Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Low-temperature (1 K) angle-resolved photoemission investigation of the predicted topological Kondo insulator behavior of SmB_6 OLIVER RADER, PETER HLAWENKA, EMILE RIENKS, KONRAD SIEMENSMEYER, EUGEN WESCHKE, ANDREI VARYKHALOV, Helmholtz-Zentrum Berlin, NATALYA SHITSEVALOVA, National Academy of Sciences of Ukraine, SLAVOMIR GABANI, KAROL FLACHBART, Slovak Academy of Science — The system SmB_6 is known for its unusual resistivity which increases exponentially with decreasing temperature and saturates below 3 K [1]. This has recently been attributed to topological-Kondo-insulator behavior where a topological surface state is created by Sm $4f$-$5d$ hybridization and is responsible for the transport [2]. Local-density-approximation + Gutzwiller calculations of the (100) surface predict the appearance of three Dirac cones in the surface Brillouin zone [3]. We perform angle-resolved photoemission at temperatures below 1 K and reveal surface states at $\overline{\Gamma}$ and $\overline{\mathrm{X}}$. Bulk conduction band states near $\overline{\mathrm{X}}$ appear at higher temperature. These findings will be discussed in detail vis-á-vis the theoretical and experimental literature. [1] J. C. Cooley, M. C. Aronson, Z. Fisk, P. C. Canfield, Phys. Rev. Lett. 74, 1629 (1995). [2] M. Dzero, Kai Sun, V. Galitski, P. Coleman, Phys. Rev. Lett. 104, 106408 (2010). [3] F. Lu, J. Zhao, H. Weng, Z. Fang, Xi Dai, Phys. Rev. Lett. 110, 096401 (2013).

Oliver Rader
Helmholtz-Zentrum Berlin

Date submitted: 14 Nov 2014 Electronic form version 1.4