Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Spin Orbit Induced Electronic Structure and Magnetotransport in WTe_2[1] DAVID J. SINGH, University of Missouri, MINGHU PAN, Huazhong University of Science and Technology, JIAQIANG YAN, University of Tennessee, BIAO YANG, Soochow University, YUNYI ZANG, Tsinghua University, JUNJIE ZHANG, Soochow University, KE HE, Tsinghua University, MENGHAO WU, Huazhong University of Science and Technology, YANFEI ZHAO, Peking University, DAVID MANDRUS, University of Tennessee, JIAN WANG, Peking University, QIKUN XUE, Tsinghua University, LIFENG CHI, QING LI, Soochow University — We report electronic structure studies of WTe_2, which shows an XMR behavior and is non-centrosymmetric. We find a spin-orbit split semimetallic band structure with a different Fermi surface topology than that initially reported, including Rashba split bands with Fermi surface around the zone center. The metallic properties are not one dimensional and are best described in terms of an anisotropic 3D metal with compensating low carrier density Fermi surfaces. The spin texture and transport is discussed as the origin of the XMR effect and in particular is consistent with the geometry in which the XMR effect is observed and its angle dependence.

[1]Work supported by DOE through the Computational Synthesis of Materials Software Project

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Date submitted: 02 Nov 2015 Electronic form version 1.4