Investigation of External Field Influence on Structural Properties of Doped Nematics Using SAW Technique

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Abstract. Utilization of surface acoustic waves (SAW) for investigation of structural changes in the doped nematic liquid crystals (6CHBT, 6CB) under applied external electric or weak magnetic field is presented. Dopants such as superionic nanoparticles or magnetic nanorods were added to liquid crystal matrix in various volume concentrations. With the enhancement of specific properties for orientational coupling between both magnetic and dipole moments of nanoparticles and liquid crystal molecules, we can achieve extraordinary characteristics of such material in electric or magnetic fields. This approach was confirmed by acoustic spectroscopy using SAW, which is considered as a useful non-destructive method for observations of structural changes in doped liquid crystals induced by external fields. Obtained results could lead to the creation of new types of sensors and optoelectronic devices for the future.