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Separating Lattice and Electronic Thermal Conductivity Contributions in Bi_2Se_3 and Bi_2Te_3 Single Crystals CYRIL OPEIL, MENGLIANG YAO, Boston College, Chestnut Hill, MA 02467, STEPHEN WILSON, University of Calfornia, Santa Barbara, CA 93106, MONA ZEBARJADI, Rutgers University, Piscataway, NJ 08854 — Nanostructured materials are an effective approach in reducing lattice thermal conductivity and improving overall thermoelectric efficiency. A challenge for experimental measurements of thermal conductivity is separating the contributions from both carriers and phonons. Building on the work of K. Lukas et al., Phys. Rev. B 85, 205410 (2012), we report measurements of thermal and electrical conductivity of single crystal thermoelectrics: Bi_2Se_3 and Bi_2Te_3 in a transverse magnetic field up to 9 Tesla. Our experiments provide a separation of the lattice/electronic components and make possible a better theoretical model of the lattice portion of the thermal conductivity in materials.

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