

Error estimates for theoretical predictions: example Skyrme functional

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Abstract

Experimental results are generally given together with uncertainties. Theoretical predictions are uncertain as well. Strategies to evaluate appropriate error bars depend on the model. This contribution explains briefly the case of the nuclear mean-field model using Skyrme and Fayans functionals. Its parameters are determined by a least-squares fit to empirical nuclear ground state data. With a statistical interpretation of the least-square technique, one can deduce uncertainties of the model parameters and from these uncertainties of other observables as well as correlations between observables. The power of the method will be demonstrated by examples how this helps in model development.