

ABSTRACT

In a communication system, the speed and capacity are the main parameters that must be taken into account in the process of data transmission. To meet these needs, fiber optic becomes a choice since it has many advantages. But in practice, there is still a shortage of fiber optic so needed a method of good transmission, which is capable of transmitting information with a high capacity, secure against the error of interference. To produce optical communication system that can transfer information effectively, requires modulation format with the addition of error correction techniques. One of error correction technique is low density parity check codes.

In this final project, conducted a performance analysis of optical communication system with low density parity check codes. Parameters used is distributed feed back (DFB) lasers as light source and external modulators using Mach-Zehnder and with the addition of error correction method for low density parity check codes as a detector and fixing bugs. The analysis will be done by changing the capacity of the error by changing the speed of the code rate, iterations decoding and constraintlength contained in low density parity check codes are modeled with MATLAB software 7.9 and production as compared with the system without using low density parity check codes.

Simulation results show that optical communications system with a low density parity check codes can fix errors that occur as a result of the variance, or noises that occur during the transfer process. Optical communication system using LDPC codes were able to meet them at the SNR 7.8 dB for BER 10^{-9} with a code rate 1/2, iterations decoding 15, constraintlength 768, whereas in the case did not add the low density parity check codes can only be executed if the SNR is 16 dB resulting in improved performance ± 8.2 dB.

Keywords : Fiber Optic, BER, low density parity check codes, SNR