

Abstract Submitted
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How the insulator and pseudogap states coalesce beneath the superconductor dome ALEJANDRO CABO MONTES DE OCA, ICIMAF, La Habana, Cuba, VICTOR MARTINEZ, Facultad de Fisica, Universidad de La Habana, La Habana, Cuba, ALEJANDRO CABO-BIZET, Departamento de Física, Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear, La Habana, Cuba — The effect of hole doping on La_2CuO_4 physical properties is investigated by means of a TB model for the CuO planes proposed in previous works which generalizes the Hubbard model. Thus, its former predictions of the insulator and paramagnetic-pseudogap states at half-filling become natural ones as emerging from a more general analysis. The effects of hole doping on the insulator state and the paramagnetic-pseudogap one are investigated at $T=0 \text{ K}^0$. The results predict a quantum phase transition in which the insulator state coalesce at a critical doping $\delta_c = 0.2$ with the pseudogap state, to become a paramagnetic-metal at higher hole densities. The evolution with small doping of the Fermi surface in the insulator state, shows that the holes tend to become localized at the middle of the sides of the Brillouin zone. Then, when the hole doping passes through the critical value, the holes move to become situated at the corners of the zone, showing a structural change of the Fermi surface at the phase transition point. These results offer a clear answer to the debated question about the existence and nature of a QPT beneath the superconductor Dome.

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