

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Effective theory for weakly coupled one-dimensional imbalanced Fermi gas ERHAI ZHAO, W. VINCENT LIU, University of Pittsburgh — We present a theory for a lattice array of weakly coupled one-dimensional ultracold attractive Fermi gases (1D “tubes”) with spin imbalance, which are currently under experimental investigation using ultra-cold ^6Li atoms. We first construct an effective field theory for the 1D Fulde-Ferrel-Larkin-Ovchinnikov (FFLO) state based on the exact solution. Special attention is paid to the effect of spin-charge mixing. Then we analyze the instability of the 1D FFLO state against inter-tube tunneling by renormalization group analysis to obtain the phase diagram of the quasi-1D system and further determine the scaling of the superfluid transition temperature with intertube coupling.

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Date submitted: 21 Nov 2008

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