

# Terahertz optical anisotropy of the altermagnet $\alpha$ -MnTe

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We present a terahertz (THz) polarization-resolved spectroscopic study of the optical properties of the altermagnetic compound  $\alpha$ -MnTe. In the THz frequency range,  $\alpha$ -MnTe exhibits pronounced optical anisotropy, including both birefringence and strong dichroism, reflected in the anisotropy of the real and imaginary parts of the refractive index. To our knowledge, neither the THz dielectric properties nor the THz optical anisotropy of  $\alpha$ -MnTe have been reported previously. The birefringence rises with temperature until the Néel temperature of approximately 310 K. In addition, the dichroic response displays a nonmonotonic temperature dependence at low temperatures, with a pronounced feature around 50 K. This behavior correlates with the temperature dependence of the dc transport properties, where a maximum in electrical conductivity is observed as a result of increasing carrier concentration and decreasing mobility. In the THz transmission spectra, this transport anomaly manifests itself as a plasma-edge-like feature. The coexistence of temperature-dependent birefringence, strong dichroism, and a THz plasma response highlights the rich low-energy electrodynamic of  $\alpha$ -MnTe and calls for further theoretical and experimental studies to fully clarify the microscopic origins of these effects.

## References:

[1] J. Dzian et al, Phys. Rev. B 112, 024433 (2025)

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