Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Terahertz study of potential multiferroic materials $Sr_2FeSi_2O_7$ and $BaFe_{12}O_{19}$[1] THUC T. MAI, M.T. WARREN, J. BRANGHAM, Center for Emergent Materials, Department of Physics. The Ohio State University. Columbus, OH 43210, T-H. HWAN, POSTECH, South Korea, S-W. CHEONG, Department of Physics, Rutgers University, J. YAN, Oak Ridge National Laboratory and University of Tennessee Knoxville, R. VALDÉS AGUILAR, Center for Emergent Materials, Department of Physics. The Ohio State University. Columbus, OH 43210 — We present data on the complex dielectric function of two iron-based quantum magnets in the terahertz frequency range. We study the phase transitions in $Sr_2FeSi_2O_7$ at low temperature when it becomes a collinear antiferromagnet, in contrast with the canted antiferromagnetic state of iso-structural multiferroic $Ba_2CoGe_2O_7$. We compare the terahertz response of these two materials in light of the recent observation of electromagnon excitations in $Ba_2CoGe_2O_7$. We have also studied $BaFe_{12}O_{19}$, a hexagonal ferromagnet that is predicted to have an antiferroelectric state. We will report experiments at terahertz frequencies probing this predicted state.

[1]Work partially supported by the NSF MRSEC Center for Emergent Materials under grant DMR-1420451.

Thuc T. Mai
Center for Emergent Materials, Department of Physics.
The Ohio State University. Columbus, OH 43210

Date submitted: 14 Nov 2014 Electronic form version 1.4