**Field theoretic study of a cold Fermi gas in the unitary limit**

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Abstract: Trapped and cooled gases of alkali atoms can be manipulated to exhibit a variety of interesting phenomena. For example, dilute gases of fermionic atoms, in 2 hyperfine states, can be cooled to temperatures where they become superfluid. An external field can be applied to tune the scattering length $a$. When $|a|$ exceeds the interparticle spacing, nonperturbative tools are needed to study the system theoretically. The unitary limit, $|a| \to \infty$, is particularly interesting due to its universality and symmetry. Lattice field theory and effective field theory can be used to systematically calculate properties of this system. Results are presented for the finite temperature phase transition and for behavior near zero temperature.