

ABSTRACT

Optical communication systems that have data transmission speeds as fast as light still have some drawbacks, one of which many experience is the distance between the transmitter and receiver is far. Therefore, multiplexing technology is needed, namely, Dense Wavelength Division Multiplexing (DWDM). DWDM is a technology that utilizes bandwidth efficiently and transmits in parallel with different optical fiber frequencies. However, to optimize DWDM, an amplifier such as the Hybrid Optical Amplifier (HOA) is needed which has the function of increasing signal power. HOA is a combination of FRA and EDFA, system modeling using long haul U-DWDM with in-line parallel configuration on hybrid amplifier (FRA-EDFA). The analysis used is a BER value that does not exceed 10^{-9} and the Q factor value used as a benchmark is ≥ 6 . The results show that HOA has a longer maximum distance of 150 km, while EDFA has a maximum distance of 125 km and FRA has a maximum distance 100 km. This shows that the hybrid amplifier configuration (FRA-EDFA) which is arranged using an in-line parallel configuration is only effective at a maximum distance of 150 km with the lowest Q -Factor value of 3.5 and the highest value of 4.7. As for BER, the smallest value is 8.19×10^{-7} and the largest value is 0.0001.

Keywords : DWDM, HOA, FRA-EDFA