

Abstract Submitted  
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**AC Field Modulation of Diffraction in Dye and Carbon Nanotube Doped Liquid Crystal Permanent Gratings** GENE CARLISLE, MIKAIL ABASOV, TINA MAXWELL, West Texas A&M University, WEST TEXAS A&M UNIVERSITY TEAM — We have written permanent gratings in planar nematic liquid crystal (LC) cells doped with Methyl Red (MR) and single-wall carbon nanotubes (CNT). This was accomplished using low-intensity visible light and without application of electric fields. The diffraction efficiency can be enhanced and controlled with ac fields. We report our results for voltages ranging as high as 21 V and frequencies ranging from near zero to 1 MHz. Cells doped with both MR and CNT produced approximately twice the diffraction efficiency as cells doped only with MR. A mechanism is proposed for grating formation based on trans-cis photoisomerism of MR followed by adsorption of the cis-isomer on the alignment layers in the bright regions of the light interference pattern. The gratings are robust and have remained stable for over two years.

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