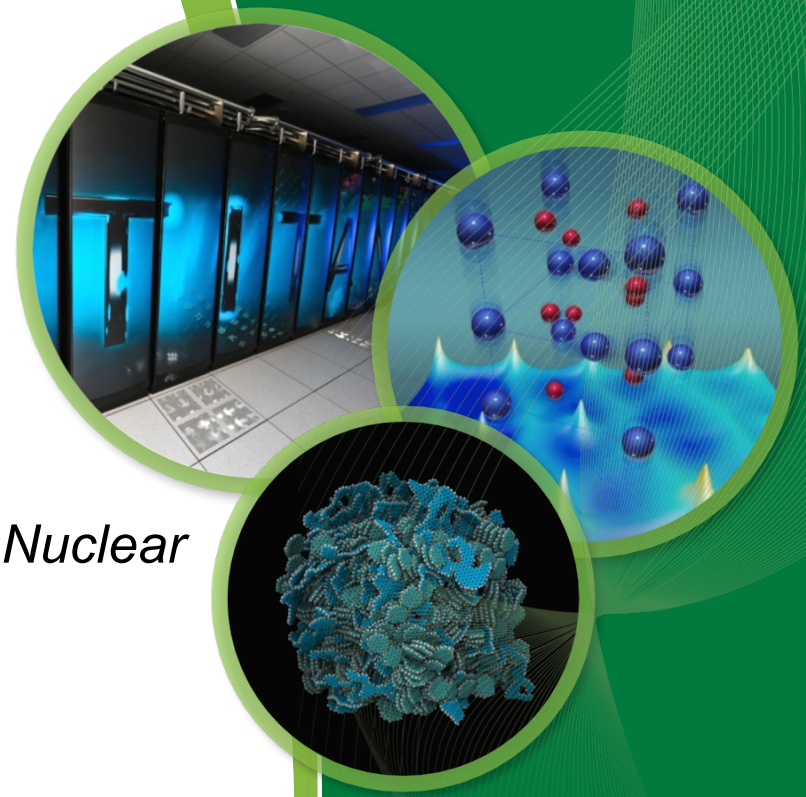
^{63,65}Cu Evaluation



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^{63,65}Cu Evaluation ENDF/B-VIII.b3 Update

Resolved Resonance Region

- Resonance parameters fit experimental data up to 300 keV
- ORELA Transmission Data
  1 keV – 300 keV continuous
- GELINA Capture Data
  0.1 keV – 220 keV continuous
  220 keV – 300 keV renormalized
- LRF = 7, $B_c = -\ell$, both fixed from ENDF/B-VII.1
- Resonance Parameter Covariance Matrix, File 32, LCOMP = 2

Merger with High Energy Evaluation

- Smooth transition between all reactions at 300 keV
- Angular distribution of elastic scattering calculated based on resonance parameters and smoothed for reduced storage
- Investigation of connecting angular distribution with high energy evaluation and impact on benchmark calculations

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Experimental Data Used in the New Evaluation

Reference	Energy Range (eV)	Facility	Measurement
Pandey et al.	32 – 185 000	ORELA	Trans. at 78 m
Pandey et al.	1 000 – 1 400 000	ORELA	Trans. at 78 m
Guber et al.	100 – 90 000	GELINA	Cap. at 58 m
Guber et al.	100 – 2 200 272	GELINA	Cap. at 58 m
Sobes et al.	0.01 – 0.1	MITR	Trans. at 1.2 m

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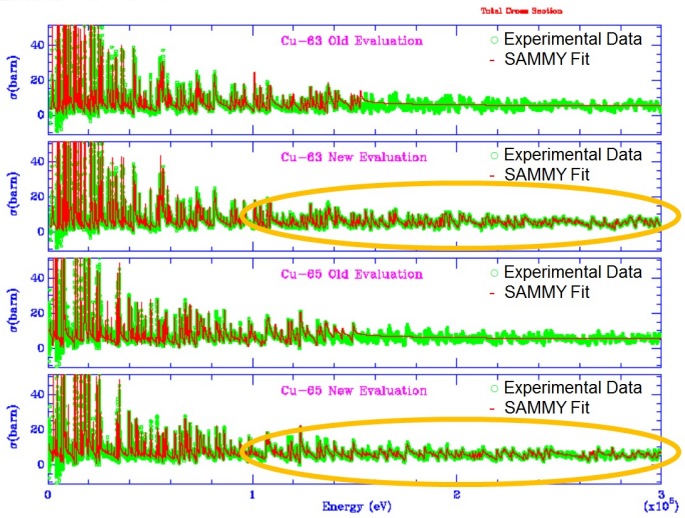
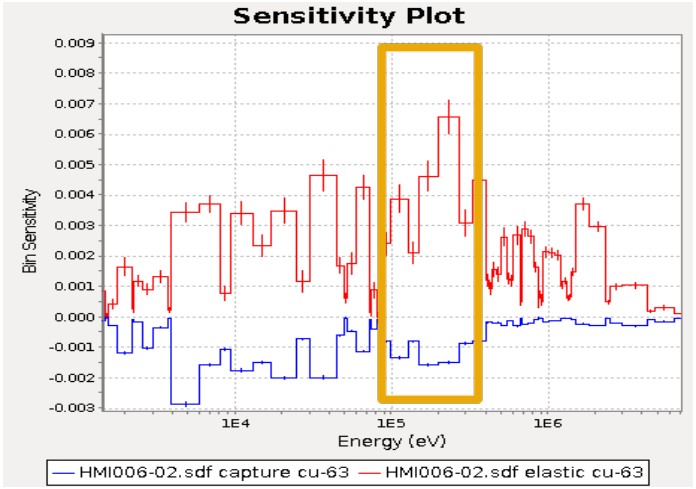
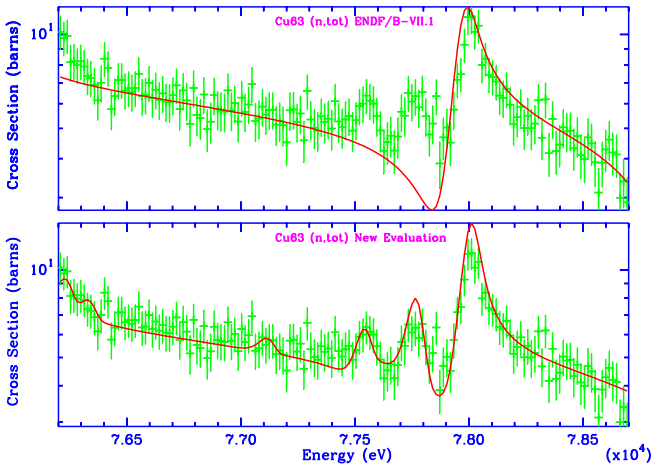
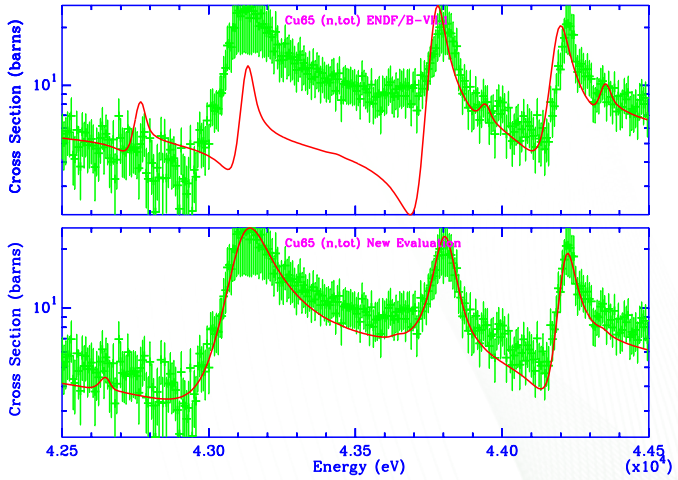
Resolved Resonance Region up to 300 keV









