# ABSTRACT

*As technology advances, the use of communication systems that are needed is increasing, one of the communication systems that is very often used today is an optical communication system or Fiber Optic, but implementing Fiber Optic technology requires quite large costs. In the optical communication system there is Free Space Optic technology, namely, one type of application of optical communication which uses the Atmosphere Channel as the propagation medium.*

*This research will create a calculation simulation using MATLAB software for Free Space Optic technology to find out whether this technology has good quality BER & SNR values for the Irradiance log values that have been determined. In this research there are also several parameters used in this research, namely, The number of bits of data sent, the data frame used, after all the simulation parameters have been entered, we will see what the quality of what is sent after passing through the FSO random channel is whether the quality of the data that reaches the recipient is good or a lot of data is distorted due to the influence of the FSO random channel. .*

*After the calculation simulation program was run from 3 log irradiance values, namely 0.9, 0.5, 0.1, the quality of the FSO system could be said to be very good at a log irradiance value of 0.1 because the decrease in the BER value was still below Theoretical Rayleigh and above Theoretical AWGN and the decrease in BER value was also very stable, whereas in the test, it was assessed that the log irradiance of 0.5 could be said to be quite good because the decrease in the BER value was still below Theoretical Rayleigh and above Theoretical AWGN, however, the decrease in the BER value was still unstable, then, it was assessed that the log irradiance of 0.9 had poor results because the decrease in the BER value was still above Theoretical Rayleigh and decreasing BER values are also still unstable, all the tests above were carried out with the same parameters, namely, the number of data bits generated was 1000 and the data frames used were 500. It is hoped that the results of the research can be used as a reference in designing and optimizing FSO systems in future.*



***Keywords***: MATLAB, Free Space Optic, BER, SNR.