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The Full Bayesian Evaluation Technique - Properties and Developments

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The Full Bayesian Evaluation Technique has been developed for nuclear data evaluation and provides a consistent set of nuclear reaction cross sections and associated uncertainty information in form of covariance matrices. The technique is based on the concept of Bayesian statistics, which is the proper mathematical tool accounting simultaneously for the a-priori knowledge as well as for the gain of information by additional experimental data.

In this contribution we present the concept of the Full Bayesian Technique for nuclear data evaluation and current methods to determine its various components, i.e. the prior and the likelyhood function. The former accounts for the a-priori information and its proper determination is of particular importance for nuclear data evaluation beyond 20 MeV, where experimental data are scarce. Here, current developments on the prior will be presented. Emphasis will be given to specific features of the Bayesian technique, i.e. the role of systematic errors and the impact of cross channel correlations, which are discussed at the example of actually performed evaluations of Mn-55 and Pb-208 cross sections.

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