

On the hopping number versus transmitting power for the two-tier cellular system

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ABSTRACT

The system performance of an MC-CDMA(multi-carrier coded-division multiple-access) system deployed with TH(time-hopping) scheme is evaluated and studied in the this theirs. The tow-tier femtocell operation environment is applied on this analysis which is majoring in the hopping number. It is known that a two-tier femtocell can be distributed around macro-cell network for applying, in indoor, for instance, small office, little enterprise and mobile phone. The results from evaluation of this theirs significantly show that the system performance of an TH-MC-CDMA system definitely is definitely affected by the hopping numbers.

Keywords : TH-MC-CDMA、 femtocell

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REFERENCES

[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 Two-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. Samuel, " 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.