

Abstract Submitted
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Infrared Hall study of underdoped cuprate superconductor $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_4$ A. ZIMMERS, L. SHI, D.C. SCHMADEL, R.L. GREENE, H.D. DREW, Center for Superconductivity Research, Department of Physics, University of Maryland, College Park, MD 20742 — The underdoped cuprate superconductor $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_4$ exhibits a gap-like feature (cond-mat/0405284) in its optical conductivity that depends on electron doping and temperature. This feature suggests either the formation of a density wave state or the presence of hot spots on the Fermi surface. The magneto-optical properties of underdoped PCCO ($x=0.13$) thin film are investigated in the temperature range between 30K and 300K and in magnetic fields up to 8 Tesla by measuring the Faraday rotation and circular dichroism in the infrared region from 900 - 1100 cm^{-1} . A dramatic increase of the Hall frequency is observed as the temperature is lowered below $\sim 150\text{K}$. These results together with the optical conductivity data, are consistent with a partial gapping of the Fermi surface and formation of a density wave state and not consistent with hot spots in the low temperature state. We will compare the IR Hall response of underdoped PCCO and overdoped PCCO where there is no evidence for gapping in the optical conductivity. Work supported by NSF grant DMR-0352735 and DMR-0303112.

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