

## **Study of the morphologies and polarization switching in polymer dispersed ferroelectric liquid crystal composite films and display devices**

***Pankaj Kumar<sup>1</sup>, K.K. Raina<sup>1\*</sup> and Praveen Malik<sup>2</sup>***

<sup>1</sup>Liquid Crystal Group, Materials Research Laboratory, School of Physics and Materials Science, Thapar Institute of Engineering and Technology (Deemed University), Patiala, 147004, Punjab, INDIA

<sup>2</sup>Department of Physics, NREC College Khurja, C.C.S. University Meerut, 203131, Uttar Pradesh, INDIA

### **Abstract**

Liquid crystals constitute an important class of display materials used in liquid crystal display (LCD) devices. In recent years, polymer dispersed liquid crystals (PDLC) have attracted significant attention among various research groups due to its technological applications. These materials are found to be of wide ranging applications e.g. flexible displays to optical devices. In the present study, polymer dispersed ferroelectric liquid crystal (PDFLC) composite films have been prepared by polymerization induced phase separation (PIPS) technique containing different of ferroelectric liquid crystal (FLC) material and UV curable polymer NOA 65. The droplet morphology, electro-optic properties and switching behaviors of these materials have been investigated in these PDFLC composite films. These composite systems show the switching time of few microseconds. The effect of temperature and applied voltage on the LC droplet morphology and its optical characteristics on these films could be optimized for detail.