Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Short-range incommensurate d-wave charge order from a two-loop renormalization group calculation of the fermionic hot spot model[1]
HERMANN FREIRE, VANUILDO DE CARVALHO, Universidade Federal de Goias
— The two-loop renormalization group (RG) calculation is considerably extended here for a two-dimensional (2D) fermionic effective field theory model, which includes only the so-called "hot spots" that are connected by the spin-density-wave (SDW) ordering wavevector on a Fermi surface generated by the 2D $t - t'$ Hubbard model at low hole doping. We compute the Callan-Symanzik RG equation up to two loops describing the flow of the single-particle Green's function, the corresponding spectral function, the Fermi velocity, and some of the most important order-parameter susceptibilities in the model at lower energies. As a result, we establish that – in addition to clearly dominant SDW correlations – an approximate (pseudospin) symmetry relating a short-range *incommensurate* d-wave charge order to the d-wave superconducting order indeed emerges at lower energy scales, which is in agreement with recent works available in the literature addressing the 2D spin-fermion model. We derive implications of this possible electronic phase in the ongoing attempt to describe the phenomenology of the pseudogap regime in underdoped cuprates.

Reference: V. S. de Carvalho and H. Freire, Annals of Physics 348, 32 (2014).

[1]We acknowledge financial support from CNPq under grant No. 245919/2012-0 and FAPEG under grant No. 201200550050248 for this project.

Hermann Freire
Universidade Federal de Goias

Date submitted: 03 Nov 2014 Electronic form version 1.4