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Low Frequency Conductivity Scaling in CaRuO₃ SAEID KAMAL, STEVE DODGE, Department of Physics, Simon Fraser University, B.C., V5A-1S6, Canada, DONG-MIN KIM, CHANG-BEOM EOM, Department of Materials Science and Engineering, University of Wisconsin-Madison, Madison, Wisconsin 53706 — We present low frequency conductivity measurements of CaRuO₃ thin films using time domain terahertz spectroscopy. The complex conductivity is measured in the frequency range of 200 GHz to 1.4 THz and temperature range of 10 K to 290 K. Below 50 K a Drude-like peak develops which is sufficiently narrow that it is only observable in our frequency window. We also observe a universal scaling of conductivity in the form of $\sigma_1\omega^{1/2} \propto g(\omega/T)$ for $1 < \hbar\omega/k_B T < 5$, in agreement with infrared observations of Lee et al.¹ However, our low frequency range allows us to identify deviations from such scaling for $\hbar\omega/k_B T < 1$.

¹Y.S. Lee et al. Phys Rev B **66**, 041104 (2002)

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