WP 2002-12

Redundant coding, new data heading PART-OUT
CP-C/304, CP-A/122

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Memo CP-C/304

DATE: May 3, 2002
TO: Distribution
FROM: V. McLane
SUBJECT: Redundancies in EXFOR (Memo CP-C/259)

We have discussed redundancies in EXFOR at many of the recent NRDC meetings. In Memo CP-C/***259***, I made some proposals for clarification. *(Note by NDS: CP-C/259, dated 17 November 1999, was not received at NDS until 6 May 2002).* There is no mention of whether anything was decided at the NRDC in 2000, I will reiterate the following proposals.

1. Independent versus cumulative: In EXFOR, a defined cross section is assumed to be independent if no other indication is given.

   Proposal: The use of the code IND, in REACTION sub-field 5, is restricted to use with the codes F and X in SF3.

I have a code that will convert the affected entries.

2. Undefined reaction channels: Similarly, a reaction for which the reaction channel is undefined is coded using the process code X in sub-field 3. The use of UND was introduced for charged particles and was coupled to the number of protons and neutrons being given in sub-field 3. This led to the introduction of the variable number of emitted nucleons formalism in order to be able to use the variable nucleus formalism for multiple reaction products.

Distribution

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Proposals:

a.) Eliminate the use of the codes UND and DEF in REACTION sub-field 5. The code (DEF) will remain.

b.) Eliminate the use of a variable number of emitted nucleons, that is, the process codes XN and YP. XN have been used in about 60 subentries, where neutron emission data is given, i.e., they should be coded as (…,X)0-NN-1…..).

c.) Eliminate the data headings N-OUT and P-OUT. These have been used in only one entry, which could be easily recoded. (*There are new proposals for variable output particles*).

I volunteer to retrieve and convert the entries affected.

3. Experimental data code: Data with no code in REACTION SF9 is considered to be experimental. For charged-particle data, the code EXP was introduced for REACTION sub-field 9 as a positive indication that the data is experimental. This is not so serious, however, it may be confusing to users, who may think there is a difference between data coded in 2 different ways..

Proposal: Eliminate the use of the code EXP in REACTION sub-field 9.

MEMO CP-A/122

02 Apr 2002

To: **Distribution**
From: **F.E. Chukreev, S. Babykina**
Subject: **Action A38 of Technical Meeting 2001**

Addition to Dictionary 24

Add to dictionary 24

We suggest to input in Dic.24 new code-

PART-OUT (the number of emitted particles)

The development of experimental technique permits detects some particles simultaneously.

For example: In work of F.Goldenbaum et.al. “Heating of nuclei with energetic antiprotons”, published in Phys. Rev. Letters, v.77, p.1230, 1996, the authors measured the reaction cross sections in dependent from the number of outgoing particles (all hydrogen and helium isotopes). If we can use N-OUT and P-OUT for neutrons and protons, another particles request more common decision.

Therefore, we propose PART-OUT as new independent variable (the quantity emitting particles. SIG/DN could be used as measurement unit (see C24 of Technical Meeting 2001). Of course, under PART-DET we must indicate measured particles, obligatory.

Another similar publication:

1. PR/C,63,034616,2001
2. EPJ/A,8,197,2000
3. PL/B,472,15,2000.

In future we will have many publication produced on “Berlin ball”, where similar measurements are possible.

