

## ABSTRACT

The speed and capacity are needed in the process of transmitting data. To fulfil 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 Mach-Zehnder as a external modulator with adding FEC (Forward Error Correction) method with Reed-Solomon Codes one branch FEC as a detector and error correction.

This Final Project analyzed the changes in ability of error correction/symbol and the number of bits/symbol of the Reed-Solomon Codes then simulated on Matlab 7.1 and compared the output with the system without using a Reed-Solomon Codes.

The results of the analysis prove that the addition of Reed-Solomon Codes 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 Reed Solomon Codes has been able to fulfill at SNR 26 dB precisely RS (255, 191, 32), while without a new error correction it can be fulfilled at SNR 160 dB and increase the performance improvement of 134 dB.

Keyword: FEC, BER, *Reed-Solomon*, SNR