ABSTRACT

Nowaday, communication technology continues to develop rapidly. The *Visible Light Communication* (VLC) system is one of the communication technologies that will take action as an alternative to radio communication in the process of transmitting data faster between users. But the main limitation in VLC is bandwidth divided modulation for the use of many users. Non-orthogonal multiple access (NOMA), starting to be researched to be used as an effective multiple access technique on the network 5G because this technique can save modulation bandwidth.

In this Final Project, the NOMA we use is *Power Domain* (PD) NOMA-VLC, examples of the PD NOMA-VLC technique are *Static Power Allocation* (SPA) and *Gain Power Ratio Allocation* (GRPA), for this final project the power allocation technique used is SPA, this final project is carried out to analyze the performance of SPA on the *line of sight* (LOS) propagation channel with OOK modulation with 2 users. perform a simulation in a room measuring 9 x 9 x 3 m using 1 LED. In addition, we also compared the use of SPA and GRPA in NOMA-VLC.

In the simulation results of this study, it was found that the SPA performance on the NOMA-VLC system got a BER value of up to $5 \cdot 10^{-6}$ for user 1 and user 2 at an SNR of 29 dB at power allocation $\alpha_1 = 0.7$ and $\alpha_1 = 0.3$. Based on the simulation, the performance for SPA and GRPA shows that the use of SPA in PD NOMA-VLC produces a BER value of up to $6 \cdot 10^{-6}$ at an SNR value of 29 dB, while GRPA produces a BER of up to $2 \cdot 10^{-5}$ at an SNR value of 29 dB under the same conditions and parameters.

Keywords: *Visible Light Communication*, *Power Domain*, *OOK*, *SPA*, *SNR*, *BER*.