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Exact Sum Rules for Approximate Ground States KEN LUU, CALVIN JOHNSON, San Diego State Univ, YI LU, Qufu Normal University — Electromagnetic, weak, and other transitions tell us a great deal about the structure of atomic nuclei. Yet it is often easier to compute the ground state, if only as an approximation, than a full spectrum of excited states, which makes testing transitions difficult. One alternatives are through sum rules, in particular the non-energy-weighted and energy-weighted sum rules, which can be written as the expectation value of an operator. To explore this, we compute the sum rules for a variety of nuclei, comparing the numerically exact full configuration-interaction shell model, as a reference, to Hartree-Fock, projected Hartree-Fock, and, where practical, the nucleon pair approximation.

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