

Abstract Submitted
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Kondo resistance minimum in topological insulators JIE WANG, DIMITRIE CULCER, ICQD, University of Science and Technology of China — We present a theory of the Kondo resistance minimum applicable to topological insulators (TI) and spin-orbit coupled semiconductors in the high-temperature limit, defined as $T > T_K$, the Kondo temperature. We derive the T-matrix for a general strongly spin-orbit coupled system, including the many-body Kondo scattering terms. The physics is qualitatively different from the well-known case of metals due to the interplay of impurity degrees of freedom with the spin-orbit induced spin-momentum locking of the conduction electrons. TI have a single Fermi surface, while in spin-orbit coupled semiconductors scattering between the two spin-split Fermi surfaces must be taken into account. We determine the resistance minimum and Kondo temperature, and comment briefly on Kondo screening and Kondo singlet formation in the presence of strong spin-orbit coupling.

Jie Wang
ICQD, University of Science and Technology of China

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