Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Holographic liquid crystal photonic materials stabilized with monoacrylate LC monomer. AUGUSTINE URBAS, ERIC BECKEL, VINCENT TONDIGLIA, LALGUDI NATARAJAN, TIMOTHY BUNNING, AFRL — Active structured optical materials such as dynamically tunable photonic crystals have potential technological applications in imaging and communications. Structured liquid crystal materials are especially promising for their observed high performance and wide range of dynamic response. In addition, they provide multiple routes of response, including electro-optic and photo-optic. Reverse mode holographic polymer dispersed liquid crystals (HPDLCs) are typically fabricated by multiple laser beam exposure of an LC photo-sensitive syrup containing diacrylate liquid crystal (LC) monomer. The function of the diacrylate monomer is to form the basis of a highly cross-linked network which stabilizes regions with high polymer content. The use of monoacrylate functional liquid crystals in this application has the potential of tuning the stabilizing effect of the polymer network by changing the crosslink density. This affects the switching time and the contrast between stabilized and unstabilized regions of the patterned structure. These parameters are particularly important to photo-switchable patterned photonic structures containing azobenzene derivatives. The effects on electro-optic and photo-optic properties of reverse mode HPDLCs containg of different monoacrlyate functional liquid crystal fractions in the stabilizing patterned polymer network will be presented.

Augustine Urbas
AFRL

Date submitted: 11 Jan 2006 Electronic form version 1.4