Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Angular Magnetoresistivity Measurements in the Pseudogap Region of $Y_{1-x}Pr_xBa_2Cu_3O_{7-\delta}$[1] T. KATUWAL, P. GYAWALI, C.C. ALMASAN, Kent State University, B.J. TAYLOR, M.B. MAPLE, University of California, San Diego — We carried out a detail investigation of the angular dependence of in-plane conductivity $\sigma_{ab}(\theta)$ (θ is the angle between the direction of H and c-axis of the sample) near and above the zero field critical temperature T_{c0} of $Y_{1-x}Pr_xBa_2Cu_3O_{7-\delta}$ single crystals for applied magnetic field H up to 14 T. We studied a large range of Pr concentrations x; i. e. $0.20 \leq x \leq 0.53$. We write the total in-plane conductivity as the sum of quasiparticle and flux-flow type contributions. This expression fits very well the data in the pseudogap region up to a temperature T_ϕ ($T_{c0} < T_\phi < T^*$, where T^* is the pseudogap temperature) and for all values of H. Above T_ϕ, the quasiparticle component alone is able to fit the data perfectly. These results clearly indicate the presence of vortex like contribution to dissipation above T_{c0}. The temperature and magnetic field dependence of the three fitting coefficients will also be discussed. A plot of the T_ϕ *vs* x phase diagram is compared with the corresponding $T_{c0}(x)$ in order to show the extent of T_ϕ above T_{c0}. The ratio of T_ϕ/T_{c0} increases with increasing x doping.

[1]This research was supported by the NSF Grant No. DMR-0406471 at KSU and by the DOE Grant No.DE-FG03-86ER-45230 at UCSD

Carmen Almasan
Kent State University

Date submitted: 22 Dec 2004 Electronic form version 1.4