Abstract Submitted
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Ferromagnetism in Two-component Fermi gases: Variational and Green's Function Monte Carlo Studies[1] NANDINI TRIVEDI, SOON-YONG CHANG, MOHIT RANDERIA, The Ohio State University — We study the possibility of a ferromagnetic instability in both repulsive and attractive two-component Fermi gases using lowest-order constrained variational (LOCV), variational Monte Carlo (VMC), and fixed-node Green's function Monte Carlo (GFMC) methods. For repulsive interactions, where the range r_0 is of order the scattering length $a > 0$, we find clear evidence for a ferromagnetic Stoner instability at $k_F a \sim \mathcal{O}(1)$. The occurrence of ferromagnetism is robust though the precise value of $k_F a$ at the instability is not universal and depends upon the shape of the potential. To model the recent experiments [1], where the underlying interactions are attractive with $|a| \gg r_0$, one must be on the repulsive excited branch on the $a > 0$ side of the Feshbach resonance. We write the many-body wavefunction as a suitable Jastrow factor times a fermionic determinant, with a nodal structure that ensures the system is on the excited branch. We will report on the possible ferromagnetic instability in this Fermi-liquid state and its implications for experiments. [1] G-B. Jo *et al.*,

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