Spin Susceptibility in the Superconducting State of Cuprates

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— An analytic expression for the spin susceptibility in the superconducting state was derived taking into account strong correlation effects. Starting from a Hubbard model that also accounts for the repulsion between doped holes, the equations of motion were solved using a decoupling scheme. Since the commutator algebra of the model is different from that valid in the weak-coupling conventional Fermi liquid picture, the general expression for the susceptibility is quite different from the standard Pauli–Lindhard formula. We have then evaluated $\chi(q,\omega)$ using parameter values adopted to Fermi surfaces and neutron scattering data. The temperature dependence of the spin susceptibility is calculated for both s– and d–wave pairing symmetry. The results are compared with NMR and NQR experiments on the spin–lattice and spin–spin relaxation rates as well as with features observed in neutron scattering experiments.

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