

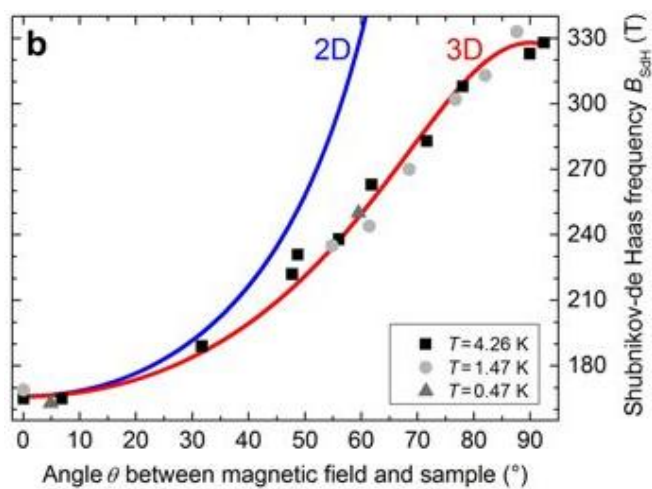
High-temperature quantum oscillations of the Hall resistance in bulk Bi_2Se_3

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Short Abstract

Helically spin-polarised Dirac fermions (HSDF) in protected topological surface states (TSS) are of high interest as a new state of quantum matter. In 3D materials with TSS, electronic bulk states often mask the transport properties of HSDF. This bulk contribution can form a system of layered 2D electronic systems. Here, the measured angular and temperature dependence of the Hall resistance and Shubnikov-de Haas oscillations of nominally undoped bulk Bi_2Se_3 serve to identify the dimensionality of the bulk contribution. We suggest the coexistence of TSS and 2D layered transport for Bi_2Se_3 .



Above. Angular-dependence of Shubnikov-de Haas oscillations: Curves show calculated behaviour for a planar 2D Fermi surface and for an ellipsoidal 3D Fermi surface.