

Reflective Phase Spatial Light Modulator

Article Overview

Reflective Spatial Light Modulators (SLMs) use Liquid Crystal on Silicon (LCOS) technology to modulate the phase, amplitude, or polarization of light with high resolution and speed.

Overview

Reflective SLMs are devices that modulate optical wavefronts by reflecting light off a liquid crystal layer mounted on a silicon backplane. Unlike transmissive SLMs, which allow light to pass through, reflective SLMs control light by altering its phase or amplitude upon reflection, making them ideal for high-power and high-precision optical applications (MEETOPTICS Academy).

Technology

Most reflective SLMs use LCOS technology, where a birefringent liquid crystal layer is sandwiched between a glass substrate and a CMOS silicon backplane. A reflective mirror, typically aluminum or dielectric, is placed on top of the silicon chip. The tilt of the liquid crystal molecules is controlled electrically, which changes the refractive index and thus the optical path length, enabling precise phase modulation (HOLOEYE ; MEETOPTICS Academy).

- Aluminum mirrors provide broad wavelength reflection, suitable for multiple laser sources.
- Dielectric mirrors are optimized for specific wavelengths, offering higher reflectivity and reduced absorption, which is critical for high-power laser applications (MEETOP...

Article Content

Jun 14, 2026

Spatial light modulator

Schematic of a liquid crystal-based Spatial Light Modulator. Liquid crystals are birefringent, so applying a voltage to the cell changes

Apr 17, 2026

Spatial Light Modulators | MEETOPTICS Academy

Spatial light modulators (SLMs) are a type of transmissive or reflective device that is used to modulate amplitude, phase, or

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Progress in Phase Calibration for Liquid Crystal Spatial Light Modulators

Phase-only Spatial Light Modulator (SLM) is one of the most widely used devices for phase modulation. It has been

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Phase Calibration of Liquid-Crystal-Based Spatial Light Modulators ...

Phase-only spatial light modulators (SLMs) are very useful and versatile components for various wavefront-shaping

Aug 29, 2025

Frontiers | Spatially Addressable Polarimetric Calibration of ...

Spatial light modulator (SLM) is a programmable liquid crystal device (LCD), which is used to modulate the amplitude,

Aug 10, 2025

LCOS-SLM (optical phase modulator) X15213-03CL

The X15213-03CL is a reflective phase only Spatial Light Modulator (SLM), based on Liquid Crystal on Silicon (LCOS) technology

Oct 10, 2025

(PDF) Spatial light modulators

Spatial Light Modulators (SLMs) are quasiplanar devices, allowing for the modulation of the amplitude, phase and

Mar 01, 2026

Determination of the phase

Abstract The use of liquid crystal spatial light modulators in applications, require good characterization of phase,

Feb 18, 2026

Spatial Light Modulator Principles

Spatial Light Modulator Principles Meadowlark Optics award-winning Spatial Light Modulators (SLMs) provide precision retardance

May 31, 2026

Spatial Light Modulators

Thorlabs' Exulus® Spatial Light Modulators (SLMs) employ Liquid Crystal on Silicon (LCoS) technology to

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LCOS-SLM (Optical phase modulator) | Hamamatsu Photonics

LCOS-SLM are reflective spatial light phase modulators that freely modulates optical phases and optical phase of

Sep 06, 2025

Alternative use of reflection spatial light modulator in phase shifting ...

This beam is modified using a Spatial Light Modulator (SLM), where a number of selected SLM pixels generate a plane

Sep 25, 2025

Spatial Light Modulators | MEETOPTICS Academy

What are Spatial Light Modulators? Spatial light modulators (SLMs) are a type of transmissive or reflective device that is used to

Nov 30, 2025

Spatial Light Modulators

Spatial light modulator (SLM) is a general term describing devices that are used to modulate amplitude,

Jul 03, 2026

Spatial Light Modulators and Their Applications in Polarization ...

Spatial light modulators (SLMs) are electro-optical devices, pertaining to manipulating the fundamental

May 20, 2026

Phase Modulation Characteristics of Spatial Light

Abstract: The phase modulation characteristics of liquid crystal SLM (spatial light modulator) and the system for calibrating are

Sep 03, 2025

High resolution multispectral spatial light modulators based ...

A spatial light modulator is demonstrated based on Fabry-Perot nanocavity resonances, enabling micrometer-sized

Sep 26, 2025

LCOS Spatial Light Modulator Technology

LCOS Structure and Function — Intrinsic polarization modulation / phase modulation for p- and/or s-polarizations — Phase-only

Dec 07, 2025

Digital spatial light modulators

The PLUTO phase-only spatial light modulator kit from HOLOEYE Photonics AG (Berlin, Germany) is based on a reflective liquid

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PLUTO-2.1 LCOS Spatial Light Modulator

The PLUTO-2.1 LCOS Spatial Light Modulator is the all-rounder within our product range. It is the best

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Polarization phase shifting interferometric technique for phase ...

Calibration of phase in spatial light modulators is a prerequisite for applications where a prespecified phase distribution

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Spatial Light Modulators

LETO-3 Phase Only Spatial Light Modulator Series The LETO-3 Spatial Light Modulator is our fast SLM platform with high band

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All-solid-state spatial light modulator with independent phase and ...

By controlling two voltage gates separately from one another, a spatial light modulator has been made that can

Jan 09, 2026

Liquid Crystal Spatial Light Modulator with Optimized Phase ...

A liquid crystal on silicon spatial light modulator (LCoS SLM) with large phase modulation has been thoroughly

Dec 22, 2025

Spatial Light Modulation as a Flexible Platform for Optical Systems

Abstract Spatial light modulation is a technology with a demonstrated wide range of applications, especially in optical systems.

Sep 16, 2025

Melia Bonomo / SLM Intro

A spatial light modulator (SLM) is a transmissive or reflective device that's used to spatially modulate the

Jul 31, 2025

Spatial Light Modulators (SLMs)-JCOPTIX MALL

The reflective spatial light modulator provided by JCOPTIX adopts a new silicon-based liquid crystal display (LCOS-LCD) method,

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Spatial Light Modulators

Our liquid crystal on silicon (LCoS) spatial light modulators boast exceptional speed, efficiency, and high

Apr 23, 2026

Adaptive focal lengths in white light focusing Fresnel lenses enabled ...

Here, we first examine a novel adaptive focal length in white light focusing by using reflective-type and phase-only spatial light

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.iiss.co.za>

Email: sales@iiss.co.za

Phone: +27 63 174 2895

Address: Unit 8, Innovation Park, 15 Rivonia Road, Sandton, Johannesburg,
2196, South Africa

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