

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Dimensional crossover from Quasi-1D to 3D in spin-polarized Fermi superfluids¹ STEFAN BAUR, Cornell University, MEERA PARISH, Princeton University, ERICH MUELLER, Cornell University, DAVID HUSE, Princeton University — We use a zero temperature Bogoliubov de Gennes mean field theory to study the evolution of the exotic FFLO superfluid in a spin-imbalanced Fermi gas as one progresses from quasi-1D to 3D by changing the coupling between an array of tubes. The boundary between the uniform BCS superfluid and the FFLO state is determined by examining the energetics of a single π -domain wall in the superfluid order parameter. In the quasi-1D limit, each tube contains a single excess particle at the center of each domain wall and the spectrum of single particle excitations is gapped. As one approaches 3D there is a phase transition where this commensurability condition is relaxed and gapless single particle excitations can be found. [1] M. M. Parish, S. K. Baur, E. J. Mueller, and D. A. Huse, arXiv:0709.1120

¹This work was supported in part by the Army Research Office Grant No. W911NF-07-1-0464.

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Date submitted: 26 Nov 2007

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