Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Continuous wave terahertz spectroscopy of Sr_2CrReO_6 thin films at cryogenic temperatures and in high magnetic fields D.R. DAUGHTON, R. HIGGINS, S. YANO, Lake Shore Cryotronics, C.H. DU, A.J. HAUSER, R. ADUR, J.M. LUCY, H.L. WANG, D.V. PELEKHOV, E. JOHNSTON-HALPERIN, F.Y. YANG, P.C. HAMMEL, The Ohio State University — Temperature and magnetic field dependent terahertz spectroscopies have proven useful in characterizing and manipulating the structural, charge, and magnet ordering in complex oxide systems. THz transmission measurements on epitaxial thins films of the double-perovskite ferrimagnet Sr_2CrReO_6 (SCRO) were performed with a novel continuous-wave terahertz transmission spectrometer operating from 5 K to 300 K and with fields up to 9 T. Temperature-dependent changes in the film conductivity manifest as strong variations in the Fabry-Perot interference patterns from the supporting substrate. Indicative of variable-range hopping transport in the films, we find the conductivity varies with the THz frequency (f) as f^s with s$\sim$0.8 at 5 K. Depending on the handedness of the incident THz source, magnetic fields in excess of 4 T enhance or suppress the THz transmission of the SCRO films by $\sim$8%.

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Date submitted: 15 Nov 2013 Electronic form version 1.4