BROOKHAVEN NATIONAL LABORATORY

M E M O R A N D U M

Memo CP-C/117

DATE: March 20, 1984

TO: Distribution

FROM: V. McLane

SUBJECT: Covariance

    Enclosed are the manual update pages outlining the proposal for the coding of covariance data in EXFOR. I have added the covariance data file format as Appendix B since it is not part of the normal EXFOR transmission files.

Charles L. Dunford

INFORMATION

84 03 26

ACKNOWLEDGEMENT

ORIGINAL TO:

FORWARD TO FILE STATION:

ENCLOSURES

DESCRIPTION:

VM:gaj
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CMPD-QUANT

(moved to Appendix A)

COMMENT

1. This keyword is used to give pertinent information which cannot logically be entered under another of the keywords available. See also LEXFOR Comment.

2. This keyword is optional and contains free text only.

CORRECTION

1. This keyword is used to give information about corrections applied to the data in order to obtain the values given under 'DATA'. See also LEXFOR Correction.

2. This keyword is optional and contains free text only.

COVARIANCE

1. This keyword is used to give covariance information provided by the experimentalist or to flag the existance of a covariance data file. See also LEXFOR Covariance. See Appendix B for format of Covariance Data File.

2. This keyword is optional and contains either free text only or the code (COVAR) followed by free text.

CRITIQUE

1. This keyword is used to give comments on the quality of the data presented in the data table. See also LEXFOR Comments.

2. This keyword is optional and contains free text information only.

APPENDIX B

COVARIANCE DATA FILE FORMAT

Covariance data may be stored as a separate covariance file. There are three record types in the covariance file: a comment record, a data record and an end record.

Comment Record Format:

```
Col. 1       'C'
Col. 2- 9    Data set number
Col.10       Blank
Col.11-80    Comment which includes covariance type and format
```

Data Record Format

```
Col. 1       'D'
Col. 2- 9    Data set number
Col.10       Blank
Col.11-80    Data as given by format
```

End Record Format

```
Col. 1       'E'
Col. 2- 9    Data set Number
```

See also LEXFOR Covariance

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Covariance

Covariance matrices, if given by the experimentalist, should be included, where possible, either in structured form as free text under the keyword COVARIANCE or, for large matricis, stored on a separate covaiance file.

Information-Identifier Keyword COVARIANCE

Only non-zero matrix elements need by given.

Example:

```
COVARIANCE VALUES GIVEN ONLY FOR ELEMENTS BELOW DIAGONAL OF
          SYMMETRIC MATRIX ON SAME ENERGY GRID AS DATA.
          1.0
          0.98 1.0
          0.90 0.97 1.0
          0.70 0.82 0.93 1.0
          0.54 0.68 0.83 0.96 1.0
          0.64 0.75 0.85 0.92 0.95 1.0
          0.72 0.78 0.83 0.83 0.83 0.95 1.0
          0.64 0.67 0.69 0.69 0.68 0.83 0.93 1.0
          0.60 0.61 0.60 0.58 0.56 0.74 0.87 0.98 1.0
```

Covaiance File

Data is stored in the experimentalists' original format with a header record which specifies the data set number to which the matrix belongs, the covariance type and the format. See EXFOR Appendix B for format.

Example:

```
C10034002 VALUES GIVEN ONLY FOR ELEMENTS BELOW DIAGONAL OF
C10034002  SYMMETRIC MATRIX ON SAME ENERGY GRID AS DATA.
C10034002 FORMAT(9E5.2)
D10034002  1.0
D10034002  0.98 1.0
D10034002  0.90 0.97 1.0
D10034002  0.70 0.82 0.93 1.0
D10034002  0.54 0.68 0.83 0.96 1.0
D10034002  0.64 0.75 0.85 0.92 0.95 1.0
D10034002  0.72 0.78 0.83 0.83 0.83 0.95 1.0
D10034002  0.64 0.67 0.69 0.69 0.68 0.83 0.93 1.0
D10034002  0.60 0.61 0.60 0.58 0.56 0.74 0.87 0.98 1.0
E10034002
```

The code COVAR is used under the keyword COVARIANCE to signal the existance of a covariance file for that data set.

Example: COVARIANCE (COVAR) COMPLETE COVARIANCE MATRIX GIVEN IN SEPARATE
                          COVARIANCE FILE.