



Monte Carlo study of tunable negative-zero-positive index of refraction in nanosphere dispersed liquid crystals

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Résumé en anglais	<p>Khoo et al.1, 2 have shown that nanosphere dispersed nematic liquid crystal (NDLC) constitutes a new type of metamaterial with index of refraction tunable from negative to positive values. Recently3 we have combined this approach with Monte Carlo simulations of inhomogeneous molecular order in planar NLC cells. Lebwohl - Lasher effective hamiltonian with Rapini - Papoular term for anchoring forces was used. Electric field and amplitude of anchoring forces are control parameters which determine the profiles of order parameter. In this paper we study, using the same approach, local spatial distribution of refractive index in NDLC planar cell. We show that NDLC material consists of layers with negative-zero-positive index of refraction. The spatial organization of those layers strongly depends on incident light wavelength. The role of spatially modulated external electric field for tuning of refractive index of NDLC is briefly discussed.</p>
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