

Abstract Submitted  
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**Diffraction by Permanent Gratings in Dye-Doped Liquid Crystal**

MIKAIL ABBASOV, GENE CARLISLE, West Texas A&M University — Permanent gratings were written in dye-doped and in dye *and* carbon nanotube-doped nematic LC using low laser power without application of an electric field. The diffraction efficiency of the gratings can be modulated with applied ac fields. Cells doped with both dye CNT show greater diffraction than those doped only with dye. In order to gain further understanding of these materials we have obtained Frederiks transition, capacitance and conductivity data. The presence of CNTs has little effect on the Frederiks transition, which occurs  $\sim 67$  mV/ $\mu$ m. However, the CNT-doped cells exhibit greater capacitance and conductivity over a wide range of ac fields and frequencies, with significant increases beginning at the Frederiks transition. The dielectric data, which support the diffraction data, will be presented along with a grating model.

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