PSI-21

Fast tunable microlens array using electroclinic effect of chiral smectic A liquid crystals

Yongmin Lee(1), Kwang-Ho Lee[1], Kyung-Bae Kim[1], Yoonseuk Choi[2] and Jae-Hoon Kim[1,2]

[1] Department of Electronics and Computer Engineering, Hanyang University
[2] Research Institute of Information Display, Hanyang University
17 Haengdang-Dong, Seongdong-Gu, Seoul, 133-791, South Korea
jhoon@hanyang.ac.kr

For real-time optical applications, fast switching microlens arrays are essential. We demonstrate a new liquid crystal microlens array based on electroclinic effect of chiral smectic A liquid crystals, which achieves fast tunable and analog modulating device. The switching time of the proposed microlens array is approximately 24□s, which is more than 3 times faster than conventional microlens arrays with surface stabilized ferroelectric liquid crystals (SSFLCs). As the induced tilt angle in the smectic A phase is changed to the linearly increasing electric field, the focusing beam intensity of the proposed microlens array is linearly tunable with the applied electric field. The induced tilt angle for analog optical modulation is obtained around 10□ at room temperature. The proposed microlens array was fabricated by adopting a flat surfaced stacked layer of liquid crystalline polymer on a concave microlens array of UV curable polymer.

12th International Topical Meeting on Optics of Liquid Crystals

Book of Abstracts

October 1-5, 2007

Hotel NH

Puebla City México

Organized by

Instituto Nacional de Astrofísica, Óptica y Electrónica

Apartado Postal 51 y 216
Puebla Pue. 72000 Mexico
www.inaoep.mx

Benemérita Universidad Autónoma de Puebla

4 Sur # 104 Col. Centro
Puebla Pue. 72000 Mexico
www.buap.mx

POSTER SESSION I
MONDAY OCTOBER 1

	Author(s)	Abstract Title
PSI-1	Y. Reznikov, N. Eisenberg, M. Klebanov, Y. Kurioz, V. Lyubin, M. Manevich	Photoalignment of Liquid Crystals on Chalcogenide Glassy Films
PSI-2	S. Serak, N. Tabiryan ,G. Chilaya, A. Chanishvili, G. Petriashvili	Azobenzene nematics with chiral dopant photoswitchable with a green laser beam
PSI-3	O. Abbate, C. Chiccoli, P. Pasini and C. Zannoni	Monte Carlo simulations of a composite liquid crystal-polymer model system.
PSI-4	Anjuli Khandelwal	Twist Grain Boundary Phases shown by Bio-molecules
PSI-5	P.L. Almeida, J.L. Figueirinhas and M.H. Godinho	Cellulose derivative based PDLC type cells using cholesteric liquid crystal
PSI-6	Yue-Hua Cong, Ji-Wei Wang, Yan-Hua Du, Fan-Bao Meng & Bao-Yan Zhang	Textures of Cholesteric BP III of Polymer
PSI-7	S. Shelestiuk, V. Reshetnyak, A. Marino, G. Abbate	Understanding the dynamical behavior of Policryps and Poliphem composites: a theoretical model versus experimental results
PSI-8	Natalie Aryasova	Optical Testing of Alignment at Random Inhomogeneous Polymer Surfaces
PSI-9	J. Beeckman, F. Anibal Fernandez, R. James, E. Willman, K. Neyts	Finite element analysis of liquid crystal optical waveguides
PSI-10	O.O. Prishchepa, V.Ya. Zyryanov, A.P. Gardymova, V.F. Shabanov	Optical textures and orientational structures of nematic and cholesteric droplets with heterogeneous boundary conditions
PSI-11	S. Jana and S. Konar	Nonlinear Propagation of sinh-Gaussian Pulses in Dispersive Cubic Quintic Nonlinear Medium and formation of Bistable soliton
PSI-12	A. Corella-Madueño, J. A. Reyes and S. A. Salazar-Torres	Hydrodynamically controlled multiplexer based on a nematic fiber
PSI-13	Qiong Song, Haiqing Xianyu, Sebastian Gauza and Shin-Tson Wu	High birefringence and low crossover frequency dual-frequency liquid crystals
PSI-14	Gegham Zakharyan, Rafik Hakobyan, Artur Galstyan	Distribution of diffraction intensity in diffraction orders for thin anisotropic diffraction gratings
PSI-15	Gegham Zakharyan	Light diffraction in anisotropic reflection gratings: comparison with isotropic theory
PSI-16	E. Pérez, D. López-Velázquez, A.R. Hernández-Sosa, J.P. Fernández-Blázquez, A. Bello	Phase transitions in liquid-crystalline biphenyl derivatives
PSI-17	O.G. Morales-Saavedra, G. Pelz, V. Torrez-Zuñiga, C. Roman-Moreno, J. Ocotlan Flores-Flores and R. Ortega-Martinez.	Chlorine-substituted bent-core liquid crystal based sono-gel hybrid materials:Synthesis, optical and nonlinear optical properties
PSI-18	M. Pérez-Cortés, I. Maury-Cuna M. Ortiz-Gutierrez	Color filter design with optical activity in PDLC
PSI-19	M.A. Karpierz, U.A. Laudyn, K. Jaworowicz, K. A. Rutkowska	Nematicons in chiral nematics
PSI-20	A. S. Zolot'ko, I. A. Budagovsky, M. P. Smayev, and M. I. Barnik	Asymmetric aberration pattern at light beam self-action in NLC doped with stilbene dye
PSI-21	Yongmin Lee, Kwang-Ho Lee, Kyung-Bae Kim, Yoonseuk Choi and Jae-Hoon Kim	Fast tunable microlens array using electroclinic effect of chiral smectic A liquid crystals
PSI-22	A. Marino, I. Real, G. Abbate, I. Rendina, L. De Stefano, G. Barillaro	Liquid Crystal Tunable Si/Air Planar Bragg Gratings
PSI-23	A. Sanchez-Castillo, O. Baldovino-Pantaleon, A. Olivares-Perez and R. Ramos-Garcia	Critical opalescence and grating recording in liquid crystals doped with azo dyes