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Optical spectroscopy of $La_{2-x}Ba_xCuO_4$ single crystals: influence of stripe order L-Y. YAN, D.B. TANNER, University of Florida, GENDA GU, Brookhaven National Laboratory — The *ab*-plane and *c*-axis reflectance spectra of ten $La_{2-x}Ba_xCuO_4$ single crystals, with x ranging from undoped to optimally doped, have been measured over a wide frequency range and at temperatures from 10 to 300 K. The influence of stripe order around $x = 0.125$ appears in the spectra below $T = 50$ K, observed both as a reduction in the free-carrier (normal state) and superfluid (superconducting state) density and by the appearance of a relatively narrow conductivity band near 25 meV. The superfluid density is estimated from the real part of the dielectric function and the f-sum rule. The *c*-axis spectra are those of an insulator or very bad metal, with very little doping or temperature dependence. The Josephson plasma edge is not observed in any of these spectra.

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