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Aspect Ratio Study of Microstructures Formed using an Adaptable Photomask ANNA FOX, ADAM FONTECCHIO, Drexel University — We present an aspect ratio study of microstructures fabricated using a holographically formed polymer dispersed liquid crystal (H-PDLC) adaptable photomask. Recently it has been shown that H-PDLC films can act as electrically controllable light valves to selectively allow transmission of UV exposure in the lithographic process, making it ideal for application as a reconfigurable photomask. This study focuses on comparing aspect ratios of structures patterned using this adaptable photomask and processed with wet etching and reactive ion etching techniques. Aspect ratio comparisons with structures fabricated using a binary mask and etched using an identical process are presented. Results indicate that features formed using an adaptable H-PDLC mask have comparable aspect ratios to features fabricated using a binary mask. H-PDLC is a polymeric material formed holographically to have periodically spaced stratified layers of cured monomer and liquid crystal droplets. Reflection of a particular band of wavelengths occurs due to the periodicity of the layers and the index mismatch of the randomly aligned liquid crystal droplets. Bias applied to the film electrically aligns the liquid crystal layers eliminating the index mismatch yielding a transparent film.

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