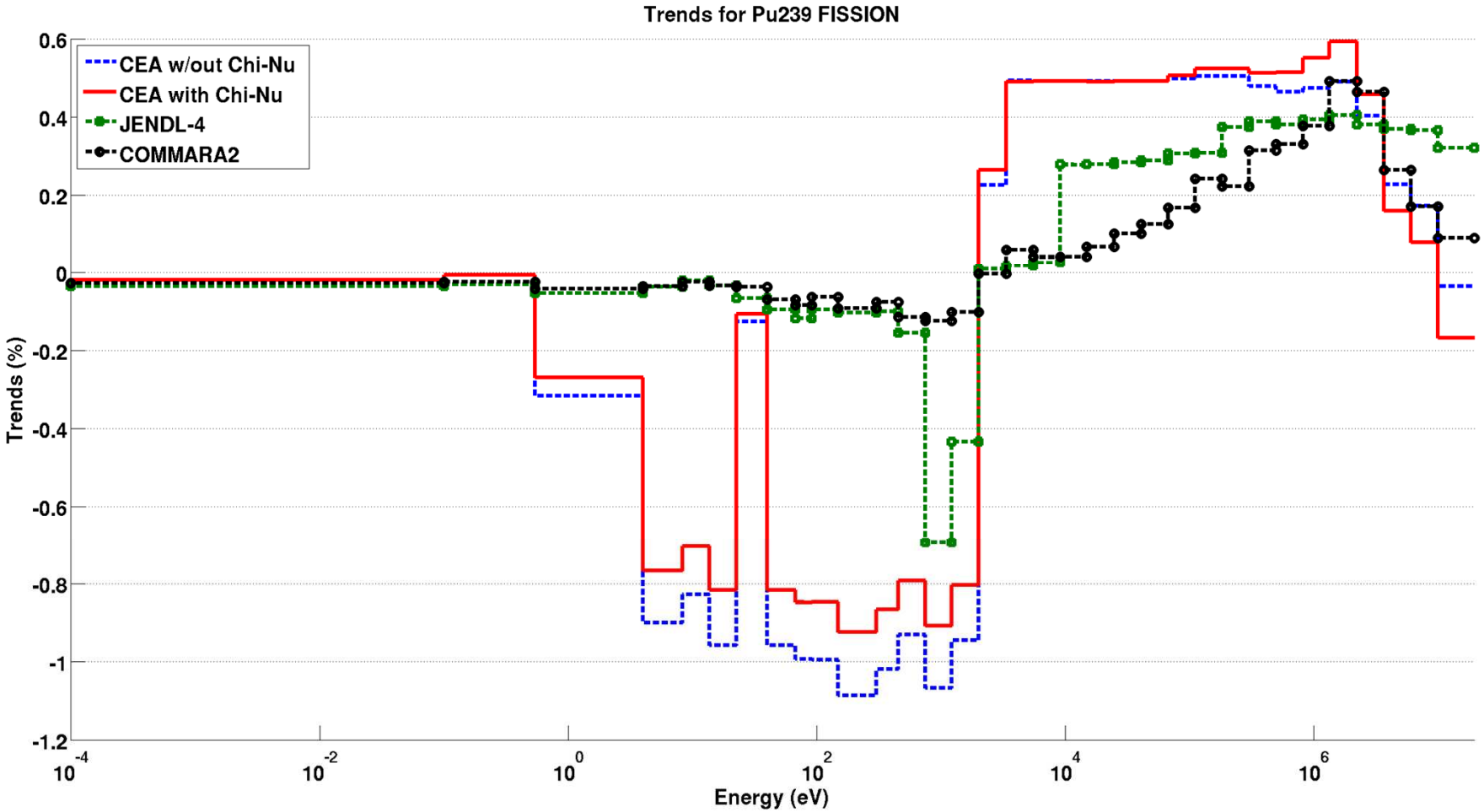
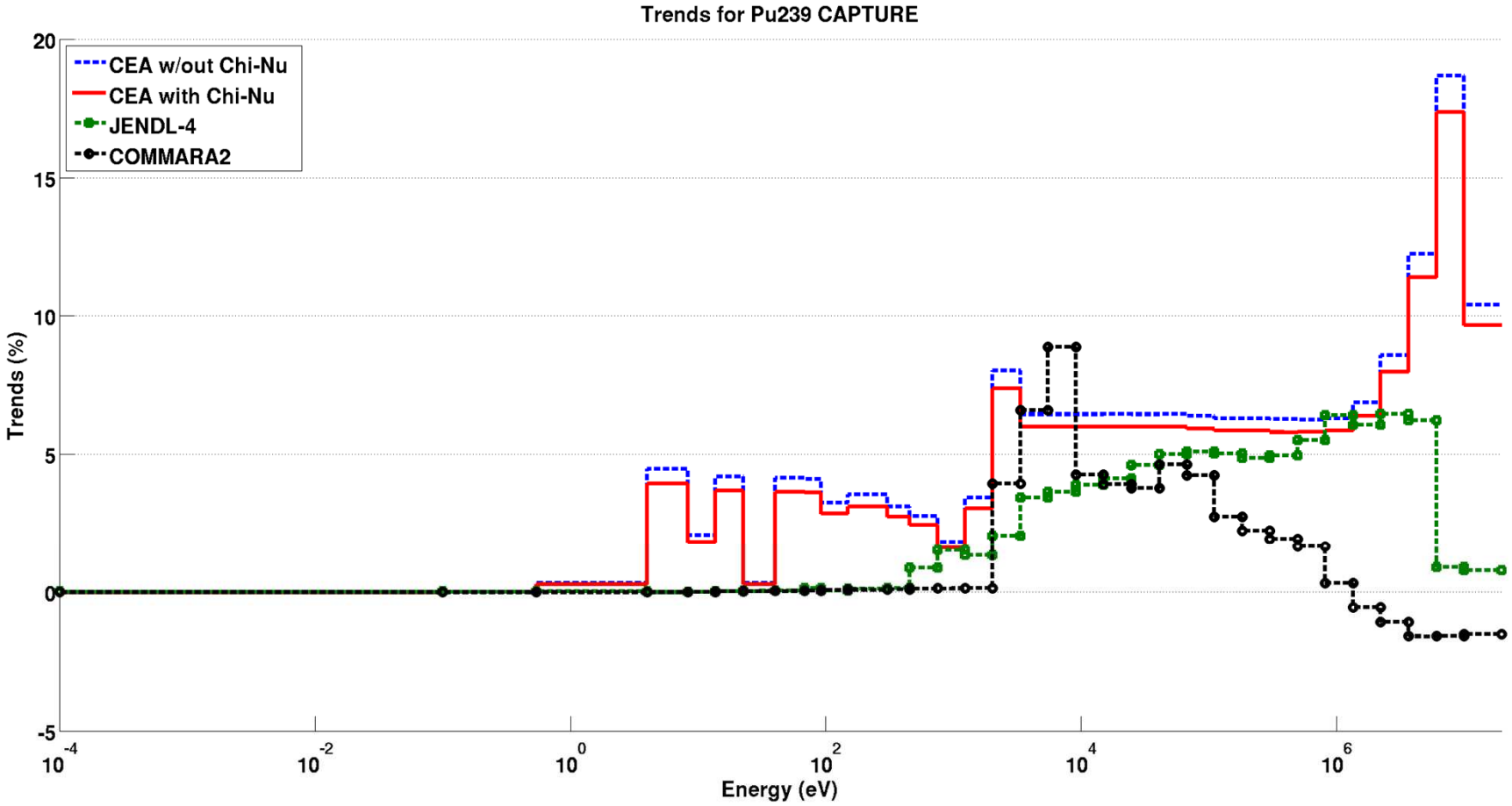
Experiment	Uncertainty(%)	Initial C/E-1	Uncertainty(%) CEASG33	Uncertainty(%) COMMARA
Jezebel_Keff	0.2	-0.311	0.163491	0.170003
Jezebel_F28_F25	1.1	-2.134	0.744417	0.737298
Jezebel_F37_F25	1.4	-2.559	0.839579	0.434832
Jezebel_F49_F25	0.9	-1.721	0.661754	0.553682
Jezebel_Pu240_Keff	0.2	0.066	0.159233	0.186238
FlatTop_Keff	0.3	-0.671	0.277304	0.262622
FlatTop_F28_F25	1.1	-3.109	0.733302	0.655061
FlatTop_F37_F25	1.402	-2.943	0.61206	0.542937
ZPR6_7_Keff	0.23	0.207	0.0987317	0.0995374
ZPR6_7_F49_F25	2.1	-3.92	1.28902	1.50719
ZPR6_7_F28_F25	3	-4.736	0.835735	0.481806
ZPR6_7_C28_F25	2.4	1.097	1.1006	0.803618
ZPR6_7_Pu240_Keff	0.22	0.164	0.0985588	0.100382
ZPPR9_Keff	0.117	0.103	0.097361	0.0988789
ZPPR9_F28_F25	2.7	-8.811	2.24896	2.15191
ZPPR9_F49_F25	2	-3.246	0.847238	0.471784
ZPPR9_C28_F25	1.9	0.816	1.07654	0.824741
ZPPR9_NaV_S3	1.9	2.53	1.21771	1.21181
ZPPR9_NaV_S5	1.9	-4.031	1.52818	1.4715
Joyo_Keff	0.18	0.172	0.168565	0.170174

