Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Unconventional large magnetoresistance in $Cu_{2-x}Te$[1] JOSEPH H. ROSS, ALI A. SIRUSI, Texas AM University, ALEXANDER PAGE, CTIRAD UHER, University of Michigan, LUCIA STEINKE, M. C. ARONSON, Texas AM University — Copper-based chalcogenides have been shown to have interesting physical properties which make them promising for thermoelectric, solar energy, and magnetic sensor devices. Here we report magnetotransport measurements on $Cu_{2-x}Te$, for several polycrystalline samples with x in the range 0.13 to 0.22. The results demonstrate that the magnetoresistance becomes linear above a relatively low applied field. The magnitude of the linear magnetoresistance reaches 250% at 2 K in a 9 T field, comparable to the effect observed in Ag_2Se and Ag_2Te. We discuss the results in terms of recent evidence for topological band inversion in Cu_2Te, and the possibility of high mobility surface states. Evidence from NMR and transport vs. composition indicates the normal carriers to occupy simple hole pockets, precluding compensation effects. Furthermore, the magnitude of maximum magnetoresistance scales as the mobility, as does the crossover field, while the magnetoresistance amplitudes drop to lower values as the vacancy density (x) increases. The results are discussed in terms of a Parish-Littlewood model and high mobility carriers.

[1]This work supported by the Robert A. Welch Foundation and the Center for Solar and Thermal Energy Conversion funded by the U.S. Department of Energy

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Date submitted: 11 Nov 2016 Electronic form version 1.4