

“Superconductivity in the three-band model of cuprates vs experiments”

Abstract:

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Using cluster generalizations of dynamical mean-field theory for the three-band Hubbard model, we explain three apparently unrelated experiments that suggest how to optimize T_c in cuprates: i) NMR experiments that show that T_c is optimized by maximizing oxygen hole content [1] ii) Scanning Tunneling spectroscopy that shows that T_c is optimized by decreasing the charge transfer gap [2] and iii) neutron experiments that show that T_c is optimized by increasing superexchange [3]. The unified explanation of these three experiments that we offer also explains the mechanism for superconductivity in cuprates. The results suggest new avenues to discover compounds that superconduct at even higher temperature [4].

References

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