

论文

1.4 μm ~1.7 μm 宽带光放大材料研究

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摘要:

宽带光放大是指在整个硅基光纤最低损耗带1.4 μm ~1.7 μm 能够获得有效信号净增益的光放大。研究高效的宽带光放大材料可以大大满足人们提高通信容量和实现光集成的要求。材料体系的研究主要集中在稀土掺杂氧化物薄膜、玻璃材料和有机聚合物材料上。着重从宽带的获得、发光性能的改善和发光机理的探索3个方面介绍了稀土掺杂玻璃和薄膜材料的研究进展。结合已经取得的结果和积累的经验,探讨了提高发光效率的方法,指出纳米结构设计的共掺材料体系可以获得有效的宽带发光。最后展望了本领域的发展前景。

关键词: 光放大 掺氧化物 稀土材料 宽带光放大

Recent progress in 1.4 μm ~1.7 μm broadband light amplification materials

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Abstract:

The broadband amplification is defined as the net amplified gain achieved in the whole lowest loss wavelength band 1.4 μm ~1.7 μm of silica based fibers. Efficient broadband light amplification materials can meet the needs of large information capacity and optical integration in communications. The materials for this application are mostly oxide-doped rare earth (RE) thin films, glasses and polymers. The former two materials are introduced in terms of band width, photoluminescence (PL) characteristic and PL mechanisms. The methods to improve the PL properties are discussed with the author's previous results and experiences. It is concluded that there is a great potential for nano-structured RE co-doped materials. Finally, the prospect of the optical amplification is put forward.

Keywords: light amplification oxide-doped rare earth material broadband light amplification

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