

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Scattering studies of stacked polymer/liquid crystal composites**

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— In this work we investigate light scattering from stacked polymer/liquid crystal composite films on several different substrates. Effect of different substrates such as glass, PET and PMMA coated with conductive layers such as Indium-Tin-Oxide (ITO) and PEDOT:PSS conducting polymer are analyzed using scattering and wavefront measurements. Scattering of light in both transmission and reflection mode is measured as a function of angle and its effect using different substrate layers coated with different conducting layers is analyzed. Shack Hartmann wavefront sensor is used to characterize the effect of various substrate and conducting layers on the transmitted wavefront quality in both transmission and reflection mode. Optimal stack length at which the scattering and wavefront degradations are at acceptable levels is derived from the scattering and wavefront measurements. Spectrometry results show notch formations at different wavelength and the effect on transmitted baseline reduction due to scattering using different substrates. SEM imaging shows the effect of different substrates and conducting layers on the formation and quality of gratings along with the LC droplet size which contributes to scattering. Optical path and stack length reduction of up to 45% for a stack of 10 layers is confirmed.

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Date submitted: 04 Dec 2007

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