Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Anomalous 3D bulk AC conduction within the Kondo gap of SmB_6 single crystals[1] N. J. LAURITA, C. M. MORRIS, S. M. KOOHPAYEH, Institute for Quantum Matter, Johns Hopkins University, P. F. S. ROSA, University of California Irvine, Los Alamos National Laboratory, W. A. PHELAN, Institute for Quantum Matter, Johns Hopkins University, Department of Chemistry, Johns Hopkins University, Z. FISK, University of California Irvine, T. M. MCQUEEN, Institute for Quantum Matter, Johns Hopkins University, Department of Chemistry, Johns Hopkins University, N. P. ARMITAGE, Institute for Quantum Matter, Johns Hopkins University — The Kondo insulator SmB_6 displays anomalous transport behavior at low temperatures which has recently been proposed to originate from in-gap topological surface states. Here, we investigate the low energy optical conductivity within the hybridization gap of single crystals of SmB_6 via time domain terahertz spectroscopy. Samples grown by both optical floating zone and aluminum flux methods are investigated and are found to display significant 3D bulk conduction originating within the Kondo gap that is many orders of magnitude larger than any known impurity band conduction. The nature of these in-gap states and their coupling with the low energy spin excitons of SmB_6 is discussed. Additionally, we show that any surface states, which lie below our detection threshold if present, must have a sheet resistance of $R \geq 1$ kΩ.

[1]DOE Grant No. DE-FG02-08ER46544, NSF Grant No. DMR 08-01253, Grant No. FAPESP 2013/20181-0

Nicholas Laurita
Johns Hopkins University

Date submitted: 09 Nov 2016 Electronic form version 1.4