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器件物理及器件制备技术

液晶闪耀光栅中的指向矢二维分布与特性研究

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摘要：　在连续弹性体理论的基础上,采用差分迭代数值分析方法仿真模拟了液晶闪耀光栅中的液晶分子指向矢二维分布情况。利用液晶的电控双折射特性,对液晶光栅电极施加经过插值计算以及修正后的周期电压,使之形成光程差阶梯形分布,具有二元光栅结构的液晶闪耀光栅。得到了液晶光栅的光程差以及相位延迟曲线。通过实验,采用四分之一波片法作出了相位延迟随电压的变化关系曲线,验证了仿真结论,给出了周期电场分布的液晶闪耀光栅在正交偏光下的显微照片。

关键词：　液晶闪耀光栅　指向矢二维分布　电控双折射　二元光栅

Molecule Directors Two-Dimensional Distribution Simulation and Characteristics Research of Liquid-Crystal Blazed Grating

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Abstract: On the basis of the continuous elastic theory, the molecule directors two-dimensional distribution of a liquid-crystal blazed grating is simulated by difference iteration method. The electrodes are applied periodic voltages got by one-dimension spline method and adjustment. The liquid crystal cell is became a blazed grating with the optical path difference binary grating distribution by electrically controlled birefringence. The optical path difference curve and the phase delay curve are got. The simulation conclusion is verified by the experiment of the phase delay versus voltage calibration curve with quarter-wave plate method. The LC blazed grating photomicrograph under the orthogonal polarization is given.

Keywords: liquid-crystal blazed grating　molecule directors two-dimensional distribution　electrically controlled birefringence　binary grating

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