

Principle of SLM Spatial Light Modulator



AI Overview

A Spatial Light Modulator (SLM) controls the amplitude, phase, or polarization of light in a spatially varying manner using a matrix of individually addressable pixels.

Basic Principle

An SLM functions by modulating the properties of an incident light beam—intensity, phase, or polarization—across its spatial profile. This is achieved through a matrix of pixels, each of which can be independently controlled electrically or optically to alter how light is transmitted or reflected. The modulation can be transmissive, where light passes through the device, or reflective, where light is reflected after modulation.

Liquid Crystal-Based SLMs

Most modern SLMs use liquid crystal (LC) technology, particularly Liquid Crystal on Silicon (LCOS) devices. In LCOS-SLMs, a liquid crystal layer is sandwiched between a silicon substrate with pixel electrodes and a glass substrate with transparent electrodes. Applying a voltage to each pixel changes the orientation of the liquid crystal molecules, which in turn modifies the refractive index and the optical path length of light passing through or reflecting off the pixel. This allows precise phase modulation without altering the intensity profile of the beam.

Pixel Control and Phase Modulation



Article Content

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

LCOS Spatial Light Modulators: Trends and Applications

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

Spatial Light Modulators | MEETOPTICS Academy

SLMs function by dynamically altering the properties of light through a matrix of pixels. These pixels are controlled electrically or

Spatial Light Modulation Principles

Meadowlark Optics award-winning spatial light modulators (SLMs) provide precision retardance control for

Spatial Light Modulators

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

spatial light modulator

A spatial light modulator (SLM) is a pixellated liquid crystal device that can individually control the phase value of each pixel. It

(PDF) Spatial light modulators

Spatial light modulators (SLM) are opto-electronic micro-displays capable to modulate the amplitude, the phase, or the

Getting to grips with spatial light modulators

Spatial Light Modulators (SLMs) have advanced the fields of complex and structured light. These Liquid-Crystal-on

Functional principle of the spatial light modulator (SLM)-based...

Functional principle of the spatial light modulator (SLM)-based spectrometer setup. Light diffracted from grating G1 is imaged onto

Santec Spatial Light Modulator Solutions Guidebook

From switching optical networks that support the vast amounts of data in modern society to optical computing that solves power

CHAPTER 5: SPATIAL LIGHT MODULATOR SYSTEM

Spatial Light Modulator (SLM) is a device that modulates the coherent light based on its control input. It is used in the LIM to encode

spatial light modulator | Photonics Dictionary | Photonics Marketplace

A spatial light modulator (SLM) is an optical device that modulates or manipulates the amplitude, phase, or polarization of light in two

Spatial Light Modulators

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

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.

Spatial light modulator

A spatial light modulator (SLM) is a device that can control the intensity, phase, or polarization of light in a spatially varying manner.

Spatial Light Modulator: Revolutionizing Optical Technologies

A Spatial Light Modulator (SLM) adjusts and controls the intensity, phase, or polarization of light passing through or

Melia Bonomo / SLM Intro

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

Spatial light modulator | Description, Example & Application

Spatial light modulator (SLM) is a device that manipulates light spatially using an array of pixels. It has applications in

HowTo: Spatial Light Modulators

The former would describe spatial light modulators like the RealHolo, the Texas Instruments PLM or Silicon Light Machines PLV. In

Contact Us

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

Website: <https://kilitech.co.za>

Email: info@kilitech.co.za

Phone: +44 20 7183 2649

Address: 1st Floor, The Shard, 32 London Bridge Street, London, SE1 9SG,
United Kingdom

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