

Phase diagram of YBa₂Cu₃O_{7-y} at $T < T_c$ according to transverse nuclear relaxation data for Cu(2)

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Abstract

Two peaks are observed at $T = 35$ and 47 K in the transverse relaxation rate for Cu(2) nuclei in YBa₂Cu₃O_{7-y}. A comparison of the relaxation rates for isotopes ⁶³Cu(2) and ⁶⁵Cu(2) at $T = 47$ K indicates the magnetic nature of relaxation. The enhancement of local magnetic field fluctuations perpendicular to CuO₂ planes at $T = 47$ K is associated with critical fluctuations of orbital currents. The peak at $T = 35$ K is attributed to the emergence of an inhomogeneous superconducting phase. The obtained experimental results and the available data from the literature made it possible to propose a qualitatively new phase diagram of the superconducting state. © 2001 MAIK "Nauka/Interperiodica".

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