

Abstract Submitted
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Effects of carbon nanotubes on liquid crystal order parameter and Freedericksz transition in electro-optic cells GEORGI GEORGIEV¹, ERIN GOMBOS, MICHAEL MCINTYRE, MICHAEL MATTERA, PETER GATI, Assumption College, YANIEL CABRERA, PEGGY CEBE, Tufts University, ASSUMPTION COLLABORATION, TUFTS COLLABORATION — We studied the effects of multiwalled carbon nanotubes (MWCTs) at low concentrations (0.01 wt %) on the Freedericksz transition of a 4-Cyano-4'-pentylbipenyl (5CB) liquid crystal using transmission ellipsometry. In addition, we calibrated the altitudinal angle of CNTs as a function of the electric field and directed the azimuthal angle which gave us complete control of the 3D orientation of the CNTs. Our results show that in the presence of CNTs the voltage and width for the Freedericksz transition are reduced by a factor of 1.8 as compared to the control electro-optic cell without CNTs. The shift in transition voltage correlates with increase in order parameter of the electro-optic cell as measured by our polarized UV/Vis absorption spectroscopy results. Research supported by: Assumption College Faculty Development Grant, funding for students' stipends, instrumentation and supplies, the NSF Polymers Program of the DME, grant (DMR-0602473) and NASA grant (NAG8-1167).

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