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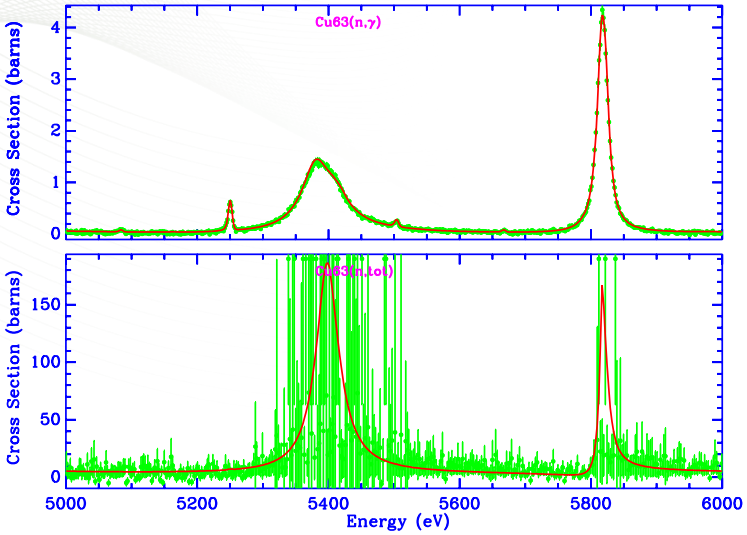
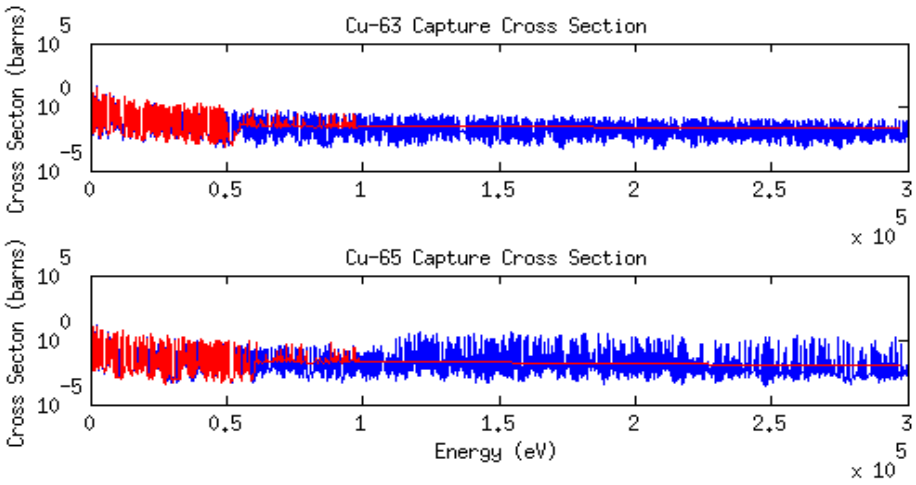
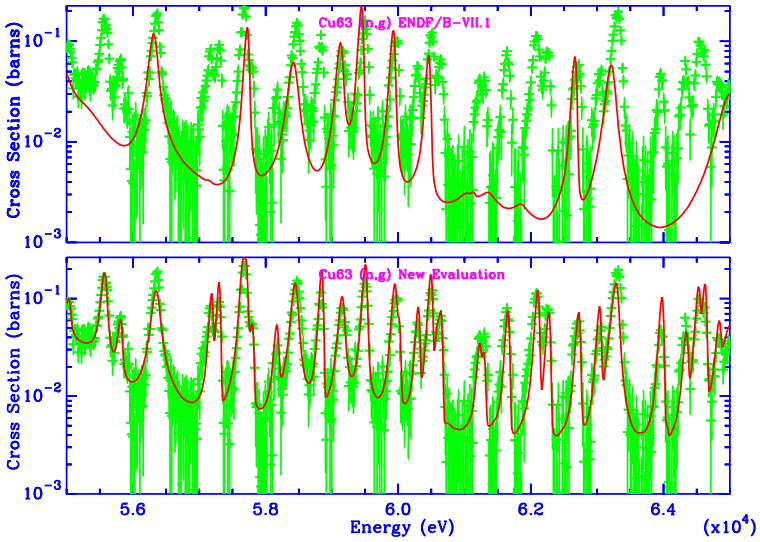
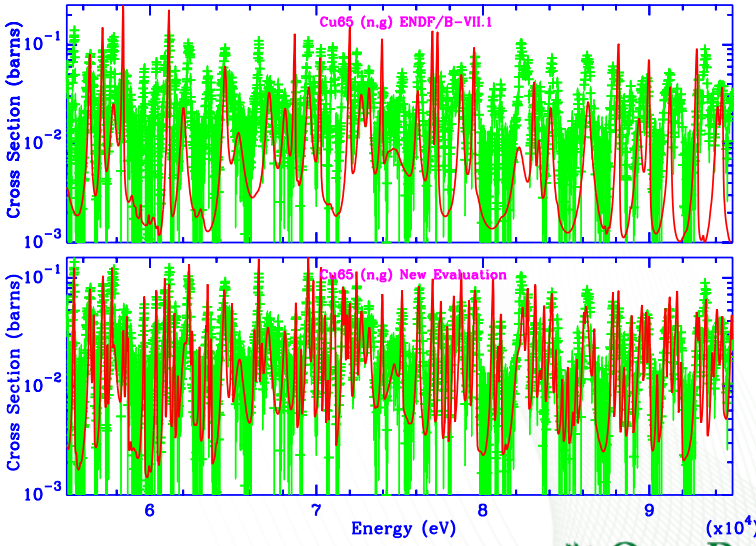
Analysis of Capture Measurements









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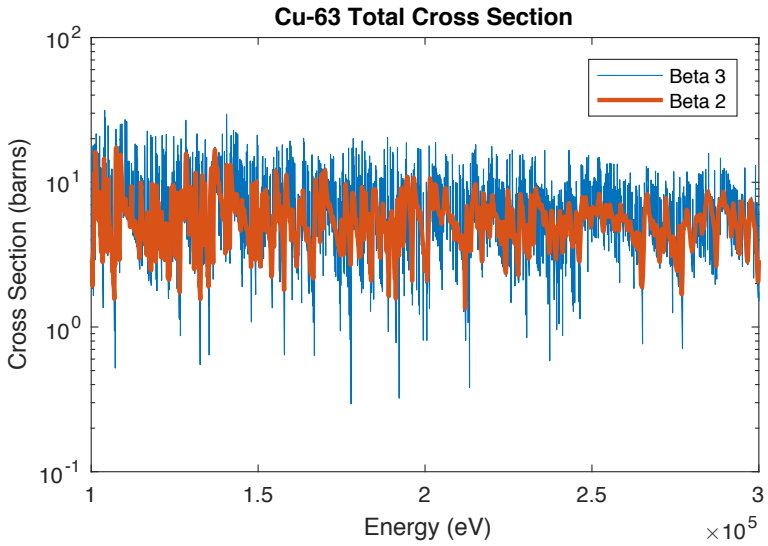
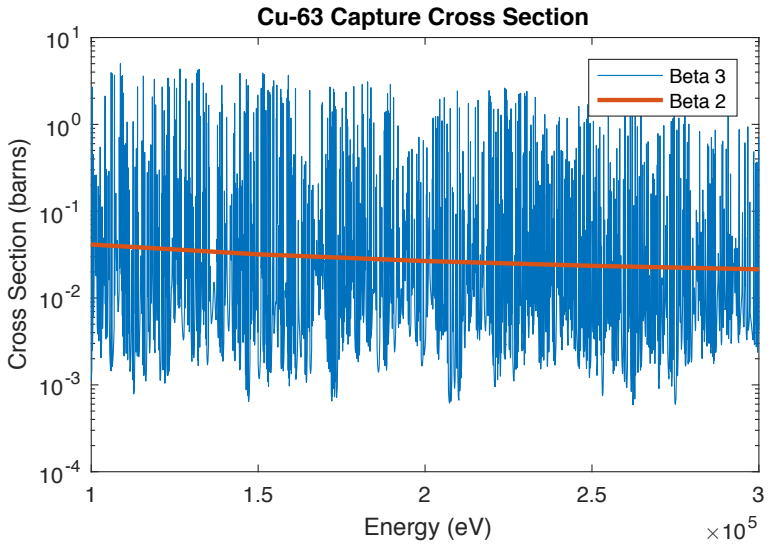
Beta 2 to Beta 3





