Benchmarking ENDF with LLNL Codes

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Benchmarking details

- Cross comparison:
  - Deterministic code (AMTRAN)
  - Monte-Carlo code (Mercury)
- AMTRAN could only be run to prompt critical so correction needed to be applied.
- Fast assemblies mainly.
- Consistency with other calculations/libraries:
  - JENDL-3.3 and MVP
  - JEFF-3.1 and TRIPOLI
  - ENDF/B-VI, ENDF/B-VIIβ2 and MCNP
- ENDF/B-VIIβ3 results

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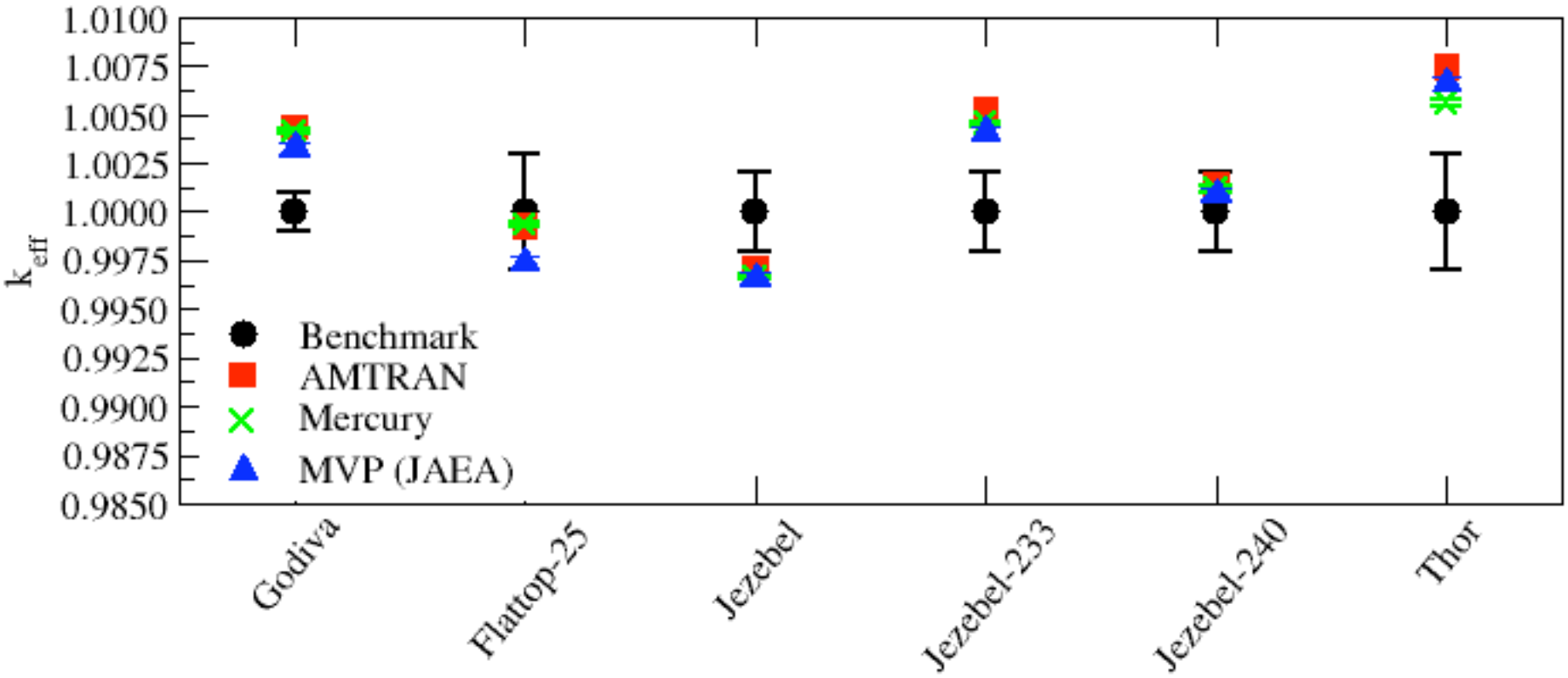
Validation of JENDL-3.3

Compare translated JENDL-3.3 data, using AMTRAN (NDF) and Mercury (MCF) w/ Okumura, *et al.* using ENDF formatted data and MVP.



