

Abstract Submitted
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Correlated topological phase in rare earth Hexaboride¹ NAN XU, X. SHI, P. BISWAS, C. MATT, R. DHAKA, Y. HUANG, N. PLUMB, M. RADOVIC, J. DIL, E. POMJAKUSHINA, K. CONDER, A. AMATO, Z. SALMAN, Paul Scherrer Inst, D. PAUL, University of Warwick, J. MESOT, Paul Scherrer Inst, HONG DING, Institute of Physics, CAS, MING SHI, Paul Scherrer Inst — We have performed an angle-resolved photoemission spectroscopy study on SmB₆ in order to elucidate elements of the electronic structure relevant to the possible occurrence of a topological Kondo insulator state. Our results reveal one electron-like 5d bulk band centered at the X point of the bulk Brillouin zone that is hybridized with strongly correlated f electrons, as well as the opening of a Kondo band gap (~ 20 meV) at low temperature. In addition, we observe electron-like bands forming three Fermi surfaces at the center Gamma-bar point and boundary X-bar point of the surface Brillouin zone. These bands are not expected from calculations of the bulk electronic structure, and their observed dispersion characteristics are consistent with surface states. Our results suggest that the unusual low-temperature transport behavior of SmB₆ is likely to be related to the pronounced surface states sitting inside the band hybridization gap and the presence of a topological Kondo insulating state. Recent result on rare earth Hexboride will be shown.

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