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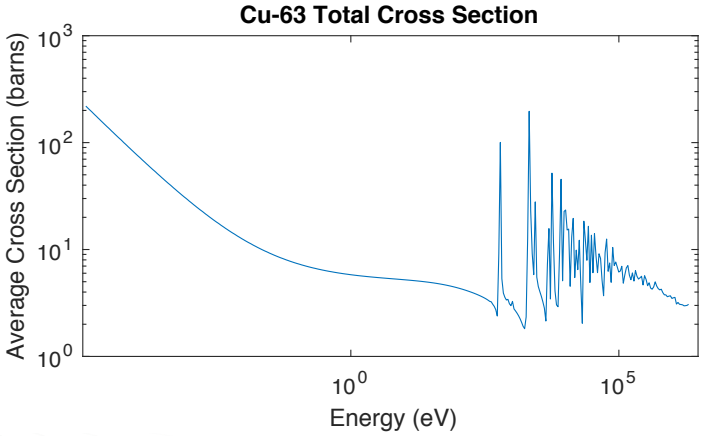

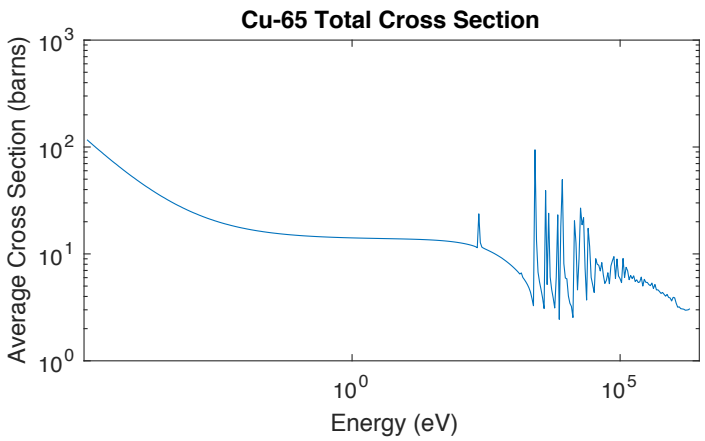

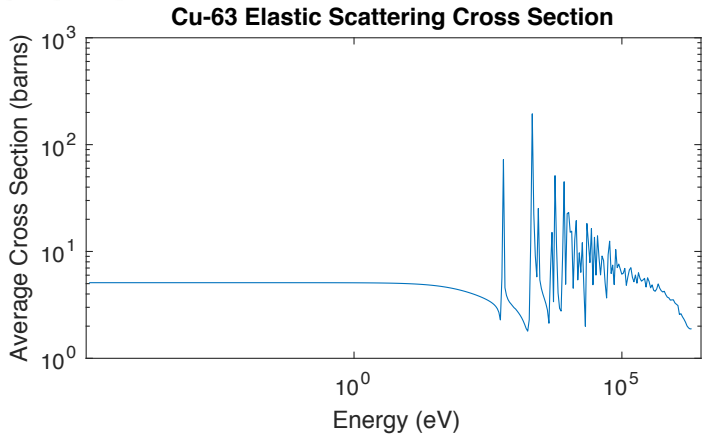

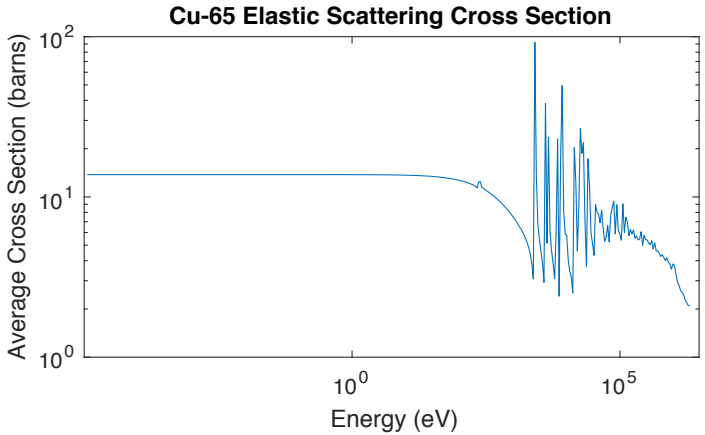

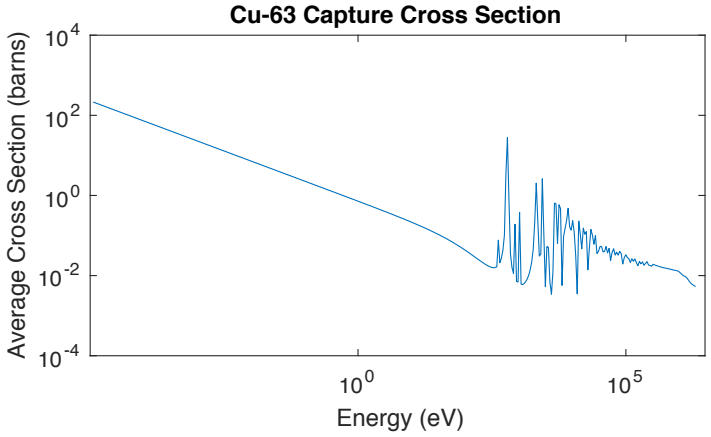

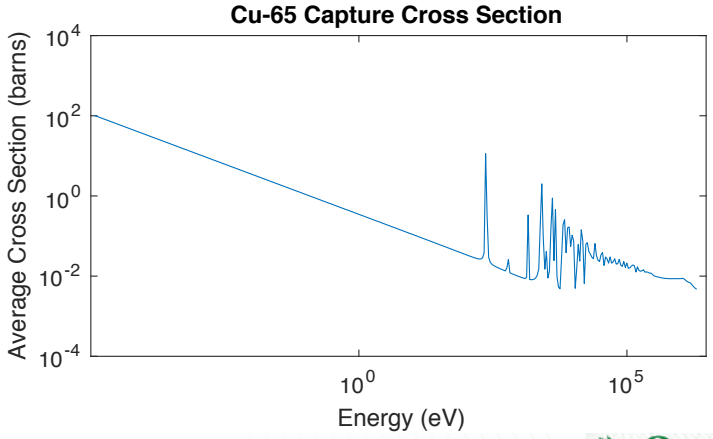

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Resonance Statistics

	^{63}Cu		^{65}Cu	
	Atlas of N. Res.	New Evaluation	Atlas of N. Res	New Evaluation
Thermal capture	4.50 +/- 0.02	4.47 b	2.17 +/- 0.03	2.14 b
Scattering radius	6.7 +/- 0.3	6.7 b	6.7 +/- 0.3	6.7 b
Avg. Lv. Spacing, s-wave	722 +/- 47	563 eV	1520 +/- 100	835 eV
Avg. Lv. Spacing, p-wave	404 +/- 22	543 eV	628 +/- 89	506 eV
Avg. Cap. Width, s-wave	0.500	1.140 eV	0.395	0.534 eV
Avg. Cap. Width, p-wave	0.260	0.532 eV	0.370	0.432 eV
Resonance Capture Integral	4.8	4.85 b	2.18	2.14 b

