

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Laser Beam Shaping For Lithography on Inclined and Curved Surfaces Using a liquid crystal Spatial Light Modulator** JAVAD R. GATABI, WILHELMUS GEERTS, Physics Department, Texas State University at San Marcos, DAN TAMIR, Department of Computer Science, Texas State University at San Marcos, KUMAR PANDEY, Department of Electrical Engineering, Texas State University at San Marcos — An exposure tool for lithography on non-flat substrates that includes a real time photoresist thickness and surface topography monitor is under development at Texas State University. Exposure dose and focusing are corrected on curved parts of the sample using novel laser beam shaping techniques: two approaches using a Holoeye liquid crystal spatial light modulator (LC-SLM) are being investigated: (1) the implementation of multiple lenses with different focal lengths to split the beam into several parts and keeping each part in focus depending on sample topography; (2) the implementation of a tilted lens function resulting in a tilt of the image plane. Image quality is limited by quantization aberration, caused by the phase modulator's bit depth limitation, and pixelation aberration, caused by the modulator's pixel size. A statistical analysis on lenses with different focal lengths provides a detailed description of the mentioned aberrations. The image quality, i.e. resolution and contrast of both techniques, are determined from developed photoresist patterns on curved samples and compared to the theory.

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Date submitted: 29 Nov 2012

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