Abstract Submitted
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Uncertainty quantification in the Importance-truncated No-Core Shell Model[1] MICHAEL KRUSE, ERIC JURGENSON, Lawrence Livermore National Laboratory (LLNL), PETR NAVRATIL, TRIUMF, BRUCE BARRETT, University of Arizona, ERICH ORMAND, Lawrence Livermore National Laboratory (LLNL) — The No-Core Shell Model (NCSM) is a first-principles nuclear structure technique with which one can calculate the observable properties of light nuclei (A < 20). Unfortunately, the many-body basis space size required for convergence of the ground-state energy is often on the order of a billion states; too large for most computer-codes in use today. The Importance-truncated NCSM, IT-NCSM, formulated on arguments of multi-configurational perturbation theory selects a small set of basis states from the initially large NCSM basis space in which the Hamiltonian is now diagonalized. Previous IT-NCSM calculations have proven reliable, however, there has been no thorough investigation of the inherent error in the truncated IT-NCSM calculations. We provide a detailed study of IT-NCSM calculations using Li-6 as our test case. Our analysis includes a study of IT-NCSM "errors" as a function of the size of the basis, the harmonic oscillator energy, as well as the extrapolation functions used.

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Michael Kruse
Lawrence Livermore National Laboratory (LLNL)

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