

Physical Review Letters 2000 vol.84 N15, pages 3422-3425

^{63}Cu NMR Evidence for Enhanced Antiferromagnetic Correlations around Zn Impurities in $\text{YBa}_2\text{Cu}_3\text{O}_{6.7}$

Julien M., Fehér T., Horvatić M., Berthier C., Bakharev O., Ségransan P., Collin G., Marucco J.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Doping the high- T_c superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{6.7}$ with 1.5% of nonmagnetic Zn impurities in CuO_2 planes is shown to produce a considerable broadening of ^{63}Cu NMR spectra, as well as an increase of low-energy magnetic fluctuations detected in ^{63}Cu spin-lattice relaxation measurements. A modelindependent analysis demonstrates that these effects are due to the development of staggered magnetic moments on many Cu sites around each Zn and that the Zn-induced moment in the bulk susceptibility might be explained by this staggered magnetization. Several implications of these enhanced antiferromagnetic correlations are discussed.