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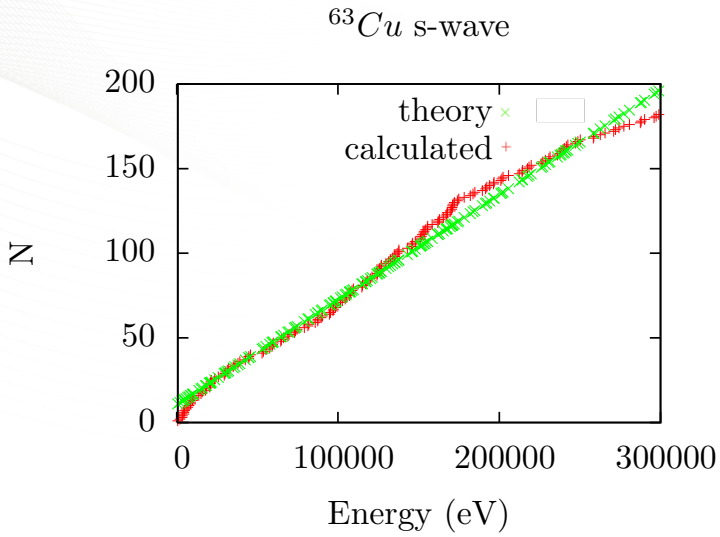
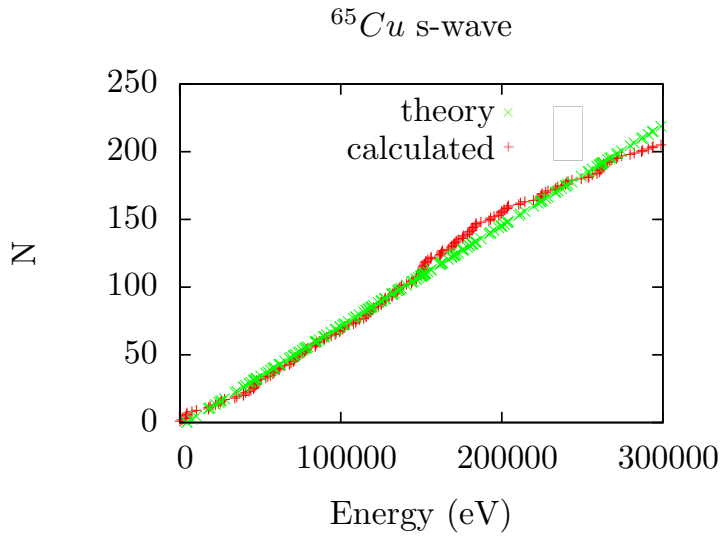
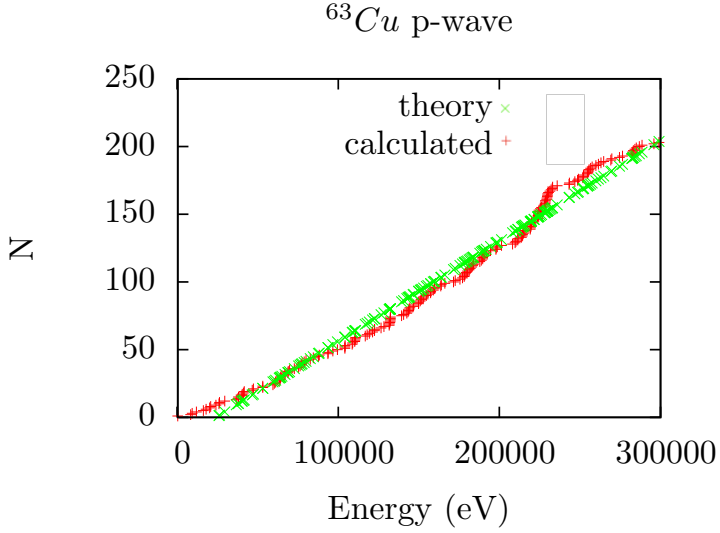
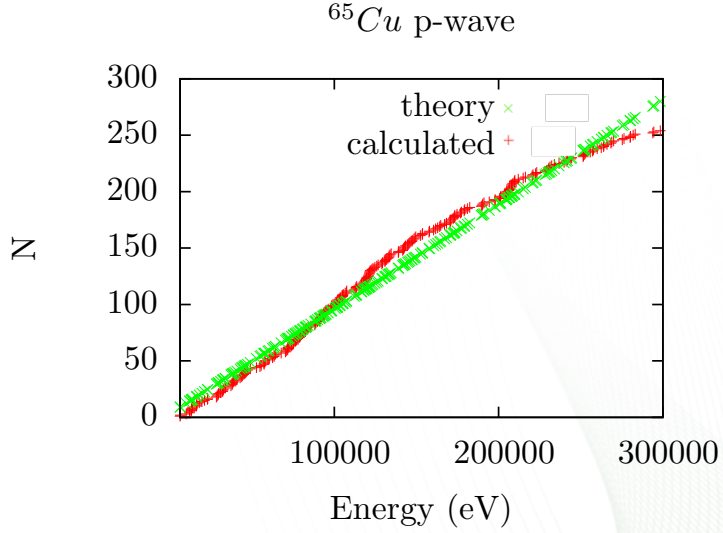
Cumulative Number of Levels









