

ABSTRACT

The biggest sources for water wireless communication are various, one of which comes from the characteristics of the seabed which affect the attenuation value which can cause light transmission to be not optimal. Therefore, to analyze these challenges, a more complex channel coding scheme can be used, namely Low Density Parity Check (LDPC). The design will produce several analytical simulations of two different types of water, namely clear ocean and coast ocean and compare Irregular LDPC with designs without using LDPC.

Testing is carried out by designing a system model from the data that will be sent through the transmitter using an LED and received by the receiver using a PIN photodetector. The algorithm used is Bit Flipping for the decoding process and Lower Triangular for the encode process, after which a comparison is made with several test parameters, namely Bit Error Rate (BER), Signal to Noise Ratio (SNR), transmission distance and receiving power.

From the simulation results, it can be proven that the UVLC system using Irregular LDPC experienced a decrease in quality at BER, SNR, power and transmission distance with a performance level of 2% lower than without Irregular LDPC. The UVLC system without applying the Irregular LDPC code can reach a maximum distance of 2.6 m, while the system with the Irregular LDPC code in the clear ocean application reaches a maximum distance of 2.57 m and in the coastal ocean the transmission distance does not reach the target BER 10^{-3} . So when compared between the two types of water, it can be concluded that clear ocean water is better than coastal ocean.

Keywords: *UVLC, LDPC Irregular, BER, SNR, Power, Transmission Distance.*