Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Nernst and magneto-thermal conductivity in a lattice model of Weyl fermions**[1] GIRISH SHARMA, Clemson University, PALLAB GOSWAMI, University of Maryland, College Park, MD, SUMANTA TEWARI, Clemson University — Weyl semimetals (WSM) are topologically protected three dimensional materials whose low energy excitations are linearly dispersing massless Dirac fermions, possessing a non-trivial Berry curvature. Using semi-classical Boltzmann dynamics in the relaxation time approximation for a lattice model of time reversal (TR) symmetry broken WSM, we compute both magnetic field dependent and anomalous contributions to the Nernst coefficient. In addition to the magnetic field dependent Nernst response, which is present in both Dirac and Weyl semimetals, we show that, contrary to previous reports, the TR-broken WSM also has an anomalous Nernst response due to a non-vanishing Berry curvature. We also compute the thermal conductivities of a WSM in the Nernst ($\nabla T \perp \mathbf{B}$) and the longitudinal ($\nabla T \parallel \mathbf{B}$) set-up and confirm from our lattice model that in the parallel set-up, the Wiedemann-Franz law is violated between the longitudinal thermal and electrical conductivities due to chiral anomaly.

[1]G.S and S.T are supported by AFOSR (FA9550-13-1-0045). P.G was supported by NSF-JQI-PFC and and LPS-CMTC.

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Date submitted: 03 Nov 2015 Electronic form version 1.4