

Differential Detection of Multi-h Continuous Phase Frequency Shift Keying

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ABSTRACT

A special class of continuous phase modulation (CPM) offers power and bandwidth efficiency, called multi-h phase-coded modulation (MHPM) where time-varying modulation indices are used. In previous researches, an optimum detector, Maximum Likelihood Sequence Detector under AWGN background, has been considered to demodulate the multi-h CPFSK and it is actually a form of VA (Viterbi algorithm) decoder. However, based on the complexity of receiver in the actual environment of mobile radio, we adopt a non-coherent differential detection to demodulate the multi-h CPFSK system. In our study, we derived the theoretical value of BER(Bit-Error-Rate) by analytical investigation and verified the accuracy by simulations. We show that the proposed architecture can indeed progress demodulation through one-bit differential detection and with wonderful BER performance. It is also interested to note the set of modulation indices with larger minimum squared Euclidean distance do not always outperform the set with smaller one.

Keywords : Continuous Phase Modulation ; Multi-h Phase-Coded Modulation ; Viterbi Algorithm ; Differential Detection ; Coherent Demodulation

Table of Contents

封面內頁 簽名頁 授權書.....	iii 中文摘要.....
.....v 英文摘要.....vi 誌謝.....
.....vii 目錄.....viii 圖目錄.....
.....x 表目錄.....xii 第一章 簡介.....
.....1 1.1 研究動機.....1 1.2 研究背景.....
.....2 1.3 論文架構.....5 第二章 Multi-h
CPFSK 調變系統.....	6 2.1 前言.....
6 2.2	CPFSK(Continuous Phase Frequency Shift Keying)調變系統.....7 2.3
Multi-h CPFSK 調變系統.....	12 第三章 MHPM 之相差解調.....17
3.1 簡介.....	17 3.2 系統模型.....19
第四章 解析方法計算位元錯誤率.....	23 第五章 模擬結果與分析.....
29 5.1 系統模擬.....	29 5.2 模擬結果分析.....
41 第六章 結論與展望.....	43 6.1 結論.....
43 6.2 未來展望.....	44 參考文獻.....
45 附錄A 計算 演算法.....	49 附錄B Q-Function.....
.....53	

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