

NJOY/MUIR-02
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D. Muir: Covariance Processing News

Subject: Covariance Processing News
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Covariance Processing News, 20 November 1998

I would like to inform you of the implementation of a number of changes to NJOY97 over the past few months. These changes improve the usefulness of the code in processing data covariances with the ERRORR module and plotting the covariances in the COVR module, and they restore the previous (NJOY94) capability to produce a compressed ASCII covariance library in BOXR format in the COVR module.

Bob MacFarlane has made many improvements in the COVR module, in order to convert the graphics output to pure PostScript and to add a color option to the covariance plots (green for positive correlation, red for negative). For very detailed covariance plots, the color graphics are far superior to the older black-and-white shading option. My contribution of recent months was to track down some small problems in the implementation of the color option, and to add some minor new features, such as additional reaction names in the plot labels and some refinements of the color and black-and-white shading logic.

The revisions and improvements to the ERRORR and COVR modules are now complete, and they are included in the standard version of NJOY, which was recently upgraded to version NJOY97.45. See <http://t2.lanl.gov/> for details of this new version.

In addition to the substantial improvements in ERRORR and COVR in the standard NJOY version, I have created some local variations on the standard version which perform some rather specialized additional tasks. These can be appended to Bob MacFarlane's *ident up45 in the usual NJOY update procedure. The ident's have the following special purposes:

new1

Increase the container array in ERRORR to permit processing of multigroup covariances in the SAND-IIa (640-group) structure. The code runs faster with this dimensioning than the standard dimension. For more typical group structures the standard dimension of 30,000 words is fine.

new2

These very large dimensions are necessary in order to run the BOXR format library option in the SAND-IIa structure. The Windows PC version of NJOY with these dimensions is large but not impractically so (executable occupies 23 megabytes). For more typical group structures, the standard dimension of 50,000 words is fine.

new3

This is an experiment to evaluate the effect of removing all sub-sections with LB=8 from an evaluation. In very fine-group libraries, LB=8 produces very large in-group covariances, which may or may not be realistic. The option is activated by setting the material number MATD negative.

=====
beginning of local updates to ERRORR and COVR
=====

```
*ident new1
*/ errorr -- 2nov98
*/  increase storage to permit processing of sand-ia 640 groups
*d errorr.128
    common/estore/a(120000)
*d errorr.154
    namax=120000
*d errorr.2192
    common/estore/a(120000)
*ident new2
*/ covr -- 2nov98
*/  increase storage to permit processing of sand-ia 640 groups
*/  note change to both iamax and ntics3
*d covr.100
    common/storec/a(880000)
*d covr.131
    data iamax/880000/, niad/15/, ipr/1/, ntics3/1200/
*d covr.1070
    common/storec/a(880000)
*ident new3
*/ errorr -- 2nov98
*/  add a new feature to optionally suppress lb=8
*d errorr.126
    common/mode/imode,isupp
*i errorr.198
c    use a negative value of matd to suppress lb=8 by 10.**(-10)
    isupp=0
    if (matd.lt.0) then
        isupp=-10
        matd=-matd
    endif
*d errorr.1070
    common/mode/imode,isupp
*d errorr.1317
    a(icov+jh-1)=a(icov+jh-1)+a(loci+5+k2)*xcv*10.**isupp
```

*d errorr.1789
common/mode/imode, isupp