

Unified picture of the distribution of electric field gradients at Cu, O, and Tm sites in $\text{ReBa}_2\text{Cu}_3\text{O}_{7-\delta}$

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Abstract

An abundant set of published experimental NMR/NQR data on electric field gradients in $\text{ReBa}_2\text{Cu}_3\text{O}_{7-\delta}$ high temperature conductors, where $\text{Re}=\text{Y}$ and Tm, is used as a test for the singlet-correlated band theory. Because of the unusual spectral weight ("capacity") of this band, it has been possible to match the number of holes per lattice site to photoemission data on the energy spectrum and the location of the Fermi level. In the framework of a unified picture of the distribution of holes (charges) it has been possible for the first time to explain satisfactorily the observed electric field gradients at the Cu(1), Cu(2), O(1), O(2), O(3), and O(4) sites, as well as NMR and inelastic neutron scattering data on the electric field at the Tm ions. © 1997 American Institute of Physics.
