

預選低峰值因素之子載波群來降低OFDM系統之峰值因素

李振璋、李金椿

E-mail: 344744@mail.dyu.edu.tw

摘要

本文提出以預先篩選出來低的峰值因素 (Crest Factor, CF) 之子載波群來有效地降低OFDM訊號的峰值因素之技術, OFDM訊號可視為子載波群的線性和, 其峰對均值功率比 (Peak to Average Power Ratio, PAPR) 隨著其子載波數目而改變, 本文首先探討所有可能的子載波群之峰對均值功率比, 選出較低者來使用, 其中模擬結果使用互補累積分佈函數 (Complementary Cumulative Distribution Function, CCDF) 來評估其效能。並以CCDF為10⁻³情況下, 以四個子載波為例子, 原始之OFDM之峰值因素為7.78dB, 經過篩選過後的3, 2個子載波, 峰值因素為5.93dB, 4.61dB, 相對降低了1.85dB, 3.17dB, 可以發現此方法相當的有效。

關鍵詞: 峰值因素、峰對均值功率比、互補累積分佈函數

目錄

封面內頁 簽名頁 中文摘要	iii	英文摘要	
. iv	誌謝	v	目錄
. vi	圖目錄	viii	表目錄
. x	第一章 續論 1.1 研究動機	1	
1.2 研究方法	2	1.3 章節介紹	2
分頻多工基本原理 2.1 正交分頻多工歷史簡述	4	2.2 功能簡述	
. 4	2.3 串列與並行	6	2.4 正交性
. 7	2.5 反快速傅立葉轉換和快速傅立葉	8	2.6 保護區間和循環字首
正交分頻多工之優缺點	12	2.7	9
. 16	第三章 峰對均值功率比 3.1 高峰對均值功率比造成的問題		
. 17	3.2 峰對均值功率比定義	17	3.3 互補累積分佈函數定義
. 17	3.3 降低峰對均值功率比技術優缺點	18	第四章 子載波群之篩選與模擬結果分析 4.1 訊號模
. 20	4.2 子載波群之組合	22	4.3 模擬與分析子載波
. 23	4.4 子載波群之篩選	26	第五章 結論
. 30	參考文獻	31	

參考文獻

- [1] R. V. Nee and R. Prasad OFDM for Wireless Multimedia Communication, Artech House Publishers, Boston, 2000.
- [2] R. V. NEE and R. Prasad, "OFDM for Wireless Multimedia communications", Artech House, 1999.
- [3] PandhariPande, "Principles of OFDM," Potentials. IEEE, vol. 21, Issue2, pp. 16-19, Apr. 2002.
- [4] R.O' Neill and L. B. Lopes, "Envelope Variat and Spectral Splatter in Clipped Multicarrier Signal," Proc.IEEE PIMRC '95. Toronto, Canada, pp. 71-75, Sept.1995.
- [5] Yunjun Zhang, Abbas Yongacoglu, Jean-Yves Chouinard and Liaug Zhang. "OFDM Peak Power Reduction By Sub-Block Coding and It's Extened Versions," Vehicular Technology conference IEEE 49th, vol. 1, pp. 695-699, May 1999.
- [6] Tao Jiang and Guangxi Zhn, "Complement Block Coding for Reduction in Peak-to-Average Power Ratio of OFDM Signals," IEEE Radio Communication, Spet. 2005.
- [7] Seog Geun Kang, Jeong Goo Kim and Eon Kyeong Joo, "A Novel subblock Partition Scheme for Partial Transformat Sequence OFDM," IEEE Transactions on Broadcasting, vol. 45, no. 3, Sept. 1999.
- [8] R. W. Bami, R. F. H. Fischer and J. B. Hber, "Reducing the peak-to-average power ratio of multicarrier modulation by selective mapping," IEEE Electronics Letters, vol. 32, pp. 2056-2057, Oct.1996.
- [9] Bernard Sklar, Digital Communications, Prentice-Hall International, Inc. 2nd edition, ch4, 2001.
- [10]藍得誌, "Reduction the Peak-to-Average Power Ratio in CDMA-OFDM Systems", 大葉大學, 2006.
- [11]鄭宜馨, "On Using Convolution Codes to Reduce the Crest Factor of OFDM Signal", 大葉大學, 2009.
- [12]繆紹綱; 黃嘉淵 通訊系統模擬: systemwiwe by elanix使用入門, 全華科技圖書股份有限公司, 2002.