

ABSTRACT

Dense Wavelength Division Multiplexing (DWDM) is a transmission technique that using light with different wavelength which afterward done multiplexing process so transmitted through fiber optic. On DWDM transmission systems there are nonlinear effect one of them is Four Wave Mixing (FWM). FWM is a nonlinear effect that will affect network system performance of fiber optic communication with the addition of signals that transmitted on fiber optic. In this research DWDM system design are using three scenarios, such as EDFA-ROA, ROA-EDFA and ROA-ROA using Optisystem 15 to reduce the nonlinear effect of FWM that found on fiber optic communication system using DWDM system design. This design is using 16 channels with 1.6 channel spacing and 100 km link length. On this research the power variations in the laser were 0, 2, 4, 6, 8, and 10 dbm. Based on the results of testing has been done on Dense Wavelength Division Multiplexing (DWDM), of the three scenarios that used in this simulation there is one scenario that has the best result like ROA-ROA with value on the input power side having BER value $8.23E-07$ with input power 8 dBm and Q-Factor 4.865933 with input power 10 dBm, for the value on the canal side has BER value $2.00E-06$ on channel 10 and Q-Factor 4.74117 on channel 16.

Keywords - DWDM, FWM, EDFA, ROA, Q-Faktor and BER