Covariance Matrix of a Double-Differential Elastic Scattering Cross Section*

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We generate temperature-dependent covariance matrices for double-differential (DD) elastic scattering cross sections near low energy resonances of ^{238}U, for which Doppler broadening effects are significant. The formula for the covariance matrix is derived from an expansion of a DD elastic scattering cross section into Doppler broadened Legendre moments. These moments are computed using the expressions derived by Arbanas *et al.* [*International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2011)*]. The covariance matrix of a DD elastic scattering cross section can be seen as a functional of a simpler covariance matrix of an energy-differential elastic scattering cross section. Covariance matrices of DD elastic scattering data could be useful for DD elastic scattering data fitting or for computation of uncertainties.

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