

Abstract Submitted
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Holographically

phase separated gold/nanoparticle films KASHMA RAI, Drexel University, ADAM FONTECCHIO, Drexel University — Holographic Polymer Dispersed Liquid Crystals (HPDLCs) show a shift in the reflected wavelength due to a change in the fringe separation of the Bragg gratings when pressure is applied perpendicular to the surface plane. Typically urethane based monomer forms the polymer layer via photopolymerisation by holographic laser exposure in conjunction with liquid crystals. In this paper we study the effect of step variation in pressure in the range of 0-20psi on the peak wavelength reflection of the holographic polymer dispersed gold nanoparticles. The high refractive index mismatches between gold and polymer composition produces good quality Bragg diffraction gratings. We investigate the use of Polydimethylsiloxane (PDMS), a siloxane based oligomer with high elasticity as the polymer for the gold/ polymer grating formation. The high elasticity of the PDMS along with sensitivity of the film to applied pressure enhances the pressure response. We present the application of the polymer /gold nanoparticle films for pressure sensors, in which a linear change in the wavelength of the reflected light corresponds to the pressure variations on the films.

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