

Abstract Submitted
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High magnetic field Shubnikov-de Haas oscillations in BiTeCl¹

CATALIN MARTIN, Ramapo College of New Jersey, Mahwah, NJ, 07430, L. E. WINTER, R. G. MCDONALD, V. ZAPF, A. V. SUSLOV, National High Magnetic Field Laboratory, Los Alamos, NM, 87545, USA, PHILIPPE BUGNON, ARNAUD MAGREZ, H. BERGER, Crystal Growth Facility, Ecole Polytechnique Federale de Lausanne, Switzerland, D. B. TANNER, University of Florida, Gainesville, Florida, 32611, USA — We report high magnetic field Shubnikov-de Haas oscillations on single crystals of the bulk Rashba compound BiTeCl. Effective mass and scattering rate extracted from temperature and magnetic field dependence of the oscillations amplitude are in good agreement with our previous optical measurements. The present work will focus on the angular dependence study. First, we notice that oscillations were detected for all our measured angles between the magnetic field and the crystallographic z -axis, $0 \leq \theta \leq 120^\circ$. This is consistent with a 3D Fermi surface and, in good agreement with optical data, confirms that oscillations originate from bulk carriers. Second, the frequency has unusual angular dependence around $\theta = 90^\circ$. We will show that this behavior is consistent with a torus shaped Fermi surface, providing direct evidence for a Rashba spin-split bulk conduction band. Moreover, we extract reliably the bulk Rashba parameters and the anisotropy of BiTeCl.

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