Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Chiral Magnetic Effect in Condensed Matter[1] TONICA VALLA, QIANG LI, Brookhaven National Laboratory, DMITRI KHARZEEV, Brookhaven National Laboratory and Stony Brook University, CHENG ZHANG, YUAN HUANG, Brookhaven National Laboratory, IVO PLETIKOSIC, Brookhaven National Laboratory and Princeton University, ALEXEI FEDOROV, Lawrence Berkeley National Laboratory, RUIDAN ZHONG, JOHN SCHNEELOCH, GENDA GU, Brookhaven National Laboratory — The chiral magnetic effect (CME) is the generation of electric current induced by chirality imbalance in the presence of magnetic field - a macroscopic manifestation of the quantum anomaly in relativistic field theory of chiral fermions. The recent discovery of Dirac and Weyl semimetals opened a fascinating possibility to study this phenomenon in condensed matter experiments. Magneto-transport in $ZrTe_5$ shows a strong evidence for CME. Our ARPES experiments show that this material's electronic structure is consistent with a highly anisotropic 3D Dirac semimetal. We observe a large negative magnetoresistance in parallel magnetic field, with the quadratic field dependence of the magneto-conductance - a clear indication of the CME.

[1]This work is supported by the US Department of Energy and ARO

Tonica Valla
Brookhaven National Laboratory

Date submitted: 05 Nov 2015 Electronic form version 1.4