
ABSTRACT

The speed and capacity are required in the process of transmitting data. To fulfill these demands, the optical fiber becomes one of the options because it has many advantages. However, in the application, fiber optics have many lack so it needs better transmission method that is capable in sending information with a large capacity, secure against interference errors, and provides better services.

The system designed is fiber optic communication system using the Distributed Feedback (DFB) laser as a light transmitter and Dual Parallel Mach-Zehnder as a external modulator that modulated input signal become Differential Quadrature Phase Shift Keying (DQPSK) and adding FEC (Forward Error Correction). Addition of Forward Error Correction (FEC) can reduce bit error rate (BER) as a result of large and fast data delivery. Forward Error Control that used in this Final Project was the Turbo Code. The advantage of Turbo Code is the minimum power required at each modulation to enable delivery of signal. In this Final Project, analysis be done by changing the type of interleaver, code rate and constraint length on Turbo Code then simulated in Matlab 7.4 and compared the output with the system without using Turbo Code.

The results of the analysis prove that the addition of Turbo Code is able to fix errors that occur as a result of the dispersion and noise which appears at the time when the transmission takes place. To achieve BER 10^{-9} , a system using Turbo Code has been able to fulfill at SNR 11 dB precisely Turbo code with 1/3 code rate, random interleaver and 8 constraint length while without Turbo Code it can be fulfilled at SNR 25 dB so the performance increased 14 dB.

Keyword : Turbo Code, BER, SNR, DPMZ, DQPSK