Future Developments for SAMMY

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Development of the SAMMY code[1] is an evolutionary process, with new features and incremental improvements occurring as the need or the opportunity becomes apparent. In this presentation, we will attempt to look into the "crystal ball" to see what might become available in the near future. A few concepts are listed in this abstract; more will be described during the presentation.

In the resolved-resonance region: Capability will be created for analyzing inverse reactions simultaneously with the forward reaction (e.g., $\alpha+^{13}C$ together with $n+^{16}O$). The option to model a rectangular sample for multiple-scattering corrections will be updated and restored. Coding will be made available for easy calculation of the data-covariance-matrix components for use in SAMMY's implicit data covariance method.

In the unresolved-resonance region: Capabilities will be added for treating multiple nuclides in the sample, for calculating multigroup averages, and for including integral quantities in the fitting procedure. Efforts will be made to upgrade the ENDF format to use the theoretical formulations currently available in SAMMY and FITACS.[2] Newer formalisms, such as those under development by other speakers at this conference, may also be implemented into SAMMY.

In both regions: Fine-tuning and incremental improvements will be made to many of the existing options. Continued modernization of the coding will occur, quite probably including conversion to Fortran 90. Graphical user interfaces and sophisticated data storage and retrieval methods are also on the "wish list."

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[1] *Updated Users' Guide for SAMMY: Multilevel R-Matrix Fits to Neutron Data Using Bayes' Equations*, N. M. Larson, ENDF-364 and ORNL/TM-9179/R6, Oak Ridge National Laboratory, Oak Ridge, TN (May 2003). Also ORNL/TM-9179/R7, to be published in 2006.

[2] "Evaluation of the Unresolved Resonance Range of ^{238}U," F. H. Fröhner, *Nucl. Sci. Eng.* **103**, 119–128 (1989).