ABSTRACT

Dense Wavelength Division Multiplexing (DWDM) is a system in optical fiber communication system that enables the delivery of multiple signals at once with different wavelengths on a single mode optical fiber. DWDM constitute the right technology implemented on backbone network .The decrease of the power signal level in the technology DWDM mainly result from the attenuation optical fiber it's itself. To overcome them, amplifier optics is used. Amplifier within communication systems optical fiber there are 3 types, namely Semiconductor Optical Amplifier (SOA), Erbium dopped Fiber Amplifier (EDFA) and Raman Optical Amplifier (ROA). Other alternatives in reducing disitorsi due to dilation pulses within optical fiber is using the pulse Soliton. Soliton is pulses which can maintain the shape the signal is along the link systems fiber communication optic.

This final project discusses regarding performance comparison system DWDM soliton with amplifier SOA, EDFA and ROA with variations of channel spacing, number of canals, and bitrate. The total link length is 100 km with two amplifier homogen used in cascade conditions with total gain 20 dB placed at a distance 28.29 km from transmitter. This final project is simulated with software optisystem 7.0.

in general, ROA produces DWDM system performance better than the other amplifiers, such as the number of channel 8 pieces, 0.8 nm channel spacing, and bitrate 10 Gbps DWDM system with amplifier ROA produces the best BER of 10^{-15} compared with EDFA amplifiers and SOA amplifiers each produce BER 10^{-11} and 10^{-7}. This final project also purposed a new scheme of amplifier hybrid EDFA-ROA that produce system performance better than ROA amplifier in a term of BER 10^{-17} in the same DWDM system parameters.

Keyword: Soliton, DWDM, SOA, EDFA, ROA.