Release notes for ENDF/B Development n-070_Yb_168 evaluation

April 26, 2017

- `psyche` Warnings:

  1. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53628E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

     ```
     FILE  2
        SECTION 151
              ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                            STRENGTH FUNCTION 1.53628E-04
                                                LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
     ... [1 more lines]
     ```

  2. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53635E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

     ```
     FILE  2
        SECTION 151
              ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                            STRENGTH FUNCTION 1.53635E-04
                                                LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
     ... [6 more lines]
     ```

  3. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53632E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

     ```
     FILE  2
        SECTION 151
              ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                            STRENGTH FUNCTION 1.53632E-04
                                                LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
     ... [2 more lines]
     ```

  4. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53636E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

     ```
     FILE  2
        SECTION 151
              ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                            STRENGTH FUNCTION 1.53636E-04
                                                LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
     ... [3 more lines]
     ```

  5. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53631E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                       STRENGTH FUNCTION 1.53631E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [3 more lines]
```

6. Strength function in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53637E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                       STRENGTH FUNCTION 1.53637E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [1 more lines]
```

7. Strength function in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53638E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                       STRENGTH FUNCTION 1.53638E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
```

8. Strength function in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53634E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                       STRENGTH FUNCTION 1.53634E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [1 more lines]
```

9. Strength function in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53629E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                       STRENGTH FUNCTION 1.53629E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
```

10. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53633E-04 / LIES OUTSIDE LIMITS

1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                        STRENGTH FUNCTION 1.53633E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
```

11. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53630E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                        STRENGTH FUNCTION 1.53630E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [3 more lines]
```

12. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53626E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                        STRENGTH FUNCTION 1.53626E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
```

13. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53628E-04 / STRENGTH FUNCTION 1.53640E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53628E-04
                        STRENGTH FUNCTION 1.53640E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
```

14. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53633E-04 / STRENGTH FUNCTION 1.53633E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53633E-04
                        STRENGTH FUNCTION 1.53633E-04
                                             LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [7 more lines]
```

15. Strength function in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION

IS 1.53633E-04 / STRENGTH FUNCTION 1.53634E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53633E-04
                       STRENGTH FUNCTION 1.53634E-04
                                          LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [5 more lines]
```

16. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53633E-04 / STRENGTH FUNCTION 1.53632E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53633E-04
                       STRENGTH FUNCTION 1.53632E-04
                                          LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [7 more lines]
```

17. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53633E-04 / STRENGTH FUNCTION 1.53631E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53633E-04
                       STRENGTH FUNCTION 1.53631E-04
                                          LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [6 more lines]
```

18. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.90000E+02. STRENGTH FUNCTION IS 1.53633E-04 / STRENGTH FUNCTION 1.53630E-04 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  1.90000E+02. STRENGTH FUNCTION IS  1.53633E-04
                       STRENGTH FUNCTION 1.53630E-04
                                          LIES OUTSIDE LIMITS 1.00000E-05 TO 1.50000E-04
... [3 more lines]
```

19. Non-threshold reaction with Q value differing from PSYCHE's expectations
FILE 3 / SECTION 103 / THE CALCULATED Q 5.82708E+05 DISSAGREES WITH THE GIVEN Q 5.25365E+05 (0): Iffy Q

```
FILE  3
   SECTION 103
            THE CALCULATED Q  5.82708E+05 DISSAGREES WITH THE GIVEN Q  5.25365E+05
```

20. Non-threshold reaction with Q value differing from PSYCHE's expectations
FILE 3 / SECTION 203 / THE CALCULATED Q 5.82708E+05 DISSAGREES WITH

THE GIVEN Q 5.25365E+05 (0): Iffy Q

```
FILE  3
   SECTION 203
            THE CALCULATED Q  5.82708E+05 DISSAGREES WITH THE GIVEN Q  5.25365E+05
```

- `groupie` Errors:
  1. Very small elastic cross section found
     0: Small elastic

```
Multi-Group and Multi-Band Parameters from ENDF/B Data (GROUPIE 2015-2)
-------------------------------------------------------------------------------
ENDF/B Input and Output Data Filenames
ENDFB.IN
ENDFB.OUT
... [97 more lines]
```

- `fudge-4.0` Warnings:
  1. Missing a channel with a particular angular momenta combination
     resonances / resolved / MultiLevel_BreitWigner (Error # 0): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
```

  2. Potential scattering hasn't converted, you need more L's!
     resonances / resolved (Error # 1): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=0 at E=190.0 eV, xs[0]/xs[0]=100.0% > 0.1%
```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.19%
```

  4. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: nonelastic (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.82%
```

