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Nodal-antinodal dichotomy in doped Mott insulators TIAGO C. RIBEIRO, Massachusetts Institute of Technology — The cuprate high-Tc superconductors are anisotropic in momentum space as observed by a variety of experiments. In hole underdoped samples the pseudogap regime becomes of preponderant importance and the excitations around the nodal points $[\vec{k} = (\pm\frac{\pi}{2}, \pm\frac{\pi}{2})]$ are well described as Landau's quasiparticles while those near the antinodal points $[\vec{k} = (\pi, 0), (0, \pi)]$ show no signs of quasiparticle-like behavior. We employ the exact diagonalization and the self-consistent Born approximation techniques to study the single hole $tt't''J$-model in order to address how excitations with different momentum can be so disparate. We find that the single hole states can be understood as the superposition of two distinct states, namely a state with hole-like quasiparticle features and a spin-charge separated state, and explain how the different properties of these states underlie the observed nodal-antinodal dichotomy in the pseudogap regime.

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