

ABSTRACT

The rapidly developing technology has given rise to various innovations in the field of technology. One of them is Visible Light Communication (VLC), a communication system that utilizes visible light as a means of transmission. VLC has a bandwidth disadvantage when used by many users at once. In addition, interference from objects can block the transmission of light to the user. In this research, Non-Orthogonal Multiple Access (NOMA) technology is used to overcome these problems. NOMA allocates power with Gain Ratio Power Allocation (GRPA) to balance the bandwidth. The modulation applied is Pulse Position Modulation (PPM). This simulation is performed with variations in the number of users and a predefined distance. The channels used include Line of Sight (LOS) and Non-Line of Sight (NLOS). System performance uses Signal to Interference plus Noise Ratio (SINR) parameters, channel capacity, and Bit Error Rate (BER). This research results in a superior SINR value in LOS channel conditions, compared to the NLOS channel. Meanwhile, in the NLOS channel variation, the better value is the NLOS 3 variation which receives 80% of the light that will be received by the user. In the 2-user scenario, SINR reaches the highest value compared to the 4-user scenario. The SINR value of the 2-user scenario is 33.120 dB for the LOS channel and 31.182 dB for the NLOS 3 channel. In addition, increasing the modulation level in PPM results in a smaller BER value, which indicates the BER quality is getting better.

Keywords: *Bit Error Rate, Gain Ratio Power Allocation, Non-Orthogonal Multiple Access, Signal to Interference Noise Ratio, Visible Light Communication..*