SPREAD SPECTRUM : PERFORMANCE COMPARISON IN LINEAR AND NON-LINEAR SYSTEM

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ABSTRACT

Spread spectrum is one of the most popular transmission system used widely in satellite communications for its signal security. It is called spread spectrum because the transmission bandwidth employed is much greater than the minimum bandwidth required to transmit the information signal. Satellite power for transmission is expensive and for terrestrial transmissions, a rate limited power amplifier is used, which ideally permits no amplitude variation in the transmitted signal.

In this thesis, the performance of linear system and non-linear system is being compared using mathlab Simulink simulation software. The received signal in both linear and non-linear system will be compared with the transmitted signal in the existence of Additive White Gaussian Noise (AWGN) in the channel. The bit error rate and error curve will determine the better system for spread spectrum transmission.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Digital communications deal with the transmission of information that can only be drawn from a finite set of waveforms or symbols. The transmission of digital signals over long distances depends on the types of modulation. The modulation schemes commonly employed are amplitude shift keying (ASK), frequency shift keying (FSK) and phase shift keying (PSK). The modulation techniques are applied in which the amplitude, frequency and phase of the carrier signal being varied according to the information data.

Noise and interference play a major role in giving a huge impact to the effectiveness of a communication signal. Noise is considered an unwanted electrical energy present in the usable pass band of a communication circuit. The modulation technique operating with frequency, amplitude and phase shift keying is prone to be contaminated with the unwanted electrical energy leading to inaccurate received signal at receiver. The disadvantage of being vulnerable to noise and interference, originated by other signal, which shares the same RF band. This vulnerability to interference led to the development of other forms of modulation known as wideband. Spread spectrum is one of such wideband modulating techniques that apart from its interference rejection capability offers other advantages of particular interest in multiple-access, ranging and jamming anti-jamming resistant system communications.