

Performance of dual-branch selection combining diversity systems in non-identical Nakagami-q (Hoyt) fading channels

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Abstract: Motivated by the low-complexity to implement a dual-branch selection combining system, which is a practical method to improve the performance of a communication system subject to fading, this paper studies important performance measures for that system over independent but nonidentically distributed Nakagami-q fading channels. In particular, a novel closed-form expression is derived for the moments of the output signal-to-noise ratio (SNR), which is utilized to obtain expressions for the average output SNR, and amount of fading. An expression for the outage probability is also obtained in a closed-form. Furthermore, novel expressions for the channel capacity are derived for two adaptive transmission schemes: the optimal rate adaptation with constant power, and channel inversion with fixed rate. The corresponding expressions for one-sided Gaussian and Rayleigh fading are obtained as special cases of Nakagami-q fading. Finally, numerical examples are presented for illustration.