PERFORMANCE STUDY OF AWGN CHANNEL AND RICIAN FADING USING R-S CODE APPLY IN DVB

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ABSRACT

This thesis is highlight the performance of Additive White Gaussian Noise (AWGN) and Rician fading that being apply in Digital Video Broadcasting (DVB) by using 256 Quadrature Amplitude Modulation (256-QAM) and 1024 Quadrature Amplitude Modulation (1024-QAM). The modulation technique that is used in this thesis is QAM. The purpose of using this modulation technique is because of to increase the spectral efficiency. This thesis also use Reed-Solomon codes as the encoder and decoder in able to correct and detect any error that is occurred in this communication. The main objective of this thesis is to know which channel that give better performance either by using AWGN as the channel or using Rician Fading as the channel. During the transmission of the signal the noise will be added and for this thesis the noise that is added is either AWGN or Rician fading. The performance of this thesis will be evaluated by using the MATLAB software version 7.6.0. The AWGN and Rician fading is be compared in terms of bit error rates (BER) and signal energy to noise power density ratio (E_b/N_0). The model consists of transmitter, transmission channel and receiver.

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CHAPTER 1

INTRODUCTION

1.1   BACKGROUND STUDY

Nowadays, the technology of digital video broadcasting or also be known as DVB is getting more advanced in this world. The television transmission before this used the analog method to transmit the signal. Although the analog television broadcasting has given the good service for many years but it is extremely inefficient [1]. The format of the signals for analog system was essentially determined by the requirements of the cathode ray tube as a display. The reason was that the receiver might be as simple as possible, and is constructed with a minimum number of vacuum tubes. In this system, some infinite variation of a continuous parameter has conveyed the information. The example is the voltage on a wire or the strength or frequency of flux on a tape. That is why the broadcasters wanted to changed their system to the digital system because that is the main weakness of analog signals.

The DVB system is more reliable and efficient to be used in nowadays as when DVB is used the quality of the video and audio is more excellent rather than to use the analog television broadcasting. By using DVB system, the noise is also much smaller than use the analog television broadcasting. All broadcasters are by now considering the strengths of digital television and deciding on which functions will be the most attractive to the end consumer. With all of the new digital broadcasting systems the quality of the picture to the consumer is anticipated and furthermore it will improve with a transition from analog to digital channel encoding [2].

In this thesis in able to complete the communication of this DVB system, there are several process. The process that is involved in this thesis are modulation process, encoding, adding channel, demodulation and decoding process. In this report, a