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Kondo hybridization and the origin of metallic states at the (001) surface of SmB_6 EMMANOUIL FRANTZESKAKIS, NICK DE JONG, BEREND ZWARTSENBERG, YINGKAI HUANG, YU PAN, University of Amsterdam, XIN ZHANG, JIUXING ZHANG, FANXING ZHANG, Beijing University of Technology, LIHONG BAO, OJIYED TEGUS, Inner Mongolia Normal University, ANDREI VARYKHALOV, Helmholtz Zentrum Berlin, ANNE DE VISSER, MARK GOLDEN, University of Amsterdam — Is SmB_6 an ideal topological insulator with states of topological character located in a Kondo hybridization gap? SmB_6 could be the first of a new material class of topological Kondo insulators. We present high-resolution ARPES data showing that Kondo hybridization is the key to unraveling the origin of two metallic states observed in the electronic structure of $SmB_6(001)$. One is of bulk origin, while the other represents a good candidate for a topological surface state. However, before this claim is substantiated by measuring its massless dispersion relation, our data raises the bar in terms of the energy resolution required, as we uncover strong renormalization of the hybridization gaps compared to theory. Our results map the electronic landscape in SmB_6, pointing the way for future work in the quest of Dirac cones in the first topological Kondo insulator.

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