

ABSTRACT

Optical Wireless Communication (OWC) system is an alternative application of indoor and outdoor technology that is appropriate. Free Space Optics (FSO) technology is one of the developments in fiber optic communication technology, in practice it can be combined with Orthogonal Frequency Division Multiplexing (OFDM) technology, which has the advantage of faster sending data speeds with large bandwidth capacities.

This final project simulates and analyzes the performance of FSO with OFDM technique in Kim and Kruse channel using Quadrature Phase Shift Keying (QPSK) modulation on the effect of wavelength variations and transmitted power on the visibility of performance system in atmospheric visibility conditions and transmission distance from transmitter to receiver with reference to Bit Error Rate (BER) $< 10^{-4}$.

The simulation and analysis results show that increasing the wavelength from 850 nm to 1550 nm can increase the visibility of performance system on Kim model by 0,02 km and Kruse by 0,1 km. In transmit power increase of 2 watts can increasing performance system at atmospheric visibility condition by 0,02 km. The increasing in wavelength can increase the transmission distance of Kim model on clear air by 0,43 km, light fog by 0,53 km, dense fog by 0,02 km and Kruse clear air by 0,38 km, light fog by 0,47 km, but in conditions of dense fog doesn't reach BER standards, only wavelength 1550 nm does reach BER standards. The increasing of Fast Fourier Transform (FFT) value can increase the number of subcarriers so that system performance increases and reduces the bit error that the BER value is getting lower.

Keywords: *FSO, OFDM, QPSK, BER, Kim, Kruse, FFT*