CEA Activities in SG33 : Multiple adjustment



CEA Activities in SG33 : Multiple adjustment



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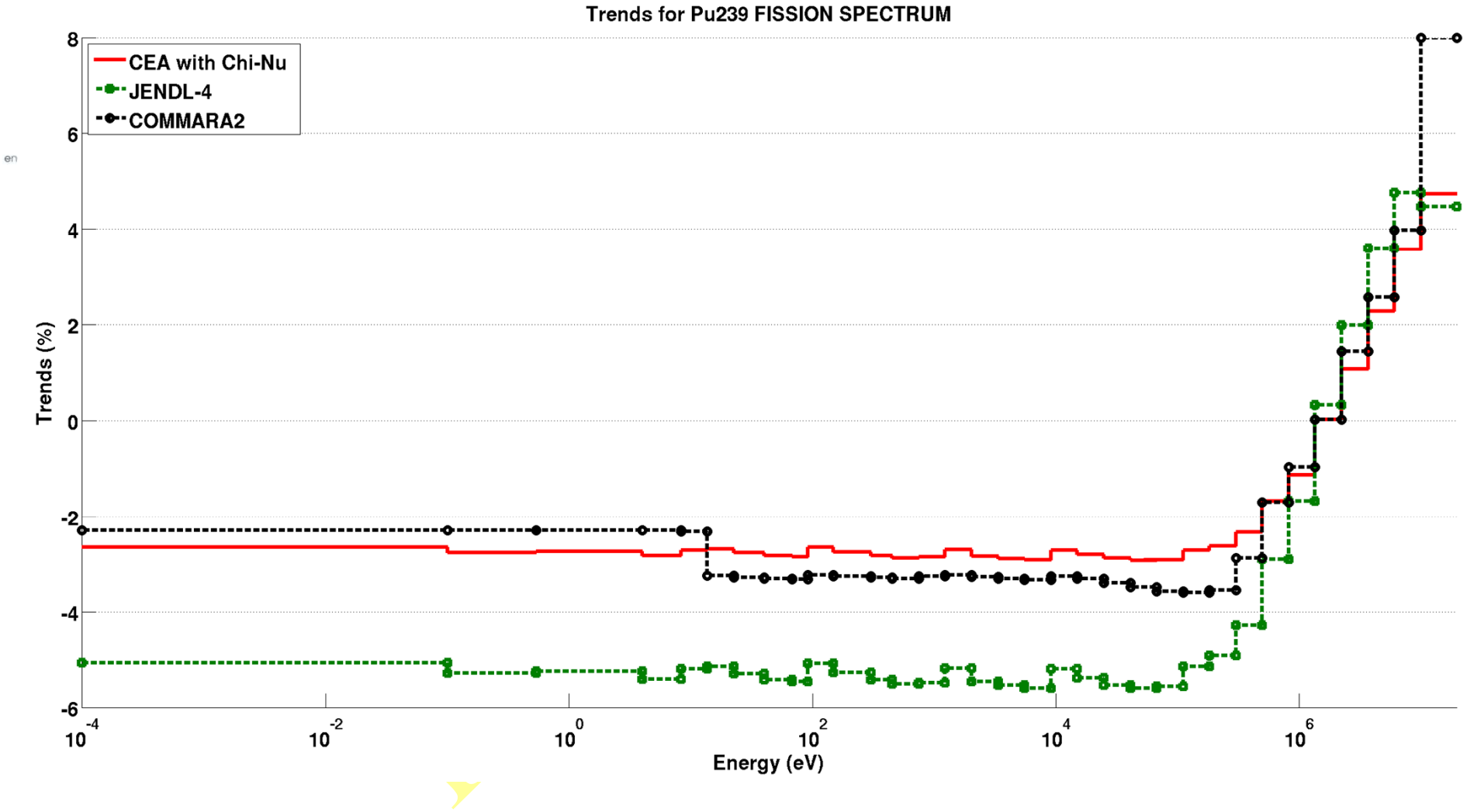

