AMPX Cross-Section Processing Status

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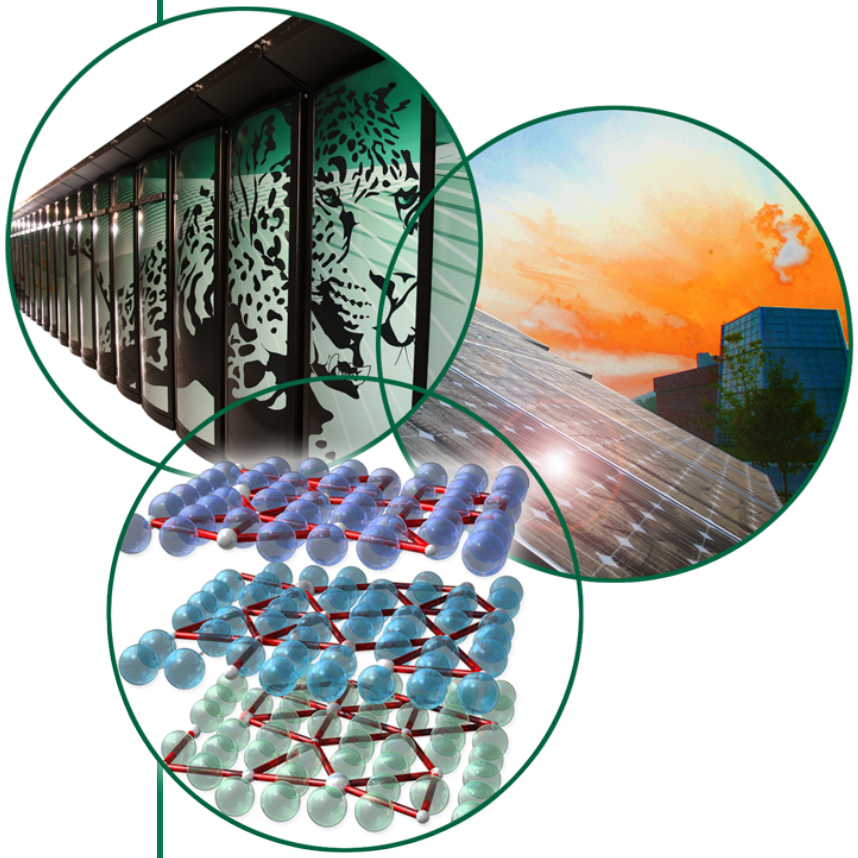
CSEWG MEETING



U.S. DEPARTMENT OF ENERGY

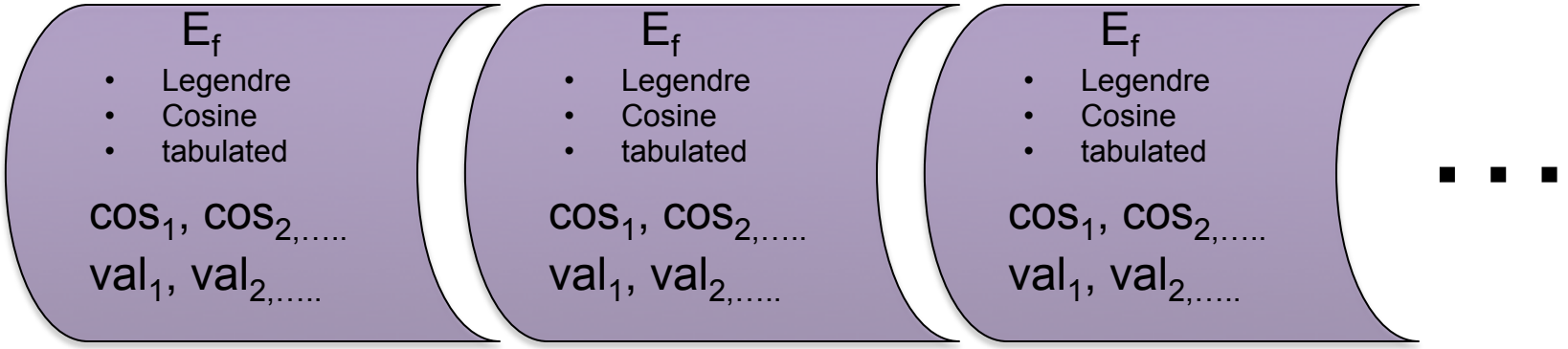
OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Outline

- Improvements in kinematic data processing
- New multi group library
- Processing ENDF/VII.1

