Headings E-LVL-INI, E-LVL-FIN as "additional information"

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Entry 31492 (transmitted on TRANS 3106) was criticized for "multiple representation of independent variable" because, for a partial gamma production cross section, besides the gamma energy (E) also E-LVL-INI and E-LVL-FIN are given.

While it is clear that only one representation of independent variables is allowed, we believe that this case is different:

1) "Physics" argument: in many cases of complicated decay schemes, the gamma energy alone is not sufficient to define the transition because there may be several transitions with (almost) identical energies. In this particular entry, there are 3 cases where 2 transitions have the same gamma energies (within 1 keV) and could not be resolved, so that we even had to use headings E-LVL-INI1, 2 and E-LVL-FIN1,2 to give both of them.

2) "Formal" argument: Formally, we claim that E-LVL-INI and -FIN are in this case used as "additional information" headings (which are given after the DATA column in the DATA section, or in the COMMON section) but not as the independent variable. The EXFOR Systems Manual (Footnote 1 on page 4.5 of the April 2000 edition) states ***"that some data headings may be used either as independent variables or as additional information".*** And page 6.8 on Dictionary 24 has a Footnote 11 on "Secondary Energy" saying ***"except E-LVL-INI and E-LVL-FIN".*** What is the meaning of this footnote? It could even suggest that these headings are to be used **only** as additional information but not as independent variable.

We propose to state explicitly in the manual that E-LVL-INI and E-LVL-FIN may be used (also) as additional information.

(If necessary, we may also clarify whether or not headings which may be used both ways, may be given not only in the DATA section after the DATA column, but alternatively also in the COMMON section. If not, we might move E-LVL-INI and -FIN to the DATA section to make it clear that here they are used as additional information.)

