NJOY21 Regression Tests

Test01

Uses ENDF/B-V Tape. No longer supported

Test02

Uses ENDF/B-IV Tape. No longer supported

Test03

Uses old ENDF/B Tape, although not sure what vintage.

Test04

Uses ENDF/B-V Tape. No longer supported

Test05

Uses ENDF/B-V Tape. No longer supported

Test06

Uses ENDF/B-V Tape. No longer supported

Test07

Uses ENDF/B-V Tape. No longer supported

Test08

So this looks like it runs just fine, but has different answers because RECONR is different. In looking at the ACE file (tape25), it appears that the energy grid is smaller in modern RECONR. Since the energy-grid is different, *everything else* is also different.

Test09

Passed

Test10

Passed

Test11

Passed

Test12

Test runs fine. Looks like differences because we have a new RECONR.

Test13

Test runs fine. Looks like differences because we have a new RECONR.

Test14

Passed

Test15

tape25
Looks like very small differences even though we have a new RECONR. Most of the differences are in areas that modern RECONR doesn't touch.

tape26
Small differences in MF=3. Perhaps some large differences in MT=33.

tape27

Small differences in MF=3.

tape36

Differences likely due to new RECONR.

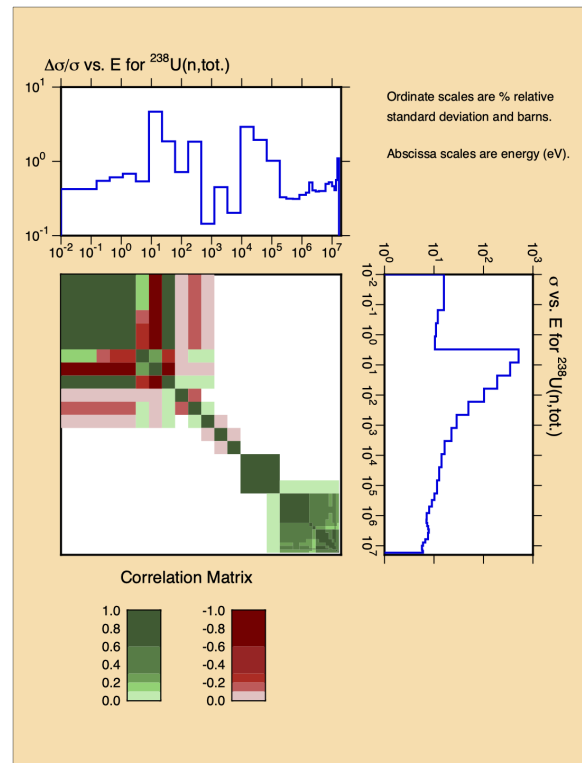## tape37

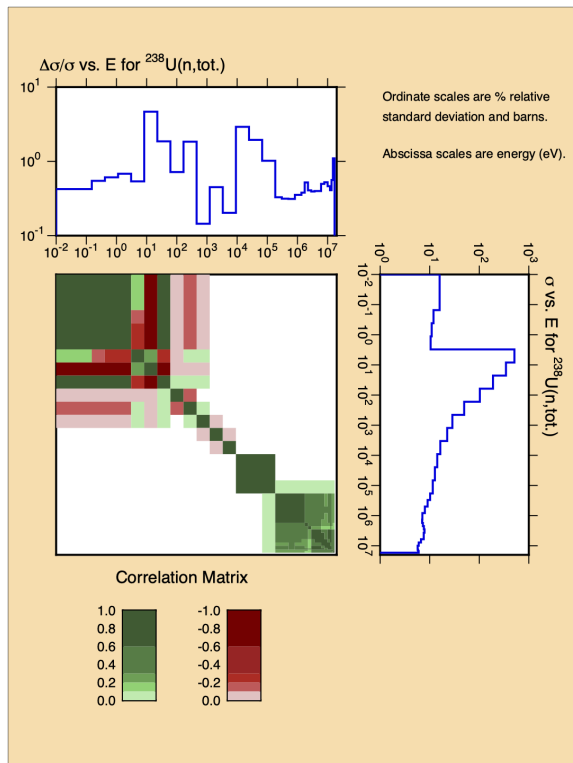Very small differences in round-off

tape46

Differences in postscript plotting

Shown in the following table are the comparisons between the processing of the two different inputs. Even though the numbers may be different, qualitatively they give the same result. Comparing the differences from tape 46 (results of processing MF=33) isn't quite so easy because they are multiple pages. But I've included them here anyway.

Legacy	**Modern**

- **Legacy Tape46**
- **Modern Tape46**

tape47

Very small differences in round-off

tape91

Some fairly substantial differences on about a dozen numbers in MF=3/MT=1. Addition of MF=3/MT-27,101 (expected). All the other changes are minor/round-off.

Test16

tape26—output from error/MF=33

Big differences in individual numbers throughout the file. Whether they are collectively substantial, is undetermined.
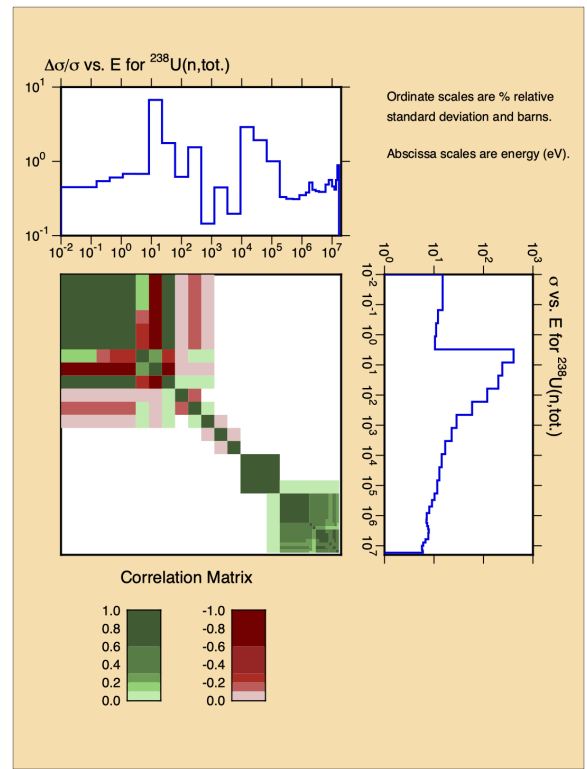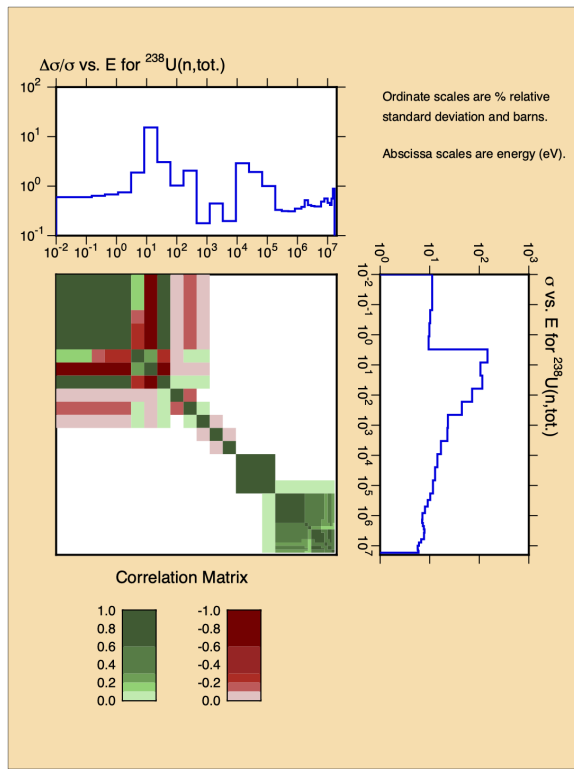
tape27—output from error/MF=34
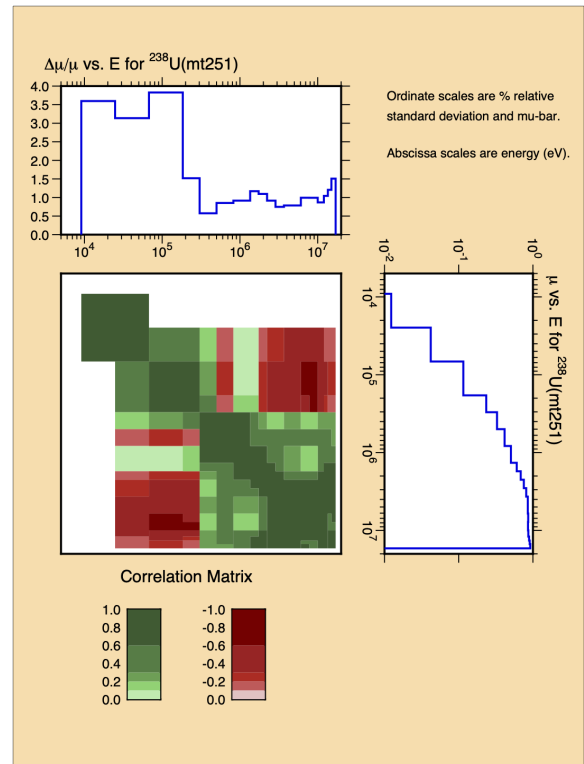
Mostly round-off errors

