QUANTUM OSCILLATIONS IN KONDO INSULATOR SmB_6

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In Kondo insulator samarium hexaboride SmB6, strong correlation and band hybridization lead to a diverging resistance at low temperature. The resistance divergence ends at about 3 Kelvin, a behavior recently demonstrated to arise from the surface conductance. However, questions remain whether and where a topological surface state exists. Quantum oscillations have not been observed to map the Fermi surface. We solve the problem by resolving the Landau Level quantization and Fermi surface topology using torque magnetometry. The observed angular dependence of the Fermi surface cross section suggests two-dimensional surface states on the (101) and (100) plane. Furthermore, similar to the quantum Hall states for graphene, the tracking of the Landau Levels in the infinite magnetic field limit points to -1/2, the Berry phase contribution from the 2D Dirac electronic state.