

ABSTRACT

This Final Project studies a technology that is being developed in the telecommunications system. Nowadays fast and efficient communication becomes an important requirement. To make this happen, a reliable technology is needed, namely Visible Light Communication (VLC). VLC that utilizes free space optics as a transmission channel has high speed data communication capability, which uses LEDs as a transmitter.

One of the promising channel coding as Forward Error Correction (FEC) is the QC-LDPC codes. The function of this channel coding is to protect the information signal and allow avoidance of noise on the transmission channel. So, to improve the performance of the VLC system, FEC codes are used in this study on the encoder and decoder. An evaluation performance with variation number of decoding iterations are studied, as to get a good performance. Then the VLC system using QC-LDPC codes will be compared to the VLC system which is not using the FEC encoding towards the BER, received power, propagation distance and SNR.

The simulation in this study produced with this FEC codes is when using 15 iterations of decoding iteration. The results of the simulation of the VLC system using QC-LDPC codes with a target of $BER \leq 10^{-3}$ improves performance by increasing the propagation distance by 7%, with advantages of 2.75 dB on SNR, and received power with better performance of 27.5%

Keywords : VLC, QC-LDPC codes, Received Power, BER, SNR.