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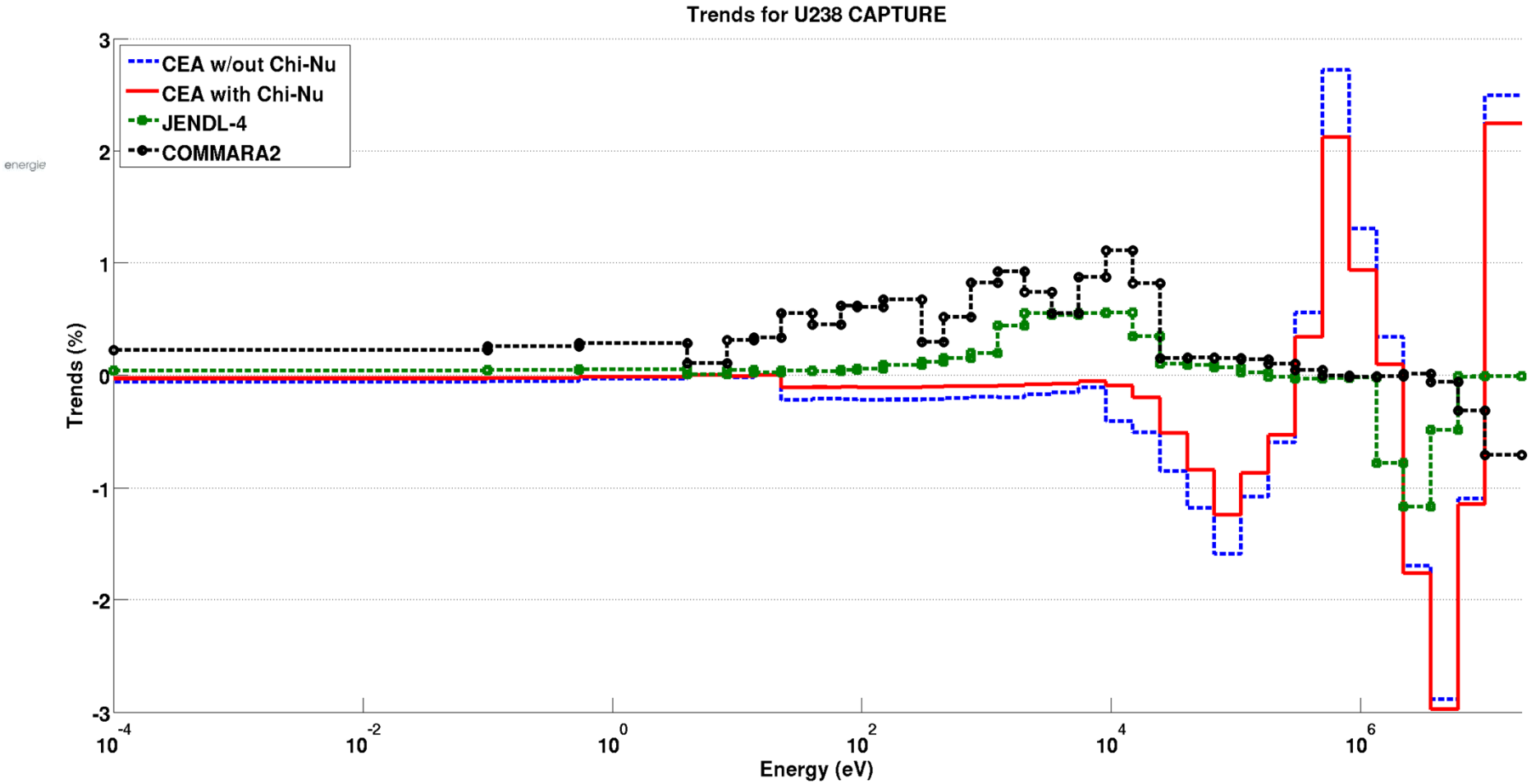

