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Far-infrared magneto-spectroscopy study of ultrathin Bi²Se³ layers in high magnetic field WENLONG YU, GA Inst Tech, LI-CHUN TUNG, NHMFL, XUNCHI CHEN, DMITRY SMIRNOV, IRENEUSZ MIOTKOWSKI, HELIN CAO, YONG P. CHEN, ZHIGANG JIANG — We present a far-infrared (FIR) magneto-spectroscopy study of thin Bi₂Se₃ layers. Transmittance and reflectance measurements are performed in the Faraday geometry at 4.2 K and in a magnetic field up to 17.5 T. The thin samples (much less than 1 micron) are stabilized on the Scotch tape, which enable us to obtain reliable FIR transmission signals. A pronounced electron-phonon coupling, i.e., the coupling of a FIR phonon of Bi₂Se₃ with the continuum free-carrier spectrum, is observed and strongly enhanced by the applied magnetic field. The phonon lineshape is asymmetric and can be fit by a Fano formula. After examining the fitting parameters, we find no systematic broadening of the lineshape in our measurements.

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