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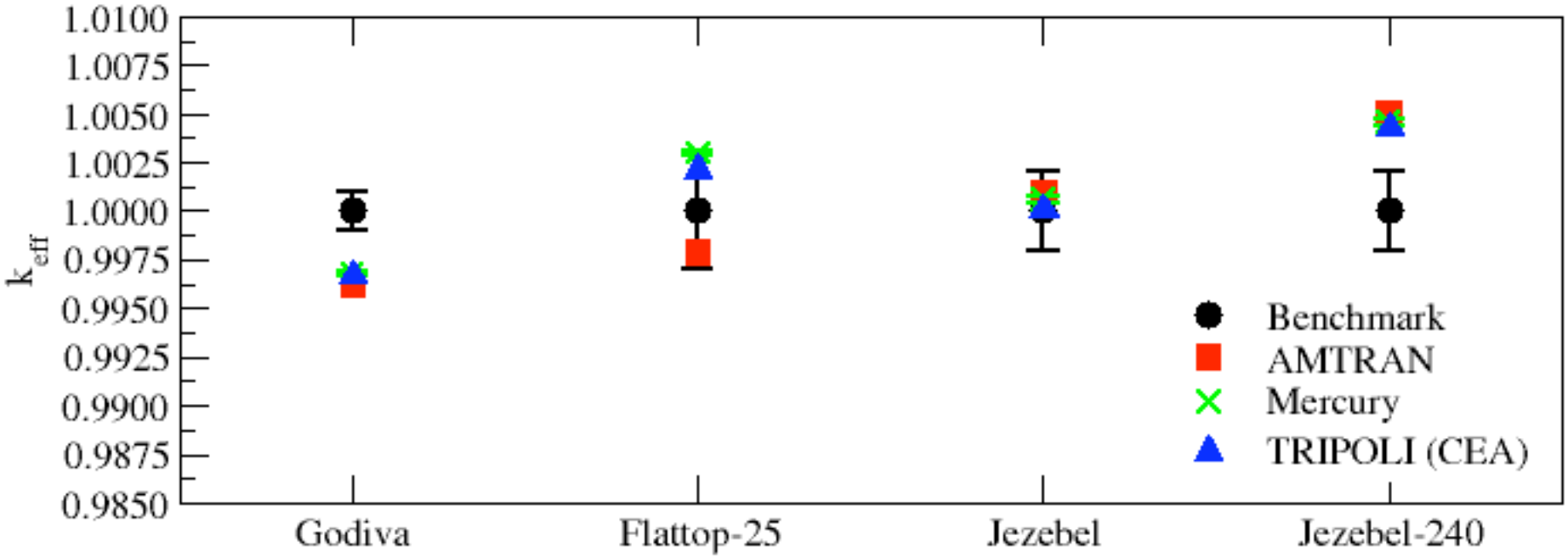
Validation of JEFF-3.1

Compare translated JEFF-3.1 data, using AMTRAN (NDF) and Mercury (MCF) w/ Sublet *et al.* (Cadarache) using ENDF formatted data and TRIPOLI.



