



POLARIZATION INDEPENDENT CAPABILITY —256 x 256 Spatial Light Modulator

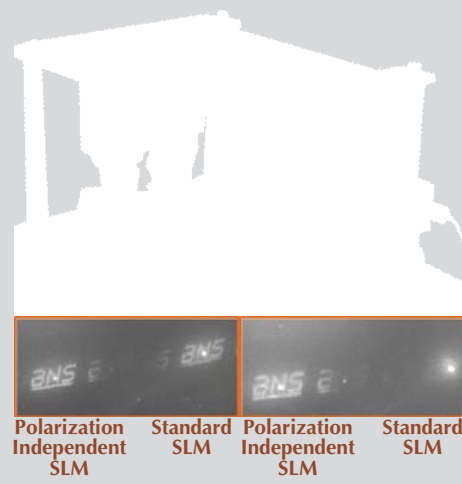
Boulder Nonlinear Systems is currently offering Engineering Evaluation Samples for the first Polarization Independent Liquid Crystal on Silicon Spatial Light Modulator (LCoS SLM).

LCoS SLMs are proving to be an essential component in a variety of applications such as flexible-grid fiber telecommunication networks, enhanced microscopy and high-resolution adaptive optics (AO). Boulder Nonlinear Systems (BNS) has developed a high-resolution, polarization-independent, phase SLM capability which has not been commercially available until now. This unique device opens up new market possibilities by overcoming several limitations and obstacles that exist with present day LCoS and micro-electromechanical system (MEMS) SLM devices.

POLARIZATION INDEPENDENT LCoS vs. STANDARD LCoS

The polarization state of light coming out of a telecom fiber can vary due to changes in temperature or mechanical stress. If the SLM used to switch that light is not polarization independent, a host of additional components are required to avoid a complete loss of modulation for certain polarization states, which can directly impact network integrity.

For microscopy, an SLM that could modulate all polarization states would result in a big leap in optical efficiency, and more light is critical in light-starved applications such as single-molecule fluorescence microscopy.



APPLICATIONS

- Telecommunications
- Flexible-grid fiber networks
- Enhanced Microscopy
- High-resolution Adaptive Optics

UNIQUE ADVANTAGES

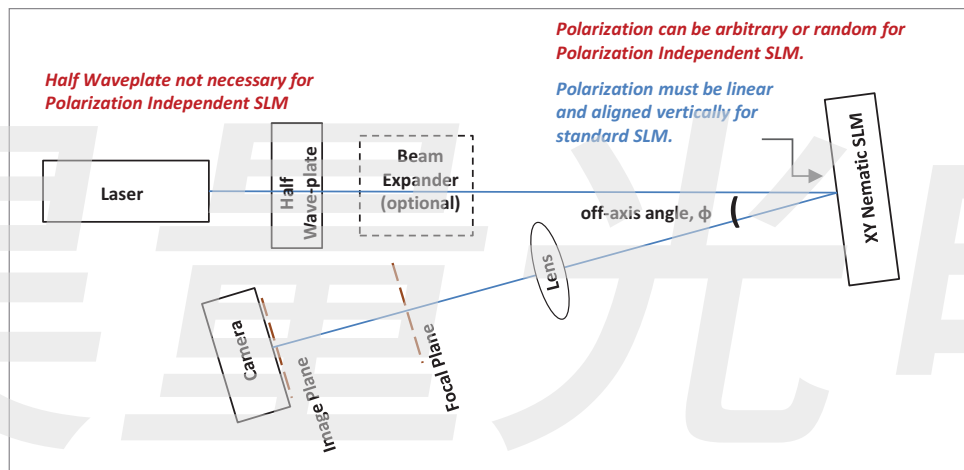
- Doubles your efficiency
- Analog phase operation
- Efficiently diffracts randomly polarized light
- Insensitive to polarization variation
- Diffracts LED light
- Works up to 1550 nm

POLARIZATION INDEPENDENT LCoS vs. MEMS

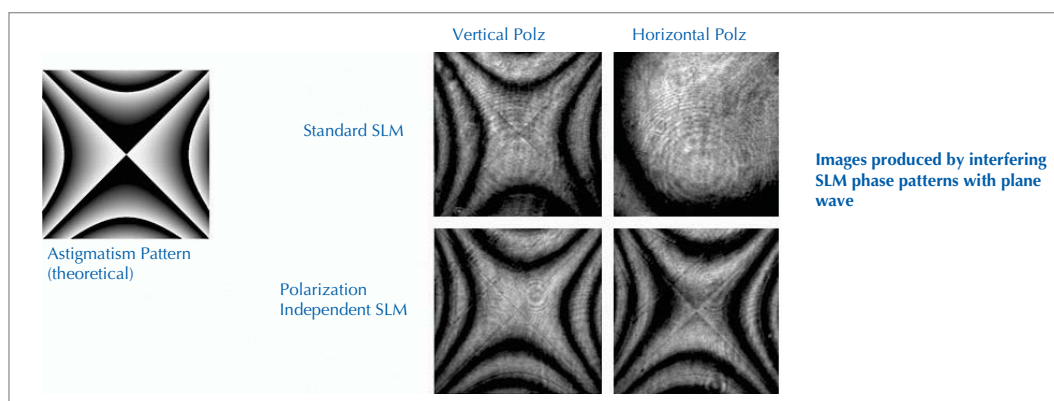
Analog MEMS Resolution – Due to the complication of controlling many mechanical actuators in an analog fashion, the array size of MEMS devices is quite limited compared to LCoS devices. For the new flexible-bandwidth routing schemes being proposed to maximize fiber network utilization, the limited number of actuators in MEMS devices greatly restricts network flexibility. Resolution (pixel count) is also an issue for several microscope and AO applications needing complex phase holograms or phase patterns to extract signal information, such as digital holography.

XY POLARIZATION INDEPENDENT SLM – OPTICAL SET-UP & RESULTS

The Boulder Nonlinear Systems, Inc. (BNS) XY Nematic Series Polarization Independent Spatial Light Modulators (PI SLMs) are designed for versatility and ease of use in typical optical laboratory environments. The XY Nematic Series PI SLMs are optimized to provide a full wave (2π) of phase stroke upon reflection at one of several nominal design wavelengths. These SLMs provide phase-only modulation regardless of the polarization state of the input light source.



Optical Setup



Phase Pattern Comparison



Boulder Nonlinear Systems • 450 Courtney Way • Lafayette, Colorado 80026 • 303-604-0077