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Magneto-optic spatial light modulators for high-density holographic data storage

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Spatial light modulator (SLM) is a real-time micro-device for modulating the amplitude (or intensity), phase, or polarization of an optical wave as a function of the spatial position across the wavefront. Recent need of more sophisticated SLMs enabling ultra-high speed modulation of light have resulted from the renewed interests in holographic data storage or 3-dimensional display, which generally necessitate high rate of data transfer. Magneto-optic spatial light modulators (MOSLMs) are good candidate for such applications. They provide magnetic visual images based on the Faraday effect, and the pixel switching takes place by the magnetization reversal being inherently very fast in the order of several nanoseconds. Nonvolatility, robustness and radioactive resistance are also the main features of MOSLM. In this paper, we present two types of MOSLMs with LPE-grown magnetic garnet films; one is driven by current (*i*-MOSLM) while the other is driven by voltage (*v*-MOSLM) for controlling the direction of magnetization in a magneto-optic pixel. These SLMs are attractive for optical volumetric recording with holography. At the conference, we show our recent results on these SLMs and their applications in high-density data storage with collinear holography.