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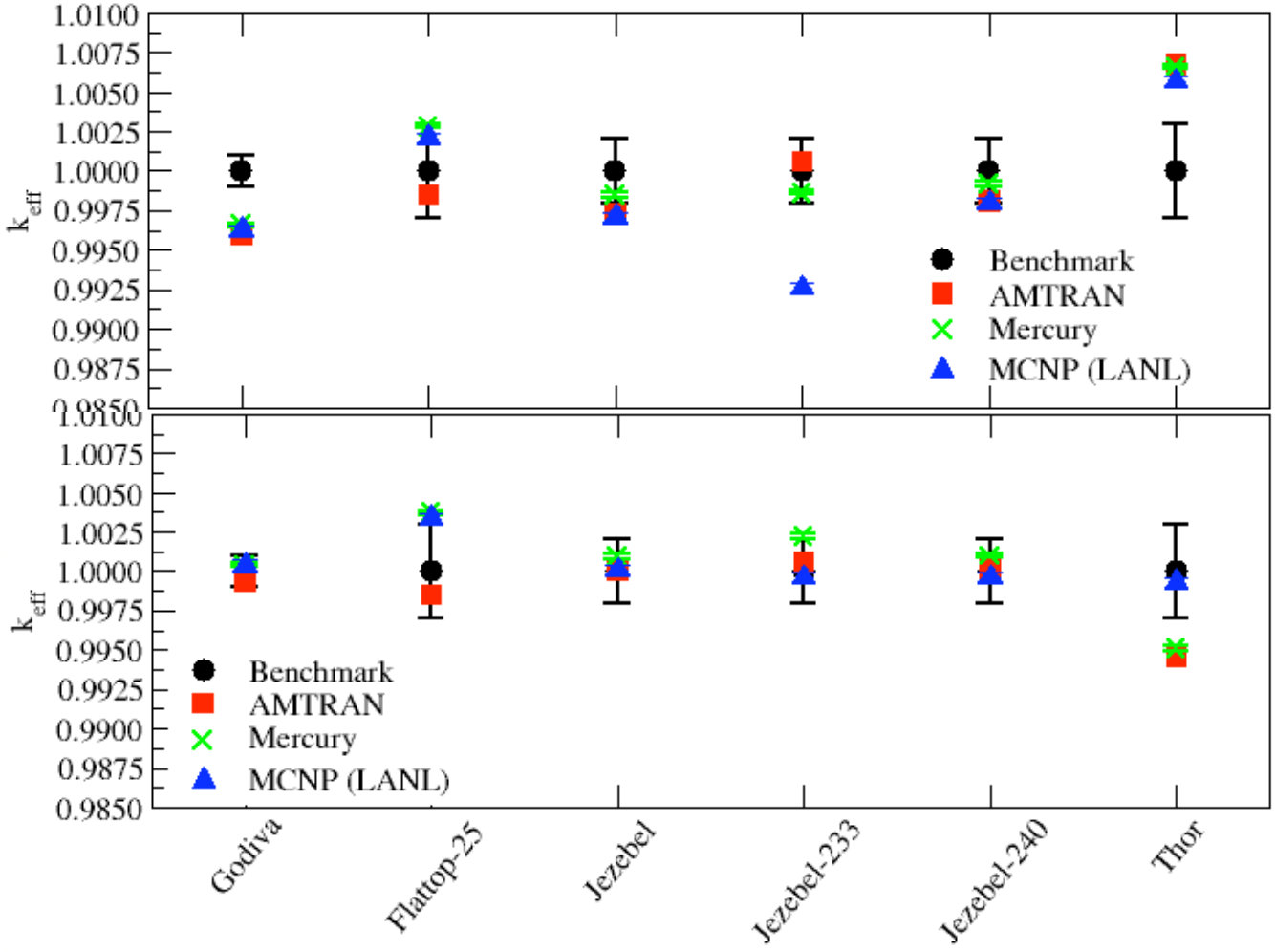
Validation of ENDF/B-VI,VIIβ2

Compare translated ENDF/B-VI and ENDF/B-VIIβ2 data w/ R. Mosteller (LANL) using ENDF formatted data and MCNP.

