

ABSTRACT

These days, wireless optical communication can meet and support the needs of communication technology facilities such as fast internet. Visible Light Communication (VLC) is one of the optical technologies currently being developed to make communication more effective and efficient in the future. The type of VLC used is a Light Emitting Diode (LED), but the LED has a limited bandwidth, while the data that must be transmitted is quite a lot, so Multiple Input Multiple Output (MIMO) is used to handle that.

This final project analyses LED power usage and different Full Width at Half Maximum angles at 2×2 MIMO carried out in Visible Light Communication-based communication. In this study, 2 LEDs were used in the Line of Sight (LOS) channel conditions located at point coordinates (4, 2.5, 3) and (1, 2.5, 3) with the receiver in the form of 2 PIN photodiodes in a 5×5×3 meters³ room. System performance evaluated based on the Distribution of Receive Power, Bit Error Rate (BER) and Signal to Noise Ratio (SNR) using On-Off Keying Non-Return to Zero (OOK-NRZ) and On-Off Keying Return to Zero (OOK-RZ) modulation.

Based on the simulation and analysis in this final project, it showed that the system using an FWHM angle of 30° produced a power distribution quality of -9.998 dBm with an SNR value of 47.46 dB. While the use of OOK-RZ modulation technique produced a better BER value of 5.07×10^{-58} and 4.81×10^{-91} than OOK-NRZ.

Keywords: BER, FWHM, MIMO, OOK-NRZ, OOK-RZ, SNR, VLC.