Analytical Study Of Holographic Polymer Dispersed Liquid Crystals Using Finite Difference Time Domain Method

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Abstract : In this research, we have studied and analyzed the modulation of light and liquid crystal in HPDLCs using Finite Domain Time Difference (FDTD) method. HPDLCs are modeled as a mixture of polymer and liquid crystals (LCs) that categorized as an anisotropic medium. FDTD method is directly solves Maxwell's equation with less approximation, so this method can analyze more flexible and general approach for the arbitrary anisotropic media. As the results from FDTD simulation, the highest diffraction efficiency occurred at ±19 degrees (Bragg angle) using p polarization incident beam to Bragg grating, Q > 10 when the pitch is 1µm. Therefore, the liquid crystal is assumed to be aligned parallel to the grating constant vector during these parameters.

Keywords : birefringence, diffraction efficiency, finite domain time difference, nematic liquid crystals
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