

ABSTRACT

The development of telecommunication technology is currently developing very rapidly. The effect is to the higher the public's desire to access the internet quickly and efficiently. Light Fidelity (Li-Fi) is a wireless communication technology that possesses a fast data transfer rate and a greater frequency spectrum than Wireless Fidelity (Wi-Fi). Li-Fi technology utilizes visible light in Light Emitting Diode (LED) lamps as the data transmission medium. Multibeam LED is an LED that has several rays in one lamp.

In this final project, a simulation to determine the performance of multibeam LED lamps with the change in direction of the beam angle is 15° , 30° , and 45° to the coverage area. This research will be conducted in a room measuring 5 x 5 x 3 meters with lights placed at coordinate points (0, 0, 3) and there are two scenarios carried out in this study, the first scenario the room does not have sunlight interference, while for the second scenario there is a window on one side of the wall so that part of the room is interfered with by sunlight. Both of these scenarios use the Line of Sight (LOS) channel. Performance analyzed by Signal to Noise Ratio (SNR), and Bit Error Rate (BER) to find coverage area.

Based on the results of the study showed that the system without sunlight is better than with interference from sunlight. The results of the coverage area without interference at a beam angle direction of 15° is 24.84 m^2 and at a beam angle direction of 30° , 45° , the coverage area is 25 m^2 . While using sunlight interference, the coverage area at beam angles direction of 15° , 30° , and 45° is 18.76 m^2 , 22.6 m^2 , and 22.8 m^2 .

Keywords: Light Fidelity (Li-Fi), Wireless Fidelity (Wi-Fi), Line of Sight (LOS), LED multibeam, Signal to Noise Ratio (SNR), Bit Error Rate (BER), Coverage Area.