

Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Diffusion Monte Carlo Calculations for Trapped Fermi Gases¹

JAVIER VON STECHER, SETH T. RITTENHOUSE, CHRIS H. GREENE, Department of Physics and JILA, University of Colorado, Boulder, Colorado 80309-0440 — Monte Carlo methods are particularly useful to test the validity of the effective theories. Blume and Greene have used diffusion Monte Carlo to study the corrections to the Gross-Pitaevskii equation for bosons [1]. We study the ground state energy of a trapped degenerate Fermi gas using Monte Carlo methods. We compare mean field results and higher order corrections with our calculations. As in the case of bosons, effective theories predict a collapse of a Fermi gas at negative a_0 [2]. We analyze the possibility of collapse considering finite range interactions. [1] D. Blume and Chris H. Greene, Phys. Rev. A 63, 063601 (2001). [2] S. T. Rittenhouse et al, arXiv:cond-mat/0510454.

¹This work was supported in part by the NSF.

Javier von Stecher
Department of Physics and JILA, University of Colorado,
Boulder, Colorado 80309-0440

Date submitted: 01 Feb 2006

Electronic form version 1.4