File - Fotonuclear

MEMO 4C-4/25

DAT/324-0

To: Distribution

2 April 1976

From: V.Manokhin

Subject: Application of EXFOR - format to fotoneutron reactions

Please find attached the proposals on application of EXFOR - format to compiling of photoneutron reaction cross sections. These proposals are developed by A.I.Abramov.

Distribution:

L.Lesca, NDCC

S.Pearstein, NNCSC

J.Schmidt, NDS

F.Chukreev

I.Kondurov

Schmidt
~~Dunet~~
Attree
Ohnoto
Uhdil
Lammer
Schmidt
Lorenz

R143

04090

PROPOSALS ON APPLICATION OF EXFOR-FORMAT TO PHOTONEUTRON REACTIONS

With the purpose of ascertaining the possibility of the EXFOR format use for recording the experimental data on the nonneutron nuclear reactions an attempt had been made by us to present in this format the results of some measurements on the effective photoneutron reaction cross-sections in the vicinity of a threshold [1-3]. The results of the woork performed, according to our opinion, show the possibility of the EXFOR format use for recording the information over a wide range of nuclear reactions and their parameters with some minimum modifications of the existing dictionaries. In the course of drawing up the proposals of these modifications we have followed the same common principles which have been assumed as a basis for our proposals on the development of the bibliographical indexes [4], namely: a natural and free manner of reading as well as a symmetry and a community for recording of the nuclear reactions of various types. Some of these proposals agree with those of the letter [5].

Our remarks for the individual dictionaries are listed below:

The dictionary 1 - modifications are not required.

The dictionary 2.

1. It is reasonable to keep the key word NUC-QUANT and to add the key word REACTION.

2. The key word N-SOURCE should be replaced by the key word PART-SOUR so that it could be used for the sources of any type particles (including the gamma-and bremsstrahlung sources).

3. Similarly the key word EN-SEC should be replaced by.....

The dictionary 3 - modifications are not required.

The dictionary 4 - modifications are not required.

The dictionary 5 - modifications are not required.

The dictionary 6 - modifications are not required.

The dictionary 7 - modifications are not required.

The dictionary 8 - modifications are not required.

The dictionary 9 - modifications are not required.

The dictionary 10

1. The evident addition is the codes of some nonneutron reactions: GN, AN, G2N, PN, etc.

2. The building of the EL-type codes which can relate to the reactions of any types is less evident. One of the possible solutions: to adopt that these codes with their former spelling are related to the neutrons and in all other cases it should be added the symbol of a proper particle, for example: EL-G is the elastic scattering of gamma-rays.

The dictionary 11 - modifications are not required.

The dictionary 12 - modifications are not required.

The dictionary 13 - modifications are not required.

The dictionary 14

1. Modifications are not required if from the previous recordings it is known what a particle or a reaction is mentioned about. In the rest of the cases the modifications agree with the early formulated principles, for example, GG, COR is the gamma-gamma correlation.

2. One ought to add codes of the partial widths of resonances, for example, GO/WJD $\equiv \Gamma_{\gamma_0}$ (Γ_{γ_0} is the unreduced gamma width, but the one corresponding to a direct transition into the ground state).

The dictionary 16 - modifications are not required.

The dictionary 18 - modifications are not required.

The dictionary 19

1. It is recommended to replace the title of the dictionary by PRIMARY PARTICLES SOURCE.

2. One should add the following codes: BRST is the bremsstrahlung target (the bremsstrahlung source). ALAY - is the layer of an alpharadioactive substance, FLAY is the layer of a spontaneously fissionable substance, etc.

The dictionary 21 - modifications are not required.

The dictionary 22 - modifications are not required.

The dictionary 23 - modifications are not required.

The dictionary 24

1. Some addition is necessary to the characteristics of the primary particles, for example: EP-CM is the incident proton energy in the C.M.S., EG-MAX is the peak maximum gamma - or bremsstrahlung energy, etc.

2. It is better to use E-RES instead of EN-RES in order to relate it to the resonances of every type; otherwise, one has to point out the type of a particle in accordance with the common rules, for example: EP-RES is the proton resonance energy.

The dictionary 25 - modifications are not required.

References

1. Abramov, A.I., Kitaev V.Ja., Yutkin, M.G. Nuclear Physics, 20, 438 (1974); Izv. AN USSR, ser.phys, 38, 2112 (1974).
2. Abramov, A.I., Kitaev V.Ja., Rogov A.V., Yutkin, M.G. The 25-th Annual Meeting on Nuclear Spectrometry and Nuclear Structure, Leningrad, 1975; Izv. AN USSR, ser.phys. 39, 1754(1975).
3. Kitaev, V.Ja., Abramov, A.I., Rogov, A.V., Yutkin, M.G. The 3-rd Conference on Neutron Physics, Kiev, 1975.
4. Abramov, A.I. Preprint of the Institute of Physics and Power Engineering - 337, 1972.
5. Schmidt, J.J., Lemmel, H.D. Memo 4C-3/121, 20 June 1975.