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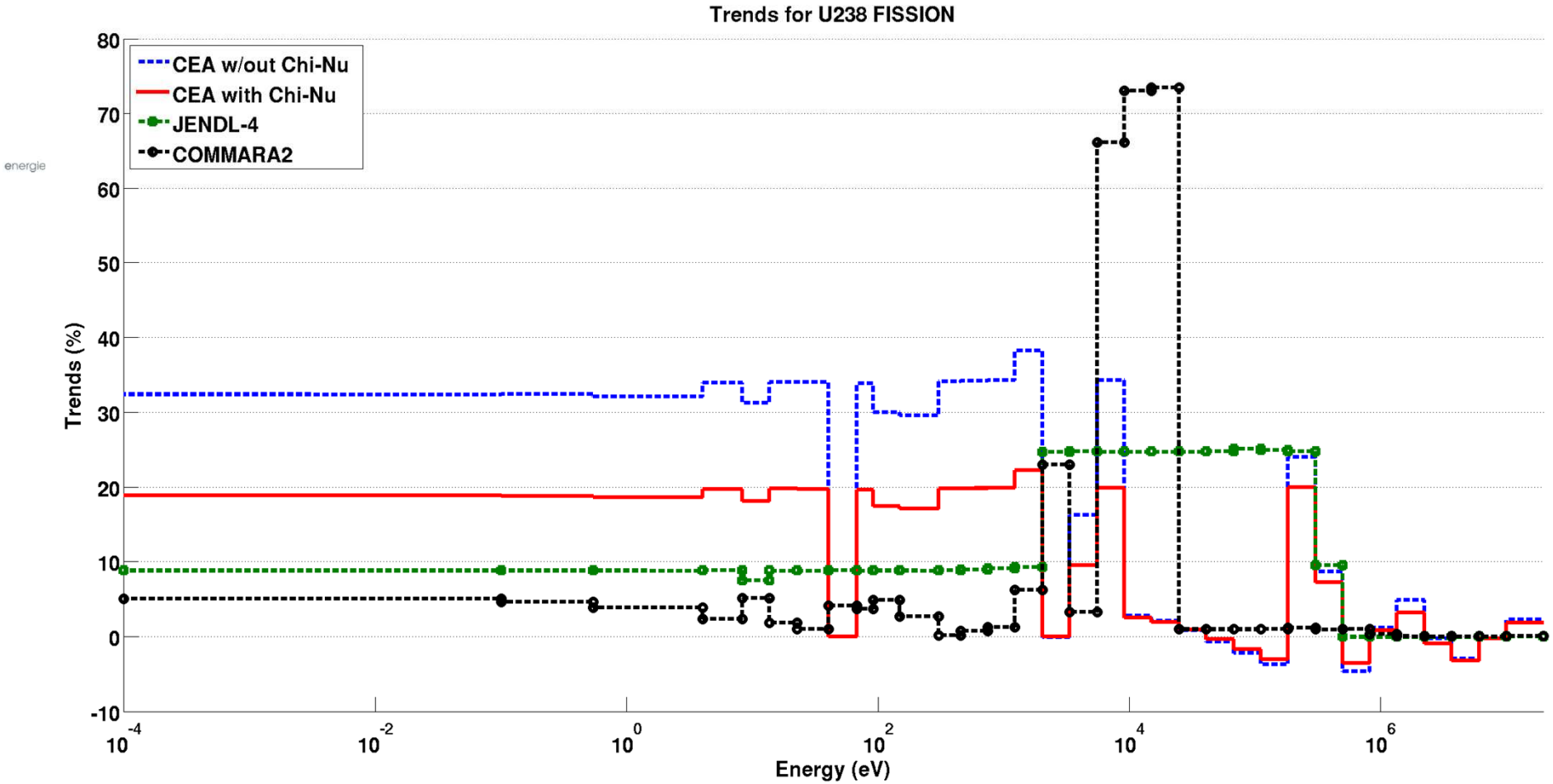