FORTRAN derived types for kinematic data
+functions to handle and add dynamic memory management



Repeat for each incident energy

New modules using the types

- KINZEST: combine kinematic files and select on AWP and ZAP
- KINKOS: convert between all supported formats
- MG_TO_KIN: convert MG scattering matrices to double differential form

Supporting subroutines

- Insert additional exit energies or incident energies
- Test whether exit energies, exit angles or incident energies can be interpolated
- Thin exit energy or exit angles as needed.
- Convert between tabulated and moment formats, adding extra angles and exit energies as needed

Processing of thermal moderator data

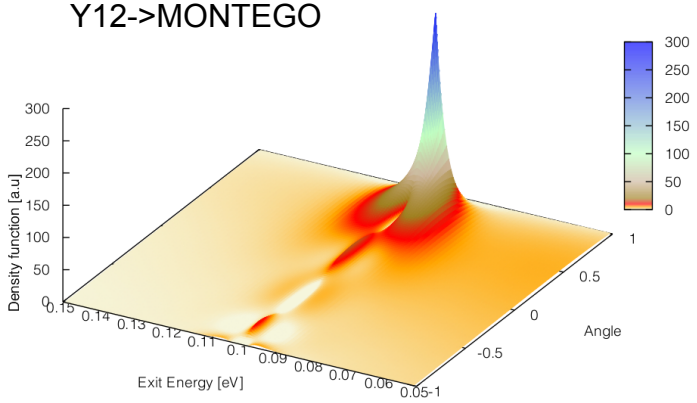
Since primarily used for MG:

Y12
File 7 -> cosine moments

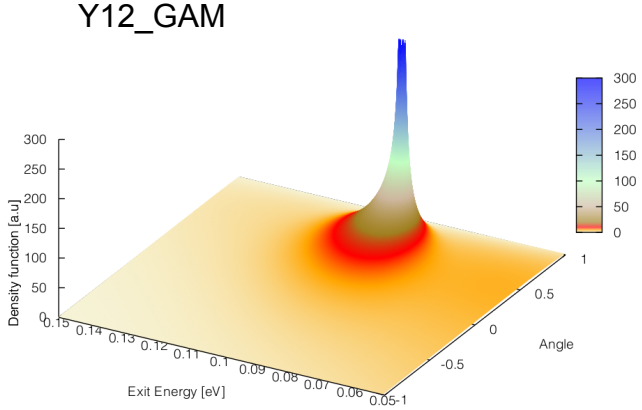
MONTEGO
cosine moments -> point-wise

JAMAICAN
point-wise -> probability distr.

