Abstract Submitted
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Effective theory for trapped few-fermion systems[1] JIMMY ROTUREAU, University of Arizona, IONEL STETCU, University of Washington, BRUCE BARRETT, University of Arizona, MIKE BIRSE, University of Manchester (UK), BIRA VAN KOLCK, University of Arizona — The properties of strongly interacting Fermi gases have been the object of great interest in recent years. When the scattering length a_2 is much larger than the effective range of the interaction r_0, few-atom systems serve as a testing ground for techniques developed for the ab-initio solution of few-nucleon systems. We have applied the principles of Effective Field Theory to describe few-fermions systems in a harmonic trap. The interaction is written as a controllable expansion of contact interactions with derivatives. The no-core shell model is used to solve the many-body Schrödinger equation at leading order and corrections beyond LO are treated in perturbation theory. We have also adressed the relationship between the two-body and many-body cutoffs needed for a consistent model space. Results for the energies of the 3-fermions system at unitarity will be presented and shown to agree with known results. Results for systems with 3, 4 fermions for different values of a_2/b (b being the trap length) and r_0/b will also be presented.

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