ABSTRACT

Visible Light Communication (VLC) can be a solution in wireless communication because of the limited frequency available in the world and also the advantages that VLC has. the use of Orthogonal Frequency Division Multiplexing (OFDM) can increase the speed of data in this VLC system. However, conventional OFDM signals are bipolar and complex whereas VLC must be unipolar and real. Therefore, to overcome this problem DC biased Optical OFDM (DCO-OFDM) is used in this Final Project.

But it is widely known that the use of OFDM has weaknesses, one of which is high Peak Average to Power Ratio (PAPR). One effective method that has been widely used to reduce PAPR values is Selected Mapping (SLM). However, because the signal in DCO-OFDM VLC must have a real and positive value, the Conventional SLM (CSLM) cannot be used immediately. In fact, to detect which signals to choose, the CSLM method requires Side Information (SI) transmission. The method called Symetric Selected Mapping (SSLM) has been introduced to reduce PAPR values in VLC DCO-OFDM systems without sacrificing bandwidth efficiency caused by SI transmission.

The experimental results show that the simulated method achieves PAPR reduction which is comparable to the CSLM scheme with SI detection which is an improvement of 2.8 dB. In fact, the SSLM scheme with SI detection produces a bit error rate that is better than the CSLM scheme with perfect SI detection with a slight increase in the average power transmitted which is equal to $0{,}01\ x\ 10^{-3}$.

Keywords*: *VLC, PAPR, OFDM, DCO-OFDM, SSLM