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器件制备及器件物理

波导随机散射系统的激光发射

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摘要： 提出在随机分布的散射微粒中嵌入环形波导结构以改善随机激光器的随机发射特性。利用时域有限差分法(FDTD),数值模拟了内嵌环形波导的随机散射系统及其对比结构中光场的分布,得到了各结构的模式频谱。结果显示,本结构只在中心处有激光出射,表明环形波导的存在可以影响随机系统的激光发射,减少激光的模式输出,并在一定程度上增强了出射激光的强度。

关键词： 随机激光器 时域有限差分法 环形波导 激光发射模式

Lasing Emission of Waveguide Random Scattering System

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Abstract: A random laser structure is proposed in which we symmetrically embed a toroidal waveguide in the randomly distributed scattering particles. The finite difference time domain (FDTD) method is used to numerically simulate the distribution of the optical filed in the random scattering system embedded with a toroidal waveguide and the corresponding comparative structures, and the modes spectra of each structure are obtained. The results show that there only exists a narrow linewidth lasing emission in the center of system, which verifies that the presence of the toroidal waveguide can influence the lasing emission of the random system, reduce the number of modes, and enhance the lasing intensity to a certain degree.

Keywords: random lasers finite difference time domain toroidal waveguide lasing modes
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