

High-frame-rate liquid crystal phase modulator for augmented reality displays

Ran Chen,^{1,2} Yuge Huang,² Jian Li,³ Minggang Hu,³ Juanli Li,³ Xinbing Chen,¹ Pei Chen,¹ Shin-Tson Wu^{2,*} and Zhongwei An^{1,3,*}

¹ Key Laboratory of Applied Surface and Colloid Chemistry, School of Materials Science and Engineering, Shaanxi Normal University, Xi'an 710119, China.

² College of Optics and Photonics, University of Central Florida, Orlando, FL 32816, USA

³ Xi'an Modern Chemistry Research Institute, Xi'an 710065, China

Electronic supporting information

Table S1. The fitting parameters of the three LC mixtures shown in Eqs. (1-3).

LC mixture	Δn_0	β	G (μm^{-2})	λ^* (μm)	A ($\text{ms}/\mu\text{m}^2$)	E_a (meV)
SNNU-1	0.369	0.173	3.29	0.265	1.69×10^6	403.3
MCRI	0.335	0.164	3.11	0.260	2.80×10^6	333.3
HTD028200-200	0.376	0.177	3.16	0.266	4.97×10^5	322.0

Table S2. Selected nine phase levels for PTP response time measurement.

Phase level	1	2	3	4	5	6	7	8	9
Voltage (V)	0	1.74	1.94	2.16	2.40	2.66	3.03	3.67	5.00
Phase change in a 3.43- μm transmissive cell (π)	0	0.28	0.55	0.83	1.10	1.38	1.66	1.93	2.21
Phase change in 1.55- μm reflective cell (π)	0	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00