

跳時數目對傳輸功率於雙層毫微微蜂巢系統之研究

邱俊傑、陳雍宗

E-mail: 345386@mail.dyu.edu.tw

摘要

本論文的目的是對於操作兩層毫微微蜂巢(two-tier femtocell)環境之中多載波分碼多重存取系統(multi-carrier coded division multiple access, MC-CDMA)的系統進行效能的估算，並且分析數值結果。首先考慮本論文的部署，假設有多個毫微微蜂巢(femtocell)分布在巨大蜂巢(Macrocell)的周圍，可應用於室內使用者，如家用辦公室、小公司或移動手機等。在跳時分碼多重存取(time-hopped coded division multiple access, TH-CDMA)系統中，使用不同的時跳數目，研究跳槽數量藉由這參數控制系統效能，以及次載波的數量在多載波分碼多重存取系統之中重要的因素，它的確影響多載波分碼多重存取系統操作在多使用者傳輸系統的系統效能。

關鍵詞：跳時分碼多重存取、毫微微蜂巢

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
ix 第一章 緒論 1.1 研究背景	11.2	論文
內容摘要	4	第二章 毫微微蜂巢技術簡介 2.1 毫微微蜂巢(femtocell)技術
6.2.2 毫微微蜂巢科技觀點	10	2.3 毫微微蜂巢商業觀點
和覆蓋率分析	13	第三章 跳時多載波分碼多重存取技術 3.1 跳時多載波分碼多重存取訊號
16.3.2 調製參數	18	3.3 功率頻譜密度
19.3.4 接收機模型	21	第四章 跳時數目對傳輸功率於雙層毫微微蜂巢系統之效能分析
4.1 毫微微蜂巢之遠景	26	4.2 系統分析和通道環境
31.4.4 數值結果和討論	34	4.3 系統分析
36 參考文獻	37	第五章 結論

參考文獻

- [1] V. Chandrasekhar and J. G. Andrews, " Uplink Capacity and Interference Avoidance for Two-femtocell Networks, " IEEE Trans. Wireless Commun, Vol. 8, No. 7, pp. 3498-3509, July 2009.
- [2] S. K. Mem, L. J. Greenstein, H. V. poor, and S. C. Schwartz, " Uplink User Capacity in a Multicell CDMA System with Hotspot Microcells, " IEEE Trans. Wireless Commun, Vol. 5, No. 6, pp. 1333-1341, June 2006.
- [3] H. -S. Jo, S. Menber, C. Men, Lee, J. Moon, and J. – G Yook, " Interference Mitigation Using Uplink Power Control for Two-Tier Femtocell Network, " IEEE Trans. Wireless Commun, Vol. 8, No. 10, pp. 4906-4910, Oct. 2009.
- [4] V. Chandrasekhar and J. G. Andrews, " Femtocell Networks:A Survey, " IEEE Commun. Magazine, Vol. 46, No. 9, pp. 59-67, Sep. 2009.
- [5] N. Yee, Jean-Paul M.G. Linnart and G. Fettweis, " Multi-Carrier CDMA in Indoor Wireless Radio Network, " IEEE Trans. Commun, Vol. E77-B, No. 7, pp. 900-904, July 1994.
- [6] S. -P. Yeh, S. Taluar, Sa-Co, Lee, and H. Kim, " WiMAX Femtocells :A Perspective on Network. Architecture, Capacity, and Coverage, " IEEE Commun. Magazine, Vol. 46, No. 10, pp. 58-65, Oct. 2008.
- [7] V. Chandrasekhar and J. G. Andrews, " Spectrum Allocation in Tiered Cellular Network, " IEEE Trans. On Commun, Vol. 57, No. 10, pp. 3059-3068, Oct. 2009.
- [8] G. L. Stuber " Principles of Mobile Communication, " Kluwer Academic Publishers, Massachusetts, 1996.
- [9] J. Reig and N. Cardona, " Approximation of outage probability on Nakagami fading channels with multiple interferes, " Electronics Letters, Vol. 36, No. 19, Sep. 2000.
- [10] Y. D. Yao and Sheikh, A. U. H., " Outage probability analysis for microcellular mobile radio systems with co-channel interferers in Rician/Rayleigh fading environment, " Electronic letters, Vol. 26, No. 13, pp. 864-866, June 1990.
- [11] Rappaport T. S., " Wireless communication principles & practice, " Prentice Hall PTR Upper Saddle River, New Jersey, 1996.

