

光纤传感和光通信

915nm泵浦混合掺铒/铒镱共掺双包层光纤放大器

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摘要:

研究了一种混合掺铒/铒镱共掺光纤放大器, 用掺铒光纤放大器作为输入信号的预放大器, 用铒镱共掺双包层光纤放大器作为主放大器. 掺铒光纤放大器采用20m长掺铒光纤作为增益介质, 采用最大输出功率318mW的单模半导体激光器二极管作为泵浦源, 预放大器获得的最大输出功率是113mW. 铒镱共掺光纤放大器采用14m长铒镱共掺双包层光纤作为增益介质, 采用2个915nm多模半导体激光二极管作为泵浦源, 在输入信号功率为10mW、信号波长1555nm时, 混合光纤放大器获得了最大输出功率为32.04dBm, 即1.6W, 与此相应的混合光纤放大器的光-光转换效率为18.5%。

关键词: 光电子学 高功率光纤放大器 混合结构 铒镱共掺双包层光纤

Hybrid Er³⁺-doped/Er³⁺-Yb³⁺ co-doped double-cladding fiber amplifier pumped by 915nm laser

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Abstract:

A hybrid Er³⁺-doped/Er³⁺/Yb³⁺ co-doped double-cladding fiber amplifier is developed. It comprises an Er³⁺-doped fiber amplifier as a pre-amplifier and a Er³⁺/Yb³⁺ co-doped double-cladding fiber amplifier as a post-amplifier. In the Er³⁺-doped fiber amplifier, the active fiber is a 20m Er³⁺-doped fiber and is pumped by a single mode semiconductor laser diode with maximum output power of 318mW. The maximum output power of the pre-amplifier is 113mW. In the Er³⁺/Yb³⁺ co-doped double-cladding fiber amplifier, the active fiber is 14m Er³⁺/Yb³⁺ co-doped double-cladding fiber and is pumped by two multimode semiconductor laser diode at the wavelength of 915nm. When the input signal power is 10mW and the signal wavelength is 1555nm, the maximum output power of the hybrid fiber amplifier is 32.04dBm or 1.6W, corresponding light-light transfer efficiency is 18.5%.

Keywords: optoelectronics high power fiber amplifier hybrid structure Er³⁺-Yb³⁺ co-doped double-cladding fiber

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