

ABSTRACT

It is a promising technology and provides better performance as it can handle a large load of network, which is very good. The Erbium Doped Fiber Amplifier (EDFA) and Fiber Raman Amplifier (FRA) amplifier are used to optimize the increase in gain bandwidth from the Wavelength Dense Multiplexing (WDM)-based system. Improving gain-bandwidth optical amplifier is the most effective way to efficiently utilization the optimal bandwidth fibers in an increase in the number of WDM-based channels.

In this research conducted a comparison of Dense Wavelength Division Multiplexing (DWDM) system at a maximum distance of 250 km without amplifier, using FRA amplifier, EDFA amplifier, and use of Hybrid Optical Amplifier (HOA) amplifier of the FRA and EDFA merger. Then do a comparison of how much maximum gain can still be done, system simulation is done using the software Optisystem 7.0 and comparing the best value Bit Error Rate (BER) $< 10^{-9}$.

Result obtained from a series of simulation system with the most optimal configuration of HOA FRA-EDFA in parallel in line at a distance 210 km with the lowest Q factor value of 6.10417 and the BER value $5.08 \cdot 10^{-10}$ so that is still worth to use at this distances.

Keywords: EDFA, FRA, HOA, DWDM, Optical Amplifier.

