

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**The FFLO Phase in Imbalanced Spin Fermions in 1-d**<sup>1</sup> MIRIAM HUNTLEY, MIT, RICHARD SCALETTAR, UC Davis, GEORGE BATROUNI, Universite de Nice-Sophia Antipolis, VALERY ROSSEAU, Universiteit Leiden Instituut Lorentz — Pairing in imbalanced spin populations has lately been the focus of many experimental and theoretical studies. Different mechanisms have been proposed to explain how pairing takes place between the two fermionic species. In this talk we will present exact Quantum Monte Carlo simulations of imbalanced spin populations in one dimension. We will first discuss the case where no confining potential is imposed. Here we have found that the pair-pair correlation function develops oscillations at nonzero polarizations, corresponding to a pair momentum distribution that, instead of being peaked at zero, is peaked at a momentum equal to the difference in the Fermi momenta. This indicates that the pairing mechanism is described by the Fulde Fuerrel Larkin Ovchinnikov (FFLO) picture, and not by other proposed phases which require zero-momentum pairing. When a confining potential is included in the simulations, we find that the FFLO oscillations are still present. In addition, we show that the local polarization displays a dip in the center of the trap, similar to experimental observations performed with 3-dimensional optical traps.

<sup>1</sup>MHH is supported by NSF PHY-0649297 (REU), RTS by DARPA/AFOSR, GGB by the CNRS (France) PICS 18796, and VGR by the research program of the ‘Stichting voor Fundamenteel Onderzoek der Materie (FOM)’.

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Date submitted: 14 Dec 2007

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