**Memo issued on behalf of**

**National Nuclear Data Center**

**Brookhaven National Laboratory**

**USA**

**Memo CP-C/487**

**Date:** 28 September 2020

**To:** Distribution

**From:** O. Schwerer, N.Otsuka

**Subject:** **Additions to dictionary 236 (Quantities): ,DA/DA,\*/\*+\* and**

 **,DA/DA/DE,\*/\*+\*/\* and related questions**

We propose the quantities ,DA/DA,\*/\*+\* and ,DA/DA/DE,\*/\*+\*/\* containing new wild card combinations in SF7 for these SF6 parameters, for addition to dictionary 236.

**References:**

W.G.Meyer et al., PR/C,20,1716,1979 (Exfor C2493)

J.R.Wu et al., PR/C,24,500,1981 (Exfor C2495)

S.B.Kaufman et al., PR/C,26,2694,1982 (Exfor C2496)

**Additions to Dictionary 236 (Quantities)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Quantity** | **Reaction Type** | **Dim.** | **Expansion** | **Subentries** |
| ,DA/DA,\*/\*+\* | DAA | DA2 | Angular correl.betw.specif.particles,rel.angle | C2493.002-007, C2496.002-009 |
| ,DA/DA/DE,\*/\*+\*/\* | D3A | D3A | Triple diff.cs d3/dA(\*)/dA(\*+\*)/dE | C2495.003 |

As mentioned above, the only new aspect of these quantities are new wild card combinations in SF7. Very similar quantities, namely

,DA/DA,\*+\*/\*

and

,DA/DA/DE,\*/\*/\*+\*

exist in dictionary 236. The new ones proposed now cause error messages in the check programs and therefore a dictionary update is needed.

On this occasion we want to raise the question whether we should continue to add such quantities to the dictionary which are new only with respect to the position of the + sign in wild card combinations in SF7.

This concerns both the needs of users and compilers and has also consequences for the check programs. One important aspect is that we want to keep dictionary 236 as compact as possible, i.e. avoiding the addition of quantity codes which are not needed for checking purposes, nor for users and compilers to properly compile and understand the measured quantity.

Note also that in the above proposal, the expansion for one of the new quantities is - also because of the limited space in the dictionary for the “short expansion” - the same as for the corresponding existing quantity given above. From this point of view, such new dictionary entries may not be very helpful for users, or might even cause confusion.

The alternative would be to allow the wild card ‘\*’ to stand not only for a single particle but also for a particle pair, which is currently written as ‘\*+\*’ (usually referred to as “particle pair specified” in the dictionary expansions).

A shortcoming of this option would be to have less consistency in the particle order in SF7. For example, LEXFOR asks to put the particle combination *a*+*b* after the particle *a* in SF7 when the cross section is differential for the angle of the particle *a*, and angle of *a*+*b* (“*a*/*b*/*a*+*b*” in LEXFOR should read “*a*/*a*+*b*”). But a checking program may accept both DA/DA,*a*/*a*+*b* and DA/DA,*a*+*b*/*a* if \* includes \*+\* in dictionary 236. Note that DA/DA,\*+\*/\* has been defined in dictionary 236, and used in two entries E1711 and E1748 where the particle combination is not *a*+*b*/*c* rather than *a*+*b*/*a*.

We would like to have this question discussed by compilers and programmers. The needs of users, compilers and programmers should be taken into account.

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