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Transport Signatures of Fermi Surface Topology in BiTeI LINDA YE, University of Tokyo, JOSEPH CHECKELSKY, Massachusetts Institute of Technology, FUMITAKA KAGAWA, YOSHINORI TOKURA, RIKEN Center for Emergent Matter Science — The giant bulk Rashba spin-orbit coupling in BiTeI makes it not only an interesting spintronics system but also a host of an effect Dirac-like electronic structure of fundamental interest. As a function of lowering the Fermi level E_F across the associated Dirac point ($E_F = 0$), the Fermi surface of BiTeI changes its topology: from a spindle-torus ($E_F > 0$) through a horn-torus ($E_F = 0$) to a ring-torus ($E_F < 0$). Here we report a systematic evolution of the magnetoresistance across these energy boundaries in high quality single crystals exhibiting Shubnikov-de Haas oscillations. We further discuss the physical origin of the detailed E_F/field/temperature dependences and remark on the relevance of this study to band crossings generally occurring in 3D systems.

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