Spin Gap, Electronic Crossover, and Charge Density Waves in Y-Ba-Cu-O Superconductors*

Detlef Brinkmann

Physik-Institut, University of Zürich, Winterthurerstrasse 190, CH-8057-Zürich

Z. Naturforsch. **53a,** 488 – 491 (1998); received December 30, 1997

This paper discusses recent NQR/NMR studies performed on Y-Ba-Cu-O superconductors at the University of Zürich. The work is concerned with normal state properties which are still controversial, for instance the spin-gap effect, i.e. the opening of a pseudo gap in the electron spin excitation spectrum at a temperature T^*, which lies above T_c. We will report on the detection of "anomalies" which are displayed in the temperature dependence of several NMR and NQR quantities measured in the normal state of $YBa_2Cu_4O_8$. These anomalies are interpreted as an electronic crossover which involves a charge redistribution in the CuO_2 planes and an enhancement of the charge fluctuations. As a possible mechanism of the crossover, a charge density wave instability is proposed.

Key words: NQR, NMR, High-Temperature Superconductors, Spin gap, Electronic Crossover.

Reprint requests to Prof. D. Brinkmann; Fax: 01/6 35 57 04.