ENTRY	80001 750718	8000100000001
SUBENT	80001001 750718	8000100100001
BIB	13 14	8000100100002
TITLE	ON THE (MN-55(G,N)MN-54) REACTION NEAR THRESHOLD	8000100100003
AUTHOR	(V.Ja.KITAEV, A.I.ABRAMOV, A.V.ROGOV, M.G.YuTKIN)	8000100100004
INSTITUTE	(4 CCP FEI)	8000100100005
REFERENCE	(75 KIEV) 3, SOVIET NATIONAL CONFERENCE ON NEUTRON	8000100100006
	PHYSICS, KIEV, USSR, JUNE 1975	8000100100007
STANDARD	ABSOLUTE MEASUREMENTS	8000100100008
METHOD	(TOF) TIME-OF-FLIGHT	8000100100009
STATUS	(APRVD) APPROVED BY AUTHOR	8000100100010
FACILITY	(MICRT) MICROTRON FEI, OBNINSK, USSR	8000100100011
G-SOURCE	(BRST) BREMSSTRAHLUNG TARGET W+AL	80001001ooo12
INC-SPECT	BREMSSTRAHLUNG SPECTRUM	8000100100013
DETECTOR	(SCIN) LIQUID SCINTIL. WITH B-10	8000100100014
PART-DET	(N) NEUTRONS	8000100100015
ERR-ANALYS	ERRORS ARE NOT PRESENTED	8000100100016
ENDBIB	14	8000100100017
COMMON	3 3	8000100100018
EG-MAX	ANG E-RSL	8000100100019
MEV	ADEG NS/M	8000100100020
13	78 12	8000100100021
ENDCOMMON	3	8000100100022
ENDSUBENT	21	8000100199999

SUBENT	80001002	750718	8000100200001
BIB	3	3	8000100200002
REACTION	(25-MN-55(G,N)25-MN-54)		8000100200003
ANALYSIS	(4PI1A) DIF.SIG.AT 78 DEG. TIMES 4PI		8000100200004
SAMPLE	METAL MN, WEIGHT 552 G.		8000100200005
ENDBIB	3		8000100200006
NOCOMMON			8000100200007
DATA	2	203	8000100200008
E	DATA		8000100200009
KEV	MB		8000100200010
0,45	11.7		8000100200011
0,457	9.6		80001002ooo12
0,463	13.8		8000100200013
0,470	11,3		8000100200014
60,4	4.39		8000100200211
63,6	2.78		8000100200212
67,0	1.59		8000100200213
ENDDATA	205		8000100200214
ENDSUBENT	213		8000100299999

	3.08		8000100400012
	6.3		8000100400013
	8.0		8000100400014
	10.0		8000100400015
	14.1		8000100400016
	19.0		8000100400017
	26.5		8000100400018
	32.5		8000100400019
	52.0		8000100400020
ENDDATA	13		8000100499999
ENDSUBENT	19		8000100499999
ENDENTRY	4		8000199999999
ENTRY	80002	750718	8000200000001
SUBENT	80002001	750718	8000200100001
BIB	13	14	8000200100002
TITLE	ON THE (NI-60(G,N)NI-59) REACTION NEAR THRESHOLD		8000200100003
AUTHOR	(V. YA.KITAEV, A.I.ABRAMOV, A.V.ROGOV, M.G.YUTKIN)		8000200100004
INSTITUTE	(4 CCP FEI)		8000200100005
REFERENCE	(75LENING) 25,ANNUAL CONF.ON NUCL.SPECTROMETRY AND		8000200100006
	NUCL.STRUCTURE, LENINGRAD, USSR, JAN, 1975		8000200100007
STANDARD	ABSOLUTE MEASUREMENTS		8000200100008
METHOD	(TOF) TIME-FLIGHT		8000200100009
STATUS	(APRVD) APPROVED BY AUTHOR		8000200100010
FACILITY	(MICRT) MICROTRON FEI, OBNINSK, USSR		8000200100011
G-SOURCE	(BRST) BREMSSTRANLUNG TARGET W+AL		8000200100012
INC-SPECT	BREMSSTRAHLUNG SPECTRUM		8000200100013

```
SUBENT                  80001003          750718
BIB                            4               4
NUC-QUANT      1(25-MN-55, PCS)
               2(25-MN-55, TOT/WID)
               3(25-MN-55, GO/WID,G)
ANALYSIS        (MLA) MULTILEVEL ANALYSIS WITH THE PADE APPROXIMATION
ENDBIB                         4
NOCOMMON
DATA                           4                                3
E-RES          DATA 1           DATA 2                          DATA 3
KEV            MB               EV                              EV
  0.68           59.3             60                              0.123
  1.48           82.5            400                              1.44
  3.08           18.8            460                              0.298
ENDDATA                        5
ENDSUBENT                     14
SUBENT                  80001004                750718
BIB                            1                    1
NUC-QUANT      (25-MN-55, GN, RES)
ENDBIB                         1
NOCOMMON
DATA                           1                   11
E-RES
KEV
  0.68
  1.48
```

```
8000100300001
8000100300002
8000100300003
8000100300004
8000100300005
8000100300006
8000100300007
8000100300008
8000100300009
8000100300010
8000100300011
8000100300012
8000100300013
8000100300014
8000100300015
8000100399999
8000100400001
8000100400002
8000100400003
8000100400004
8000100400005
8000100400006
8000100400007
8000100400008
8000100400009
8000100400011
```

