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激光物理与激光器件

基于CO_2激光的$AgGaSe_2$晶体中3次谐波产生

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摘要:

为了在$AgGaSe_2$ 晶体中产生3次谐波,利用自行研制的1台可调谐脉冲CO_2激光器,在2次谐波中采用Ⅰ类匹配,并在3次谐波中采用Ⅱ类匹配的方法。实验中CO_2激光输出波长为9.6μm,在$AgGaSe_2$ 晶体中得到了波长为4.8μm的2次谐波以及波长为3.2μm的3次谐波,其峰值功率分别为88kW和4kW,并测量了相位匹配允许角。结果表明,在该$AgGaSe_2$晶体实验中能有效地输出3次谐波,随着CO_2激光功率的增大,输出2次谐波峰值功率和3次谐波峰值功率的级数都增加。

关键词: 激光技术 3次谐波 相位匹配 CO_2激光 $AgGaSe_2$晶体

Third-harmonic generation in $AgGaSe_2$ crystals based on CO_2 laser

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Abstract:

In order to generate the third harmonic in $AgGaSe_2$ crystals, Ⅰ and Ⅱ phase-match were applied for the second and third harmonics of CO_2 laser respectively. In the experiment, output wavelength of CO_2 laser was 9.6μm. The peak power of the second-harmonic at 4.8μm was 88kW and the peak power of the third-harmonic at 3.2μm was 4kW respectively. The phase-matching acceptance angle was measured. The results show that the second-harmonic wave and the third-harmonic wave are acquired effectively and peak power of the second-harmonic wave and third-harmonic wave increase rapidly with the increase of input power of CO_2 laser.

Keywords: laser technique third-harmonic generation phase matching CO_2 laser $AgGaSe_2$ crystal

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