

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Anisotropic phases in ferromagnetic ultrathin films from multipolar interactions¹ DANIEL BARCI, University of the State of Rio de Janeiro, Brazil, DANIEL STARIOLO, Federal University of Rio Grande do Sul, Brazil — We present a model to describe complex phases observed at mesoscopic scales in ultrathin magnetic films with perpendicular anisotropy. The model is based on the interaction between magnetic dipolar as well as quadrupolar moments. This model has a very rich phase diagram. In the special case of films with strong perpendicular anisotropy, a nematic phase, characterized by orientational (stripe-like) but not translational order, is predicted. The isotropic-nematic transition belongs to the Kosterlitz-Thouless type in the thermodynamic limit. However, we find that in actual experimental scales the fluctuations of the nematic order parameter are regularized by the sample size, and real orientational order, as predicted by mean field, should be observable. The transition may be characterized experimentally from measurements of the magnetic structure factor, from which the nematic order parameter is derived.

¹Partially supported by the Brazilian agencies CNPq and FAPERJ.

Daniel Barci
University of the State of Rio de Janeiro, Brazil

Date submitted: 20 Nov 2008

Electronic form version 1.4