

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Striped Superconductor and Holography GEORGE SIOPSIS, University of Tennessee at Knoxville, JIMMY HUTASOIT, West Virginia University, JASON THERRIEN, SUMAN GANGULI, University of Tennessee at Knoxville — Using gauge/gravity duality, we analytically study the properties of a strongly coupled striped superconductor, with the charge density wave sourced by a modulated chemical potential. The calculation is done in the large modulation wavenumber Q regime and comparing the results with numerical calculations, we find good agreement for $Q \geq 3T_c$. In the absence of a homogeneous term in the chemical potential, we show that the critical temperature scales as a negative power of Q for scaling dimensions $\Delta < \frac{3}{2}$, whereas for $\Delta > \frac{3}{2}$, there is no phase transition above a certain critical value of Q . The order parameter or the condensate is found to scale as a positive power of Q such that the gap is proportional to Q . We discuss how these results change if a homogeneous term is added to the chemical potential. We also calculate the conductivity with its spatial dependence.

Jimmy Hutasoit
West Virginia University

Date submitted: 09 Nov 2011

Electronic form version 1.4