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A Phenomenological Theory of the Anomalous Pseudogap Phase in Underdoped Cuprates

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A consistent theoretical description of the many anomalous properties that characterize the pseudogap phase in the underdoped region of the cuprate phase diagram has proved challenging. The continuous progress in spectroscopic and other experiments suggests a phenomenological approach. An ansatz based on analogies to the transition to Mott localization at weak coupling in lower dimensional systems, has been proposed by Yang, Rice and Zhang some years back [1]. This ansatz has had success in describing a wide range of experiments [2]. The motivation underlying this ansatz will be described and some of the comparisons to experiment reviewed. The implications for a more microscopic theory will be discussed together with the relation to microscopic theories that start directly from strongly coupled Hamiltonians.

[1] K-Y. Yang, T. M. Rice & F. C. Zhang, Phys. Rev. B **73**,174501 (2006)

[2] T. M. Rice, K.-Y. Yang & F. C. Zhang, arXiv 1109.0632