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 δt_0 corresponding to one Monte Carlo step. With dipolar interactions, we have found that the peak of the in-phase (χ') and the out-of-phase (χ'') 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 χ' and χ'' is clearly connected to an increase or a decrease of the relaxation time due to dipolar interactions.