Abstract Submitted
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Effects of radiation on the electro-optical properties of nanoparticle-polymer-dispersed liquid crystal structures ALFONSO HINOJOSA, CECIL SHIVE, SURESH SHARMA, University of Texas at Arlington — Polymer dispersed liquid crystals (PDLCs) are composite materials consisting of submicron-size droplets of liquid crystal (LC) embedded within a polymer. By using holographic techniques, PDLCs can be transformed into periodic structures with spatial periodicity (HPDLCs), which can be controlled within reasonable limits by experimental parameters. Consequently, the optical properties of HPDLC-based devices, e. g., diffraction efficiency can also be controlled [1]. These periodic structures are used in numerous electro-optical devices; e. g., switchable holographic gratings and photonic bandgap structures. We have shown previously that the light transmission through PDLCs changes upon irradiation by gamma-rays [2]. In order to evaluate the means by which the sensitivity of these materials to radiation can be improved, we have synthesized hybrid materials consisting of nanoparticles and HPDLC periodic structures. By utilizing a high sensitivity optical characterization technique, we have carried out measurements of the luminescence properties of these materials with/without irradiation. Here, we present the resulting data and discuss the consequences of embedding nanoparticles into these structures. [1] R. A. Ramsey et al., Appl. Phys. Letts. **88**, 051121 (2006). [2] S. C. Sharma et al., Phys. Rev. Letts, **87**, 105501 (2001)

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