tape36—PLOTR output from covr with tape26
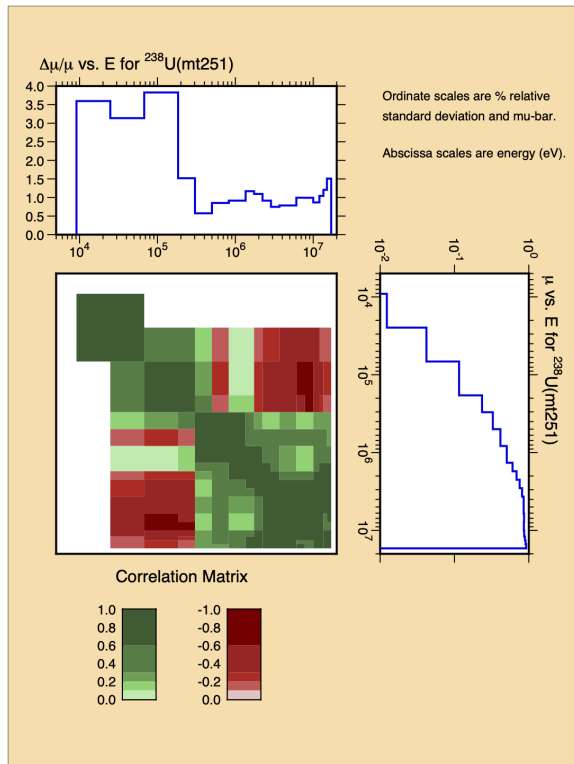
some differences in numbers

tape47

Shown in the following table are the comparisons between the processing of the two different inputs. Even though the numbers may be different, qualitatively they give the same result.

Tape46   Tape46

Tape47   Tape47

Comparing the differences from tape 46 (results of processing MF=33) isn't quite so easy because they are multiple pages. But I've included them here anyway.

- **Legacy Tape46**

- **Modern Tape46**

Test17

tape26

Some differences. Substantial, maybe. Look to be of the same order of magnitude as the differences in Test16. Output from ERROR.

tape91

Lots of round-off differences. Output from GROUPR

tape92

Lots of round-off differences. Output from GROUPR

tape93

Lots of round-off differences. Output from GROUPR

tape99

Lots of round-off differences. Combination of `tape91`, `tape92`, `tape93`. Since this references tape is redundant, perhaps the test should be removed?

