Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Experimental Evidence of the First Nonsymmorphic Topological Insulator KHgSb. JUNZHANG MA, C.J YI, B.Q LV, S.M NIE, L WANG, L.Y KONG, P RICHARD, H.M WENG, Y.G SHI, T QIAN, HONG DING, Institute of Physics, Chinese Academy of Sciences, Z.J WANG, B.A BERNEVIG, Department of Physics, Princeton University, P ZHANG, K YAJI, K KURODA, S SHIN, ISSP, University of Tokyo, Y.B HUANG, Shanghai Institute of Applied Physics, Chinese Academy of Sciences — Topological insulators (TIs) host novel states of quantum matter characterized by nontrivial conducting boundary states connecting valence and conduction bulk bands. All TIs discovered experimentally so far rely either on time reversal or mirror crystal symmorphic symmetries to protect massless Dirac-like boundary states. Several materials were recently proposed to be TIs with nonsymmorphic symmetry, where a glide-mirror protects exotic surface fermions with hourglass-shaped dispersion. However, an experimental confirmation of such new fermion is missing. Using angle- resolved photoemission spectroscopy, we provide experimental evidence of hourglass fermions on the (010) surface of crystalline KHgSb while the (001) surface has no boundary state, in agreement with first-principles calculations. Our study will stimulate further research activities of topological properties of nonsymmorphic materials.

Junzhang Ma
Institute of Physics, Chinese Academy of Sciences

Date submitted: 02 Nov 2016 Electronic form version 1.4