

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Anomalous Conductivity Tensor and Quantum Oscillations in the Dirac Semimetal Na₃Bi¹ JUN XIONG, SATYA KUSHWAHA, JASON KRIZAN, TIAN LIANG, ROBERT J. CAVA, NAI PHUAN ONG, Princeton University — Na₃Bi is a 3D Dirac semimetal with protected nodes. Angle-resolved photoemission experiments have observed these massless Dirac fermions in the bulk band, but transport experiments have been hampered by the extreme air sensitivity of Na₃Bi crystals. Transport experiments can potentially address interesting issues such as charge pumping between the separated Weyl nodes when the time-reversal symmetry is broken by a strong magnetic field. Here we report a transport measurement that reveals robust anomalies in both the conductivity and resistivity tensors. The resistivity ρ_{xx} is B-linear up to 35 T, while the Hall angle exhibits an unusual profile approaching a step-function. In addition, we have also observed a prominent beating pattern in the Shubnikov de Haas (SdH) oscillations indicating the existence of two nearly equal SdH frequencies when the Fermi energy falls inside the non-trivial gap-inverted regime.

¹Supported by NSF-MRSEC (DMR 0819860), Army Research Office (ARO W911NF-11-1-0379) and MURI grant (ARO W911NF-12-1-0461).

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Date submitted: 13 Nov 2014

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