

Influence of the pumping scheme in double-pass discrete Raman-fiber amplifiers

ABSTRACT

We demonstrate the effect of the pumping scheme in a double-pass discrete Raman-fiber amplifier. The copumping scheme outperforms the counterpumping scheme for small and medium signal power ranges. The performance discrepancy of about 0.3 dB is measured. However, the counterpumping scheme performs better than that of the copumping scheme for large signal powers. These effects are influenced by the pump distribution along the fiber-amplifying medium. The pump-depletion effect is found to be the main cause of the performance discrepancy between these two pumping schemes. These findings can be utilized as the guidelines in designing double-pass discrete Raman-fiber amplifiers.