DETECTOR	(SCIN) LIQUID SCINTIL WITH B-10	8000200100014
PART-DET	(N) NEUTRONS	80002oo100015
ERR-ANALYS	ERRORS ARE NOT PRESENTED	8000200100016
ENDBIB	14	8000200100017
COMMON	3 3	8000200100018
EG-MAX	ANG E-RSL	8000200100019
MEV	ADEG NS/M	8000200100020
12.5	78. 10.	800020010o21
ENDCOMMON	3	8000200100022
ENDSUBENT	21	8000200199999
SUBENT	80002002 750718	8000200200001
BIB	3 3	8000200200002
REACTION	(28-NI-60(G,N)28-NI-59)	8000200200003
ANALYSIS	(4PI1A) DIF, SIG, AT 78 DEG, TIMES 4PI	8000200200004
SAMPLE	NI-OXI, ENRICHMENT FOR NI-60 98, 9 PERCENTS	8000200200005
ENDBIB	3	8000200200006
NOCOMMON		8000200200007
DATA	2 144	8000200200008
E	DATA	8000200200009
KEV	MB	8000200200010
0.0714	13.9	8000200200011
0.0960	14.0	8000200200012
0.116	12.3	8000200200013
0.125	21.8	8000200200014
69.9	0.73	8000200200152

```
  71.9          0.81                                                                  8000200200153
  73.9          0.74                                                                  8000200200154
ENDDATA              146                                                             8000200200155
ENDSUBENT            154                                                             8000200299999
SUBENT        80002003          750718                                               8000200300001
BIB                   4               4                                            8000200300002
NUC-QUANT     1(28-NI-60, PCS)                                                       8000200300003
              2(28-NI-60, TOT/WID)                                                   8000200300004
              3(28-NI-60, GO/WID, G)                                                 8000200300005
ANALYSIS       (MLA) MULTILEVEL ANALYSIS WITH THE PADE APPROXIMATION                 8000200300006
ENDBIB                4                                                            8000200300007
NOCOMMON                                                                           8000200300008
DATA                  4               3                                            8000200300009
E-RES         DATA 1     DATA 2          DATA 3                                    8000200300010
KEV           MB         EV              EV                                        8000200300011
  0.198         129        39.7            1.62                                    8000200300012
  4.115           5.58   160.              0.284                                   8000200300013
 10.59            2.0    2100              1.31                                    8000200300014
ENDDATA              5                                                             8000200300015
ENDSUBENT           14                                                             8000200399999
SUBENT        80002004          750718                                             80002oo400001
BIB                   3               3                                            8000200400002
NUC-QUANT     (28-NI-60, GN, RES)                                                    8000200400003
              (2.) TRANSITION TO THE EXCITED STATE OF 28-NI-59                     8000200400004
FLAG          (1.) TRANSITION TO THE GROUND  STATE OF 28-NI-59                     8000200400005
ENDBIB                3                                                            8000200400006
NOCOMMON                                                                           8000200400007
```

DATA		3	10	8000200400008
E-RES	E-CM-RES	FLAG		8000200400009
KEV	KEV	NO-DIM		8000200400010
0.198	0.193	1		8000200400011
4.10	4.07	1		8000200400012
10.6	10.6	1		8000200400013
21.0	21.1	1		8000200400014
23.0	23.1	1		8000200400015
25.9	26.0	2		8000200400016
33.8	34.1	2		8000200400017
39.6	39.9	2		8000200400018
43.3	43.7	2		8000200400019
57.0	57.6	1		8000200400020
ENDDATA		12		8000200400021
ENDSUBENT		20		8000200499999
ENDENTRY		4		8000299999999
				9999999999999