

Gain Characteristics for C-Band Erbium Doped Fiber Amplifier Utilizing Single and Double-Pass Configurations: A Comparative Study

Abdulla. K. Abass

Laser and Optoelectronics Engineering Department, University of Technology/ Baghdad

Dr. Mohammed J. Abdul-Razak

Laser and Optoelectronics Engineering Department, University of Technology/ Baghdad

Email: dr.mohammedjalal@uotechnology.edu.iq

Mohammed A. Salih

Education College, University of Al-Iraqia, Baghdad, Iraq

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ABSTRACT

An erbium doped fiber amplifier in the conventional communication window utilizing single and double pump pass configurations were demonstrated and compared using OptiSystem 12 software.

Both of gain level and gain profile were improved in double-pass configuration utilizing broadband optical mirror. The maximum gain in both single and double-pass configurations are about 36.83dB and 50.1dB respectively, which represents a 37.13% improvement in gain level with double-pass configuration.

In addition, a 25mW pump power in double-pass configuration can provide the same gain level in a single-pass configuration at a pump power of 100mW and an input signal power of -20dBm at 1530nm. This represents a pump power conservation of about 25%.

The results show that the double-pass amplifier produces a higher noise figure than the single-pass configuration, but still in suitable level less than 6dB.

Keywords: Double-pass amplifiers, Gain profile, Gain saturation mechanisms, pump power conservation.

دراسة مقارنة لخصائص الربح للمضخمات ذات اشكال المرور المنفرد والمزدوج لليف
البصري المطعم بايونات الاربيوم

الخلاصة:

تم اجراء عرض ومقارنة للمضخمات ذات اشكال المرور المنفرد والمزدوج عند نافذة الاتصالات البصرية التقليدية لليف البصري المطعم بايونات الاربيوم باستخدام برنامج (OptiSystem12).