- `fudge-4.0` Errors:
  1. Calculated and tabulated Q values disagree.
     reaction label 16: n[multiplicity:'2'] + Yb167 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -9018198.879638672 eV vs -9051910. eV!
```

  2. Calculated and tabulated Q values disagree.
     reaction label 17: n[multiplicity:'3'] + Yb166 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -16095087.72979736 eV vs -1.61288e7 eV!
```

  3. Calculated and tabulated Q values disagree.
     reaction label 18: n + H1 + Tm167 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6281593.565673828 eV vs -6315305. eV!
```

4. Calculated and tabulated Q values disagree.
   reaction label 19: n + H2 + Tm166 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -12782727.84567261 eV vs -12816440. eV!
```

5. Calculated and tabulated Q values disagree.
   reaction label 20: Yb169 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 6900693.903686523 eV vs 6866982. eV!
```

6. Calculated and tabulated Q values disagree.
   reaction label 21: n + He4 + Er164 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1983712.324188232 eV vs 1950001. eV!
```

7. Calculated and tabulated Q values disagree.
   reaction label 22: H1 + Tm168_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 559076.7776184082 eV vs 525365.1 eV!
```

8. Calculated and tabulated Q values disagree.
   reaction label 23: H2 + Tm167_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -4057027.464752197 eV vs -4090739. eV!
```

9. Calculated and tabulated Q values disagree.
   reaction label 24: H3 + Tm166_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6525494.905059814 eV vs -6559206. eV!
```

10. Calculated and tabulated Q values disagree.
    reaction label 25: He3 + Er166_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -3469236.361358643 eV vs -3502948. eV!
```

11. Calculated and tabulated Q values disagree.
    reaction label 26: He4 + Er165_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 8633780.355621338 eV vs 8600068. eV!
```

- `njoy2012` Warnings:

1. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 16 does not give recoil za= 70167
                         one-particle recoil approx. used.
```

2. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (1): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 17 does not give recoil za= 70166
                         one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

```
---message from hinit---mf6, mt 22 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)

```
---message from hinit---mf6, mt 28 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

```
---message from hinit---mf6, mt 32 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

```
---message from hinit---mf6, mt 51 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

```
---message from hinit---mf6, mt 52 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)

```
---message from hinit---mf6, mt 53 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (8): HEATR/hinit (4)

```
---message from hinit---mf6, mt 54 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

10. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (9): HEATR/hinit (4)

```
---message from hinit---mf6, mt 55 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

11. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (10): HEATR/hinit (4)

```
---message from hinit---mf6, mt 56 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

12. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (11): HEATR/hinit (4)

```
---message from hinit---mf6, mt 57 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

13. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (12): HEATR/hinit (4)

```
---message from hinit---mf6, mt 58 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

14. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (13): HEATR/hinit (4)

```
---message from hinit---mf6, mt 59 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

15. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (14): HEATR/hinit (4)

```
---message from hinit---mf6, mt 60 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

16. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (15): HEATR/hinit (4)

```
---message from hinit---mf6, mt 61 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

17. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (16): HEATR/hinit (4)

```
---message from hinit---mf6, mt 62 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

18. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (17): HEATR/hinit (4)

```
---message from hinit---mf6, mt 63 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

19. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (18): HEATR/hinit (4)

```
---message from hinit---mf6, mt 64 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

20. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (19): HEATR/hinit (4)

```
---message from hinit---mf6, mt 91 does not give recoil za= 70168
                        one-particle recoil approx. used.
```

21. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (20): HEATR/hinit (4)

```
---message from hinit---mf6, mt203 does not give recoil za= 69168
                        one-particle recoil approx. used.
```

22. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (21): HEATR/hinit (4)

```
---message from hinit---mf6, mt204 does not give recoil za= 69167
                        one-particle recoil approx. used.
```

23. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (22): HEATR/hinit (4)

```
---message from hinit---mf6, mt205 does not give recoil za= 69166
                        one-particle recoil approx. used.
```

24. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (23): HEATR/hinit (4)

```
---message from hinit---mf6, mt206 does not give recoil za= 68166
                        one-particle recoil approx. used.
```

25. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (24): HEATR/hinit (4)

```
---message from hinit---mf6, mt207 does not give recoil za= 68165
                        one-particle recoil approx. used.
```