

Abstract Submitted  
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**Conductivity anisotropy in CaRuO<sub>3</sub>** GRAHAM LEA, AMIR FARAHANI, SAEID KAMAL, Simon Fraser University, DONG-MIN KIM, CHANG BEOM EOM, University of Wisconsin-Madison, J. STEVEN DODGE, Simon Fraser University — We present terahertz time-domain spectroscopy measurements of the optical conductivity anisotropy in thin films of CaRuO<sub>3</sub>. Linearly polarized terahertz-bandwidth pulses are transmitted through the films and extended Drude conductivity parameters in the ab-plane and c-axis are extracted. We observe strong optical mass renormalization at low temperatures in both directions that we attribute to interactions with bosonic modes of the system. For both directions we obtain the plasma frequency from the relation  $\omega_p^2 = 1/\rho\tau$ , where  $\rho$  is the dc resistivity and  $\tau$  the scattering lifetime in the low-frequency limit. Contrary to the prediction of band theory,<sup>1</sup> we find that the anisotropy in the plasma frequency is less than ten percent.

<sup>1</sup>I. I. Mazin and D. J. Singh, Phys. Rev. B **56**, 2556 (1997); **73**, 189903(E) (2006).

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