

论文

低阈值单谐振周期极化掺镁铌酸锂光参量振荡器

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摘要:

对基于周期极化掺镁铌酸锂晶体的信号光单谐振光学参量振荡器的输出特性进行了实验研究.讨论了光学参量振荡器谐振腔的腔长、周期极化铌酸锂晶体的通光长度、输出镜的透过率以及抽运光的脉冲宽度对光学参量振荡器谐振阈值的影响.光学参量振荡器的抽运源采用输出波长为1 064 nm的声光调Q Nd:YVO4激光器,在重复频率为2 kHz、周期极化掺镁铌酸锂晶体的温度为30 °C的条件下,光学参量振荡器的振荡阈值仅为48 mW.当抽运功率为94 mW时获得了25 mW的信号光输出,其光-光转换效率为26.6%.

关键词: 周期极化掺镁铌酸锂 光参量振荡器 低阈值 输出特性

Low Threshold Singly-resonant Optical Parametric Oscillator Based on Periodically Poled MgO:LiNbO₃

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Abstract:

Based on periodically poled LiNbO₃ doped with MgO,the output characteristic is discussed in singly-resonant optical parametric oscillators.The influences of the cavity length,the crystal length,the pump pulse width and the transmission of output coupling on the threshold pump power are analyzed .Optical parametric oscillator is pumped by acousto-optically Q switched Nd:YVO₄ laser in the experiment.At 30 °C,the threshold pump power of 48 mW is obtained with pulses repetition rate 2 kHz,the signal output power of 25mW is obtained with a pump power 94 mW,which possess the optical-optical conversion efficiency of 26.6%.

Keywords: Periodically poled MgO doped LiNbO₃(PPMgLN) Optical parametric oscillator (OPO) Low-threshold Output characteristics

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