Release notes for ENDF/B Development photoat-031_Ga_000 evaluation

October 13, 2016

- `checkr` Warnings:

  1. A previous error halted parsing of the current section
     MAT=3100, MF= 1, MT=451 (1): Parsing stopped

     ```
     ERROR(S) FOUND IN MAT=3100, MF= 1, MT=451
        SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      155 TO     179
     ```

- `checkr` Errors:

  1. A variable is outside the allowed ENDF range
     MAT=3100, MF= 1, MT=451 (0): Variable range

     ```
     ERROR(S) FOUND IN MAT=3100, MF= 1, MT=451
        MOD =     3 OUT OF RANGE     0 -     1           RECORD NUMBER     155
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=501 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3100, MF=23, MT=501
        SECTION 23/501 NOT IN DIRECTORY                 RECORD NUMBER     181
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=502 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3100, MF=23, MT=502
        SECTION 23/502 NOT IN DIRECTORY                 RECORD NUMBER     983
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=504 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3100, MF=23, MT=504
        SECTION 23/504 NOT IN DIRECTORY                 RECORD NUMBER    1384
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=515 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3100, MF=23, MT=515
        SECTION 23/515 NOT IN DIRECTORY                 RECORD NUMBER    1425
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=516 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3100, MF=23, MT=516
        SECTION 23/516 NOT IN DIRECTORY                 RECORD NUMBER    1459
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3100, MF=23, MT=517 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=517
   SECTION 23/517 NOT IN DIRECTORY                  RECORD NUMBER    1511
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=3100, MF=23, MT=522 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=522
   SECTION 23/522 NOT IN DIRECTORY                  RECORD NUMBER    1550
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=3100, MF=23, MT=534 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=534
   SECTION 23/534 NOT IN DIRECTORY                  RECORD NUMBER    1889
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=535 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=535
   SECTION 23/535 NOT IN DIRECTORY                  RECORD NUMBER    1912
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=536 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=536
   SECTION 23/536 NOT IN DIRECTORY                  RECORD NUMBER    1941
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=537 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=537
   SECTION 23/537 NOT IN DIRECTORY                  RECORD NUMBER    1981
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=538 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=538
   SECTION 23/538 NOT IN DIRECTORY                  RECORD NUMBER    2021
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=539 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=539
   SECTION 23/539 NOT IN DIRECTORY                  RECORD NUMBER    2054
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=540 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=540
   SECTION 23/540 NOT IN DIRECTORY                  RECORD NUMBER    2098
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=541 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=541
   SECTION 23/541 NOT IN DIRECTORY                  RECORD NUMBER    2143
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=542 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=542
   SECTION 23/542 NOT IN DIRECTORY                  RECORD NUMBER    2193
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=543 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=543
   SECTION 23/543 NOT IN DIRECTORY                  RECORD NUMBER    2246
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=544 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=544
   SECTION 23/544 NOT IN DIRECTORY                  RECORD NUMBER    2314
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=23, MT=545 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=23, MT=545
   SECTION 23/545 NOT IN DIRECTORY                  RECORD NUMBER    2366
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=27, MT=502 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=27, MT=502
   SECTION 27/502 NOT IN DIRECTORY                  RECORD NUMBER    2419
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=27, MT=504 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=27, MT=504
   SECTION 27/504 NOT IN DIRECTORY                  RECORD NUMBER    2473
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=27, MT=505 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=27, MT=505
   SECTION 27/505 NOT IN DIRECTORY                RECORD NUMBER    2528
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3100, MF=27, MT=506 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=3100, MF=27, MT=506
   SECTION 27/506 NOT IN DIRECTORY                RECORD NUMBER    2680
```

- `fudge-4.0` Warnings:

  1. generic warning message
     reaction label 0: Ga + gamma [coherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: coherentScattering is not a valid distribution component for 2-body reaction
     ```

  2. FIXME: Generic fudge unimplemented message
     reaction label 0: Ga + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for pointwise type data
     ```

  3. generic warning message
     reaction label 1: Ga + gamma [incoherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: incoherentScattering is not a valid distribution component for 2-body reaction
     ```

  4. FIXME: Generic fudge unimplemented message
     reaction label 1: Ga + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for piecewise type data
     ```

  5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 16: total (Error # 0): Sumrule

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%
     ```

  6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 18: photoelectric absorption (Error # 0): Sumrule

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 76.41%
     ```

- `fudge-4.0` Errors:

  1. Calculated and tabulated thresholds don't agree
     reaction label 0: Ga + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

     ```
     WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
     ```

2. 2-body reaction not in center-of-mass frame
   reaction label 0: Ga + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

   ```
   WARNING: 2-body reaction not in center-of-mass frame!
   ```

3. Calculated and tabulated thresholds don't agree
   reaction label 1: Ga + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
   ```

4. 2-body reaction not in center-of-mass frame
   reaction label 1: Ga + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

   ```
   WARNING: 2-body reaction not in center-of-mass frame!
   ```

5. Energy range of data set does not match cross section range
   reaction label 1: Ga + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

   ```
   WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
   ```

6. Calculated and tabulated thresholds don't agree
   reaction label 2: e- + e+ + Ga [electron field] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
   ```

7. Calculated and tabulated thresholds don't agree
   reaction label 3: e- + e+ + Ga [nuclear field] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
   ```

8. Calculated and tabulated thresholds don't agree
   reaction label 4: e- + Ga1s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 10331. eV!
   ```

9. Calculated and tabulated thresholds don't agree
   reaction label 5: e- + Ga2s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1290.7 eV!
   ```

10. Calculated and tabulated thresholds don't agree
    reaction label 6: e- + Ga2p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1150.4 eV!
    ```

11. Calculated and tabulated thresholds don't agree
    reaction label 7: e- + Ga2p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1122. eV!
    ```

12. Calculated and tabulated thresholds don't agree
reaction label 8: e- + Ga3s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 157.75 eV!
```

13. Calculated and tabulated thresholds don't agree
reaction label 9: e- + Ga3p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 111.01 eV!
```

14. Calculated and tabulated thresholds don't agree
reaction label 10: e- + Ga3p3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 107.28 eV!
```

15. Calculated and tabulated thresholds don't agree
reaction label 11: e- + Ga3d3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 27.37 eV!
```

16. Calculated and tabulated thresholds don't agree
reaction label 12: e- + Ga3d5/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 26.87 eV!
```

17. Calculated and tabulated thresholds don't agree
reaction label 13: e- + Ga4s1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 11.69 eV!
```

18. Calculated and tabulated thresholds don't agree
reaction label 14: e- + Ga4p1/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 5. eV!
```

19. Calculated and tabulated thresholds don't agree
reaction label 15: e- + Ga4p3/2 / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.88 eV!
```

20. Calculated and tabulated thresholds don't agree
summedReaction label 16: total / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
```

21. Calculated and tabulated thresholds don't agree
summedReaction label 17: pair product / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
```

22. Calculated and tabulated thresholds don't agree
summedReaction label 18: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.88 eV!
```