

Abstract Submitted
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Spin gap phase in the strong coupling limit of the hole-doped 2D Emery model¹ KAI SUN, UIUC, EDUARDO FRADKIN, UIUC, STEVEN KIVELSON, Stanford/UCLA — We investigate the strong coupling limit of the three-band Emery model of a CuO plane. Starting from the nematic phase of this model [1], an effective Hamiltonian is constructed to leading order in the strong coupling expansion and for a range of hole doping. We show that the effective Hamiltonian we found is equivalent to a Kondo lattice model which can be solved exactly. We find that this model exhibits a quantum phase transition from a spin gapless phase to a spin gap phase as a function of doping. We will discuss the implications of these results for the phase diagram. [1] E. Fradkin, S.A. Kivelson and T.H. Geballe, Phys. Rev. B 69, 144505 (2004)

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