

Influence of oxygen orbitals on impurity states in superconducting cuprates

Alexander Kemper¹, Peter J. Hirschfeld¹, Hai-Ping Cheng¹

¹University of Florida, Department of Physics, Gainesville, FL 32611-8322

Recent STM studies have shown that the oxygen states play a hitherto unappreciated role in the inhomogeneous electronic structure of the CuO₂ plane. To gain some insight into these effects, we solve the Bogoliubov-de Gennes equations numerically for a 3-band Hubbard model with d-wave pair interaction. We consider the one-impurity problem, and discuss the role of the various atomic orbitals in the formation of impurity bound states and magnetic moments in the presence of correlations described by the Hubbard U. Finally, we study the interference of many impurities.