Validation for ^{233}U Fueled Systems in KENO V.a in SCALE 6.2

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Outline

1. Overview of project
2. Experiments and libraries
3. Results
4. Conclusions

Overview of Project

- Reviewed and updated models previously created at ORNL
- Executed them in SCALE 6.2 using continuous energy and multigroup libraries
- Evaluated results to determine bias

Experiments & Libraries

Experiments considered

- 3 U233-COMP-THERM
- 10 U233-MET-FAST
- 32 U233-SOL-INTER
- 141 U233-SOL-THERM

- Total: 186 of the 244 ^{233}U cases in the Handbook

Libraries used

- ce_v7.0
- ce_v7.1
- v7.0-238
- v7.1-56
- v7.1-252n
- v7.1-200n47g

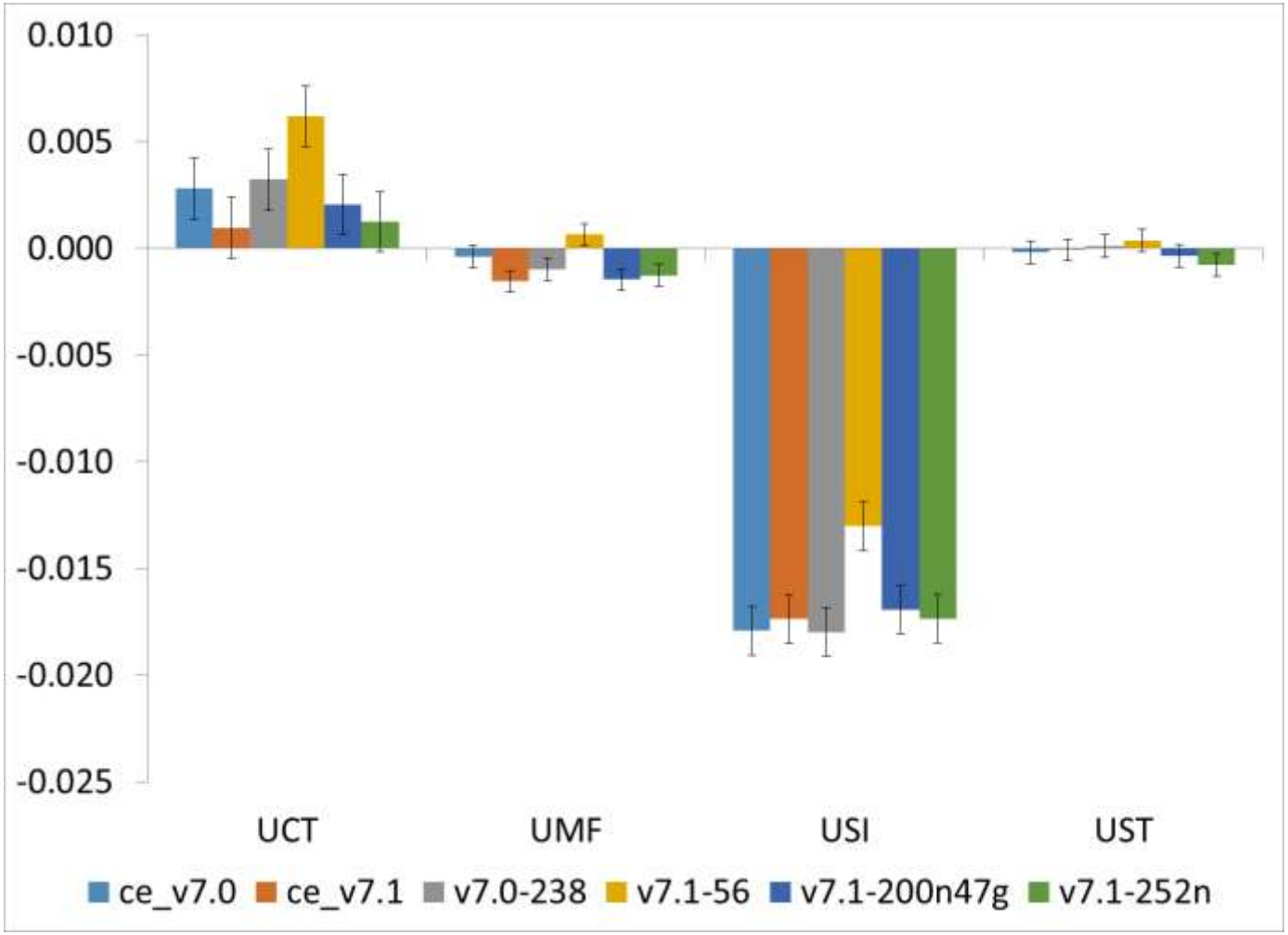
Results

Average C/E Bias by Category for Each Library

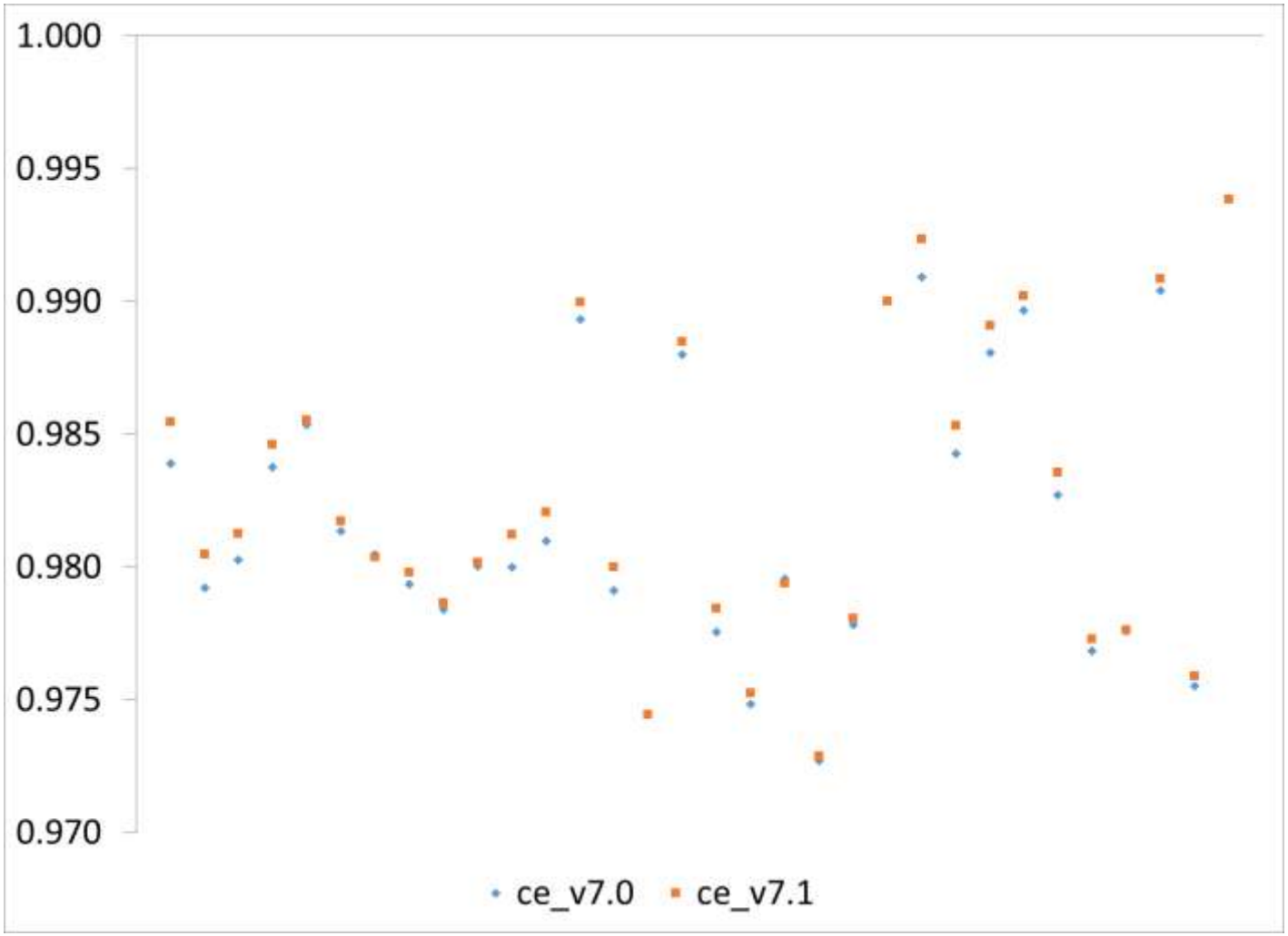
Category	ce_v7.0	ce_v7.1	v7-238	v7.1-56	v7.1-252	v7.1-200
UCT	0.00280	0.00098	0.00322	0.00619	0.00206	0.00125
UMF	-0.00039	-0.00155	-0.00099	0.00065	-0.00146	-0.00126
USI	-0.01793	-0.01737	-0.01798	-0.01301	-0.01693	-0.01735
UST	-0.00019	-0.00007	0.00010	0.00036	-0.00035	-0.00078

