**Nuclear Data Section**

**International Atomic Energy Agency**

**P.O.Box 100, A-1400 Vienna, Austria**

**Memo CP-D/1028**

**Date:** 13 October 2021

**To:** Distribution

**From:** N. Otsuka

**Subject: Suspicious REACTION SF3 of resonance parameters**

We expect SF3=0 when SF6=EN, J, PTY, SWG or D. I extracted all datasets of these parameters but SF3≠0 from EXFOR Master Ver.2021-10-05, and checked them against the source articles. My suggestions of revisions are summarized in the list appended to this memo.

It looks that the article tables of EXFOR C0295.003-004 and C1561.002-004 suggest channel dependent orbital angular momenta of resonances, and I would like to leave their further analysis to NNDC.

I also checked the resonance strengths (SF6=WID/STR) coded with SF3=0 or TOT since it looks also suspicious. A summary of this checking is also appended to this memo.

**Distribution:**

a.koning@iaea.org

abhihere@gmail.com

aloks279@gmail.com

bknayak@barc.gov.in

daniela.foligno@oecd-nea.org

dbrown@bnl.gov

draj@barc.gov.in

exfor@oecd-nea.org

fukahori.tokio@jaea.go.jp

ganesan555@gmail.com

gezg@ciae.ac.cn

iwamoto.osamu@jaea.go.jp

jmwang@ciae.ac.cn

kaltchenko@kinr.kiev.ua

kimdh@kaeri.re.kr

kimura.atsushi04@jaea.go.jp

l.vrapcenjak@iaea.org

manuel.bossant@oecd-nea.org

masaaki@nucl.sci.hokudai.ac.jp

michael.fleming@oecd-nea.org

mmarina@ippe.ru

nicolas.soppera@oecd-nea.org

n.otsuka@iaea.org

nrdc@jcprg.org

odsurenn@gmail.com

ogritzay@ukr.net

ogrudzevich@ippe.ru

otto.schwerer@aon.at

pikulina@expd.vniief.ru

pritychenko@bnl.gov

scyang@kaeri.re.kr

selyankina@expd.vniief.ru

sonzogni@bnl.gov

stakacs@atomki.mta.hu

stanislav.hlavac@savba.sk

sv.dunaeva@gmail.com

tada@nucl.sci.hokudai.ac.jp

taova@expd.vniief.ru

tarkanyi@atomki.hu

vvvarlamov@gmail.com

v.zerkin@iaea.org

vidyathakur@yahoo.co.in

vsemkova@inrne.bas.bg

yolee@kaeri.re.kr

zholdybayev@inp.kz

**Appendix 1: Suspicious SF3=0 with SF6=EN, J, PTY, SWG or D**

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| **Subentry** | **REACTION** | **Suggested corrections** |
| 10805.004.1 | (95-AM-242-M(N,F),,D) | SF3: F -> 0 |
| 10805.004.2 | (95-AM-242-M(N,F),,STF) | SF3: F -> N. Add MOMENTUM L=0. |
| 13197.005.1 | (96-CM-247(N,F),,EN) | SF3: F -> 0 |
| 14306.002 | (62-SM-147(N,G),,J) | SF3: G -> 0 |
| 14306.004 | (62-SM-149(N,G),,J) | SF3: G -> 0 |
| 14318.002.4 | (64-GD-155(N,EL),,J) | SF3: EL -> 0 |
| 14514.002.4 | (66-DY-160(N,EL),,J) | SF3: EL -> 0 |
| 14514.002.5 | (66-DY-160(N,EL),,PTY) | SF3: EL -> 0 |
| 20160.013.2 | (22-TI-47(N,EL),,J) | SF3: EL -> 0 |
| 20160.033.4 | (22-TI-48(N,EL),,J) | SF3: EL -> 0 |
| 21808.017.3 | (10-NE-21(N,G),,L) | SF3: G -> 0 |
| 21808.018.3 | (10-NE-20(N,G),,L) | SF3: G -> 0 |
| 21808.019.3 | (10-NE-22(N,G),,L) | SF3: G -> 0 |
| 22065.004.1 | (74-W-183(N,EL),,STF) | Add MOMENTUM L=0. |
| 22065.004.2 | (74-W-183(N,EL),,D) | SF3: EL -> 0 |
| 22072.008 | (14-SI-28(N,EL),,D) |  |
| 22109.004 | (73-TA-181(N,EL),,D) | SF3: EL -> 0 |