ENDF/B-VI

ENDF/B-VIIβ2



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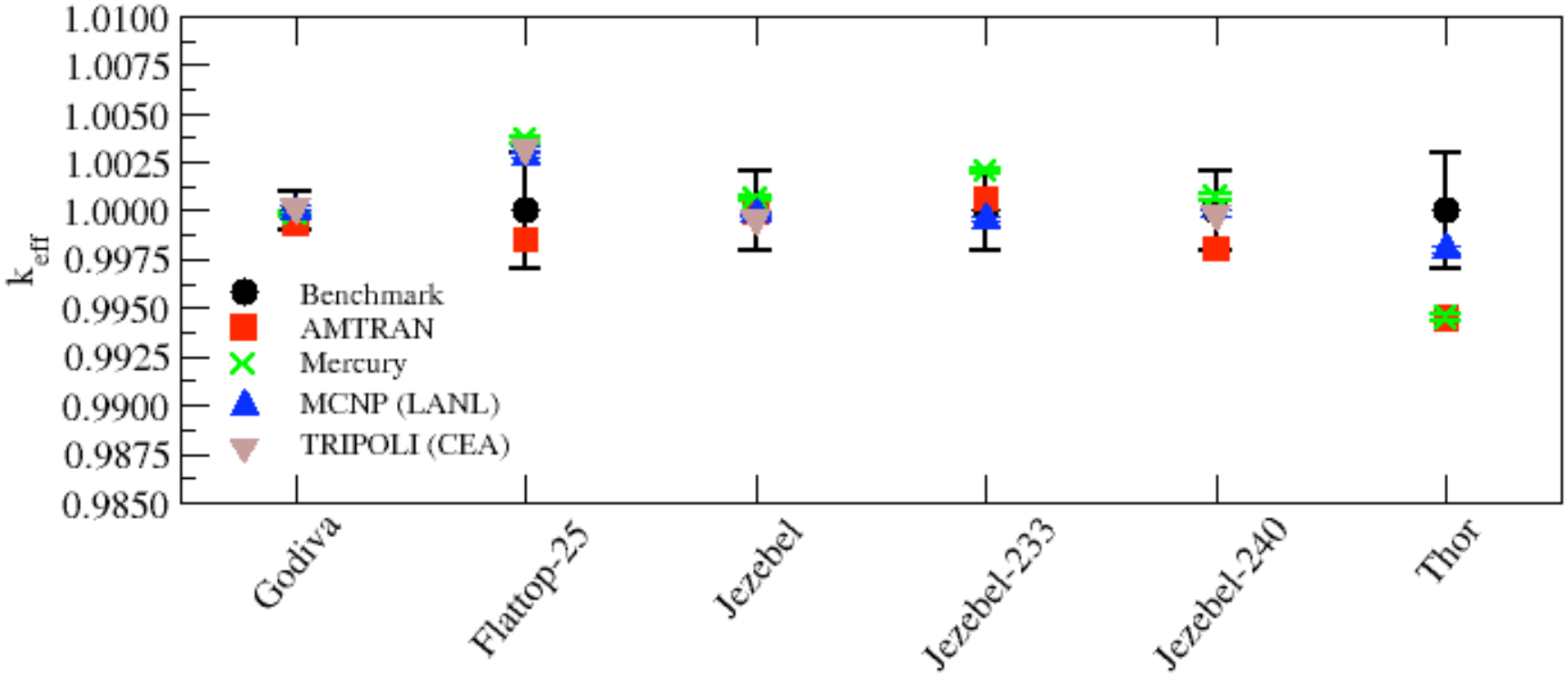
ENDF/B-VIIb3



Results generally consistent, but…

- Deterministic calc (AMTRAN) low again for Flattop-25
- Why does MCNP get Thor while we're low?

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Comments on benchmark tests

- AMTRAN's delayed nubar correction needs work
  - may account for inconsistencies in Flattop-25.
- Need $S_{\alpha\beta}$ data to get solution assemblies correct (not shown)
- Performed 9 other tests, but have no external calculations to compare and have not done our own MCNP calculations yet.
- Would like to understand differences for Thor with ENDF/B-VIIβ3

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