Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magnetization Dependent Hall Coefficient in EuB_6: a Signature of Electronic Phase Separation LIUQI YU, XIAOHANG ZHANG, S. VON MOLNÁR, P. XIONG, Florida State University, Z. FISK, UC Irvine — The nonlinear Hall effect (HE) in EuB_6 has been shown to be a signature of magnetically-driven electronic phase separation [1]: A distinct switch in the slope of its Hall resistivity versus the *perpendicular* applied magnetic field is observed in the paramagnetic phase, and it occurs at a *single critical magnetization* over a wide temperature range. Here we report HE measurements on a EuB_6 crystal platelet with the sample plane oriented nearly *parallel* to the applied magnetic field. The measurements in this configuration revealed a distinct change of the Hall coefficient as a function of magnetization induced by a parallel field, and the results are fully consistent with the perpendicular field HE measurements. They demonstrate unambiguously that the change in the Hall coefficient depends solely on the magnetization of the sample, regardless of the direction of the applied field. A two-component model based on carrier delocalization provides excellent scaling and quantitative description of our data. Work Supported in part by NSF DMR-0908625. [1] X. Zhang et al., Phys. Rev. Lett. **103**, 106602 (2009)

Liuqi Yu
Florida State University

Date submitted: 17 Dec 2009 Electronic form version 1.4