Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Is There an FFLO Region in a Polarized Trapped Unitary Fermi Gas? WILLIAM SCHNEIDER, The Ohio State University, RAJDEEP SENSARMA, Harvard University, ROBERTO DIENER, MOHIT RANDERIA, The Ohio State University — We have studied strongly interacting polarized gases in a harmonic trap beyond the local density (LDA) approximation using the Bogoliubov-deGennes equations. In particular, we are interested in the region separating an unpolarized superfluid core in the center and a fully polarized majority gas in the outer edge. Several authors have found that in this region the order parameter oscillates in a way similar to an FFLO phase. We will present the results of a detailed analysis of the properties of this system as a function of polarization, system size, and high energy cutoff used in the calculations. We find that the order parameter oscillations are an artifact of a finite (not sufficiently large) cutoff. Moreover, we find that the intermediate region shows a scaling with number of particles which makes it consistent with an interface. Our BdG calculation thus gives us a microscopic theory of the interface in a trapped unitary fermi gas.

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Date submitted: 27 Nov 2007 Electronic form version 1.4