One example of EXFOR entry with PART-OUT is given in separate attachment.

```
ENTRY            O0939     020325                                   O093900000001
SUBENT        O0939001     020325                                   O093900100001
BIB                 11         41                                   O093900100002
TITLE       Heating of Nuclei with Energetic Antiprotons.           O093900100003
AUTHOR      (F.GOLDENBAUM, W.BOHNE, J.EADES, T.V.EGITY, P.FIGUERA, O093900100004
            H.FUCHS, J.GALIN, YE.S.GOLUBEVA, K.GULDA, D.HILSCHER,   O093900100005
            A.S.IIJINOV, U.JAHNKE, J.JASTRZEBSKI, W.KURCEWICZ,      O093900100006
            B.LOTT, M.MORJEAN, G.PAUSCH, A.PEGHAIRE, L.PIENKOWSKI, O093900100007
            D.POLSTER, S.PROSCHITZKI, B.QUEDNAU, H.ROSSNER,         O093900100008
            S.SCHMID, W.SCHMID, P.ZIEM)                             O093900100009
INSTITUTE   (2GERBER)                                               O093900100010
            (2ZZZCER)                                               O093900100011
            (2GERMUN)                                               O093900100012
            (2FR PAR)                                               O093900100013
            (4RUSJIA)                                               O093900100014
            (3POLWWA)                                               O093900100015
            (2GERDRE)                                               O093900100016
REFERENCE   (J,PRL,77,1230,96)                                      O093900100017
HISTORY     (020207C)                                               O093900100018
            (020325U) Last checking has been done.                  O093900100019
SAMPLE      Cu-Natural, Ho-165, Au-197 and U-238 Targets with       O093900100020
            Thicknesses of 1-2 Mg/Cm**2, were Used.                 O093900100021
ADD-RES     (COMP).Intranuclear Cascade Calculations.               O093900100022
DETECTOR    (SCIN) Antiprotons Triggered a Scintillator System      O093900100023
            Consisting of a Thin 2-Mm Start Detector Vetoed by      O093900100024
            An Annular Detector.                                    O093900100025
            (D4PI) The Reaction Products were Detected by Means of O093900100026
            Two 4Pi-Detectors Surrounding the Target-The So-Called O093900100027
            Berlin Neutron Ball (BNB), Containing at Its Center theO093900100028
            Berlin Silicon Ball (BSIB). The Bnb is a Spherical TankO093900100029
            With an Outer Diameter of 140-Cm and a Scintillator     O093900100030
            Volume of 1500 Liters, Housing a Reaction Chamber of 40O093900100031
            Cm Diameter at the Center of Which the Targets were     O093900100032
            Located. This Detector was Mainly Used For Counting     O093900100033
            Evaporationlike Neutrons in Each Reaction. Light-       O093900100034
            Particle (H+HE ISOTOPES), Intermediate Mass Fragments   O093900100035
            And Fission Fragments were Detected by the              O093900100036
            Bsib-Detector Composed of 158 Independent Silicon       O093900100037
            Detectors, 500 Mum Thick, Forming a 20-Cm Diameter      O093900100038
            Sphere. These Detectors Covered an Active Zone of AboutO093900100039
            90% of 4Pi-Detectors.                                   O093900100040
FACILITY    (ACCEL,2ZZZCER) Low-Energy Antiproton Ring (LERA)       O093900100041
METHOD      (TOF)                                                   O093900100042
STATUS      (CURVE).By CAJAD.                                       O093900100043
ENDBIB              41                                              O093900100044
COMMON               1          3                                   O093900100045
EN                                                                  O093900100046
GEV                                                                 O093900100047
       1.2                                                          O093900100048
ENDCOMMON            3                                              O093900100049
ENDSUBENT           48                                              O093900199999
SUBENT        O0939002     020325                                   O093900200001
BIB                  3          5                                   O093900200002
REACTION    (79-AU-197(AP,ABS),,SIG/DN,,,EXP)   Figure 2a          O093900200003
PART-DET    (P) And Another Hydrogen Isotopes                       O093900200004
            (HE3)                                                   O093900200005
            (A)                                                     O093900200006
ERR-ANALYS  (DATA-ERR).Data-Point Reader Uncertainty.               O093900200007
ENDBIB               5                                              O093900200008
COMMON               1          3                                   O093900200009
DATA-ERR                                                            O093900200010
MB                                                                  O093900200011
       1.1                                                          O093900200012
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ENDCOMMON            3                                          O093900200013
DATA                 2         50                               O093900200014
PART-OUT   DATA                                                 O093900200015
NO-DIM     MB                                                   O093900200016
         1.        19.                                          O093900200017
         2.       23.8                                          O093900200018
         3.       24.6                                          O093900200019
         4.       24.7                                          O093900200020
         5.       24.8                                          O093900200021
         6.       24.8                                          O093900200022
         7.       24.9                                          O093900200023
         8.       28.1                                          O093900200024
         9.       28.9                                          O093900200025
        10.       29.8                                          O093900200026
        11.       32.2                                          O093900200027
        12.       35.4                                          O093900200028
        13.       37.9                                          O093900200029
        14.       41.1                                          O093900200030
        15.       44.3                                          O093900200031
        16.       45.9                                          O093900200032
        17.       49.9                                          O093900200033
        18.       53.9                                          O093900200034
        19.       56.3                                          O093900200035
        20.       60.3                                          O093900200036
        21.       63.6                                          O093900200037
        22.       67.6                                          O093900200038
        23.        66.                                          O093900200039
        24.       69.3                                          O093900200040
        25.       71.7                                          O093900200041
        26.       73.3                                          O093900200042
        27.       72.6                                          O093900200043
        28.       71.1                                          O093900200044
        29.       69.6                                          O093900200045
        30.       66.5                                          O093900200046
        31.       62.6                                          O093900200047
        32.        58.                                          O093900200048
        33.       51.7                                          O093900200049
        34.       45.8                                          O093900200050
        35.       39.3                                          O093900200051
        36.       33.8                                          O093900200052
        37.       28.4                                          O093900200053
        38.       21.5                                          O093900200054
        40.       15.9                                          O093900200055
        41.        12.                                          O093900200056
        42.        9.8                                          O093900200057
        43.        7.5                                          O093900200058
        44.        5.2                                          O093900200059
        45.        3.6                                          O093900200060
        46.        2.1                                          O093900200061
        47.        2.2                                          O093900200062
        48.        2.3                                          O093900200063
        49.        0.8                                          O093900200064
        50.        0.9                                          O093900200065
        51.        0.1                                          O093900200066
ENDDATA              52                                         O093900200067
ENDSUBENT            66                                         O093900299999
```