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

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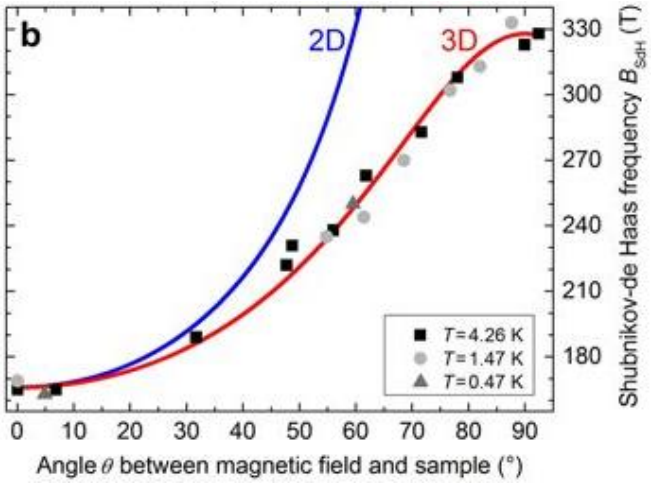
## Short Abstract

Helically spin-polarised Dirac fermions in protected topological surface states (TSS) are of high interest as a new state of quantum matter. Here, we investigate the bulk contribution can form a system of layered 2D electronic systems. 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.