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Infrared Faraday Measurements on Cuprate High Temperature Superconductors[1] M. MURAT ARIK, ALOK MUKHERJEE, JOHN CERNE, Physics Dept., University at Buffalo, Y. LUBASHEVSKY, LIDONG PAN, N.P. ARMITAGE, Physics and Astronomy Dept., Johns Hopkins University, T. KIRZHNER, G. KOREN, Physics Dept., Technion - Israel Institute of Technology — Recent measurements on cuprate high temperature superconductors (CHTS) have observed evidence for symmetry breakings in the pseudogap phase, suggesting that this is a full-fledged phase with an actual broken symmetry. To test the spectral character of this broken symmetry, we have made infrared polarization-sensitive measurements in the absence of magnetic field on a series of CHTS films. We have studied the Faraday effect (change in the polarization of transmitted light) in CHTS films as a function of temperature (10-300K), energy (0.1-3 eV), and sample orientation with respect to the incident light polarization. We observe a strong linear optical anisotropy, well above the superconducting transition temperature. This signal is maximized when the sample lattice axes are oriented near 45o with respect to the incident light polarization, and varies as the sample is rotated. We explore the temperature and energy dependence of this signal.

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