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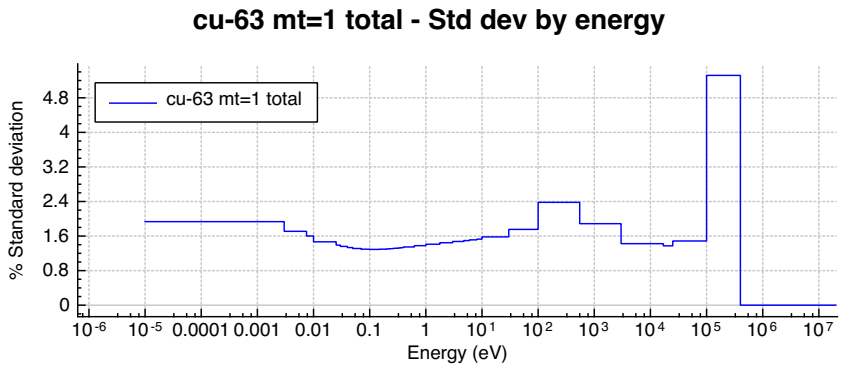
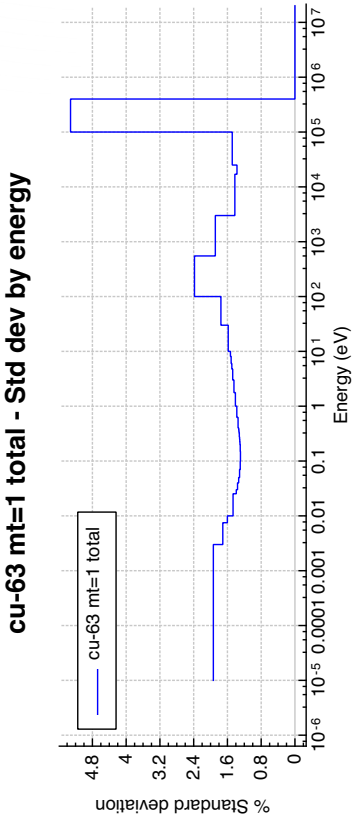
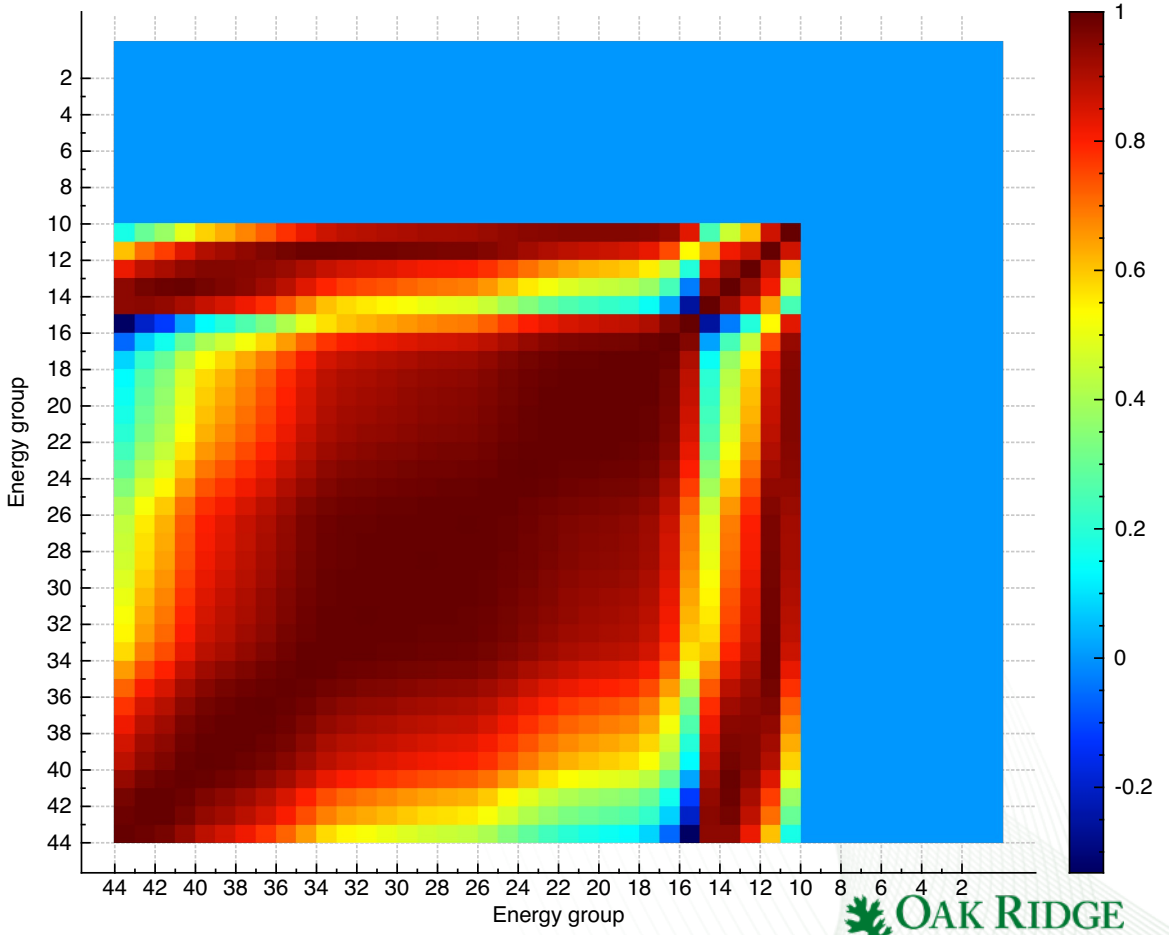
Resonance Parameter Covariance Propagated to Cross Section







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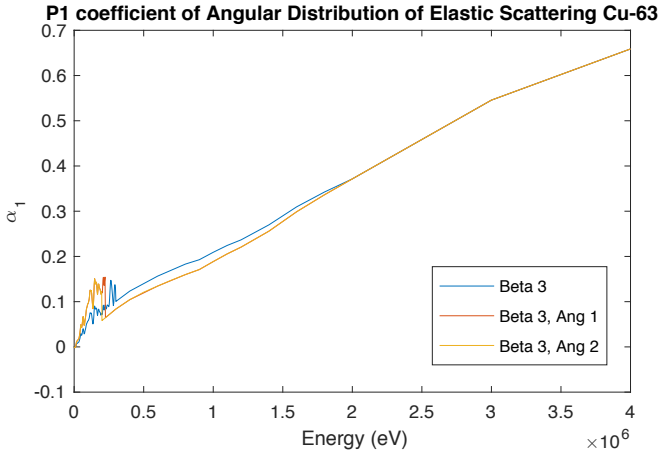
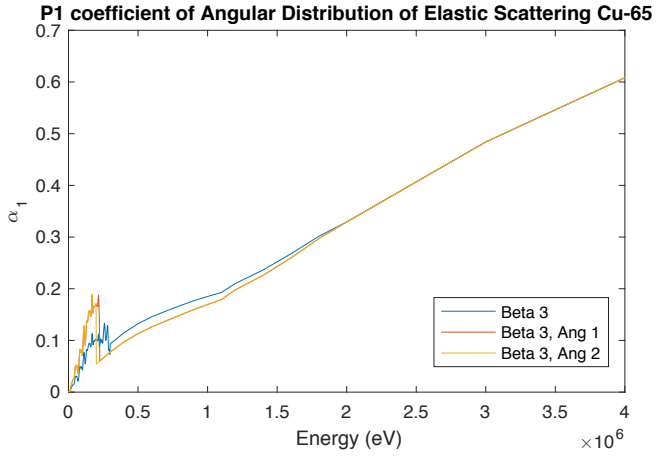
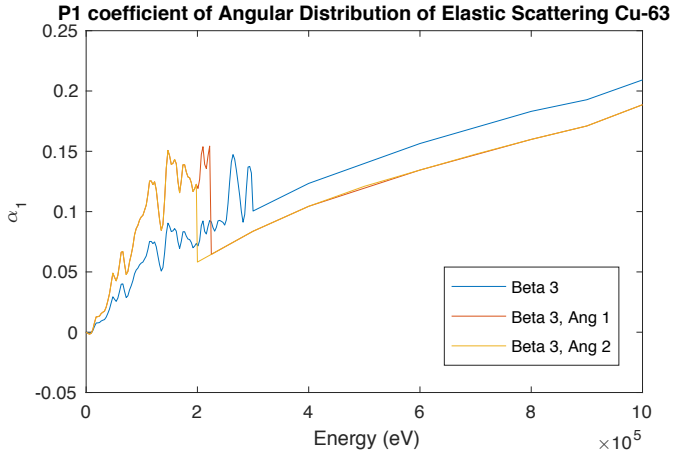
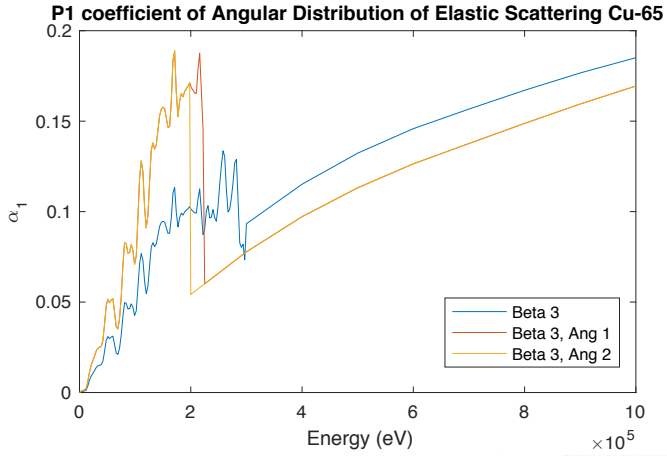
Angular Distributions of Elastic Scattering









