Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Fermi arcs in phase fluctuating d-wave superconductors EHUD ALTMAN, Weizmann Institute, EREZ BERG, Stanford University — One of the most puzzling aspects of the high T_c superconductors is the appearance of Fermi arcs in the normal state of the underdoped cuprate materials. These are loci of low energy excitations covering part of the fermi surface, that suddenly appear above T_c instead of the nodal quasiparticles. Based on a semiclassical theory, we argue that partial Fermi surfaces arise naturally in a d-wave superconductor that is destroyed by thermal phase fluctuations. Specifically, we show that the electron spectral function develops a square root singularity at low frequencies for wave-vectors positioned on the bare Fermi surface. We predict a temperature dependence of the arc length that can partially account for results of recent angle resolved photo emission (ARPES) experiments.

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Date submitted: 26 Nov 2007 Electronic form version 1.4