| 22313.003 | (56-BA-138(N,EL),,D) | SF3: EL -> 0 |
| 22314.002 | (28-NI-58(N,EL),,D) | SF3: EL -> 0 |
| 22314.003 | (28-NI-60(N,EL),,D) | SF3: EL -> 0 |
| 22318.004 | (48-CD-113(N,G),,J) | SF3: EL -> 0 |
| 22331.002 | (13-AL-27(N,EL),,D) | SF3: EL -> 0 |
| 23017.006.1 | (11-NA-23(N,G),,EN) | Delete this dataset. Ex of reaction product. |
| 23017.006.2 | (11-NA-23(N,G),,J) | Delete this dataset. J of reaction product. |
| 23487.002.1 | (48-CD-110(N,G),,EN) | SF3: EL -> 0 |
| 23487.003.1 | (48-CD-112(N,G),,EN) | SF3: EL -> 0 |
| 23487.004.1 | (48-CD-114(N,G),,EN) | SF3: EL -> 0 |
| 23487.005.1 | (48-CD-116(N,G),,EN) | SF3: EL -> 0 |
| 23490.007 | (51-SB-121(N,EL),,D) | SF3: EL -> 0. DATA=011.eV -> 11.eV (recom.) |
| 23490.009 | (51-SB-123(N,EL),,D) | SF3: EL -> 0 |
| 31475.002 | (20-CA-40(N,G),,EN) | SF3: G -> 0 |
| 31475.003 | (20-CA-42(N,G),,EN) | SF3: G -> 0 |
| 31475.004 | (20-CA-44(N,G),,EN) | SF3: G -> 0 |
| 31668.003.1 | (41-NB-93(N,TOT),,EN) | SF3: TOT -> 0 |
| 32235.003.1 | (34-SE-80(N,TOT),,EN) | SF3: TOT -> 0 |
| 32235.003.2 | (34-SE-80(N,EL),,WID/RED) | SF8: Add RM |
| 32235.003.3 | (34-SE-80(N,G),,WID) | SF8: Add RM |
| 40070.038.1 | (94-PU-239(N,G),,J) | SF3: G -> 0 (p.256 -> p.257 in STATUS) |
| 40070.038.2 | (94-PU-239(N,G),,PTY) | SF3: G -> 0 (p.256 -> p.257 in STATUS) |
| 40208.008 | (51-SB-121(N,EL),,D) | SF3: EL -> 0 |
| 40208.009 | (51-SB-123(N,EL),,D) | SF3: EL -> 0 |
| 40377.003.1 | (88-RA-226(N,ABS),,D) | SF3: EL -> 0 |
| 40377.003.2 | (88-RA-226(N,ABS),,STF) | SF3: ABS -> EL |
| 40377.003.3 | (88-RA-226(N,ABS),,RI) | Must be in another subentry (not RP) |
| 40382.041.1 | (76-OS-0(N,EL),,EN) | SF3: EL -> 0. STATUS (109.-333. eV …) looks irrelevant. |
| 40382.042 | (76-OS-0(N,EL),,EN) | SF3: EL -> 0 |
| 40382.043.1 | (76-OS-0(N,EL),,EN) | SF3: EL -> 0 |
| 40382.044.1 | (77-IR-0(N,EL),,EN) | SF3: EL -> 0 |
| 40382.045.1 | (77-IR-0(N,EL),,EN) | SF3: EL -> 0 |
| 40382.047.1 | (73-TA-181(N,EL),,EN) | SF3: EL -> 0 |
| 40382.048.1 | (73-TA-181(N,EL),,EN) | SF3: EL -> 0 |
| 40605.007 | ((62-SM-147(N,A),,WID)/(62-SM-147(N,A),,D)) | SF3: A -> 0 for denominator? |
| 40605.008 | ((62-SM-147(N,A),,WID,,AV)/(62-SM-147(N,A),,D)) | SF3: A -> 0 for denominator? |
| 40605.010 | ((52-TE-123(N,A),,WID,,AV)/(52-TE-123(N,A),,D)) | SF3: A -> 0 for denominator? |
| 40663.022.1 | (42-MO-98(N,EL),,EN) | SF3: EL -> 0 |
| 41601.004 | (64-GD-155(N,G),,J) | SF3: G -> 0 |
| C0115.006.1 | (4-BE-9(A,N),,EN) | SF3: N -> 0 |
| **C0295.003.1** | **(1-H-3(D,A),,L)** | **Unusual SF3. Channel dependent L? (c.f. Table II)** |
| **C0295.004.1** | **(1-H-3(D,EL),,L)** | **Unusual SF3. Channel dependent L? (c.f. Table II)** |
| C1487.002.4 | (8-O-15(A,G),,PTY) | SF3: G -> 0 |
| C1502.002.1 | (2-HE-6(A,TOT),,EN) | Delete this dataset. 10Be property studied by 10Be(14C,10Be). |
| C1502.002.2 | (2-HE-6(A,TOT),,WID) | Delete this dataset. 10Be property studied by 10Be(14C,10Be). |
| **C1561.002.6** | **(16-S-33(P,EL),,L)** | **Unusual SF3. Channel dependent L? (c.f. Table I)** |
