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Functional renormalization group and bosonization as a solver for 2D fermionic Hubbard models FLORIAN SCHUETZ, BRAD MARSTON, Brown University, Providence, RI — The functional renormalization group (fRG) provides an unbiased framework to analyze competing instabilities in two-dimensional electron systems and has been used extensively over the past decade [1]. In order to obtain an equally unbiased tool to interprete the flow, we investigate the combination of a many-patch, one-loop calculation with higher dimensional bosonization [2] of the resulting low-energy action. Subsequently a semi-classical approximation [3] can be used to describe the resulting phases. The spinless Hubbard model on a square lattice with nearest neighbor repulsion is investigated as a test case. [1] M. Salmhofer and C. Honerkamp, Prog. Theor. Phys. 105, 1 (2001). [2] A. Houghton, H.-J. Kwon, J. B. Marston, Adv.Phys. 49, 141 (2000); P. Kopietz, Bosonization of interacting fermions in arbitrary dimensions, (Springer, Berlin, 1997). [3] H.-H. Lin, L. Balents, M. P. A. Fisher, Phys. Rev. B 56, 65696593 (1997); J. O. Fjaerestad, J. B. Marston, U. Schollwoeck, Ann. Phys. (N.Y.) 321, 894 (2006).

Florian Schuetz
Deutsche Physikalische Gesellschaft

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