

Abstract Submitted  
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**Faraday and Kerr Effect Measurements of Cuprates in THz Regime** Y. LUBASHEVSKY, LIDONG PAN, Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, MD 21218 USA, T. KIRZHNER, G. KOREN, Physics Department, Technion - Israel Institute of Technology Haifa, 32000, Israel, N.P. ARMITAGE, Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, MD 21218 USA — Recent results using a laser-based zero-area loop Sagnac interferometer have found a small but significant spontaneous Kerr rotation [1] suggesting an emergent chiral or time-reversal broken character to the pseudogap regime in the cuprate superconductors. In this work, we have performed high resolution THz polarimetry to measure the low frequency Faraday and Kerr rotation in these compounds. The THz range gives an advantage for these studies as it presumably corresponds more closely to frequency scales relevant for the pseudogap (1 THz - 48 K). We have found that low frequencies enhances the signal into the tens of milli-radians range. Moreover, time-domain THz spectroscopy reveals more information about this phenomena as frequency dependent and birefringent effects among others can be measured. Results from YBCO and LBCO will be presented.

[1] J. Xia et al, Phys. Rev. Lett. 100, 127002 (2008).

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