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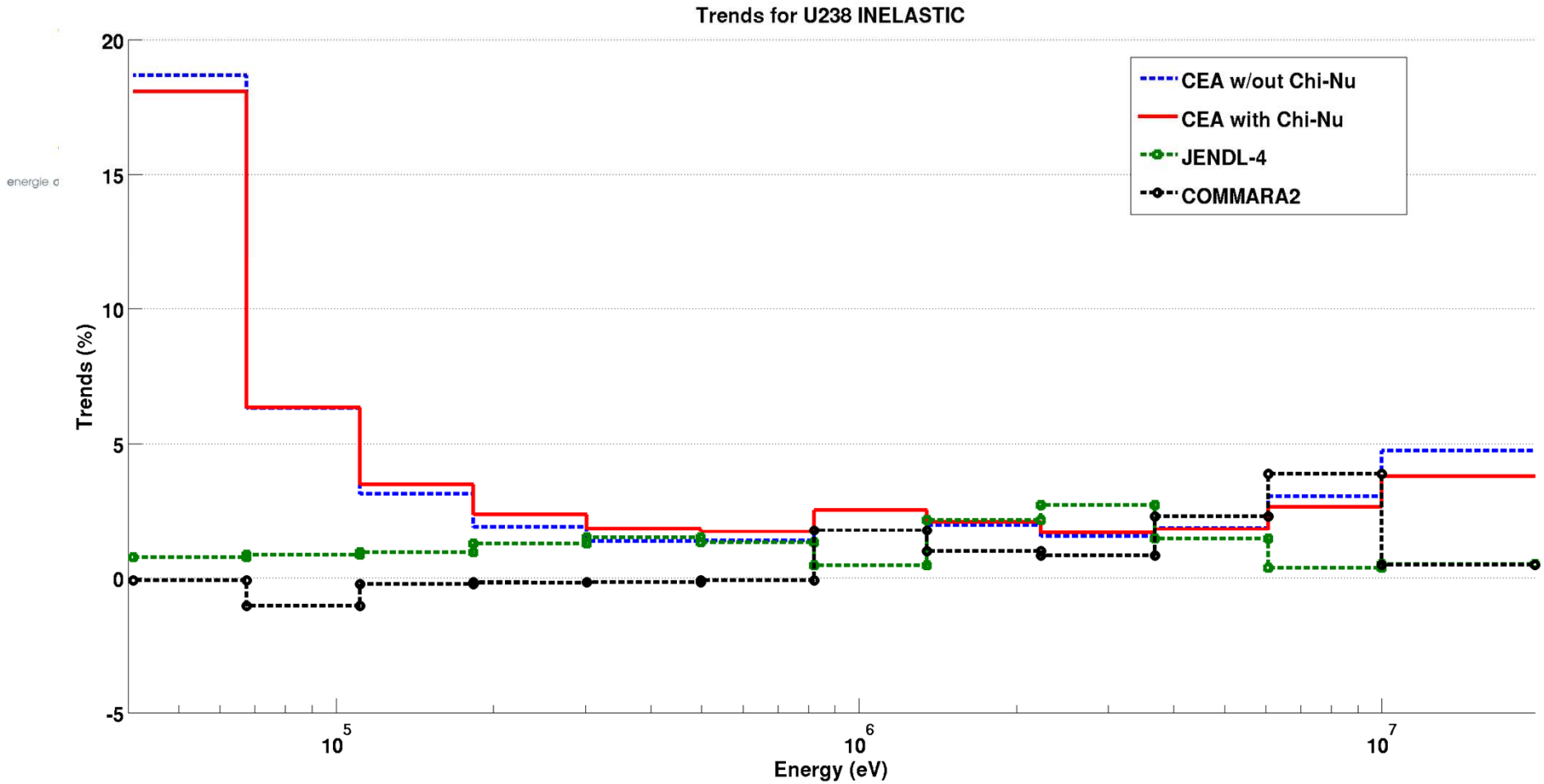

