

## 论文

### 低功率近红外光的偏振方向对光致折射率变化影响的实验研究

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摘要:

研究了利用低功率近红外光辐照In: Fe: LiNbO<sub>3</sub>晶体时写入光束的偏振方向对光致折射率变化( $\Delta n$ )的影响.分别采用正常偏振(o光)和非常偏振(e光)的近红外细激光束,在In: Fe: LiNbO<sub>3</sub>晶体中进行了光折变实验.研究表明,两种偏振方向引起晶体的 $\Delta n$ 实测曲线相似,但变化规律恰好相反,o光引起的折射率变化量约是e光的3倍左右.近红外光写入下两种偏振光束引起晶体的 $\Delta n$ 分布规律都不同于可见光,尤其是e光辐照区域中心晶体的折射率升高.因此,通过选择不同偏振方向的近红外光可以在光折变晶体中制作不同折射率分布的非线性光学器件.

关键词: 近红外光 偏振方向 光折变效应 In: Fe: LiNbO<sub>3</sub>晶体

### Experiment Research for the Influence of Polarization Direction |of Low-power Near-infrared Light on the Light-induced Refractive Index Change

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Abstract:

The influence of the polarization direction of light-induced refractive index change( $\Delta n$ ) induced by light irradiation in In: Fe: LiNbO<sub>3</sub> crystals were investigated by using ordinary and extraordinary recording polarization(opol/epol) laser beams of low-power near infrared light. The experimental results show that the curves are similar of the refractive index distribution, but they have opposite signs, and a further difference is that the saturation refractive index change is clearly larger for ordinary recording polarization, changing to extraordinary recording polarization result only about one-third. The refractive index change in photorefractive crystals induced by two polarization directions of near infrared light is differ from visible light. The crystal illuminated with extraordinary polarized light in the middle of the irradiation region, one can see a strong increased of the refractive index. Moreover, the results can be very useful for fabrication of tailored nonlinear optical device with different refractive index distributions by changing different the polarization directions of near infrared beam.

Keywords: Near infrared light Polarization direction Light-induced refractive index change

In: Fe: LiNbO<sub>3</sub> crystal

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