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Effective Field Theory for Light Nuclear Systems¹ JIMMY RO-TUREAU, University of Arizona, IONEL STETCU, University of Wasington, BRUCE BARRETT, UBIRAJARA VAN KOLCK, University of Arizona — We have applied the general principles of Effective Field Theory for the description of light nuclear systems. The interactions between nucleons is written as a controllable expansion consisting of contact interactions with an increasing number of derivatives. The many-body dynamics is solved with the No-Core Shell model approach. The nucleons are assumed to evolve in a harmonic oscillator trap characterized by the frequency ω . The presence of the trap allows for the construction of nuclear interactions within the shell-model valence space directly from the low-energy scattering physics given by the effective range expansion. Binding and excitation energies of nuclear systems in the absence of a trap are obtained by taking the limit $\omega \to 0$. Results for ³H and ⁴He at leading order and next-to-leading order will be discussed.

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