Abstract Submitted for the MAR07 Meeting of The American Physical Society

Instabilities of correlated electrons on the honeycomb lattice CARSTEN HONERKAMP, Wuerzburg University — Motivated by the possible relevance to graphene we analyze instabilities of electrons on a honeycomb lattice, interacting by Hubbard and longer-ranged interactions. Using a functional renormalization group scheme which takes into account the wavevector-dependence of the interactions throughout the Brillouin zone, we detect the leading ordering tendencies at low temperatures. Near half band filling and for dominant onsite repulsion, a critical minimal interaction strength is required for an instability toward antiferromagnetic order, in support of a previous large-N work of Herbut [Phys. Rev. Lett. 97, 146401 (2006)] which focused on the Dirac points. We also present results for longer-ranged interactions and away from half band filling.

Carsten Honerkamp Wuerzburg University

Date submitted: 20 Nov 2006

Electronic form version 1.4