- [12]S. Abbas and A. U. Sheikh, " Radio link performance on frequency selective Nakagami fading co-channel interference, " IEEE 49th Vehicular. Tech. Conf., Vol. 3, pp. 1735-1739, Oct. 2001.
- [13]M.-S. Alouini & M. K. Simon, " Performance of generalized selection combining over Weibull fading channel, " IEEE VTS 54th , Vehicular Technology Conference, Vol. 3, pp. 1735-1739, Oct. 2001.
- [14]A. D. Adnan and N.c. Beaulieu, " Outage probabilities of cellular radio system with multiple Nakagami interference, " IEEE Trans. on Vehicular Technology Conference., Vol. 4, pp. 757-768, 1991.
- [15]Nakagami, N.: " The m-distribution: a general formula for intensity distribution of rapid fading, " in HOFFMAN. W.G. (Ed.): ' Statistical methods in radio wave propagation ' (Pergamon, Oxford, UK, 1960), pp. 3-36.
- [16]Y. D. Yao and Sheikh, A. U. H., " Co-channel interference modeling and performance analysis of microcell system for wireless personal communications, " Canadian Journal of electrical and computer engineering, Vol. 19, No. 1, pp. 27-35, 1994.
- [17]T. E. Klein and S. – J Han, " Assignment Strategies for Mobile Data Users in Hierarchical Overlay Networks: Performance of Optimal and Adaptive Strategies, " IEEE J. Select. Area Commun. Vol. 22, No. 5, pp. 849-861, June 2004.
- [18]S. Kishore, L. J. Greenstein, H. V. poor, and S. C. Schwartz, " Soft Hand Off and Uplink Capacity in a Tow-tier CDMA System, " IEEE Trans. Wireless Commun, Vol. 4, No. 4, pp.1297-1301, July 2005.
- [19]V. Chandrasekhar, J. G. Andrews, and A. Gatherer, " Uplink Capacity and Interference Avoidance for Two-Tier Femtocell Networks, " IEEE Trans. Wireless Commun, Vol. 8, No. 7, pp.1-12, July 2009.
- [20]V. Chandrasekhar, J. G. Andrews, and A. Gatherer, " Coverage in Multi-Antenna Two-tier Networks, " IEEE Trans. Wireless Commun, Vol. 8, No. 10, pp.5314-5327, Oct. 2009.
- [21]H. C. Claussen, L. T. W. Ho, L. G. Samual, " Self-optimization of Coverage for Femtocell Deployments, " Wireless Telecommunications Symposium, 2008. WTS, pp. 278-285, April 2008.
- [22]V. Chandrasekhar, J. G. Andrews, and A. Gatherer, " Power Control in Two-tier Femtocell Network, " To Appear, IEEE Trans. Wireless Commun, Vol. 8, issue 8, pp. 4316-4328, Aug. 2009.
- [23]A. Ghasemi and E. Sousa, " spectrum Sensing in Cognitive Radio Networks :The Cooperation-Processing Tradeoff, " Wireless Commun. Mob. Comput., Vol. 7, No. 9, pp. 1049-1060, Nov. 2007.
- [24]L. Qian, X. Li, J. Attia, and Z. Gajic, " Power Control for Cognitive Radio Ad hoc Network, " in Proc. IEEE Workshop on Local & Metro. Area Networks, pp. 7-12, June 2007.
- [25]A. M. Hunter, J. G. Andrews, and S. Weber, " Transmission Capacity of Ad hoc Network with Spatial Diversity, " IEEE Trans. Commun, Vol. 7, No. 12, pp. 5058-5071, Dec. 2008.
- [26]Joy long-Zong Chen, " Performance Analysis for an MC-CDMA System over Single-cell and Multiple-cell Environments in Correlated-Nakagami-m Fading, " IEICE Transaction on Commun., Vol. E90-B, No. 7,pp. 1713-1724, July 2007.
- [27]M. K. Simon, M. S. Alouini, " A unified approach to the performance analysis of digital communication over generalized fading channel, " Proc. of the IEEE, Vol. 86, pp. 1860-1877, 1998.
- [28]L. L. Chong, L. B. Milstein, " Error rate of a multicarrier CDMA system with imperfect channel estimates, " IEEE International Conference on Commun., Vol. 2, pp. 934-938, 2000.