| **C1561.003.6** | **(16-S-33(P,INL),,L)** | **Unusual SF3. Channel dependent L? (c.f. Table I)** |
| **C1561.004.6** | **(16-S-33(P,INL),,L)** | **Unusual SF3. Channel dependent L? (c.f. Table I)** |
| C1634.002.1 | (10-NE-18(P,0),,EN) | Use SF1=2-HE-4 and SF2=8-O-14. Ec.m. must replace Eex(18Ne). |
| C1634.002.2 | (10-NE-18(P,TOT),,WID) | Use SF1=2-HE-4 and SF2=8-O-14. |
| C1634.002.3 | (10-NE-18(P,A),,WID) | Use SF1=2-HE-4, SF2=8-O-14 and SF3=0. |
| C1634.002.4 | (10-NE-18(P,A),,L) | Use SF1=2-HE-4, SF2=8-O-14 and SF3=0. |
| C1634.002.5 | (10-NE-18(P,A),,PTY) | Use SF1=2-HE-4, SF2=8-O-14 and SF3=0. |
| C1853.005.4 | (6-C-14(P,N),,J) | SF3: N -> 0 |
| C2204.003.1 | (5-B-13(N,0),,EN) | Delete this dataset. 13Be property studied by 9B(13B,13Be). |
| C2204.003.2 | (5-B-13(N,P),,WID) | Delete this dataset. 13Be property studied by 9B(13B,13Be). |
| C2204.003.3 | (5-B-13(N,P),,J) | Delete this dataset. 13Be property studied by 9B(13B,13Be). |
| C2204.003.4 | (5-B-13(N,P),,PTY) | Delete this dataset. 13Be property studied by 9B(13B,13Be). |
| C2316.003.1 | (6-C-12(A,N),,EN) | SF3: N -> 0 |
| D0544.004.1 | (6-C-12(2-HE-8,1-H-6),,EN) | Delete this dataset. 6H property studied by 12C(8He,6H). |
| D0544.004.2 | (6-C-12(2-HE-8,1-H-6),,WID) | Delete this dataset. 6H property studied by 12C(8He,6H). |
| D0544.005.1 | (6-C-12(2-HE-8,1-H-7),,EN) | Delete this dataset. 7H property studied by 12C(8He,7H). |
| D0544.005.2 | (6-C-12(2-HE-8,1-H-7),,WID) | Delete this dataset. 7H property studied by 12C(8He,7H). |
| D6072.003.1 | (5-B-11(P,G),,EN) | SF3: G -> 0 |
| D6072.003.3 | (5-B-11(P,G),,WID/STR) | SF8: Add RG. |
| E1494.006.2 | (28-NI-58(P,TOT),,J) | SF3: TOT -> 0 |
| E1494.006.3 | (28-NI-58(P,TOT),,L) | SF3: TOT -> 0 |
| E1494.011.2 | (28-NI-60(P,TOT),,J) | SF3: TOT -> 0 |
| E1494.011.3 | (28-NI-60(P,TOT),,L) | SF3: TOT -> 0 |
| E1494.012.2 | (28-NI-62(P,TOT),,J) | SF3: TOT -> 0 |
| E1494.012.3 | (28-NI-62(P,TOT),,L) | SF3: TOT -> 0 |
| E2434.003 | (1-H-1(11-NA-21,EL),,EN) | SF3: EL -> 0. Jpi determined in this work must be under DATA with REACTION SF6=J and PTY. |
| F0516.002.4 | (7-N-15(A,G),,PTY) | SF3: G -> 0 |
| F0948.003.2 | (20-CA-40(P,EL),,J) | Must be coded under SPIN J (taken from the literature) |
| F0948.003.3 | (20-CA-40(P,EL),,PTY) | Must be coded under PARITY (taken from the literature) |
| F1075.008.1 | (8-O-16(HE3,EL),,EN) | SF3: EL -> 0. Add MOMENTUM L=0. |
| L0242.003.1 | (18-AR-40(G,N),,EN) | SF3: N -> 0 |
| T0089.004.1 | (8-O-16(A,TOT),,EN) | SF3: TOT -> 0 |
| T0089.004.2 | (8-O-16(A,TOT),,WID) | SF3: TOT -> G |
| T0236.010.1 | (8-O-16(A,EL),,EN) | SF3: EL -> 0 |
| T0236.010.4 | (8-O-16(A,EL),,J) | SF3: EL -> 0 |
| T0236.010.5 | (8-O-16(A,EL),,PTY) | SF3: EL -> 0 |
| T0268.003.1 | (12-MG-24(A,G),,EN) | SF3: G -> 0 |
| T0268.003.2 | (12-MG-24(A,G),,J) | SF3: G -> 0 |
| T0268.003.3 | (12-MG-24(A,G),,PTY) | SF3: G -> 0 |
| T0268.004.1 | (12-MG-24(A,EL),,EN) | SF3: EL -> 0 |
| T0268.004.2 | (12-MG-24(A,EL),,J) | SF3: EL -> 0 |
| T0268.004.3 | (12-MG-24(A,EL),,PTY) | SF3: EL -> 0 |