Y12->MONTEGO



Y12_GAM



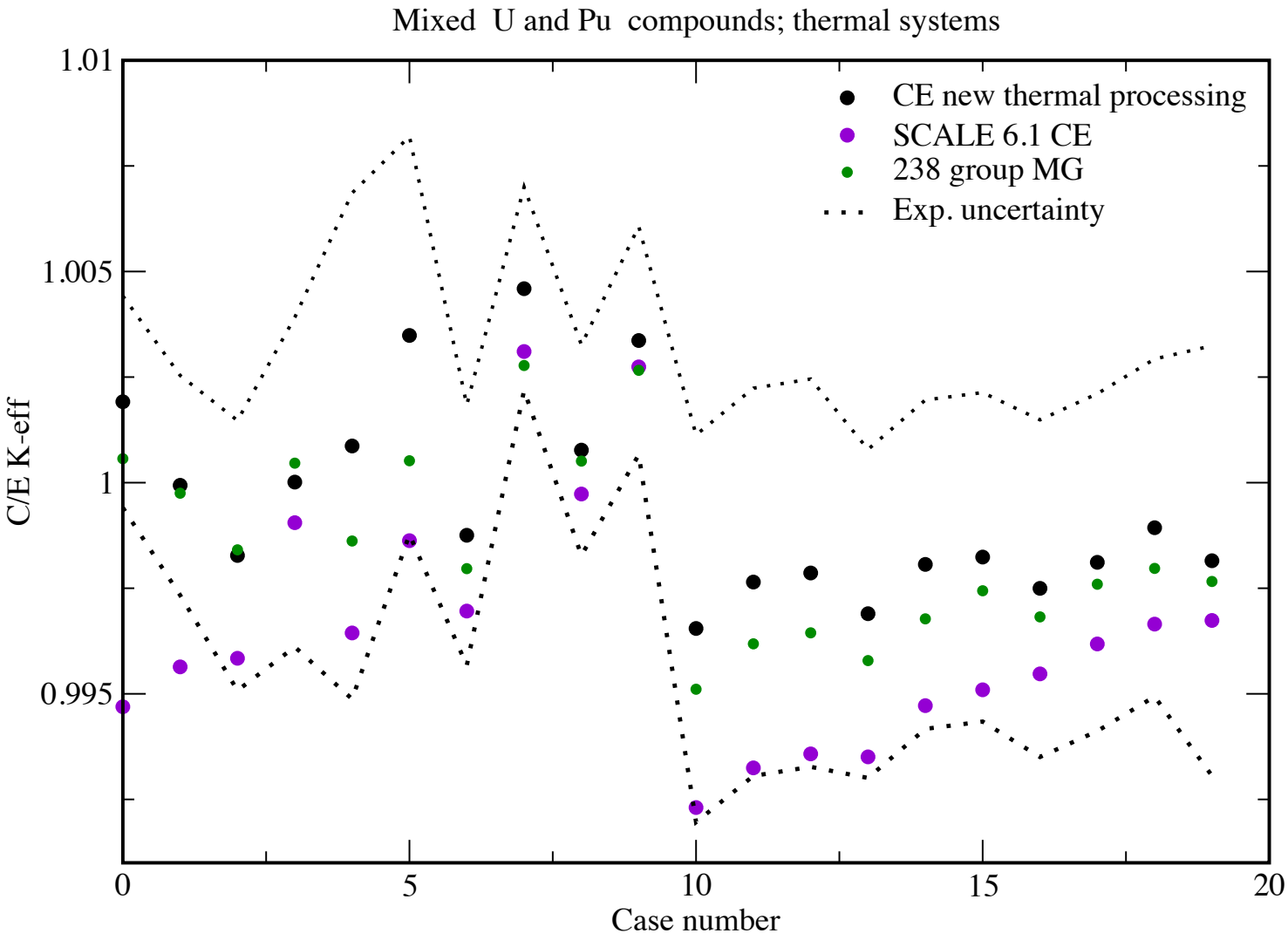
H_2O incident energy 0.1 eV

Updated for CE library

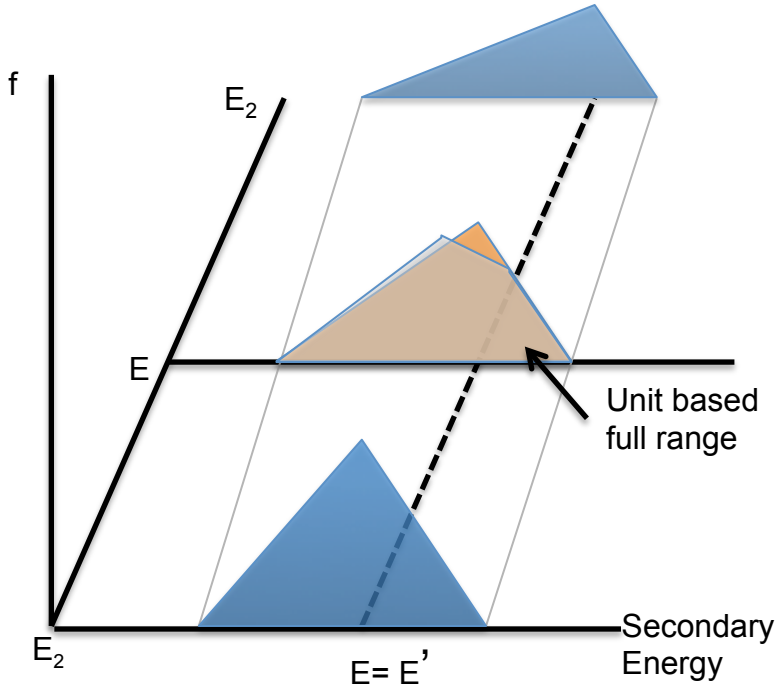
Y12_GAM
File 7 ->point-wise

JAMAICAN
point-wise -> probability distr.

