KARLSRUHE CHARGED PARTICLE GROUP

Information

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Memo CP-B/21

9.2.1978/Ki

Subject: Multiple Residual Nucleus Formalism

References: CP-D/36, CP-D/45
CP-C/23
CP-B/9, CP-B/11, CP-B/14

I. Restricted Sets of EXFOR-Formats (re CP-C/23 item I)

In general we have no objections that individual compilers or compiling groups avoid special coding-probabilities if there exists an alternative, especially with respect to more or less different data like those from neutron and charged particle induced reactions. On the other hand, too much "individual style" would deviate from the original intention of generalized EXFOR to compile also differing data in an as much as possible coherent way. This principle may become violated if we introduce e.g. a not generally acceptable formalism for fission-products (of interest for charged particle and neutron data), expand it to (more charged particle based) reactions like spallation etc., and put then a restriction on it as "not to be used for charged particle reactions" (for which Kachapag is - until now - the main data compiling center).

It should be tried, therefore, to reach as far as possible agreement on commonly acceptable formalisms. This should be possible especially in cases were merely formal discrepancies exist. We are very willing to do our best in reaching this goal. In this sense, however, statements like ".... if one group is unwilling to do one thing, then, according to our last proposal, they must do something else ..." or "There is no possibility for doing something ...." are not very helpful in reaching a compromise acceptable for all involved groups.
On the other hand, if compromises based on arguments cannot be found, there may be no other solution than to have different restricted sets of coding practices.

II. Variable Product Nucleus Formalism

At the beginning we want to point out that Kachapag was and is strongly interested in this topic (a fact that we have stated several times) since it is in our opinion of special importance and of widespread applicability for charged particle induced reactions. We, therefore, appreciated it very much that the first proposal and strong support came from the neutron-data groups though the formalism should be of more restricted importance for neutron induced reactions (fission seems to be the most frequent case). Consequently, it is hard to understand that we are forced to impose restrictions making the formalism nearly unusable for ICPND. Furthermore, it is a pity that our proposals (which admittedly became improved by the former discussions) have never been discussed in detail (especially the last one in CP-B/14) by refuting our arguments. In our opinion, statements like "We do not want to see ...", "Kachapag must ...", or "There is no possibility ..." are far from being better arguments (e.g. against our proposal to have the independent variable as an indicator for the application of the formalism, or our arguments in CP-B/14 to keep the fixed Z/A-value within the reaction string).

Returning to the actual problem, there are yet two aspects of this topic. We see clearly the problems when discussing such an extensive item via memos (misunderstandings and differing interpretations are easily possible) and propose, therefore, to have further discussions on it as a primary topic on the June Data Centers Meeting.

The two aspects on which we want to comment here again, are (i) the formalism and rules of coding and (ii) the cases of applicability.

(i) Coding formalism:

In our opinion there has not yet been reached agreement on the format how to describe variable product nuclei. We cannot find striking arguments in CP-C/23 against our proposal to have the fixed Z/A value explicitly in Reaction-SF4 (see CP-B/14). Maybe, there are programming considerations involved (why are they not mentioned ?). We will have such problems when we accept the formalism as proposed by NNDC, especially with our index and the expansion for the printed version of the Kachapag-file. These coding problems, however, are somewhat easier to solve for us than the problems of applicability (see next section).
As a compromise, we would accept, therefore, the - in our opinion not optimum - coding format as proposed in CP-C/15 and CP-C/23. On the other hand, we expect that NNDC will meet in some way our wishes regarding cases and rules of application of the formalism. Furthermore, we expect some assistance from NDS in programming the printable expansions of this coding.

(ii) Cases of application of the formalism

This aspect is in our opinion the most important since an equal use by all compilers and an optimum application and reexpansion into an edited form strongly depends on clear and exact rules of applicability.
Referring to CP-C/23 (item IV.B) we see no clear borderlines between cases with process code X in Reaction SF3 (where the variable product nucleus formalism shall be permitted) and those cases where the multiple reaction formalism shall be used. Furthermore, two sometimes overlapping possibilities can easily lead to different coding practices for the same kind of data. In our opinion, our proposal of CP-B/14 (p.5) to have the independent variable as an indicator of the applicability, is unambiguous (the author should have stated correctly, whether he has measured an excitation function or a charge/mass distribution). Such an unambiguous indication (other proposals are welcome) should be introduced in every case to guarantee a uniform application by all compiling groups. These problems, however, should be discussed at the next data-centers meeting, since in our opinion an oral discussion of this complex material seems to be more effective especially by avoidance of misunderstandings.

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