An innovative SLM technology for fast achromatic and unpolarized wavefront correction

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Abstract

Spatial Light Modulators (SLM) are commonly used for wavefront correction or wavefront shaping. They feature unrivaled resolution (up to 3840x2160) in a compact form factor. However, despite the ongoing progress in performances, Liquid-crystal-based LCOS-SLM currently require polarized light, have limited speed, and a significant chromatic effects due to the phase wrapping required in most applications. This paper presents a new concept of photothermal spatial light modulator (PT-SLM) for wavefront shaping solving the major difficulties of LCOS-SLM. While keeping the main advantages of the SLM technology the new concept of PT-SLM vastly improves the optical transmission and the wavelength range of the SLMs structure, is insensitive to polarization and suppresses the diffraction artifacts resulting from the predefined pixel grid of the digital SLM. The first proof of concept results are presented, and the performance characteristics of the design are analyzed experimentally and theoretically.

Keywords: SLM

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