

A molecular dynamics simulation of a suspension of ferroelectric nanoparticles in a nematic liquid crystal

A. A. Canabarro^a, M. S. S. Pereira^a, I. N. de Oliveira^a, L. V. Mirantsev^b,
M. L. Lyra^a

*a Instituto de Física, Universidade Federal de Alagoas, 57072-970
Maceió, Alagoas, Brasil*

*b Institute of the Problems of Mechanical Engineering, Academy of
Sciences of Russia, 199178 St. Petersburg, Russia*

A large number of interesting phenomena related to the insertion of colloidal particles in liquid crystals (LC) has recently been reported. Here, we investigate the effects produced by the introduction of a spherical-shaped suspension of ferroelectric nanoparticles in a nematic liquid crystal. Using molecular dynamics (MD) simulations, we observe that the assembly of ferroelectric particles enhances the nematic order in the LC medium changing many properties of its host above the nematic-isotropic transition temperature. The density of LC molecules, the orientational order parameter, as well as the polar and azimuthal angles profiles are calculated as functions of the distance to the center of the suspended sample for diverse temperatures of the system.