

Abstract Submitted
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How the Mott and pseudogap states coalesce beneath the superconductor Dome ALEJANDRO CABO MONTES DE OCA¹, ICIMAF, La Habana, Cuba, ALEJANDRO CABO-BIZET, CEADEN, La Habana, Cuba, VICTOR MARTINEZ, YOANDRI VIELZA, Dept. of Physics, University of Pernambuco, Recife, Brasil, COLLABORATION TEAM TEAM — Former results of a Tight-Binding (TB) model of CuO planes in La_2CuO_4 are reviewed to underline their wider implications. It is noted that physical systems being appropriately described by the TB model can exhibit the main strongly correlated electron system (SCES) properties, when they are solved in the HF approximation, by also allowing crystal symmetry breaking effects and non-collinear spin orientations of the HF orbitals. In particular, it is argued how a simple 2D square lattice system of Coulomb interacting electrons can exhibit insulator gaps and pseudogap states, and quantum phase transitions as illustrated by the mentioned former works. These results allow to understand the nature of the observed quantum phase transition laying “beneath” the superconducting Dome. It corresponds to coalescence under hole doping increase, of an insulator ground state (with a highly degenerated spin order) with an excited pseudogap state, showing a lattice order symmetry breaking. The evolution of the band structure and Fermi surface with doping are determined.

¹This abstract is associated to an invited talk of the March Meeting after being accepted. If it is not accepted as talk, we request to be considered as an oral presentation. The argue for it is in the invited talk application (Session Ctrl :97854)

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