

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Detection of a History Dependent Topological Hall Effect Due to Skyrmion Formation in FeGe Thin Films JAMES GALLAGHER, MICHAEL PAGE, VIDYA BHALLAMUDI, JACK BRANGHAM, KENG YUAN MENG, BRYAN ESSER, HAILONG WANG, DAVE MCCOMB, CHRIS HAMMEL, FENGYUAN YANG, Ohio State Univ - Columbus — B20 phase crystal structures, such as FeGe and MnSi, have been of interest because they enable magnetic skyrmion phases, which can potentially lead to low energy cost spintronic device applications. We report the synthesis of pure phase FeGe epitaxial thin films grown on Si (111) substrates by ultra-high vacuum off-axis magnetron sputtering. The FeGe films were characterized by x-ray diffraction, scanning transmission electron microscopy (STEM) and Hall effect measurements. The topological Hall effect (THE) signals were extracted by subtracting out the anomalous Hall effect and ordinary Hall effect, demonstrating the existence of the skyrmion phase in FeGe films between 5 and 275 K. Topological hall effect was observed at zero field at all temperatures below the Curie temperature, showing the possibility of metastable skyrmion particles at zero field and high temperatures. We will also discuss the study of dynamics of the ferromagnetic phases using ferromagnetic resonance.

James Gallagher
Ohio State Univ - Columbus

Date submitted: 02 Dec 2015

Electronic form version 1.4