

Abstract Submitted
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The a-axis optical conductivity of detwinned Ortho-II YBa₂Cu₃O_{6.50} THOMAS TIMUSK, JUNGSEEK HWANG, JING YANG, McMaster University, DOUG BONN, RUIXING LIANG, WALTER HARDY, University of British Columbia — The a-axis optical properties of a detwinned single crystal of YBa₂Cu₃O_{6.50} in the Ortho II phase have been determined from reflectance data over wide frequency range (70 - 42 000 cm⁻¹). At high temperature the spectra are dominated by a broad background of scattering extending to 1 eV. Below 200 K a shoulder in the reflectance signals the opening of a scattering channel with an onset frequency of 400 cm. In this temperature range we also observe a peak in the optical conductivity at 177 cm. The shoulder spectrum is consistent with a scattering model with a bosonic mode at 33 meV whose amplitude *decreases* with temperature in parallel with the magnetic resonance measured on crystals from the same source by Stock *et al.* This temperature dependence enables us to set an upper limit to any phonon contribution to the scattering. Below $T_c = 59$ K, the spectra change dramatically as the superconducting condensate appears. Its spectral weight is consistent, to within experimental error, with the FGT sum rule.

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