

Switchable two-dimensional gratings based on field-induced layer undulations in cholesteric liquid crystals

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We propose switchable two-dimensional (2D) diffractive gratings with periodic refractive-index modulation arising from layer undulations in cholesteric liquid crystals. The cholesteric cell can be switched between two states: (1) flat layers of a planar cholesteric texture and (2) a square lattice of periodic director modulation associated with layer undulations that produces 2D diffraction patterns. The intensities of the diffraction

droplet structures

^{2,3} in which the diffraction pattern is switched by changing the director field in the

Table 1. Materials and Their Electro-Optic Characteristics

Nematic Host	Birefringence of Nematic Host, Δn	Dielectric Anisotropy of Nematic Host, $\Delta\epsilon$	Chiral Dopant, % by Weight	Pitch, μm
E7	0.224	13.8	CB15, ~2.7%	5
5CB	0.211	11.5	CB15, ~2.8%	5
ZLI-3412	0.078	3.4	CB15, ~3.2%	5
BL015	0.28	16	ZLI-811, ~30%	0.31

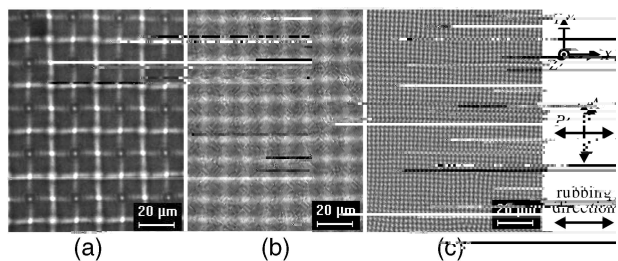


Fig. 1. Polarizing-microscopy textures of the 2D un-