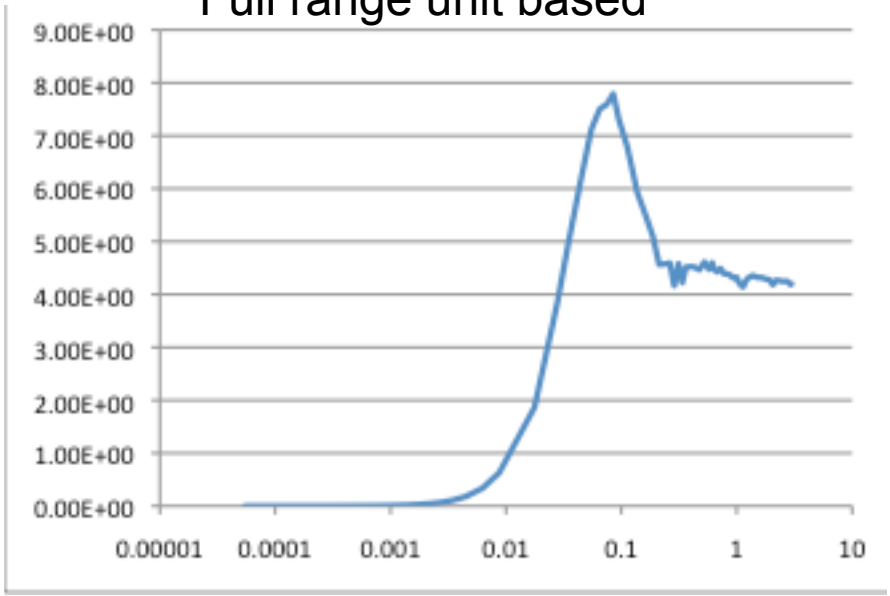
In addition a much finer grid is used -> thinned in updated JAMAICAN to keep library size manageable



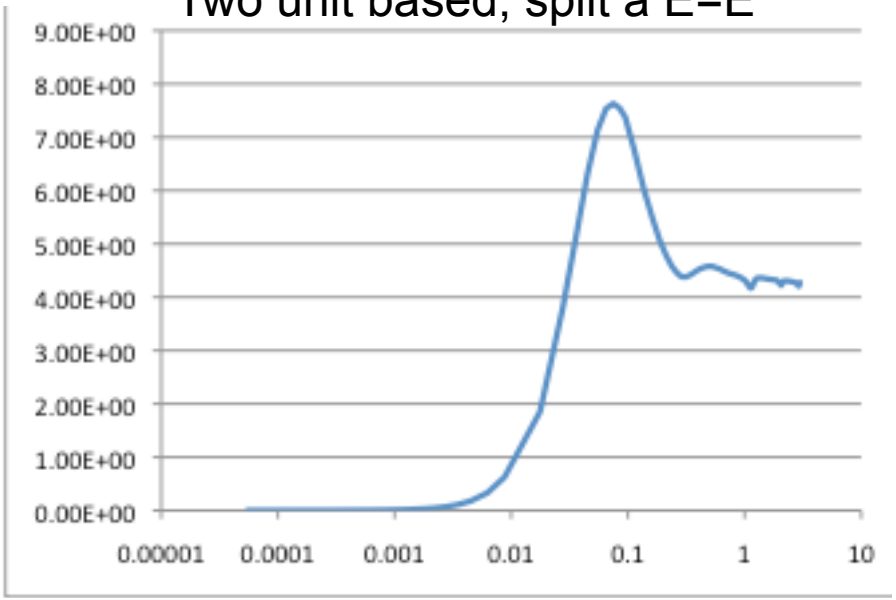
Infinite homogenous medium
U-235 and H_2O
XSDRN flux from MG calculation



Full range unit based



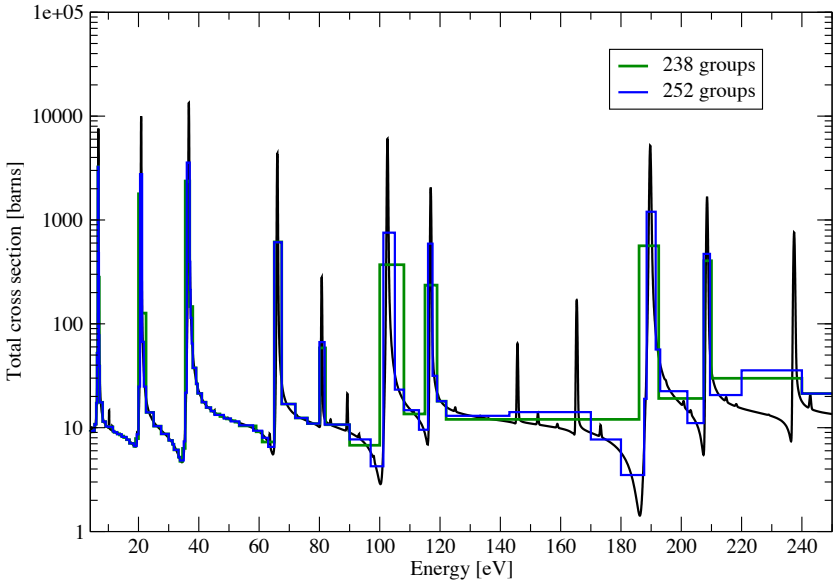
Two unit based, split a E=E'



