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Magnetic field-induced modification of superfluid density and interplane spectral weight in $YBa_2Cu_3O_y$ ANDREW LAFORGE, Univ. of CA, San Diego, WILLIE PADILLA, Boston College, KENNETH BURCH, University of Toronto, ZHIQIANG LI, ALEXANDER SCHAFGANS, Univ. of CA, San Diego, KOUJI SEGAWA, YOICHI ANDO, Osaka University, Japan, DIMITRI BASOV, Univ. of CA, San Diego — We report on the interlayer infrared response of $YBa_2Cu_3O_y$ in an applied magnetic field. This study explores both the underdoped (y = 6.67 and 6.75) and optimally doped (y = 6.95) regions of the phase diagram, and includes data for fields applied both parallel to the c axis and to the CuO_2 planes in this anisotropic superconductor. A sum rule analysis reveals that magnetic fields $H \parallel c$ eliminate the high-frequency contribution to the superfluid density, returning the system to a more BCS-like energy scale [1]. For fields $H \parallel CuO_2$, however, the high-energy component scales with the superfluid density, and the anomalous scheme of condenstate formation is maintained, at least in underdoped y=6.67 and 6.75 samples. This behavior is discussed in relation to the change of electronic kinetic energy and the suppression of interplane phase coherence. [1] A. D. LaForge *et al.*, Phys. Rev. Lett. **101**, 097008 (2008).

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