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Terahertz Faraday Rotation in the Quantum Anomalous Hall System V-doped (Bi,Sb)2Te3 OZGE OZEL, Massachusetts Inst of Tech-MIT, ALEX FRENZEL, UCSD, CUI-ZU CHANG, DANIEL PILON, JAGADEESH MOODERA, NUH GEDIK, Massachusetts Inst of Tech-MIT, GEDIK GROUP TEAM, MOODERA GROUP COLLABORATION — Time-reversal symmetry breaking in a topological insulator (TI) can be achieved by introducing ferromagnetism, which opens up a gap in the Dirac surface states. When the chemical potential is tuned to lie within the surface gap, the quantum anomalous Hall state emerges, which can be regarded as the quantum Hall state at zero external magnetic field. Recently, this state has been observed by static transport measurements in thin films of magnetically doped TIs. Time-domain terahertz spectroscopy has been demonstrated to be an effective probe of surface states and Hall effects in topological materials. Here, we use polarization modulation terahertz spectroscopy to study the intrinsic properties of massive Dirac electrons in V-doped (Bi,Sb)2Te3 via Faraday rotation measurements.

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