Change does not affect k_{eff}

Generate new MG library for SCALE

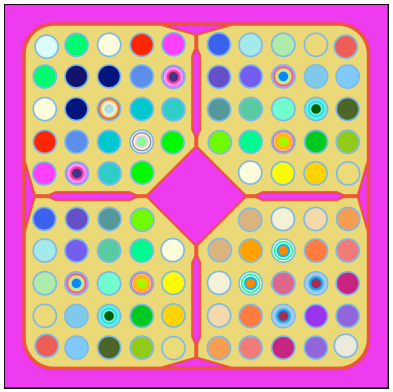
U-238 total cross section



- 252 instead of 238 neutron groups
- Use special centrm generated flux for actinides and thermal H_2O
- Add Lambda-factors for all isotopes
- Add homogenous IR-factors for actinides with RR
- Add heterogeneous f-factors for U and Pu

New Multigroup Nuclear Data Library for SCALE

Reduces bias between continuous energy and multigroup results



BWR Model for TRITON

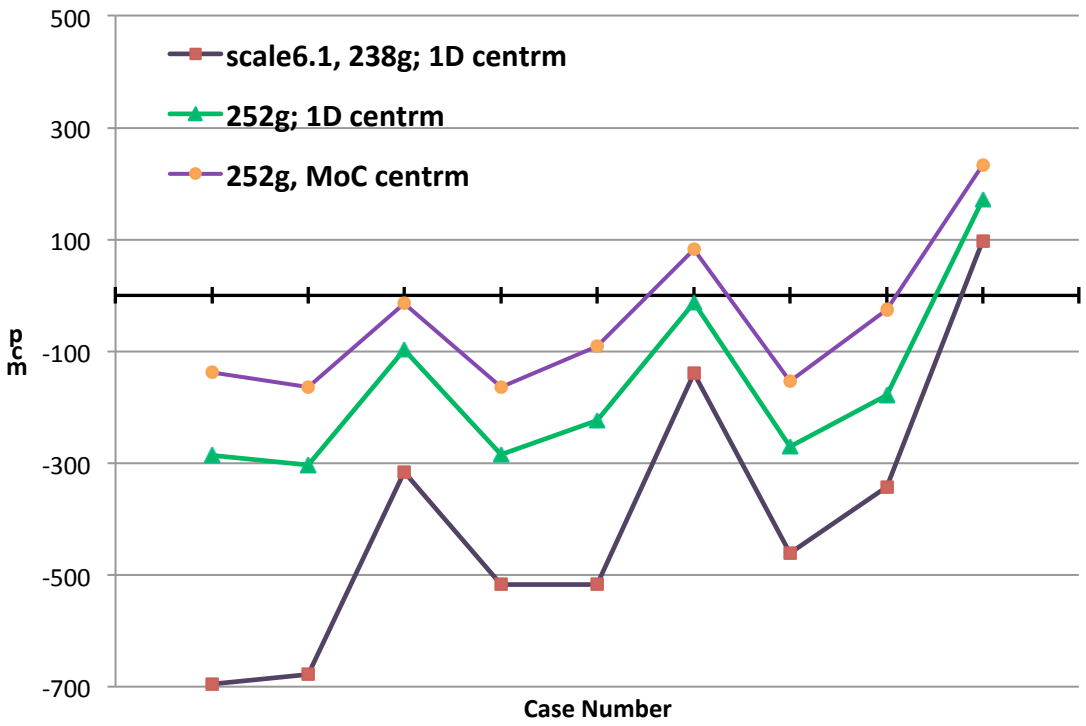
Self-Shielding

Centrm-1D (scale6.1)

