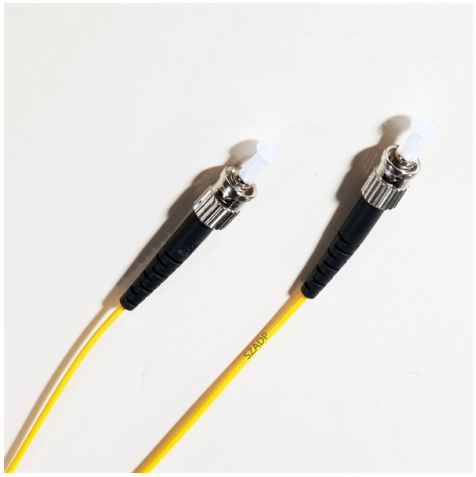
Metasurface Liquid Crystal Spatial Light Modulator



Overview

Here, we propose a concept of tunable dielectric metasurfaces modulated by liquid crystal, which can provide abrupt phase change, thus enabling pixel-size miniaturization. urface liquid crystal (LC)-based SLM for the modulation of high-power transmitted light. Our device uses a photoactive top contact which is optically addressed with a patterned 435 nm laser, cr ating a transient electrical contact that selectively switches the underlying LC medium. Here, we report on the design and realization of an optically addressable. Emerging demands for dynamic wavefront modulation in holographic displays, augmented/virtual reality, and light detection and ranging (LiDAR) require spatial light modulators (SLMs) with high pixel density and fast refresh rates.

Article Content

Progress in high-power and high-intensity structured light

In the past decade or so, the field has accelerated again with the introduction of rewritable solutions in the form of liquid crystal spatial light modulators (SLMs)

45-2: Invited Paper: Liquid crystal spatial light modulator for ...

1: Generating High-Resolution Light Field Displays for AR/VR Systems via Integral Imaging and Metasurface Optimization digital version 1-1: Invited Paper: Compact Energy Saving Pico Projector

Spatially Controlled All-Optical Switching of Liquid-Crystal-Empowered ...

Here, we demonstrate spatially controlled all-optical switching of the optical response of a homogeneous silicon nanocylinder metasurface featuring various Mie-type resonances in the

Phase-only transmissive spatial light modulator based on tunable

Here, we propose a concept of tunable dielectric metasurfaces modulated by liquid crystal, which can provide abrupt phase change, thus enabling pixel-size miniaturization.

Spatial light modulator via optically addressed metasurface

A metasurface-based spatial light modulator brings the pixel size down to the submicrometre scale while demonstrating real-time complex-amplitude holography, three

Measured and Predicted Speckle Correlation from

Spatial light modulators are essential optical elements in applications that require the ability to regulate the amplitude, phase and polarization of light,

Metasurface-enabled polarization-independent LCoS spatial light ...

We propose and demonstrate a metasurface-embedded LCoS device that achieves polarization-independent phase modulation at telecommunication wavelengths with 4K resolution

An Optically Addressable Transmissive Liquid Crystal Metasurface ...

LCs interact with both transmitted light and nanoscale metastructures in active devices. We show that our design and fabrication approach can yield high-performing transmissive metasurface S de ices

Phase-only transmissive spatial light modulator based

With a view toward developing near-eye augmented reality display technology, they combined a dielectric metasurface with a liquid crystal layer to

Dual-Mode THz Spatial Light Modulator Enabled by Liquid Crystal

Here, we propose a dual-mode SLM that simultaneously realizes reflection and transmission in a wide frequency range of 0.540 THz – 0.570 THz by modulating the state of LC. The SLM consists of

Accurate dynamic quantitative phase imaging using multi-wavelength ...

We present a novel, accurate, full-filed, dynamic quantitative phase imaging (QPI) technique by using multi-wavelength multiplexing and multi-plane iterative phase retrieval algorithm.

Metasurface-enabled polarization-independent LCoS

We propose and demonstrate, for the first time, an LCoS device that directly achieves high-performance polarization-independent phase modulation at

Liquid-Crystal Spatial Light Modulators and Their Applications

Liquid-crystal spatial light modulators achieve control of the light path by modulation of the refractive index. As an important phase-correction device, it plays an important role in adaptive

Electrically Reconfigurable Terahertz Metasurface Composed of a Liquid ...

The LCE meta-atoms exhibit excellent stability and repeatability, overcoming limitations of previous terahertz MEMS metasurfaces. This platform holds significant promise for next

Metasurface-enabled polarization-independent LCoS spatial light ...

With the distinct advantages of high resolution, small pixel size, and multi-level pure phase modulation, liquid crystal on silicon (LCoS) devices afford precise and reconfigurable spatial light ...

Metasurface-Enabled High-Resolution Liquid-Crystal

By carefully designing the metasurface, it is possible to fully control the properties of light in amplitude, phase, and/or polarization. When merged with

Mid-infrared optical modulator enabled by photothermal effect

Bright and stable near-infrared perovskite light emitters supported by multifunctional molecule design strategy Zwitterion-doped liquid crystal speckle reducers for immersive displays and vectorial

Direct Generation of an Array with 78400 Optical Tweezers Using a ...

Both (a) and (b) require a microscope objective to fo-cus the light spots into micrometer-scale optical tweezers. (c) An optical metasurface directly shapes the wavefront of light via a dense

An Optically Addressable Transmissive Liquid Crystal Metasurface ...

Here, we report on the design and realization of an optically addressable metasurface liquid crystal (LC)-based SLM for the modulation of high-power transmitted light.

Flexible Terahertz Beam Manipulations Based on Liquid-Crystal ...

Terahertz polarization and chirality modulation induced by asymmetry inversion combining chiral metasurface and liquid crystal anisotropy Article Full-text available Feb 2023

Metasurface-enabled polarization-independent LCoS spatial light ...

Liquid crystal on silicon (LCoS) spatial light modulator (SLM) is an important optical device that allows on-demand optical wavefront shaping and thus enables versatile functionalities

Metasurface holographic optical traps for ultracold atoms

Single atoms in optical trap arrays provide a promising platform to conduct fundamental quantum optics experiments and can enable a variety of technical applications, such as quantum

Optically Addressed Metasurface Spatial Light Modulator

Here, we report an optically addressed metasurface spatial light modulator (OA-MSLM), composed of independently tunable meta-atom supercells with a 756 nm pixel pitch.

Study of simulation model of diffractive neural network in liquid ...

For example, liquid crystal-based reconfigurable metasurfaces can adjust the effective dielectric constant by varying the DC voltage applied to microstrip patches on liquid crystal cells, thereby

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After passing the pulse energy controlling device and a beam expander, the laser illuminates a reflection type liquid crystal spatial light modulator (LC-R2500, Holoeye Photonics AG, Berlin, Germany).

Polarimetric Measurement of Jones Matrix of a Twisted Nematic Liquid ...

We present a novel and high accuracy (AE1°) technique for measuring the dierence in phase delay between the positive and negative eigenvectors of a twisted nematic liquid crystal

Polarization-multiplexed dynamic full-color holography using

This polarization-selective phase modulation relies on asymmetric photon spin conversion, wherein the chirality of the output light is always reversed relative to the input. Moreover, the

High-Quality-Factor Silicon-on-Lithium Niobate Metasurfaces for

Dynamically reconfigurable metasurfaces promise compact and lightweight spatial light modulation for many applications, including LiDAR, AR/VR, and LiFi systems. Here, we design and

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