ABSTRACT

Semiconductor Optical Amplifier (SOA) is an optical amplifier that uses a semi-conductor as the medium and operates on signal waves between 850 and 1600 nm. SOA is an amplifier that has the lowest cost compared to others. In addition, SOA is an optical amplifier which has a high gain value, is small in size and can make integration with semiconductor lasers.

In this final project, a simulation was carried out consisting of 2 scenarios with different bitrates and distances. The first scenario is to simulate to see the effect of bitrate changes without SOA amplifier on performance with a value of 500 Mbps and 1 Gbps to 125 Km. Meanwhile, for the second scenario uses a bitrate value of 500 Mbps and 1 Gbps from a distance of 125 Km to 225 Km with the second scenario using SOA amplifier installed in the preamplifier position. The performance parameters used are link power budget, rise time budget, SNR, BER, Power Receive and Q-factor.

From the simulation results that have been run, it is found that when without using SOA the farther the distance, the value of Q Factor and BER decreases and the maximum fair limit value is at a distance of 125 Km. Meanwhile, when using SOA it also decreased with a maximum reasonable limit at a distance of 225 Km

Keyword : *DWDM, SOA, BER, Q Factor, Bit Rate*