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Truncation and Extrapolation of *Ab initio* Calculations in a Finite Model Space M. AVETIAN, S.A. COON, M.K.G. KRUSE, U. VAN KOLCK, University of Arizona, P. MARIS, J.P. VARY, Iowa State University — Estimating the errors due to the truncation to a model space is crucial for *ab initio* calculations which require an extrapolation scheme to obtain a converged result in the full space. Of the calculations done in a harmonic oscillator (HO) basis, the model space is assumed to be characterized by N_{max} which counts the maximum number of shells, above the minimum configuration, kept in the total energy. In the spirit of effective field theory (EFT) we have examined the dependence of the truncated results on two regulators of the model space. The HO ultraviolet (UV) regulator Λ is associated with the maximum momentum included in the calculation. The infrared (IR) regulator λ is associated with the minimum momentum variation allowed. Our investigations are made with different "realistic" NN interactions smooth enough that these calculations, performed with a technology developed for the shell model, are variational in nature. Our energy spectra show a significant tendency towards simple scaling in these two regulators as the calculation approaches separately the IR and UV limits. We have established a novel extrapolation parameter composed of the two UV and IR regulators which appears universal (and NN interaction and nucleus independent) and is useful even for modest model spaces.

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