ABSTRACT

Communication technology is one of the fastest growing technologies, including wireless technology. At present, VLC (Visible Light Communication) technology is being developed primarily indoors to meet the two needs of today's society, namely lighting and internet connectivity. VLC technology was chosen because it has a higher speed than Wi-Fi (Wireless Fidelty) and is more efficient in energy use.

This Final Project simulates the effect of Matched Filter on the distance between source and receiver in a VLC system in a closed room. The information bit is modulated on the LED current to be transmitted. The modulation used is OOK-NRZ. The LED light will emit visible light as the lighting in which there is an information signal in the form of bits. The photodiode will capture the light before it is received by the EU (User Equipment).

The results obtained from this Final Project produce current parameters without matched filter with bitrate = 100 Mbps, number of bits = 1 million bits, $h_{max} = 1.1$ meter, maximum receiver shift from starting point as far as 14.14 cm, meaning the system has a coverage of 0.0628 m^2 . When the matched filter system is added, the receiver's shift distance from starting point increases to 49.49 cm with a coverage of 0.7697 m^2 . When the source position and receiver are in a straight line or the position of the receiver furthest to the specified BER standard, BER on the system with matched filter is better than without matched filter.

Keywords: VLC, Matched Filter, OOK-NRZ, Photodiode, LED, BER.