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Monte Carlo study of transverse susceptibility in ordered arrays of magnetic nanoparticles[1] DIMITRIS KECHRAKOS, KALLIOPI TROHIDOU, Institute of Materials Science, NCSR Demokritos, 15310 Athens, GR — We present Monte Carlo simulations of the field-dependent reversible transverse susceptibility (RTS) for a hexagonal array of dipolar interacting magnetic nanoparticles with random anisotropy. The thermal evolution of the RTS curves exhibits three distinct temperatures that indicate the merge of the coercive to the anisotropy peak (T_{sw}), the crossover from double-peak to single-peak behavior (T_{cross}) and the transition to the superparamagnetic state (T_b), successively. Above T_{cross} the array exhibits positive spin correlations attributed solely to dipolar interactions. With decreasing interparticle spacing, the anisotropy peak shifts to lower (or higher) values for in-plane (or off-plane) bias-field and the coercive peak merges to the anisotropy peak indicating a transition to collective reversal of the moments. Our results are in agreement with recent RTS measurements in self-assembled Fe nanoparticles.

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Dimitris Kechrakos
Institute of Materials Science, NCSR Demokritos, 15310 Athens, GR

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