Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Magnetic torque study of Weyl semimetal compounds TaP and NbP up to 45 Tesla GANG LI, TOMOYA ASABA, COLIN TINSMAN, FAN YU, BENJAMIN LAWSON, University of Michigan, YULIN CHEN, University of Oxford, LU LI, University of Michigan — Weyl semimetal is a recently proposed new state in condensed matter physics, in which the bulk bands could have three dimensional linear dispersion but the degeneracy at the cross point is lifted into a pair of Weyl points with opposite chirality. Among the predicted candidates, Tantalum monophorspide (TaP) and Niobium monophorspide (NbP) have the simplest composition and do not require extrinsic tuning. Photoemission data is accumulating and the unique Fermi-arc surface state is observed. Magnetotransport experiments has shown highly anisotropic magnetoresistance and quantum oscillations has been observed. Because both linear dispersive bands and conventional bands exist in these materials, a detailed study of the electronic strucuture of the bulk is highly desirable. We use torque magnetometry to study quantum oscillations of TaP and NbP down to 300 mK, and up to 45 Tesla, with focus on the angular dependence of oscillation frequencies. Our comparison shows clear difference in geometry of different bulk bands in these materials. Besides, a discussion will be made on high field torque data since 45 Tesla is high enough to push several of the bands into quantum limit.

Gang Li
University of Michigan

Date submitted: 06 Nov 2015 Electronic form version 1.4