

Pairwise error probability of distributed space-time coding employing Alamouti scheme in wireless relays networks

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Abstract: In this paper, we analyze the pairwise error probability (PEP) of distributed space-time codes, in which the source and the relay generate Alamouti space-time code in a distributed fashion. We restrict our attention to the space-time code construction for Protocol III in Nabar et al. (IEEE Journal on Selected Areas Communications 22(6): 1099-1109, 2004). In particular, we derive two closed-form approximations for PEP when the relay is either close to the destination or source and an upper bound for any position of the relay. Using the alternative definition of Q-function, we can express these PEPs in terms of finite integral whose integrand is composed of trigonometric functions. We further show that with only one relay assisted source-destination link, system still achieves diversity order of two, assuming single-antenna terminals. We also perform Monte-Carlo simulations to verify the analysis. © Springer Science+Business Media, LLC. 2008.

Author Keywords: Distributed space-time codes; Pairwise error probability (PEP); Relay channels

Index Keywords: Alamouti; Alamouti scheme; Closed form approximations; Distributed space-time codes; Distributed space-time coding; Diversity order; Monte Carlo Simulation; Pair-wise error probability; Q-functions; Relay channels; Single-antenna terminals; Space time code; Upper Bound; Wireless relays; Block codes; Communication channels (information theory); Time measurement; Wireless networks; Probability

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