Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Spin-glass behavior in Ni-doped high-T_C cuprate $\mathbf{La_{1.85}Sr_{0.15}CuO_4}$[1] A. MALINOWSKI, Institute of Physics, PAS, 02-668 Warsaw, Poland, V.L. BEZUSYY, R. MINIKAYEV, W. PASZKOWICZ, Y. SYRYANYY, P. DZIAWA, M. SAWICKI — We report the dc and ac magnetic properties of $La_{1.85}Sr_{0.15}Cu_{1-y}Ni_yO_4$ ($0 \leq y \leq 0.5$), investigated in the field up to 5 T and in the temperature range 2 K - 400 K. For y$\geq$0.06 the system exhibits irreversibility of dc susceptibility $\chi(T)$ below $T_{irr}(y)$ and a cusp at $T_g(y)$ in $\chi(T)$ measured after zero-field cooling. The decay of remnant magnetization with time is described by a stretched-exponential function. In accordance with the scaling theory, all the $\chi(T)$ data for a given sample taken in the vicinity of T_g at different fields collapse onto two separate curves when plotted as $q/|t|^\beta$ vs. $B^2/|t|^{\beta+\gamma}$, where q is the spin-glass (SG) order parameter, t=$(T - T_g)/T_g$, and β and γ are the critical exponents. The temperature of the peak in the real part of χ_{ac} vs. T curve increases with increased frequency according to the critical slowing-down formula. The obtained parameters do not exclude the presence of spin clusters. Variation of T_g with y is linear for $y < 0.25$ and T_g extrapolates to 0 K for $y \to 0$, what strongly suggests that the SG phase extends into the superconducting region of the phase diagram.

[1]Work supported by funds of the Polish Ministry of Science and Higher Education, Grant N20204832/1183.

A. Malinowski
Institute of Physics, PAS, 02-668 Warsaw, Poland

Date submitted: 09 Dec 2009 Electronic form version 1.4