Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Spatiotemporally resolved magnetic dynamics in B20 chiral FeGe[1] ISAIAH GRAY, EMRAH TURGUT, JASON BARTELL, GREGORY FUCHS, Cornell University — Chiral magnetic materials have shown promise for ultra-low-power memory devices exploiting low critical currents for manipulation of spin textures. This motivates systematic studies of chiral dynamics in thin films, both for understanding magnetic properties and for developing devices. We use time-resolved anomalous Nernst effect (TRANE) microscopy to examine ferromagnetic resonance modes in 170 nm thin films of B20 chiral FeGe. Using 3 ps laser pulses with 1.2 μm resolution to generate a local thermal gradient, we measure the resulting Nernst voltage, which is proportional to the in-plane component of the magnetization. We first characterize and image the static magnetic moment as a function of temperature near the helical phase transition at 273 K. We then excite ferromagnetic resonance with microwave current and study the dynamical modes as a function of temperature, spatial position, and frequency. We identify both the uniform field-polarized mode and the helical spin-polarized mode and study the different spatial structures of the two modes.

[1]This work was supported by the Cornell Center for Materials Science with funding from the NSF MRSEC program (DMR-1120296), and also by the DOE Office of Science (Grant No. DE-SC0012245).

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Date submitted: 10 Nov 2016 Electronic form version 1.4