

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Large-scale diffusion in thick photopolymer systems MATTHEW W. GRABOWSKI, AMY C. SULLIVAN, Department of Physics, Univeristy of Colorado, ROBERT R. MCLEOD, Department of Electrical and Computer Engineering, University of Colorado — The development of index change in millimeter-thick photopolymers designed for holography and optical devices has been studied on the micron scale using Bragg diffraction. These studies have revealed the importance of the relative diffusion rate of small molecules to the local polymerization rate but are limited to scales of less than about one micron. To probe the role of diffusion on larger scales, we introduce a form of direct-write lithography using multiple mutually-incoherent foci. This enables measurement of the development and relaxation time-constants over millimeter scales. These large-scale diffusion currents will impact applications in optical data storage, integrated optics, lenslet arrays and other large-scale exposures of these diffusion-limited photopolymers.

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Date submitted: 20 Nov 2006

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