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Optical properties of highly resistive Bi_2Te_2Se ANJAN REIJNDERS, S. Y. F. ZHAO, LOUISE NIEMEYER, RAPHAEL BOUSKILA, H. J. CHO, SEYEDYARA MOHAJERANI, LUKE J. SANDILANDS, University of Toronto, ROBERT J. CAVA, Princeton University, KENNETH S. BURCH, University of Toronto — Topological insulators are characterized by strong spin-orbit coupling, producing metallic surface states while the bulk remains insulating. Experimental observations of surface states in transport and optical measurements have been obstructed by bulk contributions due to sample defects, placing the Fermi level in the bulk energy gap. Bi_2Te_2Se (BTS), a three-dimensional topological insulator, has recently been shown to exhibit a bulk resistivity larger than any other topological insulator measured to date. However, quantum oscillations are still observed, and attributed to the surface states. In this talk I will present the optical properties of BTS, obtained by broadband FTIR spectroscopy combined with ellipsometry, over a range of 20 - 45,000 cm^{-1}, as well as the Raman spectrum of BTS.

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