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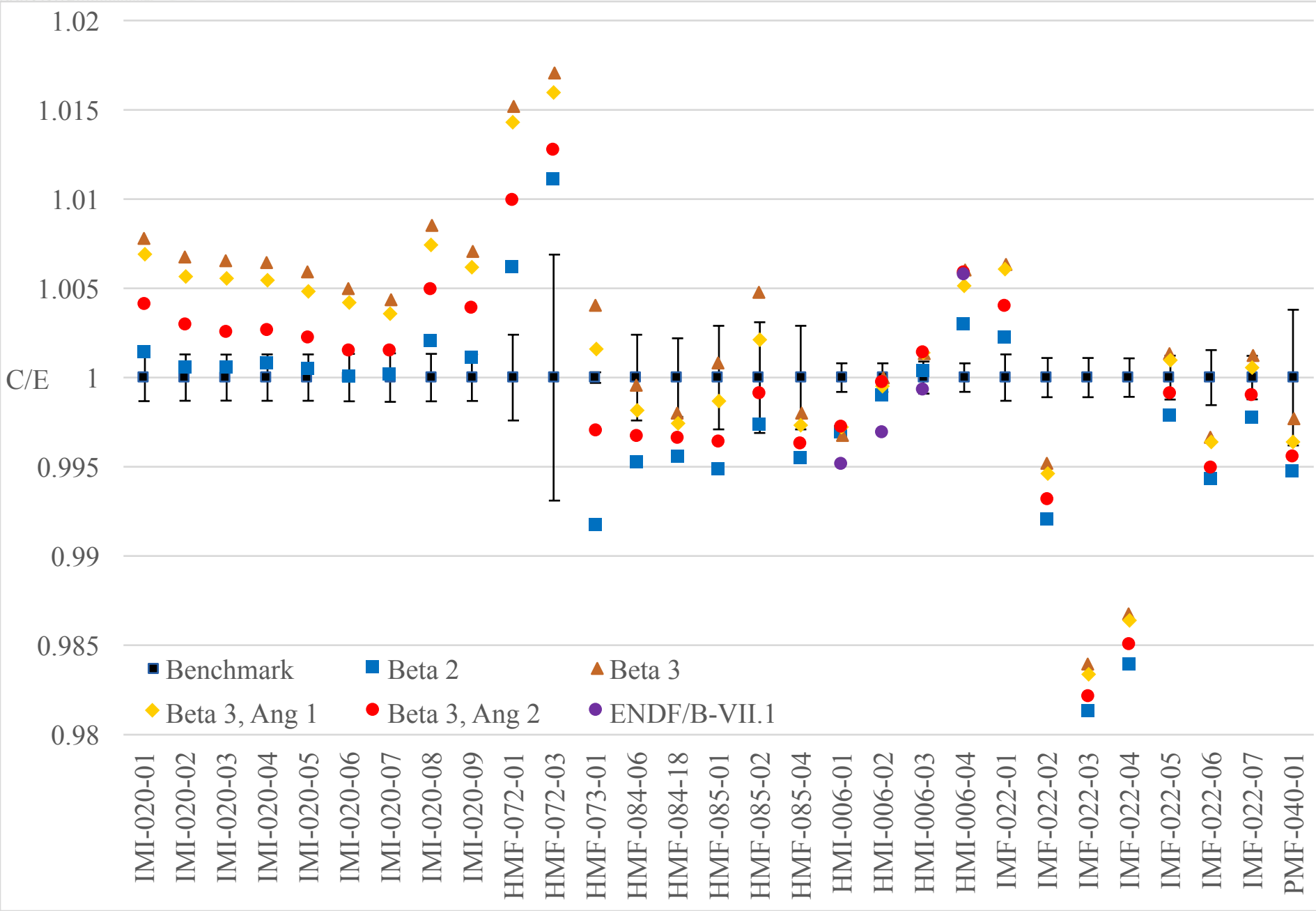
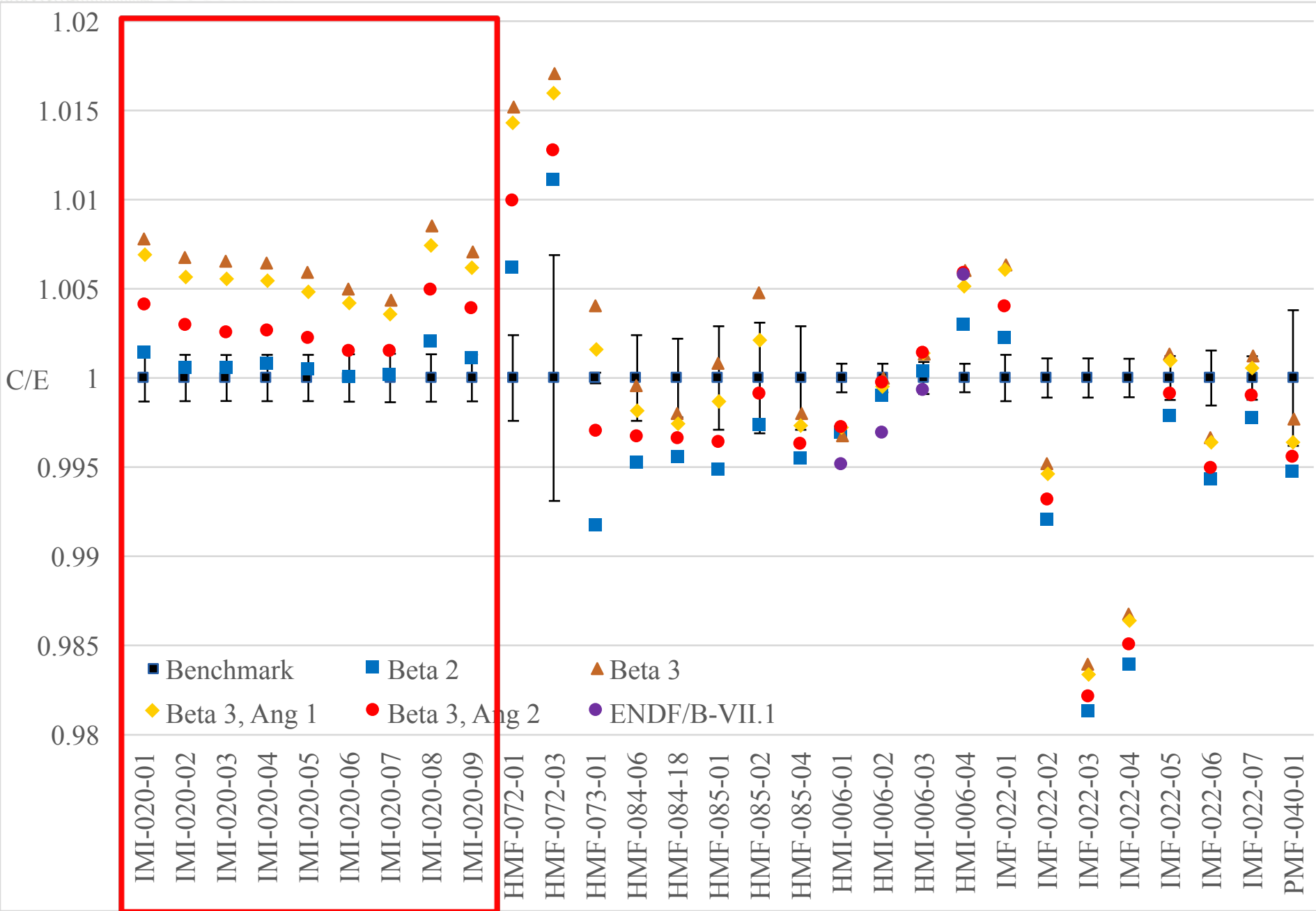
ICSBEP Benchmark Results



