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Pair Condensation in a Finite Trapped Fermi Gas[1] CHRISTOPHER
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— Cold atomic fermi gases are widely studied examples of strongly interacting quan-
tum systems. Examples include ^{40}K, ^{6}Li and neutron matter. In the unitary regime,
where the scattering length is very large compared to the mean inter-particle dis-
tance, they are nonperturbative and exhibit universal behavior. Moreover, they can
be created in the lab, providing an excellent testing ground for theory. In this talk I
will describe quantum Monte Carlo calculations we have been performing to study
the signatures of pairing and the superfluid phase transtion in finite-size systems.
Using the Auxillary Field Monte Carlo (AFMC) method, we study the pairing gap,
condensate fraction, pair wavefunction and density profile as a function of tem-
perature. Defining the onset of condensation T_{cond} as the temperature when the
condensate fraction crosses its (finite) noninteracting limit, we consider the question
of whether pairing occurs prior to condensation in the unitary regime.

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