

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Ferromagnetism in Fermi Gases REMBERT DUINE, ALLAN MACDONALD, The University of Texas at Austin — We investigate the possibility of itinerant ferromagnetism in a two-component Fermi gas with strongly repulsive short-range inter-particle interactions. Interestingly, unlike the case of an electron gas with long-range Coulomb interactions, we find that the Hartree-Fock theory underestimates the tendency towards ferromagnetism. A Fermi gas with strongly repulsive interactions may be realized in experiments with ultracold fermionic alkali atoms near a Feshbach resonance. We investigate the prospects for observing the ferromagnetic state in these cold atoms systems. One possible detection scheme is based on a spectroscopic method for measuring the pseudospin susceptibility which we expect to be strongly enhanced when repulsive interactions are strong. The same method can be used to look for suppressed pseudospin susceptibility when the singlet superconductor state is approached on the attractive interaction side of the Feshbach resonance.

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Date submitted: 01 Dec 2004

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