

论文

基于紫外纳米压印的菲涅耳透镜制作

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摘要:

针对传统聚光系统中菲涅耳透镜成本较高并且光强分布不均匀的弊端,提出了利用紫外纳米压印技术制作菲涅耳透镜的方法。利用几何光学的光线追迹理论,设计了菲涅耳透镜模具。采用自行研制的紫外纳米压印系统对模具进行压印,紫外曝光后制得薄膜菲涅耳透镜。在太阳光下进行了测试,测试结果表明,低成本、高聚光倍数和光强分布均匀的菲涅耳透镜是可以实现的。

关键词: 菲涅耳透镜 紫外纳米压印 聚光型太阳能系统 UV固化胶

Ultraviolet Nanoimprint Lithography for fabricating Fresnel lens

Abstract:

In view of the drawbacks of Fresnel lens in the traditional condenser optical system, which needs high cost and the light intensity distribution is uneven. A method of fabricating Fresnel lens by ultraviolet nanoimprint lithography is put forward. The mold of Fresnel lens is designed through ray-tracing theory of geometrical optics. The mold is imprinted by the ultraviolet nanoimprint lithography system. And after employing UV light to cure the resin, the ultra-thin Fresnel lens is fabricated. The optical properties of the ultra-thin Fresnel lens on are tested and analyzed in the sunshine. And the results show that the Fresnel lens which has low cost, high concentration and even light intensity distribution can be realized.

Keywords: Fresnel lens Ultraviolet nanoimprint lithography Concentrator photovoltaic systems UV curable resin

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