MAGNETIC STRUCTURES IN ULTRATHIN FILMS: SIMULATION

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9.7 cm

In ultrathin films, competing exchange, anisotropy and dipolar couplings lead to a large variety of magnetic structures. These structures are obtained by means of Monte Carlo (MC) simulations at different temperatures. Three classes of magnetic structures are investigated: (i) In the Ising case, stripes, chevry structures and mazes occur. (ii) Without uniaxial anisotropy, XY-spin structures with complex arrangements of **vortices** are found. (iii) For intermediate uniaxial anisotropy, a spin reorientation transition occurs from in-plane to out-of-plane spins in a twisted spin phase where both mazes and vortices appear. Magnetic hysteresis cycles are also obtained with evidence for a strong directional dependence. Domain nucleation and motion are also accessible by MC relaxation at the coercive field with 360° **solitons** in the weak anisotropy situation and **bubbles** in the case of strong uniaxial anisotropy.

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
oral

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