

255.

Accession number:20113314242914

Title:Terahertz electrically controlled nematic liquid crystal lens

Authors:Li, Hui (1); Zhu, Chen (1); Liu, Kan (1); Zhang, Xinyu (1); Ling, Furi (3); Zhang, Tianxu (1); Shen, Xubang (1); Zhang, Cunlin (4); Ruan, Shuangchen (5)

Author affiliation:(1) Institute for Pattern Recognition and Artificial Intelligence, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China; (2) National Key Laboratory of Science and Technology on Multi-spectral Information Processing, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China; (3) Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China; (4) Department of Physics, Capital Normal University, Beijing 10048, China; (5) College of Electronic Science and Technology, Shenzhen University, Shenzhen, Guangdong 518060, China

Corresponding author:Li, H.(lihui00317@163.com)

Source title:Infrared Physics and Technology

Abbreviated source title:Infrared Phys Technol

Volume:54

Issue:5

Issue date:September 2011

Publication year:2011

Pages:439-444

Language:English

ISSN:13504495

CODEN:IPTEEY

Document type:Journal article (JA)

Publisher:Elsevier, P.O. Box 211, Amsterdam, 1000 AE, Netherlands

Abstract:We report some preliminary results on the realization of terahertz (THz) nematic liquid crystal (LC) lens with electric tunable focal length. A LC cell with a single circular-hole electrode is driven by an AC voltage to yield the desired spatial distribution of the refractive index. The two-dimensional function of the phase delay introduced into THz wave depends on the AC voltage and the electrodes contacting the LC layer. This lens is operated at room temperature and its convergent optical characteristic is demonstrated at  $118 \mu\text{m}$ . We realize the lens with a clear aperture of 1 mm. The lens matched with a bolometer array is capable of obtaining real-time THz images of a sample without any mechanical scanning. All rights reserved.

Number of references:26