**Appendix 2: Suspicious SF3=0 or TOT with SF6=WID/STR**

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| **Subentry** | **REACTION** | **Suggested corrections** |
| 21014.007 | (80-HG-199(N,TOT),,WID/STR) | SF3: TOT -> G? |
| 21014.008 | (80-HG-198(N,TOT),,WID/STR) | SF3: TOT -> G? |
| 21014.009 | (80-HG-201(N,TOT),,WID/STR) | SF3: TOT -> G? |
| 13905.003.3 | (17-CL-36(N,TOT),,WID/STR) | SF3: TOT -> P |
| C0166.003.4 | (9-F-19(P,TOT),,WID/STR) | SF3: TOT -> A |
| C0166.004.3 | (9-F-18(P,TOT),,WID/STR) | SF3: TOT -> A |
| C2104.004.5 | (15-P-31(P,TOT),,WID/STR) | SF3: TOT -> A |
| D5009.002.1 | (10-NE-22(P,0),,WID/STR) | SF3: 0 -> G |
| D5036.002.1 | (12-MG-26(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5036.003.1 | (14-SI-30(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5036.004.1 | (16-S-34(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5036.005.1 | (16-S-36(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5041.002 | (16-S-36(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5042.002 | (16-S-36(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5059.002.1 | (18-AR-40(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5060.002 | (16-S-36(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5061.002.1 | (18-AR-40(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| D5068.002 | (12-MG-26(P,0),,WID/STR,,RG) | SF3: 0 -> G |
| F0605.004.2 | (18-AR-36(A,TOT),,WID/STR) | SF3: TOT -> G. SF8: Add RG. |
| F0616.002.4 | (14-SI-28(A,TOT),,WID/STR) | SF3: TOT -> G |
| T0089.004.3 | (8-O-16(A,TOT),,WID/STR) | SF3: TOT -> G |