Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Inelastic neutron scattering study on spin excitations of $\mathbf{Pr_{0.88}LaCe_{0.12}CuO_{4-\delta}}$ (T_c=27.5K) JUN ZHAO, SHILIANG LI, STEPHEN WILSON, University of Tennessee, HYE JUNG KANG, JEFF LYNN, NIST Center for Neutron Research, PENGCHENG DAI, University of Tennessee — We use neutron scattering to study the evolution of spin excitations in electron doped $Pr_{0.88}LaCe_{0.12}CuO_{4-\delta}$(PLCCO). For T_c = 24 K PLCCO, Wilson et al. [Nature 442, 59 (2006)] have reported the presence of a resonance mode, a localized magnetic excitations coupled directly to the superconductivity in high-T_c superconductors, similar to hole-doped superconductors such as $YBa_2Cu_3O_{6+\delta}$, $Bi_2Sr_2CaCu_2O_{8+\delta}$ and $Tl_2Ba_2CuO_{6+\delta}$. Below the resonance are continuing of magnetic scattering with little temperature dependence. We show here our studies of the magnetic excitations on PLCCO (T_c=27.5K) with the highest T_c reported in the literature. We confirm the presence of a resonance mode in this sample, and demonstrate that the low-energy magnetic scattering here is much different from the T_c=24 K PLCCO. Our results thus shed new light to the understanding of spin excitations in electron-doped copper oxides.

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Date submitted: 02 Dec 2006 Electronic form version 1.4