ABSTRACT

Optical communication system is currently developing quite rapidly and it is becoming a thing currently being developed to become a technology of the future. One of them is free space optics (FSO) or commonly referred to as wireless optics, an optical communication that uses the atmosphere as a propagation medium. The advantage of FSO with other wireless communication systems is that FSO communication ordains low-cost, easier and faster installation costs in the deployment process. FSO communication is influenced by several factors, such as weather conditions, absorption, turbulence, and atmospheric attenuation.

In this Final Project a foggy channel analysis is carried out on the FSO. The analysis was carried out by comparing the wavelengths of 850 nm and 1550 nm, and using 3 visibility scenarios as far as 1 km, 3 km, 5 km. The final result is the value of bit error rate (BER) of On Off Keying (OOK) NRZ and OOK RZ.

Simulation results show that the closer the distance of view, the less power received and the greater BER value obtained. And vice versa the farther the distance of sight, the greater the power received and the BER value obtained will be smaller and closer to 0. The value of the power received with the closest visibility as far as 0.01 km is equal to -39.35 dbm for wavelengths of 850 nm and of -40.17 dbm for a wavelength of 1550 nm, and BER OOK NRZ is valued $3{,}816\times 10^{-79}$ for BER OOK RZ is $4{,}873 \times 10^{-156}$ with a wavelength of 850 nm, and BER OOK NRZ is valued $3{,}135\times 10^{-55}$ for BER OOK RZ is valued $2{,}737 \times 10^{-108}$ for a wavelength of 1550 nm. And the received value obtained with the farthest visibility as far as 4.99 km is 921 dbm for both wavelengths of 850 nm and 1550 nm, and BER OOK NRZ worth $4{,}590 \times 10^{-57}$, BER OOK RZ is worth $5{,}964 \times 10^{-112}$ for wavelength 850 nm, and BER OOK NRZ and OOK RZ is 0 for a wavelength of 1550 nm.

Keywords: *Free space optics, Wireless optics, On-Off Keying, Bit Error Rate*.