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Wavefront Analysis as a Predictive Tool for Polymer/Liquid Crystal Composites with Nanostructures JARED COYLE, SAMEET SHRIYAN, ADAM FONTECCHIO, Drexel University — Nano-scale morphology is a key factor in determining the optical performance of holographically-formed polymer dispersed liquid crystal (HPDLC) thin films. The liquid crystal(LC)/polymer interface and droplet structure in these materials effects optical performance. Established microscopy techniques such as SEM and TEM are conventionally used to examine interfacial properties. In this paper, HPDLC reflective and transmissive wavefront analysis are used to examine gratings created using three different polymer formulations: acrylate, thiol-ene and a combination of acrylate and thiol-ene. Changes in the modulation transfer function, Strehl ratio and wavefront phase of both transmissive and reflective wavefronts are compared to morphological properties shown in SEM images. Wavefront properties were measured using a Shack Hartman wavefront analyzer. Optical performance characteristics were measured using an Ocean Optics spectrometer, halogen light source and oscilloscope.

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