

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**$(2k_F, 2k_F)$  density-wave orders of interacting p-orbital fermions in square optical lattice**<sup>1</sup> ZIXU ZHANG, University of Pittsburgh, W. VINCENT LIU, University of Pittsburgh and Kavli Institute for Theoretical Physics, University of California, Santa Barbara — We study instabilities of spinless fermionic atoms in the p-orbital bands in two dimensional optical lattices at non-integer filling against interactions. Stripe charge-density-wave or orbital-density-wave orders are found for attractive and repulsive interactions, respectively. A surprising result is that the superfluid phase, usually expected of attractively interacting fermions, is less energetically favored. Nesting quasi-one-dimensional Fermi surfaces in such systems are independent of filling, which ensures that the stripe density-wave orders occur in a large parameter regime.

<sup>1</sup>This work is supported by ARO (W911NF-07-1-0293) and ARO-DARPA-OLE (W911NF-07-1-0464). We also thank the KITP at UCSB for its hospitality where this research is supported in part by NSF Grant No. PHY05-51164.

Zixu Zhang  
University of Pittsburgh

Date submitted: 19 Nov 2010

Electronic form version 1.4