

COVARIANCE MATRICES AND APPLICATIONS  
TO THE FIELD OF NUCLEAR DATA\*

by

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ABSTRACT

A student's introduction to covariance error analysis and least-squares evaluation of data is provided. It is shown that the basic formulas used in error propagation can be derived from a consideration of the geometry of curvilinear coordinates. Procedures for deriving covariances for scalar and vector functions of several variables are presented. Proper methods for reporting experimental errors and for deriving covariance matrices from these errors are indicated. The generalized least-squares method for evaluating experimental data is described. Finally, the use of least-squares techniques in data fitting applications is discussed. Specific examples of the various procedures are presented to clarify the concepts.

\*This work supported by the U.S. Department of Energy.