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Two-dimensional Fermi surfaces in Kondo insulating SmB6

GANG LI, University of Michigan

There has been renewed interest in Samarium Hexaboride, which is a strongly correlated heavy Fermion material. Hybridization between itinerant electrons and localized orbitals lead to an opening of charge gap at low temperature. However, the resistivity of SmB_6 does not diverge at low temperature. Former studies suggested that this residual conductance is contributed by various origins. Recent theoretical developments suggest that the particular symmetry of energy bands of SmB_6 may host a topologically non-trivial surface state, i.e., a topological Kondo insulator. To probe the Fermiology of the possible metallic surface state, we use sensitive torque magnetometry to detect the de Haas van Alphen (dHvA) effect due to Landau level quantization on flux-grown crystals, down to He-3 temperature and up to 45 Tesla. Our angular and temperature dependent data suggest two-dimensional Fermi Surfaces lie in both crystalline (001) and (101) surface planes of SmB_6.