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**Analysis of the Kane-Mele-Kondo lattice at finite temperatures.**[1]
TSUNEYA YOSHIDA, Condensed Matter Theory Laboratory, RIKEN, ROBERT PETERS, Computational Condensed Matter Physics Laboratory, RIKEN, NORIO KAWAKAMI, Department of Physics, Kyoto University — Recently, correlation effects on topological insulators are extensively studied because the interplay of topological properties and electron correlations is expected to induce exotic phenomena. A promising candidate for a topological insulator in heavy-fermion systems is $\mathrm{SmB}_6$ where the Kondo effects play an essential role. In this article, we study the Kane-Mele-Kondo lattice at finite temperatures. By using the dynamical mean-field theory, we obtain a temperature vs. interaction phase diagram (a Doniach phase diagram). Furthermore, we have observed an intriguing crossover behavior induced by the interplay of electron correlations and topologically nontrivial properties. In the bulk system, the spin-Hall conductivity which is proportional to the spin Chern number is zero at low temperatures while the conductivity rapidly increases with increasing temperature. Correspondingly, gapless modes are restored by temperature effects at the edge sites, which are destroyed by the Kondo effect at low temperature.

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Tsuneya Yoshida
Condensed Matter Theory Laboratory, RIKEN

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