Correlation / Angular correlation: Clarifications and dictionary cleanup

- Memo **4C-4/107** (attached) proposes several new quantities for **angular correlations**, using COR in SF6.
- Existing dictionary 36 entries for angular correlations are **inconsistent**, since similar entries exist with SF6 = COR and SF6 = DA/CRL (e.g. **,COR,N/D** and **,DA/CRL,N/D**, both expanded as "Angular correlation neutrons/deuterons".
- Several years ago it was proposed to change the coding for angular correlations from COR to DA/CRL (There was an Action 20 on McLane of the 1997 NRDC meeting to check the existing EXFOR entries for angular correlations in view of this proposed change.)
- However, the **LEXFOR** page on Correlations, dated November 1997, gives a coding example for angular correlation with SF6=COR.
- If it is agreed that all angular correlations are to be coded with SF6 = DA/CRL, it is not clear whether **COR** should still be used for **other types** of correlations. It should be noted that 2 other types of correlations, not involving angles, were proposed (and added to dictionary 36) also:
  IND,FY/CRL Independent yield of correlated fragment pair, and
  PRE,KE/CRL,LF/HF Total kinetic energy of primary fragment pair
- Different SF6 codes exist for energy, mass, and momentum correlations: ECO, EMC, and MCO.
- It seems that the motivation for the proposed change from COR to DA/CRL for angular correlations was originally, to have different SF6 codes for angular and other types of correlations, e.g. DA/CRL for angular correlations, and COR for other data involving correlated particles. However, the introduction of the above codes with FY/CRL and KE/CRL does not conform to this idea.
- We found only 12 EXFOR entries containing correlations coded with either COR or CRL in SF6, therefore it should not be too difficult to rectify the situation.

  Existing entries with SF6 containing COR or CRL:
  SF6 = COR: 20220, M0035, O0011, O0375
  SF6 = CRL: 30521, 30544, 30916
  SF6 = DA/CRL: T0117
  SF6 = FY/CRL: 13599, 13624, 13648, 13698
  (No entry found with SF6 = KE/CRL.)
- The following steps are proposed (next page).

- **Proposed Actions:**
  - ♦ Agree (at this meeting) on a consistent way of coding. Our proposal:
    Code all angular correlations with SF6 = DA/CRL and all other data involving correlated particles which involve no angles with SF6 = COR. (The coding of energy, mass and momentum correlations remains ECO, EMC, and MCO).
  - ♦ Draft new LEXFOR entry on angular and other correlations, giving definitions and coding examples for all types (including the required independent variables) and a section (or cross reference) on ECO, EMC and MCO.
  - ♦ Update dictionaries accordingly, in particular: obsolete angular correlations with SF6 = COR, include new proposed angular correlations of memo 4C-4/107 using SF6 = DA/CRL instead of COR, and change entries with FY/CRL and KE/CRL to FY/COR and KE/COR, respectively.
  - ♦ Except for entry T0117, the 12 entries listed above will have to be retransmitted with corrected REACTION codes, and all centers should check whether any more correlation entries (e.g. in the PRELIM stage) need to be modified.

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MEMO 4C-4/107

  DATE: **11 September 2000**
  TO: **Distribution**
  From: **S. Maev (alias: S.Mayev)**
  Subject: **Addition to Dictionary 36**

Following additions to Dictionary are being proposed

  Dictionary 36 (Quantities)

Following codes have to be added to Dictionary 36

    "TER,COR,G/A,RSD"
  Example: REACTION   (98-CF-252(0,F),TER,COR,G/A,RSD) Angular
                         Gamma/Alpha correlation

    "TER,COR,G/LCP,RSD"
  Example: REACTION   (98-CF-252(0,F)ELEM/MASS,TER,COR,G/LCP,RSD)
                         Angular Gamma/light-charged-particle
                         correlation

    "PR,DA,G,LEG/RS"
  Example: REACTION   (98-CF-252(0,F),PR,DA,G,LEG/RS) Legendre
                         Coeff. for prompt gamma angular distribution

    "TER,COR,G/A,LEG/RS"
  Example: REACTION   (98-CF-252(0,F),PR,DA,G,LEG/RS)
                         Legendre Coeff. of G/A correlation

    "TER,COR,G/LCP,LEG/RS"
  Example: REACTION   (98-CF-252(0,F)ELEM/MASS,TER,COR,G/LCP,LEG/RS)
                         Legendre coeff. of G/LCP Angular correlation

REFERENCE Phys.Rev.Letters,v.82,#2, p.303,199911
           Entry   22461

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