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Anisotropic optical properties of semimetal WTe_2 ALEX J. FRENZEL, Department of Physics, University of California, San Diego, CHRISTOPHER C. HOMES, Condensed Matter Physics and Materials Science Dept., Brookhaven National Laboratory, QUINN D. GIBSON, Department of Chemistry, Princeton University, YINMING SHAO, KIRK W. POST, ALIAKSEI CHARNUKHA , Department of Physics, University of California, San Diego, ROBERT J. CAVA, Department of Chemistry, Princeton University, DIMITRI N. BASOV, Department of Physics, University of California, San Diego; Department of Physics, Columbia University — WTe_2 is a semimetallic transition metal dichalcogenide which exhibits extreme magnetoresistance and is expected to be a type-II Weyl semimetal. Its orthorhombic crystal structure comprises planes of distorted hexagons in which tungsten atoms form quasi-one-dimensional chains, leading to strong anisotropy of its electronic properties. We measured the *ab*-plane optical conductivity of single crystals of WTe_2 for light polarized parallel and perpendicular to the W-chain axis over a broad range of frequency and temperature. At low temperatures and far-infrared frequencies, we observe a striking dependence of the reflectance edge on light polarization, corresponding to anisotropy of the plasma frequency. We quantitatively study the temperature dependence of the plasma frequency, yielding insight into the effective mass anisotropy. We also find strongly anistropic interband transitions persisting to high photon energies. These results are analyzed by comparison with *ab initio* calculations.

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