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Novel approach to effective interactions for many-body calculations IONEL STETCU, BRUCE R. BARRETT, UBIRAJARA VAN KOLCK, Univ. of Arizona — Even in the absence of exact solutions from QCD, effective field theories (EFT) provide a modern understanding of the nuclear forces at low energies. Based on a EFT which 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. Such an approach can provide a consistent, order-by-order improvable method to obtain interactions tailored for the model spaces used in the many-body calculations, as well as the corresponding electromagnetic and weak operators. In this work, we concentrate on the description of two-body scattering observables in a restricted harmonic oscillator basis. I.S. 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.

Prefer Oral Session
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