Test18

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tape91

Some round-off errors. GROUPR output

Test19

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tape27

ACE file. Difficult to truly assess impact of differences.

tape29

Lots of differences. Probably(?) unsubstantial.

Test20

This one isn't working for some reason. After running ERRORR, a tape is produced that ENDFtk can't read.

```
Reading evaluated data from file: tape21
[error] Section encountered end of stream before reading SEND
[info] Trouble when creating a syntaxTree::Section
[info] File/section number (MF/MT) corresponding to erroneous section: 33/2
[info] Trouble encountered while constructing a file syntax tree.
[info] File number (MF): 33
[info] Trouble encountered while constructing a material tree.
[info] Material number (MAT): 1725
[info] Trouble encountered while constructing a tape syntax tree.
[info] Error ocurred when trying to open evaluated data file: tape21.
[info] Trouble running modern routine: RECONR
[info] std::exception
[info] Error while running NJOY21:
[info]   std::exception
```

Bugfix

This was fixed in NJOY2016.63, <u>Pull Request #192</u> <u>(https://github.com/njoy/NJOY2016/pull/193)</u>. After the fix there are many changes in `tape23`, due to modern RECONR.

Legacy	Modern
Tape47	Tape47
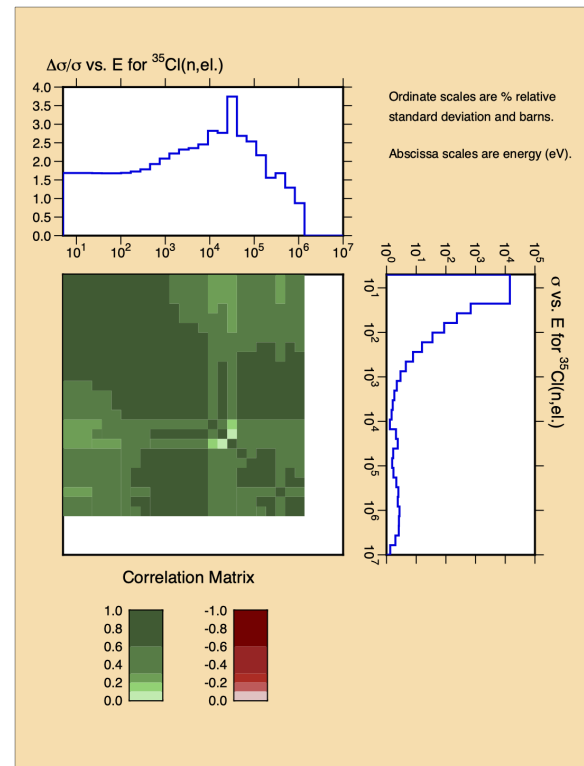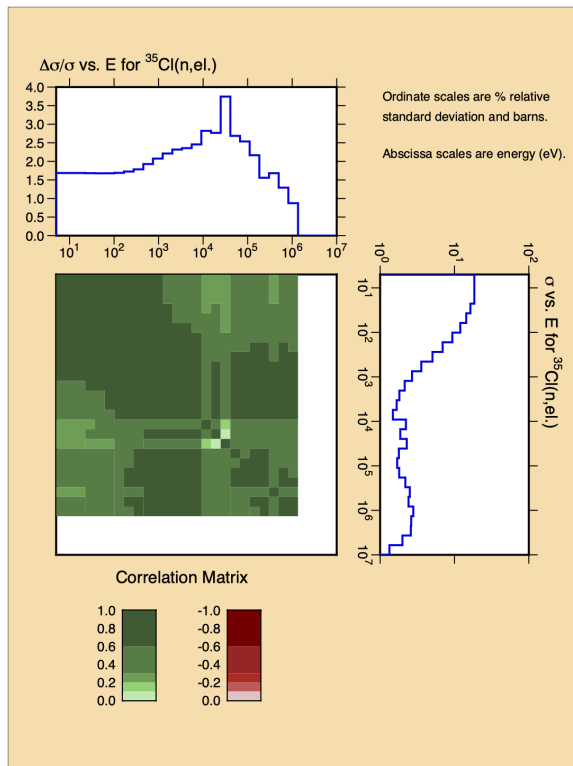
This ought to be looked at a bit more closely. It seems that σ vs E has a different shape and magnitude in modern than in Legacy.

