Abstract

This paper proposes a space-time block-coded orthogonal frequency-division multiplexing (STBC-OFDM) scheme for frequency-selective fading channels which does not require channel knowledge either at the transmitter or at the receiver. This paper proposed a generalized maximum likelihood estimation decoding algorithm. Due to the orthogonality nature of STBC, the rule for decoding was reduced to a single step. The performance investigation of the proposed system was done over Rayleigh fading channel and also over the Rician fading channel. Simulation results reveal the performance of proposed STBC communication system is near optimum.

References

A Maximum Likelihood (ML) based OSTBC-OFDM System over Multipath Fading Channels


2. S. M. Alamouti, “A Simple Transmit Diversity Technique for Wireless Communications”,

3. V. Tarokh, H. Jafarkhani and A. R. Calderbank, “Space-time block codes from orthogonal

data rate wireless communication over wideband channels”, Proc. IEEE VTC’98, pp.2232-2236,
1998.

5. S. Mudulodu and A. Paulraj, “A transmit diversity scheme for frequency selective fading

6. Z. Liu, G. B. Giannakis, A. Scaglione and S. Barbarossa, “Decoding and equalization of
unknown multipath channels based on block precoding and transmit antenna diversity”, Proc.

7. Y. Li, N. Seshadri and S. Ariyavisitakul, “Channel estimation for OFDM systems with
transmitter diversity in mobile wireless channels”, IEEE J. Select. Areas Comm., vol.17, no.3,


9. R. Raheli, A. Polydoros and C. Tzou, “Per-survivor processing: A general approach to
p.354-364.

10. V. Tarokh, N. Seshadri and A. R. Calderbank, “Space-time codes for high data rate
wireless communication: performance criterion and code construction”, IEEE Trans. Inform

11. S. Baro, G. Bauch and A. Hansmann, “Improved codes for spacetime trellis-coded


13. S. Siwamogsatham and M. P. Fitz, “Improved high rate space-time codes via expanded
STBC-MTCM constructions” Proc. IEEE Int. Symp. Information Theory (ISIT), Lausanne,


15. W. Huiming, X. Xiang-Gen, Y. Qinye and L. Bin, "A family of space-time block codes
achieving full diversity with linear receivers," IEEE Transactions on Communications, vol. 57,


17. S. N. Diggavi, N. Al-Dhahir, A. Stamoulis and A. R. Calderbank, "Great expectations: the
value of spatial diversity in wireless networks," Proceedings of the IEEE, vol. 92, pp. 219-270,
2004.

18. D. Agrawal, V. Tarokh, A. Naguib and N. Seshadri, "Space-time coded OFDM for high
data-rate wireless communication over wideband channels," in IEEE Conference on Vehicular

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Keywords

MIMO, STBC-OFDM, Almouti Scheme, Maximum likelihood estimator, BER.