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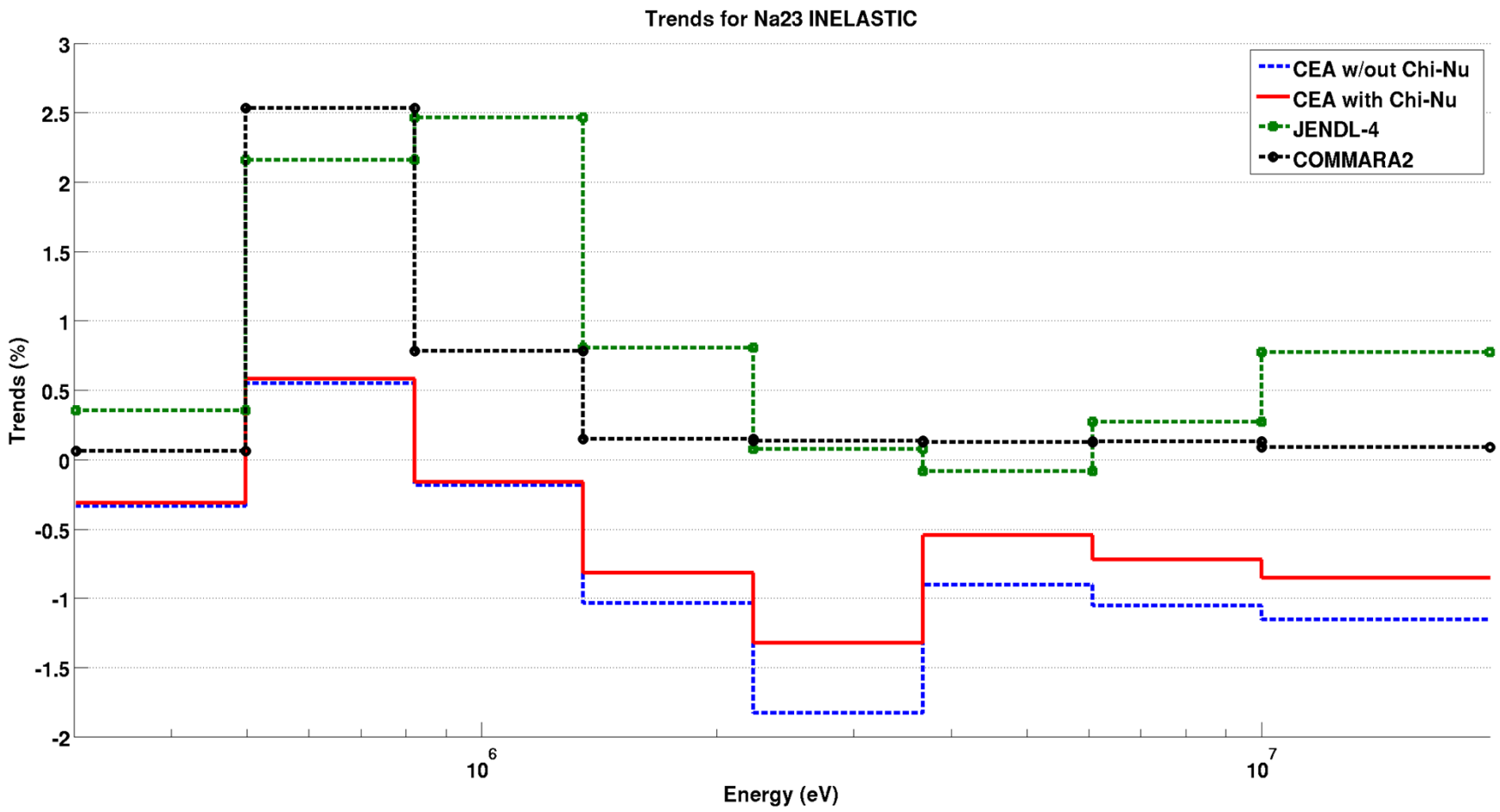

