

ABSTRACT

Underwater visible light communication (UVLC) is an application of VLC technology that uses Light Emitting Diode (LED) with the use of underwater medium. The advantages of UVLC technology include being a good alternative for underwater communication in addition to the use of acoustic and radio waves. Cost effectiveness and low energy consumption are also some of the advantages of this technology. One of the drawbacks of UVLC is the narrow modulation bandwidth resulting from the light source resulting in reduced capacity achieved by the system. To overcome this problem, Non-orthogonal multiple access (NOMA) is implemented. NOMA is a multiple access technique for several different signals based on the power of each user. In the NOMA system, there is superposition coding on the transmitter and uses successive interference cancellation (SIC) on the receiver.

In this study, we compared two power allocation methods, Gain ratio power allocation (GRPA) and Static power allocation (SPA). In addition, research was also conducted on channel with conditions of turbulence and without turbulence, the parameters that are measured are Signal to Interference Plus Noise Ratio (SINR) parameter and the capacity of each power allocation .

The results of the simulation and analysis in this research shows that the NOMA-UVLC system with the GRPA power allocation value is more stable than the SPA power allocation with a capacity increase of 52%. Then, the system capacity decreases in turbulence conditions and by applying the residual to the successive interference cancellation (SIC) process compared to not using the residual SIC process.

Keywords: UVLC, NOMA, NLOS, *Power Allocation*, SIC.