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Theory of the pseudogap in the elementary excitation spectrum of the normal phase of bilayer cuprates

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Abstract

Solutions of the integral equations for the pseudogap in the elementary excitation spectrum of current carriers in bilayer cuprates are found. In the general case, the pseudogap possesses s+id symmetry, where the s component is determined by the interaction of holes via the phonon field and the d component is due to the superexchange interaction of the copper spins and the Coulomb-repulsion screened holes. The s and d components exhibit different temperature dependences. This fact enabled us to explain the characteristic features of the temperature behavior of the normal-phase spin susceptibility of lightly doped cuprates, specifically, for the compound YBa2Cu4O8 in the entire temperature interval T>Tc. The wave-number dependence of the pseudogap agrees with the photoemission data for Bi2Sr2CaCu2O8+y. © 1997 American Institute of Physics.

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