Category	Average C/E Uncertainty
UCT	0.00143
UMF	0.00051
USI	0.00114
UST	0.00052

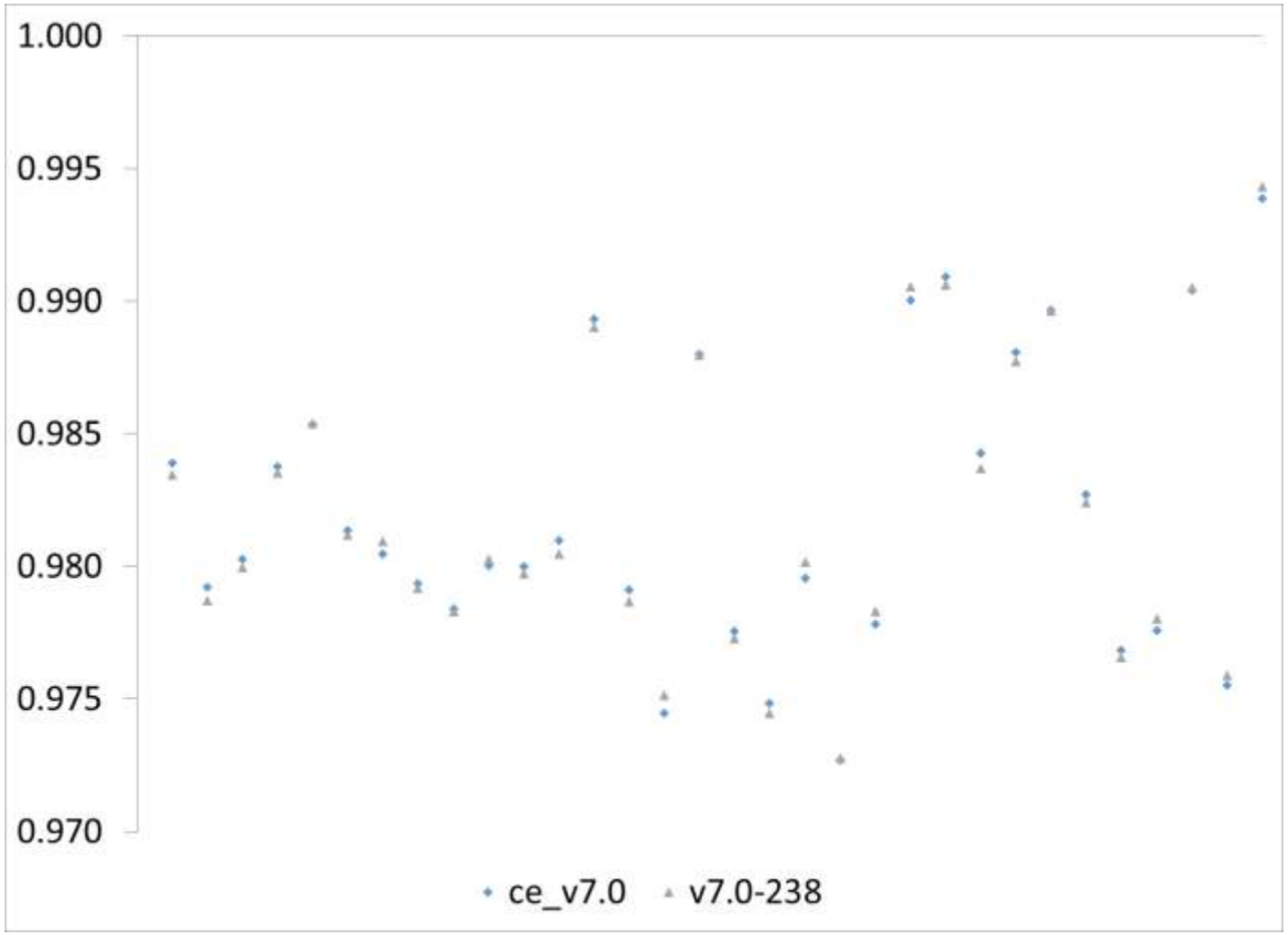
Summary Plot



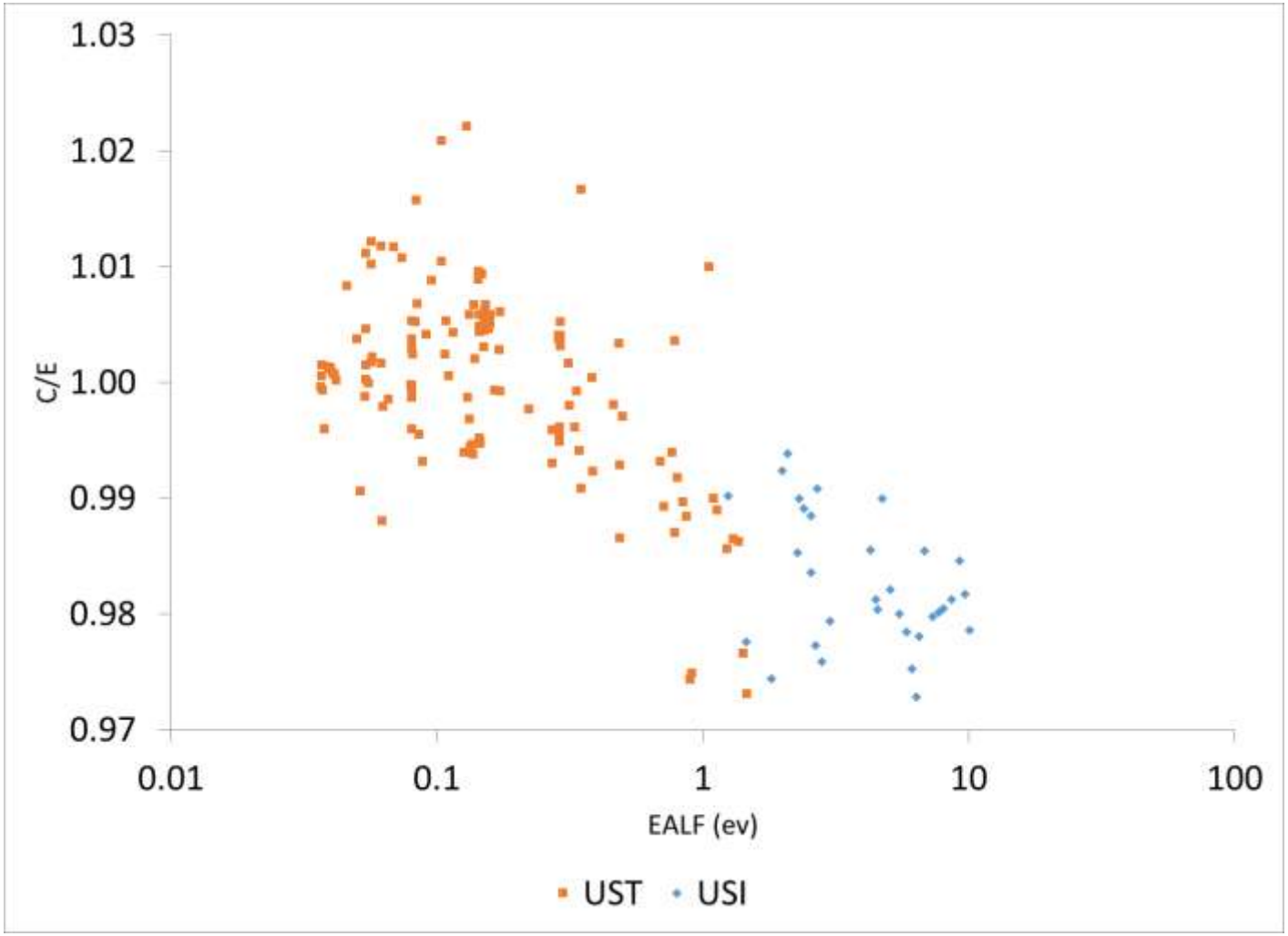
USI Plot CE



USI Plots – ENDF/B-VII.0



Solution Systems vs. EALF



Conclusions

- Current libraries do not effectively model U-233 intermediate solution cases
- ENDF/B-VII.0 and B-VII.1 continuous energy libraries agreed well
- Generally, MG and CE results agree well
  - v7.1-56 does not
- Clear trend across UST and USI systems of lower C/E with increasing energy
  - UMF systems are however, well predicted