- **Legacy Tape27**
- **Modern Tape27**

Test21

Lots of changes. Appears to be due to modern RECONR.

Test22

Passed

Test23

Passed

Test24

Lot's of changes to `tape34`, an ACE file. Most likely just differences due to modern RECONR.

Test25

There are some small (but not quite round-off small) to thermal scattering ACE files (`tape70`, `tape71`, `tape72`). Looks like it's in the energy values of the ITIE Block (inelastic scattering). Each of the different ACE files are just different temperatures of the same basic set of data.

Test26

Lot's of changes to `tape40`, an ACE file. Most likely just differences due to modern RECONR.

Test27

Passed

Test28

Lot's of differences in `tape34`, `tape44`, and `tape54`. Likely due to modern RECONR.

Test29

Some differences in GENDF files: `tape35`, `tape45`, `tape55`. Biggest differences are in MF=3/MT=1. Again, likely due to modern RECONR.

Test30

This test uses photo-atomic data. Tape40 has no MF=2/3 and so RECONR fails. Tape40 does have MF=23, but that capability has not been implemented. This has been documented in [Issue #14 (https://github.com/njoy/RECONR/issues/14)](https://github.com/njoy/RECONR/issues/14).

Test31

Lots of changes in `tape30`, likely due to modern RECONR.

Test32

Lots of changes in `tape34` and `tape35`, likely due to modern RECONR.

Test33

Passed

Test34

Passed

Test35

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test36

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test37

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test38

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test39

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test40

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR. The biggest difference is that modern RECONR still doesn't handle MF=10 (and likely won't in the near future).

Test41

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test42

Lots of changes in `tape34` (PENDF) and `tape35` (ACE), likely due to modern RECONR.

Test43

Lots of changes in `tape35`, most likely due to modern RECONR.

Test44

Lots of changes in `tape35`, most likely due to modern RECONR.

Test45

```
[info] Error while extracting material from ENDF Tape.
[info] Trouble running modern routine: RECONR
[info] The daughter nuclide cannot be determined for the reaction type 't2a' for 'n,B10'
because the reaction is impossible
[info] Error while running NJOY21:
[info]  std::exception
```

This is the ^{10}B evaluation from ENDF/B-VIII.0. We know that we can't process this. The evaluation is poorly created and <u>elementary (https://github.com/njoy/elementary)</u> gets unhappy.

Test46

A few small changes in MF=3/MT=251 that appear to be round-off.

Test47

tape45
  Lots of insignificant round-off errors

tape48
  Lots of insignificant round-off errors

tape55
  Lots of insignificant round-off errors

tape58
  Lots of insignificant round-off errors

Test48

Passed

Test49

A lot of differences in `tape71` the ACE file. Likely due to modern RECONR.

Test50

Passed—no use of RECONR

Test51

Passed—no use of RECONR

Test52

Passed—no use of RECONR

Test53

Passed—no use of RECONR

Test54

Passed—no use of RECONR

Test55

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tape31
ACE file; lots of changes.

tape34
ACE file; lots of changes.

tape40
ACE file; lots of changes.

Test60

This test uses photo-atomic data. Tape40 has no MF=2/3 and so RECONR fails. Tape40 does have MF=23, but that capability has not been implemented. This has been documented in Issue #14 (https://github.com/njoy/RECONR/issues/14).

Test61

Passed

Test62

Passed

📁 **Categories:** 2021

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