

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**An explanation of the dichotomy between Fermi arcs and Fermi pockets in underdoped high- $T_c$  superconductors**<sup>1</sup> XUN JIA, SUDIP CHAKRAVARTY, University of California at Los Angeles — We have numerically computed the spectral function  $A(\vec{k}, \omega)$  of an underdoped cuprate superconductor for the  $d$ -density wave state subject to a long range correlated disorder. The intensity of the spectral function is significantly reduced for the electron pockets for an intermediate range of correlation length, but the Fermi arcs remain quite intact. This result provides one possible explanation as to why the electron pockets are not observed in angle resolved photoemission experiments. A calculation of Shubnikov-de Haas (SdH) oscillations using a real space transfer matrix method shows that two main frequencies are still present in the presence of a moderate amount of white noise disorder. The SdH oscillations in other relevant broken symmetry states are also computed.

<sup>1</sup>This work is supported by NSF under Grant No. DMR-0705092.

Xun Jia  
University of California at Los Angeles

Date submitted: 20 Nov 2008

Electronic form version 1.4