ICSBEP Benchmark Results



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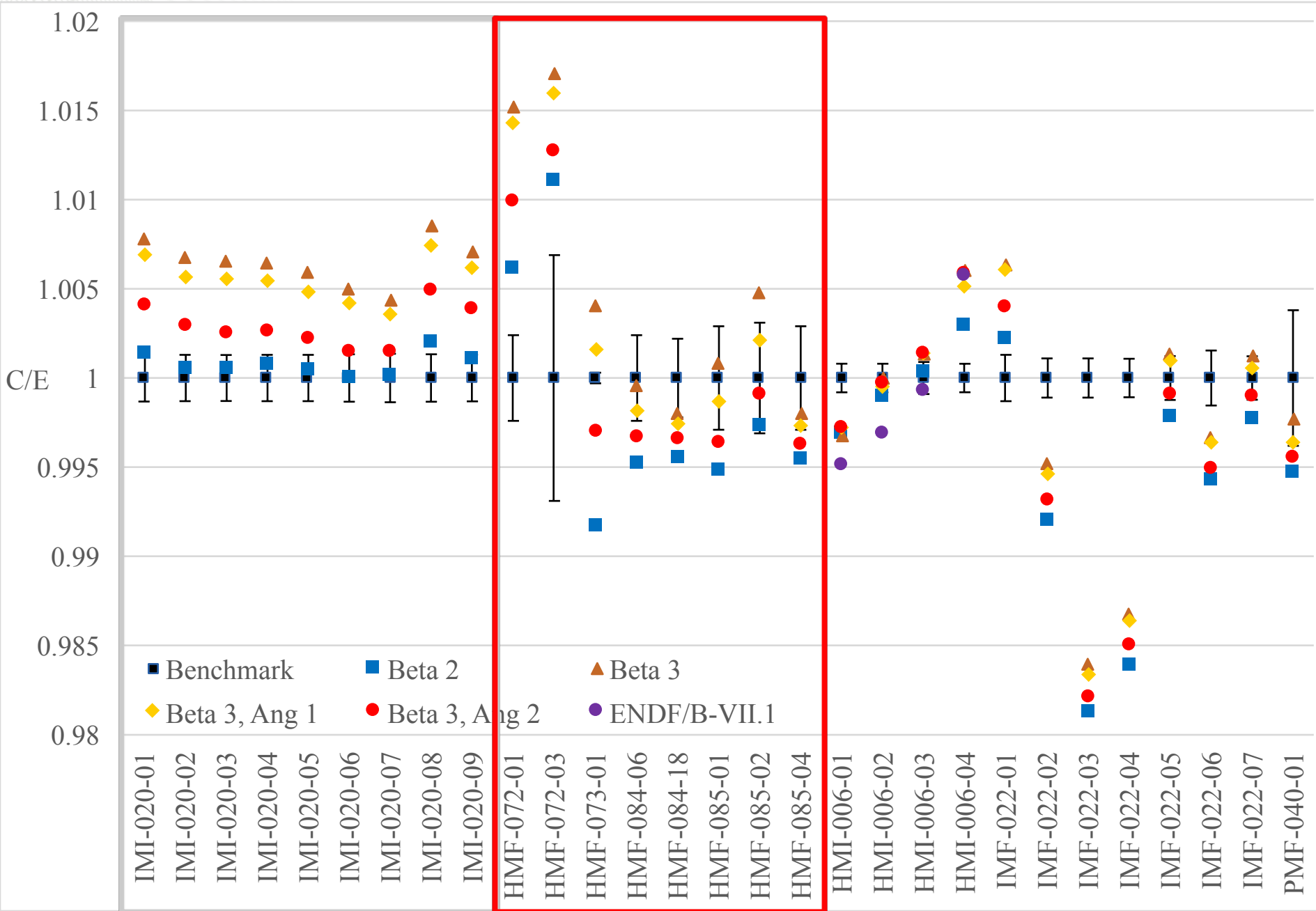

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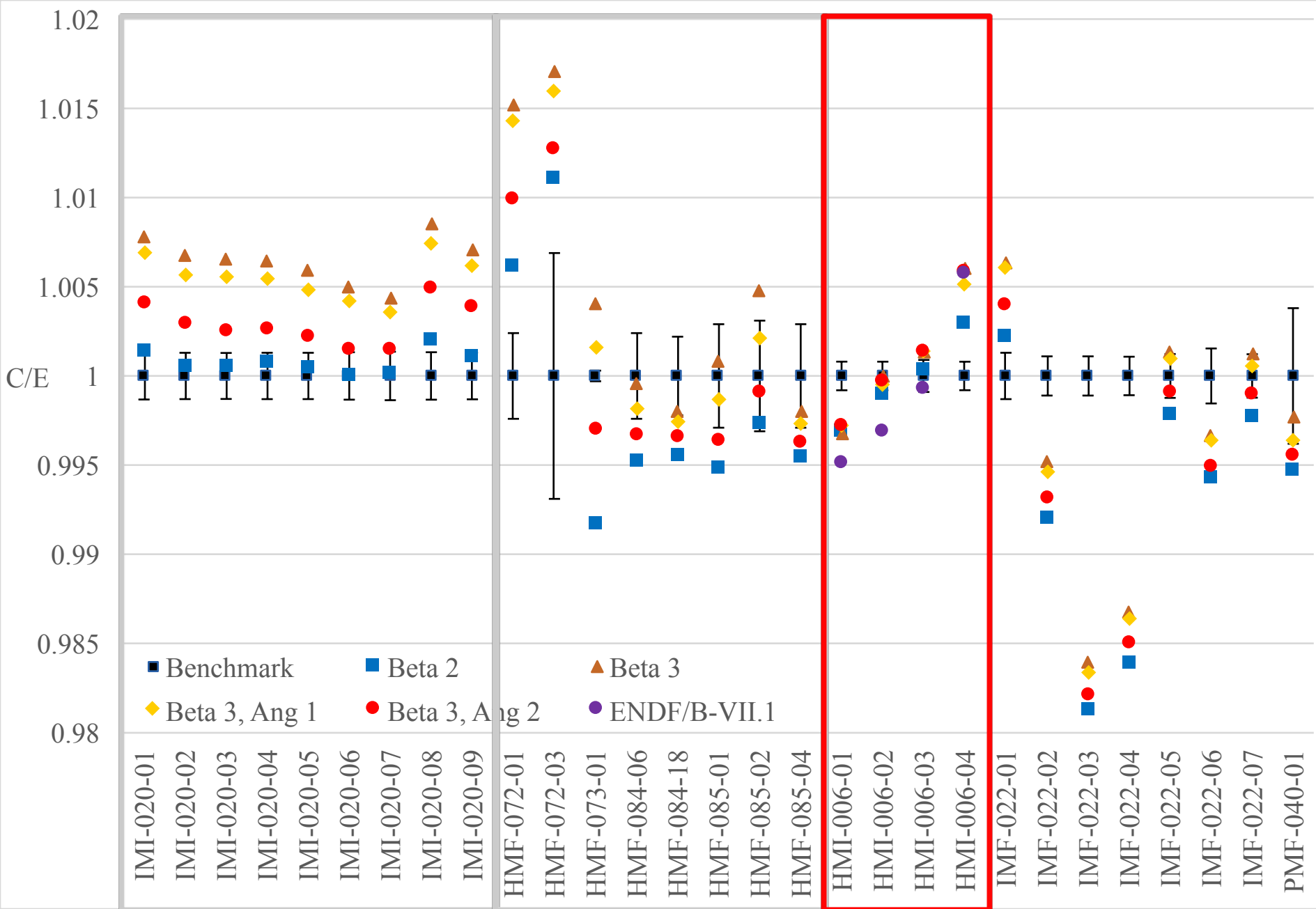

