

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Quantum Oscillations at Integer and Fractional Landau Level Indices in ZrTe₅¹ WENLONG YU, Sandia National Laboratories, Albuquerque, New Mexico 87185, USA, YUXUAN JIANG, JEREMY YANG, School of Physics, Georgia Institute of Technology, Atlanta, Georgia 30332, USA, ZHILING DUN, HAIDONG ZHOU, Department of Physics and Astronomy, University of Tennessee, Knoxville, Tennessee 37996, USA, ZHIGANG JIANG, School of Physics, Georgia Institute of Technology, Atlanta, Georgia 30332, USA, PING LU, WEI PAN, Sandia National Laboratories, Albuquerque, New Mexico 87185, USA — A three-dimensional (3D) Dirac semimetal (DS) is an analogue of graphene, but with linear energy dispersion in all (three) momentum directions. We report here the results in exfoliated ZrTe₅ thin flakes from the studies of scanning transmission electron microscopy and low temperature magneto-transport measurements. Several unique results were observed. First, a π Berry phase was obtained from the Landau fan diagram. Second, the longitudinal resistivity shows linear magnetic field dependence. Most surprisingly, quantum oscillations were also observed at fractional Landau level indices $N = 5/3$ and $7/5$, demonstrating strong electron-electron interaction effects in ZrTe₅.

¹This work was supported by the U.S. Department of Energy, Office of Science, Basic Energy Sciences, Materials Sciences and Engineering Division. Contract DE-AC04-94AL85000. Grant No. DE-FG02-07ER46451. Grant No. DMR-1350002.

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Date submitted: 11 Nov 2016

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