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Improvement of orientational order and display parameters of liquid crystalline material dispersed with single-wall carbon nanotubes

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Composites were prepared by inserting Single-Walled Carbon Nanotubes (SWCNTs) in the Nematic Liquid Crystal (NLC) to fasten the reorientation dynamics of the system under the electric field. Dispersion of SWCNTs in NLC medium enhanced the orientational order and consequently the display parameters of composite systems improved. Various display parameters such as orientational order, dielectric anisotropy, threshold voltage and splay elastic constant were explored for pure and composite systems.

Keywords: Carbon nanotubes, Composite materials, Dielectrics, Electrical properties.

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1. Introduction:

The discovery of carbon nanotubes (CNTs) in 1991 energized scientific interest in all kinds of one-dimensional (1-D) nanostructures [1]. Due to their unique optical and electronic properties, CNTs were found to be very promising as additives to different organic materials such as Liquid Crystal (LC), resulting improvement of the electrical and optical properties of the composites. LCs are organic, shape-anisotropic compounds that give rise to mesophases characterized by long-range orientational and/or one-dimensional

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