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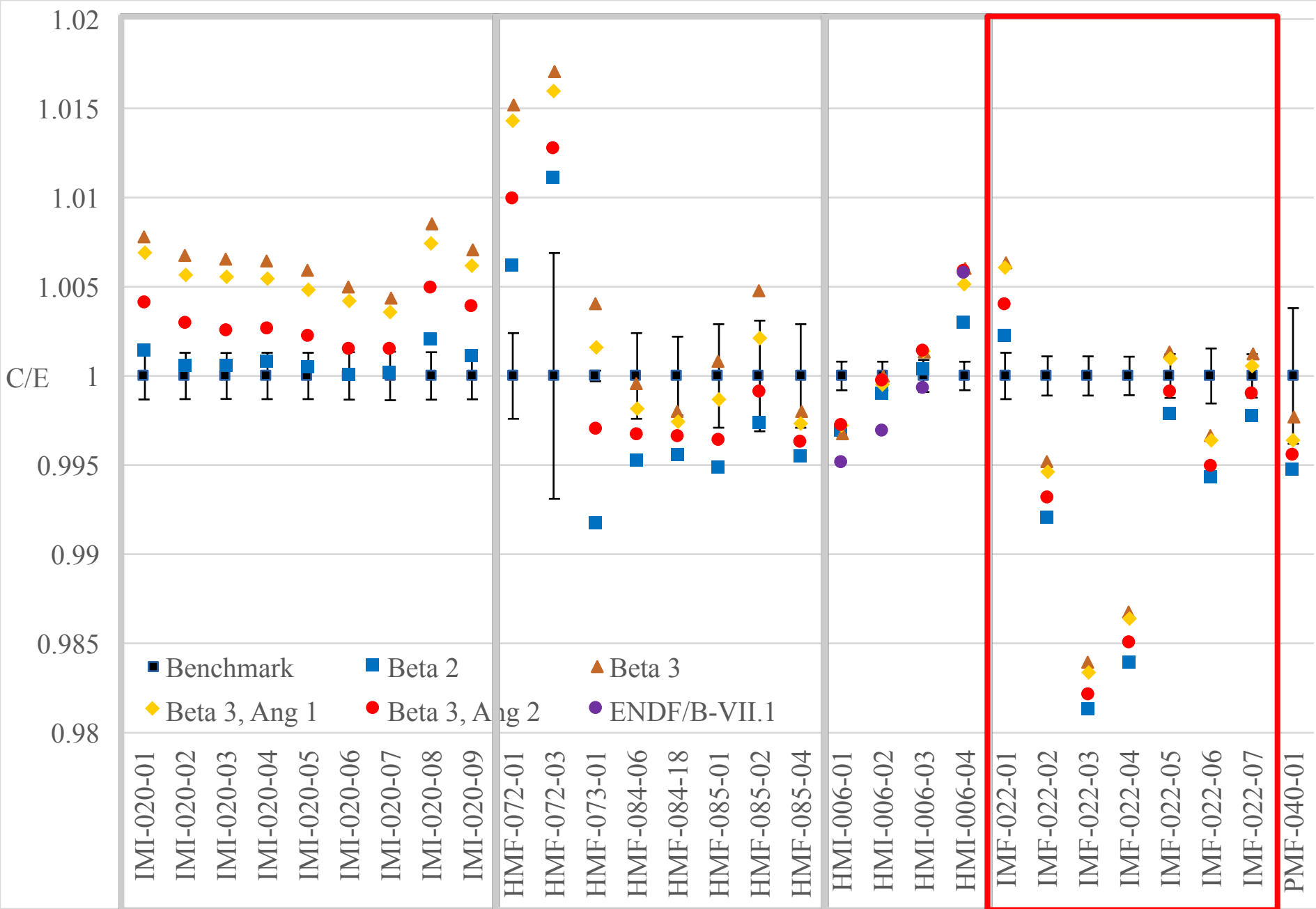
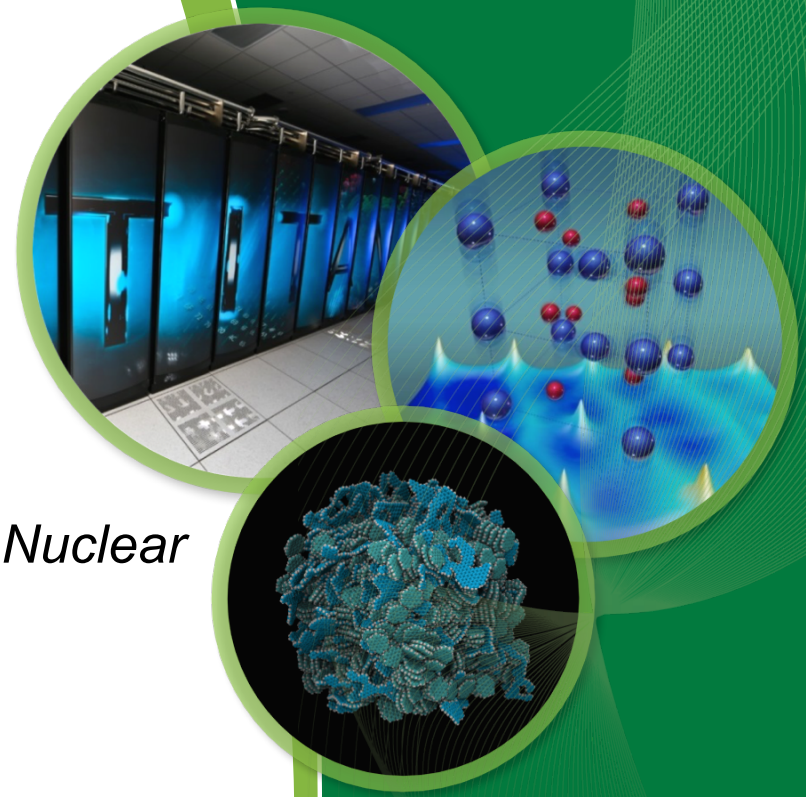


Conclusions

1. Resonance parameters fit experimental data up to 300 keV
2. LRF = 7, $B_c = -\ell$, both fixed from ENDF/B-VII.1
3. Resonance Parameter Covariance Matrix, File 32, LCOMP = 2
4. Resonance parameter statistics confirmed/updated with increased upper RRR energy
5. Uncertainty in angular distribution of elastic scattering results in varying performance in integral benchmarks

^{63,65}Cu Evaluation



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