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Memo CP-E/071 (Revised)

Date: September 21, 2005
To: Distribution
From: OTSUKA Naohiko
Subject: Energy spectrum as function of sum of kinetic energies of several particles
Reference: CP-D/434

We have two comments on Memo CP-D/434:

1) This is an extension of "Energy distribution for a correlated pair" (LEXFOR Secondary Energy Distributions item.2) to *N*-particle case, because relative energy E_{rel} is the total kinetic energies of two particles in their center of mass system (c. m. s.), and M. Meister *et al*. considers the total kinetic energies of 3 particles in their c. m. s. (=outgoing ^{6}He or ^{8}He rest frame).

   Therefore it would be better to keep consistency between two particles case and *N*-particles case, for example,

   - Codes for particles considered (SF7): `a+b+…` or `a/b/…` ?
   - Heading for the total kinetic energies in their c. m. s.: `E`, `E-CM` or `E-RL-CM` ?

   I think the reference frame of kinetic energies (laboratory system, c. m. s. of projectile-target, c. m. s. of particles considered…) should be clarified by heading and/or `EN-SEC`.

2) JCPRG has compiled similar quantity (Energy spectrum of Coulomb excited outgoing particle) in E1915.002, in which energy spectrum of Pb(^{11}Be, n+^{10}Be)Pb is given for the relative energy for n-^{10}Be(=total kinetic energies in their c. m. s.). We treated this data as energy spectrum of outgoing ^{11}Be excitation energy, because total kinetic energy in n-^{10}Be c. m. s. is equal to excitation energy of ^{11}Be (measured from n-^{10}Be threshold). This could be another solution for M. Meister *et al*.

3) Addition of new item for total kinetic energy to LEXFOR is useful. This quantity is often needed in the compilation of fission measurement, in which some works consider total kinetic energy of fission fragments (e.g. light fragment and heavy fragment).

Distribution:

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Sample of coded entry (E1915.002)

N. Fukuda *et al*., Phys. Rev., C **70** (2004) 054606 Fig.2 (a).

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SUBENT        E1915001   20050916                                    E191500100001
BIB                 12         37                                    E191500100002
…
PART-DET    (N)                                                      E191500100015
            (4-BE-10)                                                E191500100016
…
METHOD      (COINC) Detect neutron and 10Be in coincidence.          E191500100020
            (EDE)                                                    E191500100021
            (TOF) To deduce momentum vector of 10Be and neutron      E191500100022
…
COMMENT     In some data tables, excitation energy of 11Be is        E191500100035
            measured from 10Be-n threshold. Authors mention that     E191500100036
            the one-neutron separation energy is precisely known     E191500100037
            to be 504+-4 keV.                                        E191500100038
HISTORY     (20050421C) Sr + On                                      E191500100039
ENDBIB              37          0                                    E191500100040
NOCOMMON             0          0                                    E191500100041
ENDSUBENT           40          0                                    E191500199999
SUBENT        E1915002   20050916                                    E191500200001
BIB                  7         21                                    E191500200002
REACTION    (82-PB-0(4-BE-11,INL)82-PB-0,,IPA/DE)                    E191500200003
EN-SEC      ANG-CM is polar angle between beam and 11Be in center    E191500200004
            of mass system                                           E191500200005
            (E-EXC,4-BE-11) Relative energy between 10Be and         E191500200006
                            neutron (= Excitation energy of 11Be     E191500200007
                            measured from 10Be-n threshold)          E191500200008
…
ENDBIB              21          0                                    E191500200024
COMMON               3          3                                    E191500200025
EN          ANG-CM-MIN ANG-CM-MAX                                    E191500200026
MEV/A       ADEG       ADEG                                          E191500200027
 68.7        0.0         6.0                                         E191500200028
ENDCOMMON           3          0                                    E191500200029
DATA                3         60                                    E191500200030
E-EXC       DATA        DATA-ERR                                     E191500200031
MEV         B/MEV       B/MEV                                        E191500200032
  5.576E-02  6.695E-01  3.474E-02                                    E191500200033
  1.504E-01  1.337E+00  2.963E-02                                    E191500200034
…
  3.678E+01  7.046E+00  2.429E+00                                    E191500200091
  4.177E+01  1.478E+01  4.053E+00                                    E191500200092
ENDDATA             62          0                                    E191500200093
ENDSUBENT           92          0                                    E191500299999
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