

## **ABSTRACT**

*The development of the Optical Fiber Communication System (SKSO) continues to progress from year to year. The technology of fiber optic communication system that is developing very rapidly is Dense Wavelength Division Multiplexing (DWDM) technology. DWDM has several advantages over previous technologies. However, behind the advantages of DWDM, there are drawbacks that greatly affect the performance of the technology, such as the non-linearity effect of fiber, namely Four Wave Mixing (FWM). This nonlinear effect results in the emergence of several new unwanted signals that are also transmitted. In this research, the DWDM link modeling in the software is made to determine the effect of the FWM, and there are two simulation scenarios. In the first scenario, the input variables that are changed are bitrate and link distance. In the second scenario, the transmitter power is changed by using several transmitter power values. Based on the results of the average value obtained in the simulation with a bitrate of 10 Gbps, the best performance is at a distance of 151 Km, and the worst performance is at a distance of 417 Km, but can be improved by changing the transmitter power to 0 dBm. At 40 Gbps bitrate, the best performance is at a distance of 151 Km and the worst performance is at a distance of 417 Km, but it can be improved by changing the transmitter power to 4 dBm. And 100 Gbps bitrate, the best performance is at a distance of 151 Km and the worst performance at a distance of 417 Km, but can be improved by changing the transmitter power to 4 dBm. The simulation results that have been carried out are based on the average results of Q-Factor and BER, namely that the non-linear effect of Four Wave Mixing has a very bad impact on the performance of the DWDM link.*

*Keywords : DWDM, Nonlinear Effects, Optisystem*