

Anomalous Hall effect on the surface of topological Kondo insulators

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We calculate the anomalous Hall conductivity σ_{xy} of the surface states in cubic topological Kondo insulators. We consider a generic model for the surface states with three Dirac cones on the (001) surface. The Fermi velocity, the Fermi momentum, and the Zeeman energy in different Dirac pockets may be unequal. The microscopic impurity potential mediates mixed intra- and interband extrinsic scattering processes. Our calculation of σ_{xy} is based on the Kubo-Streda diagrammatic approach. It includes diffractive skew scattering contributions originating from the rare two-impurity complexes. Remarkably, these contributions yield anomalous Hall conductivity that is independent of impurity concentration, and thus is of the same order as other known extrinsic side jump and skew scattering terms. We discuss various special cases of our results and the experimental relevance of our study in the context of the recent hysteretic magnetotransport data in SmB_6 samples.