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Terahertz conductivity of MnSi thin films J. STEVEN DODGE, LALEH MOHTASHEMI, AMIR FARAHANI, Simon Fraser University, ERIC KARHU, THEODORE MONCHESKY, Dalhousie University — We present measurements of the low-frequency optical conductivity of MnSi thin films, using time-domain terahertz spectroscopy. At low temperatures and low frequencies, we extract the DC resistivity, scattering life time and plasma frequency from a Drude fit. We obtain a value of $\omega_p \simeq 1.0$ eV, which can be used to estimate the renormalization coefficient through comparison with band theory. At higher temperatures, deviations from Drude behavior are observed, suggesting a loss of quasi-particle coherence. In the region of low temperatures and high frequencies, we see evidence for a crossover to the anomalous power law dependence observed by Mena *et al.*[1] As the temperature increases, the anomalous frequency dependence becomes more pronounced, and the plasma frequency inferred from a Drude fit decreases dramatically. Above T$\approx$ 50 K, $\sigma_2(\omega)$ develops a negative slope that is inconsistent with both a Drude model and the anomalous power law observed earlier,[1] indicating a sharp pseudogap in the conductivity spectrum.

[1]F.P. Mena *et al.* Phys. Rev. B. **67**, 241101(R) (2003).

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