

# Homogenized Fourier transform holographic data storage using phase spatial light modulators and methods for recovery of data from the phase image

Joby Joseph and D. A. Waldman

We present a method for homogenizing the Fourier spectrum for holographic digital data storage by use of a phase spatial light modulator (SLM) and methods for the recovery of data from a phase image are implemented and discussed. Binary digital data are displayed on a phase SLM operating in 0 and  $\pi$  phase modes to optimally remove the intense dc peak so as to obtain a homogenized Fourier spectrum. Methods based on holographic interferometry have been developed and employed for the recovery of the original amplitude data page from the phase-data page. A new edge-detection-based method also has been demonstrated and analyzed for the reconstruction of the original data. Experimental results are presented to confirm the feasibility of these novel techniques. © 2006 Optical Society of America

*OCIS codes:* 210.0210, 210.2860.

1 September 2006 / Vol. 45, No. 25 / APPLIED OPTICS