

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Anisotropic magnetic dynamics in (Ga, Mn)As film¹ XIANG LI, SINING DONG, TAEHEE YOO, SERGIO MELLO, XINYU LIU, JACEK FURDYNA, MARGARET DOBROWOLSKA, Department of Physics, University of Notre Dame — (Ga,Mn)As shows excellent magnetic properties which are usually described by a single-domain model. In this study, we perform a systematic investigation of ac magnetic susceptibility in (Ga,Mn)As films as a function of temperature and field carried out in parallel with dc magnetization measurements. A single ac susceptibility peak is observed close to T_C for the field along [1-10] orientation; a single peak is seen close to 22 K along [110]; and both peaks are observed along [100]. Detailed analysis indicates that the peak near T_C is related to the paraferromagnetic transition. And the ferromagnetic domains nucleate with their easy axis aligned with [1-10] direction, involving 180° magnetization flips along the easy axis. The peak near 22 K, on the other hand, originates from magnetization switching between two biaxial easy axes separated by a small angle, which is induced by the competition between uniaxial and cubic anisotropy. Dynamic properties emerging from the distinct frequency dependences of the ac susceptibility in these two temperature regions, such as magnetic relaxation times, have been analyzed using various models. Investigations in patterned films will be carried out as well.

¹This work is supported by the National Science Foundation Grant DMR1400432.

Xiang Li
Department of Physics, University of Notre Dame

Date submitted: 14 Nov 2014

Electronic form version 1.4