

ABSTRACT

Underwater Visible Light Communication (UVLC) is an optical communication system utilizing visible light that is modulated to transmit data with water transmission media. Seawater transmission media possess loss propagation which is affected by beam extinction coefficients. This resulted in the system having a greater propagation loss than the VLC system. Therefore UVLC requires a photodetector that has good quality even with a limited quantity.

This study evaluates the performance of Positive Intrinsic Negative Photodetector (PIN) and Avalanche Photodetector (APD) photodetectors. There are two scenarios carried out in this Final Project. The scenario I analyze the performance of the UVLC system using a PIN. Scenario II analyzes the performance of the UVLC system using APD. Both scenarios will be tested based on distance, acceptability, Signal to Noise Ratio (SNR) and Bit Error Rate (BER) parameters.

From the simulations that have been done, the results show that the APD photodetector is superior in its application to the UVLC system. In terms of coverage distance, the APD photodetector is 69,2% greater than the PIN coverage distance. Based on the minimum acceptability value that produces $BER \leq 10^{-3}$ the APD acceptability value is 0,082x smaller than the PIN. Whereas based on the SNR value, APD produces an SNR value of 69,61% greater than the SNR value generated by the PIN.

Keywords: UVLC, Photodetector, PIN , APD, BER, Power Received.