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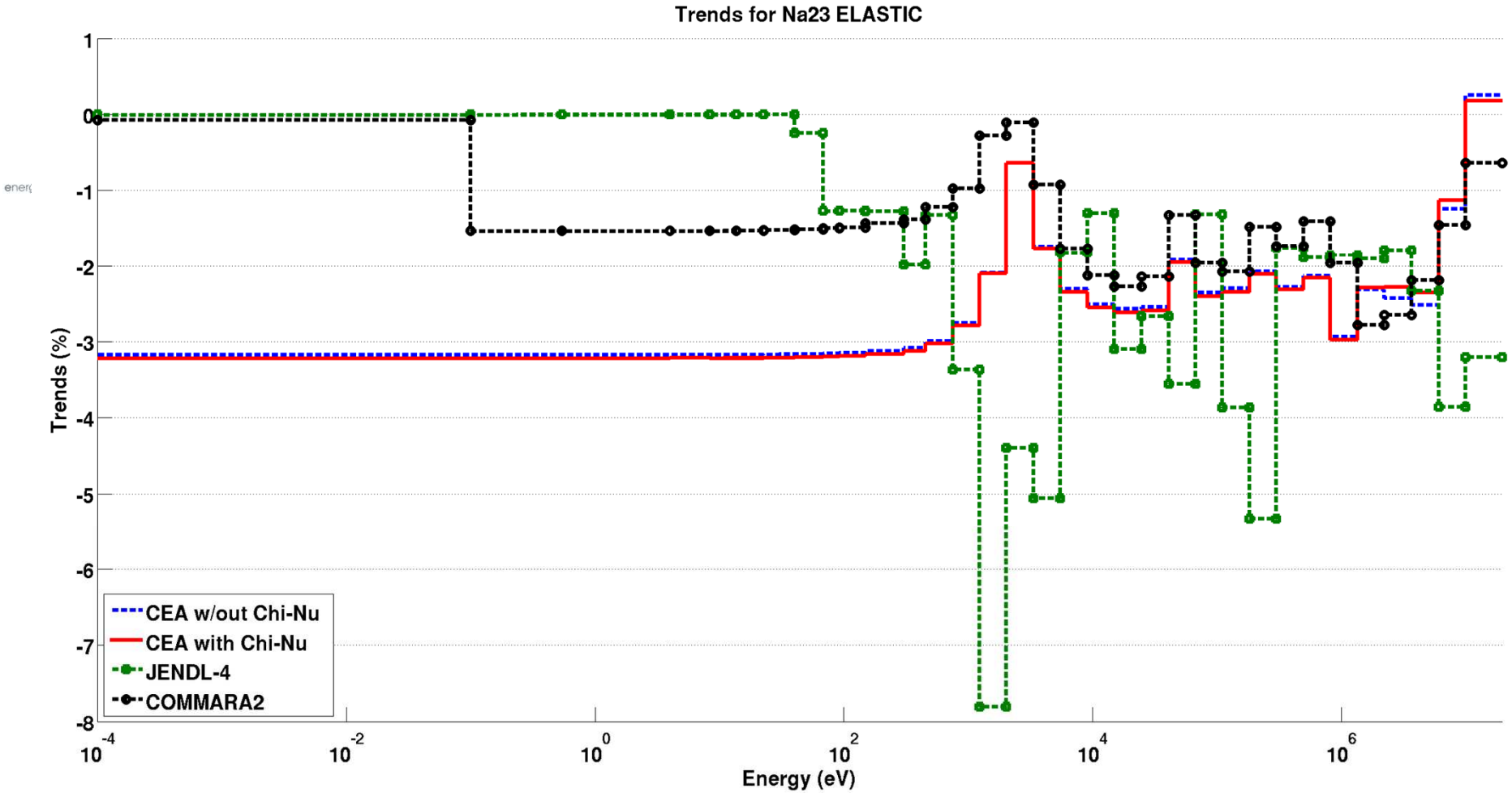

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Conclusions

- *Reduction of Uncertainties of calculated Benchmarks → factor ~ 5-10*
- *All experimental information absorbed*
- *→ Final calculated values equivalent to experimental uncertainties*
- *Some Benchmarks goes in "wrong" directions but coherent with quoted uncertainties*
- *Better Adjustment with new Corrections Factors*
- *Strange Behaviour for Iron and 239Pu capture + Very strange behaviour for 238U Fission in low energy range …*

- **Multiple adjustments**

→ Hard to analyse raw results but :

- → Covariance matrices quite different (CEA/COMMARA/JENDL)
- → Same Reduction of uncertainty for Benchmarks
- → Small effect of chi/Nu → quite low uncertainties ….
- → Similar trends between JENDL/COMMARA except for Sodium

- **Additional analysis to confirm trends (expertise on Matrices)**
- **It is going to be quite difficult to conclude**

→ need of references

→do small incremental changes