

SPIE' s Photonics West 2003

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1. 会議の概要

- 名称: Photonics West 2003
- 主催: SPIE
- 開催場所: San Jose Convention Center, San Jose California
- 日時: 25-31 January 2003
- 主な内容:
 - BiOS 2003 (Biomedical Optics)
 - LASE 2003 (Lasers and Applications in Science and Technology)
 - Optoelectronics 2003 (Integrated Optoelectronic Devices)
 - MF 2003 (Micromachining and Microfabrication)

2. 発表内容

- Title: Femtosecond laser ablation processing of x-cut LiNbO₃ substrates for optical communication devices
- Authors: R. Kitano, K. Ozono, M. Obara, H. Tsuda
- Conference: Laser Applications in Microelectronic and Optoelectronic Manufacturing VIII (4977A)
- Paper Number: 4977A-57
- Presentation type: Poster
- Date of Presentation: 28 Jan 2003
- Abstract: We propose the diffractive optical element using the sub-wavelength scale pillar array structure. The equivalent macroscopic refractive index can be controlled by changing pillar width and the pillar lattice constant. Advantages of using the sub-wavelength scale structure to manipulate the equivalent index in such a manner are that the optical functional elements can be fabricated by a single-etch-step process, and that the anisotropic optical characteristics can be realized using isotropic materials. In this paper, we have designed and fabricated the Fresnel lens with sub-wavelength structure on the Si substrate. The equivalent refractive index, n_{eff} , as a function of the pillar width and the lattice constant was calculated by the EMT (Effective Medium Theory). The width of pillar at the n -th lattice point, a_n , was determined by n_{eff} and required the local optical length of the target diffractive optical element. The design wavelength, λ , was set at 1.6 μ m, the lattice constant, Λ , was 0.45 μ m, the pillar height, h , was 1.21 μ m, and the refractive index of Si, n_{Si} , was 3.48, respectively. These parameter values satisfied the sub-wavelength condition of $\Lambda > n_{Si} \times \lambda$. The Fresnel lens with a focal length of 20 mm and the effective diameter of 1.8mm was designed and fabricated.

Posters

