

ABSRACT

Underwater Visible Light Communication (UVLC) is a development of Visible Light Communication (VLC). Photodetector used in UVLC are different from VLC that can used in bulk and quantity, UVLC requires a photodetector that has good quality even with limited quantity.

The research divided into two scenarios, the first scenario is the performance analysis of UVLC systems using Positive Intrinsic Negative Photodetector (PIN-PD) and second scenario is the performance analysis of UVLC systems using Avalanche Photodetector (APD) using Pulse Position Modulation (PPM), and using water channel (pure water). UVLC generally uses light source derived from Light Emitting Diodes (LEDs). APD is a better photodetector used in UVLC technology. In UVLC there is a loss of propagation is pure water that is influenced by attenuation in sea water that occurs due to linier combination of scattering and absorption coefficients. This causes a lack of data quality in the transmission process.

This Final Project Research can be said to be feasible if the produces BER $\leq 10^{-3}$. A wavelength of 455 nm has maximum force of $1,566 \times 10^{-6}$ W. The communication system in this study produced the fartherst distance of 8,093 m. in this communication system generates a receiving power of $7,0603 \times 10^{11}$. The comparison of BER values between PIN and APD produces BER values APD 31 times smaller than BER generated by PIN and a comparison of SNR between PIN and APD results in SNR PIN values of 8,73 times less than the SNR generated by the PIN.

Keywords: UVLC, Photodetector, PIN, APD, PPM, LED, BER.