UNIVERSITI TEKNOLOGI MARA

COMPARISON OF MODEL AND PERFORMANCE OF BPSK, QPSK AND OQPSK

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ABSTRACT

Digital modulation is a process of transforming a digital symbol to a signal suitable for transmission via a communication channel. Binary Phase Shift Keying (BPSK), Quadrature Phase Shift Keying (QPSK) and Offset Quadrature Phase Shift Keying (OQPSK) are the type of digital modulation under Phase Shift Keying family. QPSK and OQPSK modulation technique is the most widely modulation scheme used in the digital communication system such as wireless and satellite. It is due to their high performance in Bit Error Rate and bandwidth efficiency. This paper analyzes the simulation model design and performance between BPSK, QPSK and OQPSK. The model of BPSK, QPSK and OQPSK has been designed and simulated in Matlab using Simulink. The methodology used in this paper is by designing and analysing the simulation result between BPSK, QPSK and OQPSK in term of their performance. The result shows that the OQPSK is much better compare to the BPSK and QPSK for higher data rate transmission due to its delay in quadrature component make the phase shifted can only be 0° and ±90° can reduce the amplitude fluctuation in QPSK.

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CHAPTER 1

INTRODUCTION

1.1   BACKGROUND OF STUDY

Digital modulation is a process that impresses a digital symbol on to a signal suitable for transmission on a wired or wireless medium for receive signal correctly without any loss of information. For short distance transmissions, base band modulation is usually used, which is referred as line coding. A digital modulation allocate a piece of time called signal interval and generates a continuous function that represents the symbol for transmit a digital message. The message signal is often transformed onto a baseband signal.

Three basic digital modulations are amplitude-shift keying (ASK), frequency shift keying (FSK) and phase shift keying (PSK). These digital modulation techniques can be characterized by their transmitted symbols, which have a discrete set of values M and regularly spaced intervals. The selection of digital modulation technique for a specific application depends in general on the error performance, bandwidth efficiency, and implementation complexity [1].

PSK are less prone to error compare to the ASK and bandwidth efficient than FSK [2]. That make the PSK is more popular to use in high data rate application such as wireless and satellite. PSK is subdivided into two-level such as BPSK and multi level (M-ary) such as QPSK. Two-level can only transmit two bits of information for each carrier phase change. While the M-ary PSK can transmit more than two information bits for per carrier phase change. In M-PSK, as the value of M is increased, the bandwidth remains constant and minimum distance between signals reducing [3].

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