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激光物理与激光器件

双程激光脉冲放大系统的建模及仿真研究

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摘要: 为了提高脉冲放大系统模型的光光转换效率,采用建模及仿真的方法研究了双程脉冲放大模型的输出特性,得到了得到双程脉冲放大系统输出功率与抽运功率的关系、输出单脉冲能量与脉冲的重复频率的关系,以及双程放大系统转换效率与重复频率的关系。结果表明,在重复频率为40kHz时,仿真得到该脉冲激光放大模型的光光转换效率达到了29.1%。该双程脉冲放大模型有效地提高了能量转换效率。

关键词: 光纤放大器 双程放大 理论建模 低重复频率 转换效率

Research of modeling and simulation in dual-pass laser pulse amplification systems

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Abstract: In order to improve the optical-optical conversion efficiency of the pulse amplification system model, the output characteristics of the dual-pass pulse amplification were studied by means of modeling and simulation. From the transmission characteristics, the relationship

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between output power and pump power, the relationship between output single pulse energy and pulse repetition frequency, and the relationship between conversion efficiency and repetition rate were obtained. The optical to optical conversion efficiency was 29.1% when the repetition frequency was 40kHz. Therefore, this dual-pass pulse amplification model improved the efficiency of energy conversion.

Keywords: fiber amplifier dual-pass amplification theoretical modeling low repetition frequency conversion efficiency

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