

ABSTRACT

Today the use of Light Emitting Diode (LED) as lighting is increased, LED has various advantages such as not causing heat, has a longer usage period and more efficient use of energy. In addition to a LED lamp turns can also be used as a transfer data. Visible Light Communication is a communication system that uses visible light as a signal carrier. This technology is an alternative that can serve increasing data demand, when the radio frequency spectrum allocation is already very dense to used. Orthogonal Frequency Division Multiplexing (OFDM) is widely used in broadband communication systems and wireless communication because it has advantages such as its resistance to intersymbol interference (ISI). In VLC the bipolar signal cannot be transmitted, because the intensity of light cannot be negative. Asymmetrically Clipped Optical (ACO) OFDM is a signal transmission technique that cuts its negative signal on the zero axis.

This final project simulates the ACO OFDM system for visible light communication. Several schemes is investigated by changing the format of the M-QAM constellation from 4, 16, 64 and 256. The simulation are modeled indoors for LOS indirect channel types with reference to related parameters from VLC and OFDM.

The final result of this simulation, to get the expected SNR target which is > 10 dB. LED transmitter for FWHM of 50°, 60° can reach these targets with power requirements at the level of 6.5 and 7 Watt for the widest coverage at 4.64 meters. When BER 10^{-3} the signal ratio required by 4-QAM, 16-QAM, 64-QAM and 256 QAM is 10 dB, 17 dB, 23 dB and 29 dB respectively. The ACO OFDM scheme using 4-QAM shows the best performance by requiring 7 dB dan 13 dB power lower than 16-QAM and 64-QAM.

Keywords : *ACO OFDM, Visible Light Communication, Bit Error Rate, QAM*