

ABSTRACT

Satellite launches by forming a constellation are getting bigger because the need for data rate is increasing. The use of radio frequency on Intersatellite Link (ISL) is also increasing as a result of the massive constellation of satellites. With a limited resource it makes the use of radio frequency even denser. Therefore, the application of Optical Wireless Communication (OWC) technology is expected to be a solution to overcome the limited radio frequency resource.

In this study, a simulation of ISL was carried out using OWC technology with a laser wavelength of 1300 nm and the distance between the satellites and the transmitter power used varies. Final parameters has used are Bit Error Rate (BER), Signal to Noise Ratio (SNR), Throughput, and Latency.

The results obtained in this Final Project is the lowest BER value with the same SNR found in DCO-OFDM BPSK modulation. BER value DCO-OFDM BPSK for LEO 1 satellite is $2,972 \times 10^{-8}$, for LEO 2 satellite is $7,043 \times 10^{-9}$, and for LEO 3 satellite is $1,552 \times 10^{-9}$. Then, Throughput is highest in the DCO-OFDM BPSK modulation with the same SNR. Obtained Throughput value of BPSK DCO-OFDM for LEO 1 satellite is 15,45 Gbps, for LEO 2 satellite is 15,96 Gbps, and for LEO 2 satellite is 16,56 Gbps.

Keywords: Optical Intersatellite Link (OISL), Modulation, Orthogonal Frequency Division Multiplexing (OFDM), Phase Shift Keying (PSK), Bit Error Rate (BER)