

论文

LD阵列侧面泵浦棒状激光介质内的光场研究

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摘要:

建立了LD侧面泵浦激光介质内的光场分布数值模型。通过光线追迹方法, 简化了介质对泵浦光折射的计算方式。利用Matlab软件数值模拟了泵浦光在介质内的归一化分布。提出获得高质量、高能量的激光输出参数的选取原则。当LD的束腰半径为1μm、LD的数量为40个、介质的半径为1.5mm、发光面到介质的泵浦距离为0.5mm、介质吸收系数在2cm⁻¹~6cm⁻¹之间时, 泵浦光在激光介质内的增益分布较好。

关键词: 激光二极管阵列 侧面泵浦 光场分布

Light field distribution in side-pumped rod-shaped laser medium of laser diode arrays

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Abstract:

The numerical model of the light field distribution in the side-pumped laser medium of LD was established. An analytical solution for the pumping light refraction in the rod-shaped gain medium was simplified with ray tracing. The normalized distribution of pumping light in the medium was simulated numerically with Matlab. The selection principle to acquire the parameters of high-quality and high-energy laser output is proposed. The influence of the structural parameters on the distribution of pumping light is analyzed. The experiment result shows that the gain distribution of pumping light in the laser medium is satisfactory when the radius of the beam waist is 1μm, the number of LD is 40, the radius of the medium is 1.5mm, the pumping distance between the luminous surface and the medium is 0.5mm and the absorption coefficient of the medium is 2cm⁻¹ ~6cm⁻¹.

Keywords: laser diode array side pump light field distribution

收稿日期 1900-01-01 修回日期 1900-01-01 网络版发布日期

DOI:

基金项目:

通讯作者: 张彪

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