

Abstract Submitted
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Spin Correlations and Magnetic Susceptibilities of Lightly Doped Antiferromagnets I.R. PIMENTEL, F. CARVALHO DIAS, University of Lisbon, Portugal — We calculate the spin correlation function and the magnetic longitudinal and transverse susceptibilities of a two-dimensional antiferromagnet doped with a small concentration of holes, in the t-J model. We find that the motion of holes generates spin fluctuations which add to the quantum fluctuations, the spin correlations decaying with the inverse of the spin distance, while increasing with doping as the critical hole concentration, where the long-range order disappears, is approached. Moreover, the longitudinal susceptibility becomes finite in the presence of doping, due to the strong damping effects induced by the hole motion, while the transverse susceptibility is renormalized by softening effects. Both the longitudinal and the transverse susceptibilities increase with doping, the former more significantly than the latter. Our results imply that doping destroys the long-range order while local antiferromagnetic spin correlations persist. This is consistent with experiments on the doped copper oxide superconductors.

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