Abstract Submitted
for the 4CF12 Meeting of
The American Physical Society

Landau-Lifshitz-Gilbert Model and Ferromagnetic Pattern Formation SOYOUNG JUNG, MANUEL BERRONDO, Brigham Young University — We study the dynamics of multi-spin systems with energy dissipation. The Heisenberg model constitutes an essential stepping stone to understand ferromagnetic materials. Individual two-spin short-range interactions of magnetic dipoles give rise to coherent long-range behavior in a lattice structure. The spins are free to rotate and can arrange themselves in a parallel configuration in the ordered state. The local magnetic field acting on each spin arises as the result of the addition of nearest neighbors (NN) spins. The addition of dissipative effects allows us to study the onset of ordered states as a dynamical process. In addition to NN spins interactions, we include anisotropy to simulate the layer structure of the experimental samples. We also included a long range interaction as an opposing force. As a result, we have been able to observe the formation of domains in simulated 2-d ferromagnetic lattices. Depending on the external transverse magnetic fields, different patterns are formed. These patterns correlate very well with experimental observations in Co-Pt thin magnetic films.

Soyoung Jung
Brigham Young University

Date submitted: 21 Sep 2012 Electronic form version 1.4