

## ABSTRACT

Communication is the process of delivering information from a source of information to recipients of information through a medium. Media currently used for long distance transmission made of glass or so-called optical fiber. During the process of propagation along the optical fiber, the light will be weakened and the widening of the signal. This is because impurities fiber materials that absorb and scatter the light, so that the received power will be reduced.

To overcome the attenuation and widening signals, optical amplifiers can be used without conversion from electrical into optical signals form. One is the conversion of optical amplifier without amplifier Erbium doped Fiber Amplifier (EDFA) and Raman Optical Amplifier (ROA).

An analysis system using an optical amplifier with three pumps on the amplifier raman has successfully designed with a number of channels 8 pieces, channel spacing 0.2 nm, and the transmission distance of 50 km DWDM systems with amplifier hybrid EDFA-Raman produce a good performance by using bitrate 2.5 Gbps produce BER  $1,45E-121$ , the amplifier gain of 20 dB and a noise figure of 2 dB generate BER  $2,90E-15$ , power input 10 mW produce a BER of  $3,16E-15$ .

*Keywords: DWDM, EDFA, ROA, the BER*