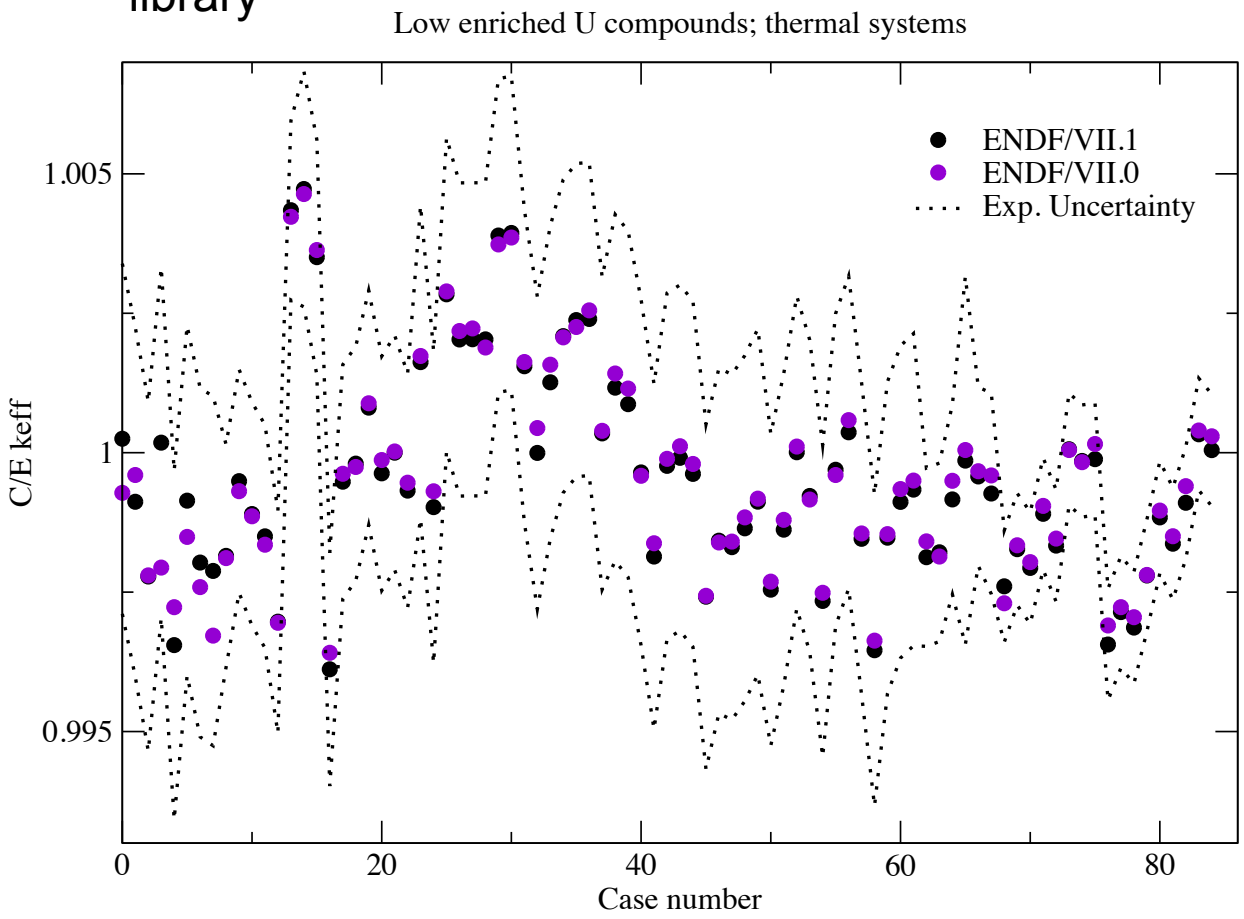
Centrm-MOC (*new!*)

CASES

	1	2	3	4	5	6	7	8	9
BU	BOL	BOL	BOL	PKR	PKR	PKR	EOL	EOL	EOL
Void%	0	40	80	0	40	80	0	40	80



- Process ENDF/VII.1
- Create CE library using all updated processing
- Create MG library analogous to 252 neutron group library



Libraries are undergoing internal testing at ORNL

Process gamma library for ORIGEN

- Add AMPX module to process File 8 into ORIGEN gamma-library
- Continuous energy distributions are converted to discrete energies, preserving integral values
- Process ENDF/VII.1 files
  (ENDF/VII.0 did not contain gamma spectra)
- ENDF/VII.1 contains more complete gamma spectra than NUDAT.

Summary

- Improved processing for CE libraries
- Create new CE libraries for distribution in SCALE 6.2
- Create new 252 neutron group library for internal testing
- Process ENDF/VII.1 and create CE and MG libraries for internal testing