Appendix: Entry 31492, subentries 2 and 17

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ENTRY            31492   20010118                                  31492  0    1C
SUBENT        31492001   20010118                                  31492  1    1C
BIB                14         34                                  31492  1    2
AUTHOR     (HONGYU ZHOU,XINGFU WANG,CHAO WANG,MING HUA,           31492  1    3
            GUANGSHUN HUANG,GUOYING FAN,TING LU,SIQING BARTEL)    31492  1    4
INSTITUTE  (3CPRBNU) Institute of Low Energy Nuclear Physics      31492  1    5
REFERENCE  (J,NSE,134,106,2000) Final results                     31492  1    6I
           (C,97TRIEST,1,625,1997)                                31492  1    7
TITLE      Study on total discrete gamma radiation from natural   31492  1    8
           lead under 14.9 MeV neutron bombardment.               31492  1    9
FACILITY   (CCW,3CPRBNU) 400 kV Cockroft Walton accelerator.      31492  1   10
INC-SOURCE (D-T) 3.2 MHz pulsed deuterons.                        31492  1   11
METHOD     (TOF,ASSOP) Neutron flux was determined by counting    31492  1   12
           the associated alpha particles with an Au-Si detector. 31492  1   13
           The TOF technique was used for reducing background     31492  1   14
           from direct and scattered neutrons. Two time gates     31492  1   15
           with 30 ns and 160 ns, covering the time regions       31492  1   16
           containing prompt and delayed gamma's respectively,    31492  1   17
           were set to record the total and delayed gamma-ray     31492  1   18
           spectrum.                                              31492  1   19
DETECTOR   (GELI)                                                 31492  1   20
SAMPLE     Solid cylindrical natural lead, 2.9*3.0 cm in size and 31492  1   21
           230.6 g. in weight.                                    31492  1   22
MONITOR    The neutron flux was monitored by counting             31492  1   23
           the associated alpha particles.                        31492  1   24
CORRECTION -Neutron flux attenuation in the backing and cooling   31492  1   25
            water of the neutron target                           31492  1   26
           -Neutron attenuation in the sample                     31492  1   27
           -Gamma-ray attenuation in the sample                   31492  1   28
           -Secondary neutron effects                             31492  1   29
ERR-ANALYS No error analysis given.                               31492  1   30
STATUS     Data taken from Tables 1,2,3 of Nuclear Science and    31492  1   31C
           Engeneering, vol.134(2000)106-113                      31492  1   32C
HISTORY    (19980630C) HW                                         31492  1   33
           (20010118A) VZ+OS Subentries 2-11: Updated to final    31492  1   34I
             publication and/or REACTION coding corrected;        31492  1   35I
             Subentries 015 to 057 added.                         31492  1   36I
ENDBIB           34          0                                    31492  1   37
COMMON            2          3                                    31492  1   38
EN         EN-ERR                                                 31492  1   39
MEV        MEV                                                    31492  1   40
14.9       0.5                                                    31492  1   41
ENDCOMMON         3          0                                    31492  1   42
ENDSUBENT        41          0                                    31492  199999
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SUBENT        31492002   20010118                                  31492  2    1C
BIB                 3          4                                  31492  2    2
REACTION  1(82-PB-0(N,X)82-PB-206,PAR/M-,DA,G) Prompt.           31492  2    3
          2(82-PB-0(N,X)82-PB-206-M,PAR,DA,G) Delayed.           31492  2    4C
EN-SEC     (E,G)                                                 31492  2    5
DECAY-DATA (82-PB-206-M,.124MSEC,DG,343.3)                       31492  2    6
ENDBIB              4          0                                  31492  2    7
COMMON              3          3                                  31492  2    8
E          E-LVL-INI  E-LVL-FIN                                   31492  2    9
KEV        KEV        KEV                                         31492  2   10
343.3      1684.1     1340.6                                      31492  2   11
ENDCOMMON           3          0                                  31492  2   12
DATA                5          3                                  31492  2   13
ANG        DATA      1DATA-ERR  1DATA      2DATA-ERR  2           31492  2   14
ADEG       MB/SR      MB/SR      MB/SR      MB/SR                 31492  2   15
55.        1.27       .38        5.63       1.13                  31492  2   16
90.        1.47       .34        3.94       1.58                  31492  2   17
140.       1.11       .33        4.10       1.64                  31492  2   18
ENDDATA             5          0                                  31492  2   19
ENDSUBENT          18          0                                  31492  299999

SUBENT        31492017   20000425                                  31492 17    1I
BIB                 2          9                                  31492 17    2
REACTION   ((82-PB-0(N,X)82-PB-207,PAR,DA,G)+                     31492 17    3
           (82-PB-0(N,X)82-PB-206,PAR,DA,G)) Prompt.             31492 17    4
            Sum of 2 unresolved gamma transitions                31492 17    5
            with very close energies                             31492 17    6
EN-SEC     (E,G)                                                 31492 17    7
           (E-LVL-INI1,82-PB-207)                                31492 17    8
           (E-LVL-FIN1,82-PB-207)                                31492 17    9
           (E-LVL-INI2,82-PB-206)                                31492 17   10
           (E-LVL-FIN2,82-PB-206)                                31492 17   11
ENDBIB              9          0                                  31492 17   12
COMMON              5          3                                  31492 17   13
E          E-LVL-INI1 E-LVL-FIN1 E-LVL-INI2 E-LVL-FIN2           31492 17   14
KEV        KEV        KEV        KEV        KEV                 31492 17   15
656.8      3834.0     2728.0     1997.8     1340.6              31492 17   16
ENDCOMMON           3          0                                  31492 17   17
DATA                3          3                                  31492 17   18
ANG        DATA       DATA-ERR                                   31492 17   19
ADEG       MB/SR      MB/SR                                      31492 17   20
55.        4.17       0.17                                       31492 17   21
90.        3.73       0.13                                       31492 17   22
140.       4.10       0.19                                       31492 17   23
ENDDATA             5          0                                  31492 17   24
ENDSUBENT          23          0                                  31492 1799999
```