

Fabrication of Domain-inverted Grating in LiNbO₃ by Electron-beam Scanning

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Abstract A domain-inverted grating is realized by using a scanning electron microanalyzer. Domain inversion in Z-cut LiNbO₃ by injecting electrons into C-face was observed. It was found that the scanning trace on the crystal surface tended to segment and the inversion width near the crystal surface was thinner than that inside the crystal. With different scan rates and beam currents, we get different domain widths and depths. The domain inversion mechanism was also discussed roughly.

Key words electron scanning, domain-inverted grating, waveguide, LiNbO₃, second-harmonic wave, scanning rate, line-charge density

钛宝石再生放大器

最近我们利用中国科学院上海光机所生长的钛宝石激光晶体,研制成功了钛宝石激光再生放大器。放大器输出光脉冲能量为 3.6 mJ,工作中心波长为 800 nm,重复频率为每秒 10 次。再生放大器的腔为平凹腔。凹面镜曲率半径 $R = 4$ m。腔长 1.76 m。腔内放置两个普克尔盒,一个 1/4 波长片,一个偏振片,作为种子脉冲的注入和放大后光脉冲的取出。钛宝石晶体尺寸为 $6 \times 6 \times 14$ mm, $\alpha_{490} = 2.6 \text{ cm}^{-1}$,两端布儒斯特角切割。放大器的泵浦源为倍频调 Q Nd:YAG 激光器。单脉冲泵浦能量为 50 mJ,种子脉冲来自于自锁模钛宝石激光器,重复率为 82 MHz,输出平均功率为 400 MW,脉冲宽度为 80~100 fs。种子脉冲经过光栅展宽器后注入到再生腔中从而实现光脉冲的有效放大,放大器放大倍数为 3.6×10^6 ,工作稳定。

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