Abstract

By Monte Carlo simulation, we have studied the thermal variation of the dynamical linear susceptibility of self-organized monodispersive assemblies of cobalt nanoclusters. All nanoclusters exhibit uniaxial anisotropy along the same easy axis (z-axis). They are located at the vertices of different periodic lattices: a 1D lattice parallel to the z-axis, a square lattice parallel to Oxy (perpendicular anisotropy) and a square lattice parallel to Oyz (in plane anisotropy). We have firstly calculated the ac-susceptibility without dipolar interactions. Thanks to a comparison with analytical results, we have deduced the physical time δt0 corresponding to one Monte Carlo step. With dipolar interactions, we have found that the peak of the in-phase (X) and the out-of-phase (X^n) components of the ac-susceptibility is shifted. This shift strongly depends on the lattice type. By means of simulations of magnetic relaxation, we have evidenced that the shift of the peak of X^1 and X^n is clearly connected to an increase or a decrease of the relaxation time due to dipolar interactions