Distinct Electronic Structure for the Extreme Magnetoresistance in YSb

JUNFENG HE, CHAOFAN ZHANG, Stanford University, NIRMAN GHIMIRE, Argonne National Laboratory, TIAN LIANG, CHUNJING JIA, Stanford University, JUAN JIANG, ALS, ShanghaiTech University, SHUJIE TANG, SUDI CHEN, YU HE, Stanford University, S.-K. MO, ALS, C. C. HWANG, Pohang University of Science and Technology, M. HASHIMOTO, D. H. LU, SLAC, B. MORITZ, T. P. DEVEREAUX, Stanford University, Y. L. CHEN, ShanghaiTech University, University of Oxford, J. F. MITCHELL, Argonne National Laboratory, Z.-X. SHEN, Stanford University, STANFORD UNIVERSITY COLLABORATION, ARGONNE NATIONAL LABORATORY COLLABORATION, ALS, LAWRENCE BERKELEY NATIONAL LABORATORY COLLABORATION, SHANGHAITECH UNIVERSITY COLLABORATION, SLAC NATIONAL ACCELERATOR LABORATORY COLLABORATION — An extreme magnetoresistance (XMR) has recently been observed in several non-magnetic semimetals. Increasing experimental and theoretical evidence indicates that the XMR can be driven by either topological protection or electron-hole compensation. Here, by investigating the electronic structure of a XMR material, YSb, we present spectroscopic evidence for a special case which lacks topological protection and perfect electron-hole compensation. Further investigations reveal that a cooperative action of a substantial difference between electron and hole mobility and a moderate carrier compensation might contribute to the XMR in YSb.

1US DOE, Office of Basic Energy Science

Junfeng He
Stanford University

Date submitted: 07 Nov 2016

Electronic form version 1.4