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No-core shell model in an EFT framework IONEL STETCU, JUHANI L. TORKKOLA, BRUCE R. BARRETT, UBIRAJARA VAN KOLCK, University of Arizona — Based on an effective field theory (EFT) that integrates out the pions as degrees of freedom (pionless theory), we present a new approach to the derivation of effective interactions suitable for many-body calculations by means of the no-core shell model. The main investigation is directed toward the description of two-body scattering observables in a restricted harmonic oscillator (HO) basis, and the inherent Gibbs oscillation problem which arises from the truncation of the Hilbert space using HO wave functions. Application of the effective interactions to the description of ${}^4\text{He}$ will be discussed. I.S. J.L.T, and B.R.B. acknowledge partial support by NSF grant numbers PHY0070858 and PHY0244389. U.v.K. acknowledges partial support from DOE grant number DE-FG02-04ER41338 and from the Sloan Foundation.

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