

LEXFOR and Formats Manual on Covariance

(O. Schwerer and N. Otsuka, 2014-04-22, Memo CP-C/428)

In WP 2013-35 a new format for covariance data was proposed. Action A24 of the same meeting asked all centres to provide feedback to this proposal. As no comments were received, the proposal can now be implemented.

As the proposal implies that the covariance data will be given within regular Exfor entries under the keyword COVARIANCE, the facility of having special covariance files stored separately will be dropped. Therefore all references to it, and to the related code COVAR, will be removed from Lexfor and the Formats Manual, and Appendix B will now contain (with minor editorial changes) the contents of WP 2013-35.

The necessary changes to current Lexfor page C.6 and to Formats Manual page 7.6 are appended. Note that a revision of Lexfor page C.5 (first part of chapter „Covariance“) is proposed in memo CP-D/680 Rev.3.

(LEXFOR page C.6)

Keyword COVARIANCE

Covariance data may be stored in an EXFOR file under the keyword COVARIANCE. These covariance data can describe several types of correlations including: correlations between data measured on different energies (correlations between experimental points and energy intervals); correlations between data of different reactions; correlations between Legendre coefficients of angular distributions; full and fractional, covariance and correlation matrices.

The details of the format are given in the **Exfor Formats Manual, Appendix B**.

~~Only non-zero matrix elements need be 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~~

~~The code COVAR is used under the keyword covariance to signal the existence of a separate covariance file for that data set.~~

Example:

~~COVARIANCE (COVAR) Complete covariance matrix given in separate covariance file.~~

Covariance File

~~**Data stored in the experimentalists' format** contains a header record that specifies the data set number to which the matrix belongs, the covariance type, and the format.~~

~~The format may be either a free format, defined in a comment record, or in ENDF-6 File 33 format.~~

~~See **EXFOR Formats Manual, Appendix B**, for description and examples of formats.~~

(Formats Manual, page 7.6)

COVARIANCE. Gives covariance information provided by the experimentalist, ~~or to flag the existence of a covariance data file~~. See also **LEXFOR, Covariance**.

1. Presence is optional. Contains ~~either~~ free text only ~~or the code COVAR, which indicates the existence of a covariance file, followed by free text~~, which may contain structured information defining the type of covariance data and the related table format as well as the actual covariance or correlation data.
2. See Appendix B for details on the **Covariance Data File** covariance data format.