Abstract Submitted
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Bayesian error analysis for phenomenological nuclear interactions[1] RODRIGO NAVARRO PEREZ, Ohio University — Phenomenological interactions have played a central role in nuclear physics since the early studies of the nucleus more than six decades ago. While microscopically derived interactions have recently shown major improvements in terms of description of experimental data and a wider range of applicability, phenomenological interactions remain the most commonly used type of interactions both for structure and reaction calculations. Although a great deal of effort is usually dedicated to determining an optimal set of parameters that best describe a large body of experimental data, the problem of quantifying uncertainties is left untouched in most cases. The reason for this lack of quantified uncertainties in phenomenological interactions is sometimes related to the already large computational cost of minimizing a χ^2 type of merit figure with respect to the interaction parameters. In this work we discuss early developments in applying Bayesian analysis and Markov Chain Monte Carlo methods to identify the posterior distribution of an already optimized set of parameters. In particular we look at an updated version of the popular AV18 potential. Further possible applications into systematic uncertainties of chiral potential as well as optical potentials are also discussed.

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