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Memo CP-D/714

Date: 26 September
To: Distribution
From: N. Otsuka, S.P. Simakov, V. Semkova, V. Zerkin
Subject: **Interdependent data separated by flags**

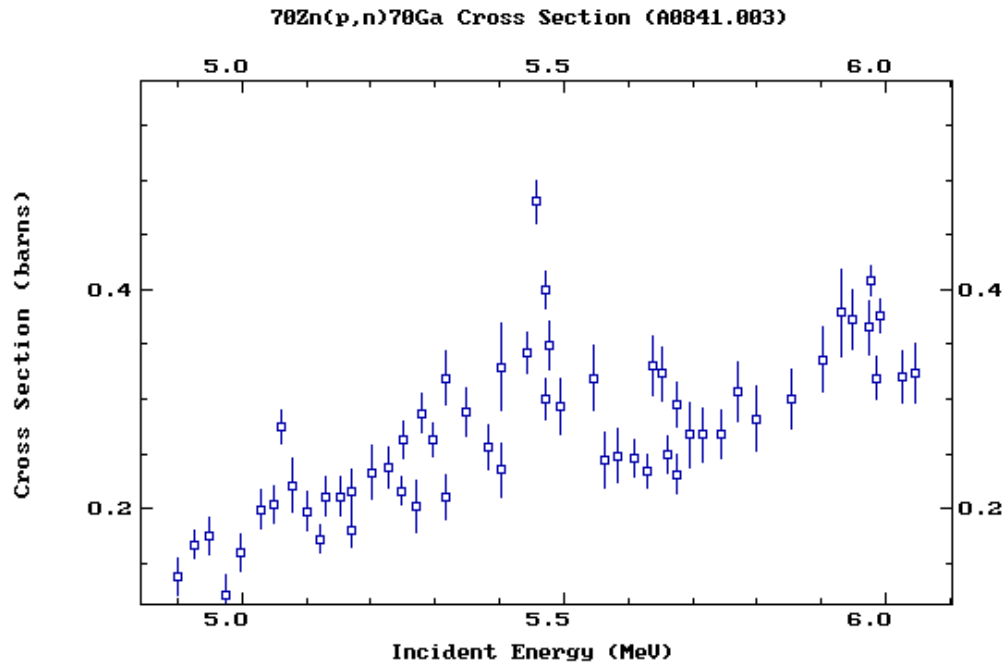
Two data sets of the same REACTION (= reaction + quantity) obtained in the same experimental work are often compiled in the same entry (e.g., same quantity derived by different detectors, different analyses, different runs). There may be systematic deviation between them, and EXFOR users should be able to treat them as two independent data sets. Usually EXFOR systems can treat them as two independent sets if they are given in one subentry with the multiple reaction formalism. However, the systems do not expect the use of flags for such a purpose (the flag can be omitted even if the data set has a column with the heading FLAG).

Example $^{70}\text{Zn}(p,n)^{70}\text{Ga}$ cross section by two derivation methods

```
SUBENT      A0841003   20100225
BIB         4         5
REACTION    (30-ZN-70(P,N)31-GA-70,,SIG) fig.2
...
FLAG        (1.) this data are deduced from thick target yield.
            (2.) these data are measured for thin target.
ENDBIB     5
...
DATA       4         59
EN       DATA       DATA-ERR   FLAG
KEV     MB         MB         NO-DIM
4903.      139.        17.         2.
4927.      168.        12.         2.
4952.      175.        17.         1.
4976.      122.        18.         2.
5000.      161.        17.         2.
5031.      200.        18.         2.
5052.      204.        17.         2.
...
```

Usually systems treat this data table as one data set. For example the NDS EXFOR System creates **Plot #1**, where we recognize two data point groups at some energy regions.

Plot #1



If we introduce the pointer formalism, the NDS EXFOR System can treat them as two different data sets and creates Plot #2.

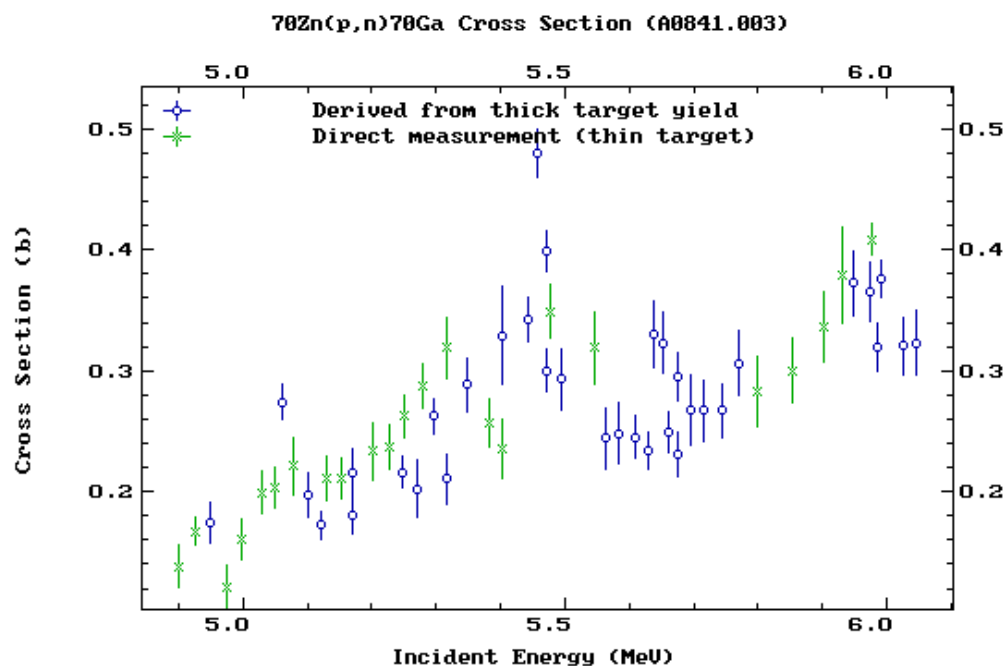
```
SUBENT      A0841003    20100225
BIB          4          5
REACTION    1(30-ZN-70(P,N)31-GA-70,,SIG,,,DERIV)
             Data deduced from thick target yield
             2(30-ZN-70(P,N)31-GA-70,,SIG)
             Data measured for thin target
...
DATA        4          59
EN          DATA     1DATA-ERR  1DATA     2DATA-ERR  2
KEV        MB         MB         MB         MB
4903.
4927.
4952.      175.       17.
4976.
5000.
5031.
5052.      139.          17.
              168.          12.
              122.          18.
              161.          17.
              200.          18.
              204.          17.
...

```

Note that cross section obtained from the thick target yield is not regarded as the cross sections obtained by most straightforward method, and therefore we have to add DERIV in SF9, too.

Conclusion: Compilers should avoid FLAG and use pointers when the data points in one subentry can be divided into several data sets to reflect the different measuring procedure (e.g. flight path), accelerators, neutron sources or detectors, processing of data, repetition of measurements etc.

Plot #2



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