

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Comprehensive analysis of NMR spin-lattice relaxation data in underdoped cuprates ANNE-CHRISTINE ULDRY, PETER FRITZ MEIER, Physics Institute, University of Zurich — We present an analysis of NMR and NQR spin-lattice relaxation measurements reported for $\text{YBa}_2\text{Cu}_3\text{O}_{6.63}$, $\text{YBa}_2\text{Cu}_4\text{O}_8$ and $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ in terms of a model of fluctuating magnetic fields. The model parameters obtained by fitting the data vary among the different compounds and depend on the doping level. We compare these changes and discuss the physics behind them. The model generally fits the data well. In particular, high accuracy NQR measurements on the Cu relaxation in $\text{YBa}_2\text{Cu}_4\text{O}_8$ are fitted with excellent precision. The model provides also a simple explanation of the observed temperature and doping dependence of ${}^{63}\text{T}_{1c}^{-1}$ in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$, which have been measured up to high temperatures. It is shown that the data provide evidence for a crossover from the relaxation dominated by quasi-particle scattering to one governed by local spin fluctuations.

Anne-Christine Uldry
Physics Institute, University of Zurich

Date submitted: 04 Dec 2004

Electronic form version 1.4