An FSMC model for the ACM scheme with repetition coding in mobile WiMAX

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Abstract: To protect vital control information from deep fades, repetition coding is recommended in mobile WiMAX. This paper considers repetition coding as a maximum ratio combining process and proposes an expression for the coding gain and its effect on BER. A 10-state finite state Markov channel (FSMC) model is also proposed for the implementation of the adaptive modulation and coding (AMC) scheme in mobile WiMAX to maximize its spectral efficiency in a Rayleigh fading environment. ??2009 IEEE.

Author Keywords: Finite state Markov channel model; Repetition coding; WiMAX, adaptive modulation and coding; Wireless communications

Index Keywords: Adaptive modulation and coding; Adaptive modulation and coding schemes; Coding gains; Control information; Finite state Markov channels; Maximum ratio combining; Mobile WiMAX; Repetition coding; Spectral efficiencies; Wireless communications; Communication; Communication channels (information theory); Delta modulation; Interoperability; Rayleigh fading; Spectrum analyzers; Wimax; Adaptive modulation

Year: 2009

Source title: ATC 2009 - Proceedings of the 2009 International Conference on Advanced Technologies for Communications

Art. No.: 5349484

Page : 233-236

Link: Scorpus Link

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Conference name: 2009 International Conference on Advanced Technologies for Communications, ATC 2009

Conference date: 12 October 2009 through 14 October 2009

Conference location: Hai Phong

Conference code: 79085

ISBN: 9.78E+12

DOI: 10.1109/ATC.2009.5349484

Language of Original Document: English

Abbreviated Source Title: ATC 2009 - Proceedings of the 2009 International Conference on Advanced Technologies for Communications

Document Type: Conference Paper

Source: Scopus

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References:

1. Wang, H.S., Moayeri, N., Finite-State Markov Channel - A Useful Model for Radio Communication Channels (1995) IEEE Trans. on Vehicular Technology, 44 (1), pp. 163-171. , February
2. Zhang, Q., Kassam, S.A., Finite-State Markov Model for Rayleigh Fading Channels (1999) IEEE Transactions on Communications, 47 (11), pp. 1688-1692. , November
3. IEEE std 802.16e-2005: Air Interface for Fixed and Mobile Broadband Wireless Access SystemsGoldsmith, A.J., Chua, S.G., Variable-Rate Variable-Power MQAM for Fading Channels (1997) IEEE Transactions on Communications, 45 (10), pp. 1218-1230. , October
4. Thang Vu, X., Thong Nguyen, D., Anh Vu, T., A Finite-State Markov Channel Model for AMC scheme in WiMAX (2009), Submitted for publication, MayProakis, J.G., (1995) Digital Communications, , Third Edition, McGraw-Hill, NY