

Abstract

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A Few Mode EDFA with Different Pumping Schemes: Performance Evaluation

The performance of few-mode (FM) erbium doped fiber amplifiers (EDFAs) with different pumping configurations is investigated and evaluated. An improvement in both gain and noise figure is achieved with a bidirectional core pumping FM-EDFA using unequal pump power with pump wavelengths of 980 nm and 1480 nm for forward and backward pumping, respectively. Moreover, the bidirectional pumping FM-EDFA is studied in case of equal pumping wavelength at 980 nm and different pump powers. Then, the system performance for the case of 6-spatial modes is tested for backward core pumping at 980 nm. The backward core pumping achieved a high modal gain with a low noise figure compared to bidirectional core pumping. Meanwhile, we report a cladding-pumped 6-modes EDFA with higher modal gain ~ 35 dB over the C-band, zero differential modal gain and low noise figure using both backward and bidirectional pumping.