

Single-layered PDLC for diffractive optics

G. B. Hadjichristov^a, Y. G. Marinov^b, A. G. Petrov^b

*a Laboratory of Optics and Spectroscopy, Georgi Nadjakov Institute of
Solid State Physics, Bulgarian Academy of Sciences, 72 Tzarigradsko
Chaussee Blvd., 1784 Sofia, Bulgaria*

*b Laboratory of Biomolecular Layers, Georgi Nadjakov Institute of Solid State Physics,
Bulgarian Academy of Sciences, 72 Tzarigradsko Chaussee Blvd., 1784 Sofia, Bulgaria*

The electrically and spatially controllable coherent light diffraction by liquid crystal (LC) droplets dispersed in an optically transparent polymer matrix is reported. Single layers of E7/NOA65 polymer-dispersed liquid crystals (PDLCs) are formed with a linear-gradient distribution of droplet size. The PDLC films contain truncated spherical LC droplets which diameter reaches several tens of micrometers. The single-layered arrangement of the PDLC films provides a tunability of the electrically-commanded coherent light diffraction controlled by the LC/polymer interface. The electro-optical properties are linked to the macro-structure and to the droplet organization of the PDLC films.