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THz conductivity measurement of MnSi LALEH MOHTASHEMI, AMIR FARAHANI, Simon Fraser University, ERIC KARHU, THEODORE L. MONCHESKY, Dalhousie University, J. STEVEN DODGE, Simon Fraser University — We present measurements of the low-frequency optical conductivity of a thin film of MnSi, 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, a deviation from Drude behavior is 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 increases 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, indicating a sharp pseudogap in the conductivity spectrum.

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

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