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Performance of Selected Diversity Techniques Over α - μ Fading Channels

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Abstract: In this paper, approximate closed-form expressions for the bit error rate (BER) of M-ary quadrature amplitude modulation (MQAM) and M-ary phase shift keying (MPSK) are derived considering independent and identically distributed (i.i.d) α - μ fading channels with a maximal ratio combining (MRC) receiver. Moreover, other closed-form expressions are obtained for the symbol error rate (SER) of both MQAM and MPSK under the same channel conditions considering dual branch selection combining (SC) receiver. The derivations for MRC are based on the exponential approximation of the coherent BER formula for both MQAM and MPSK. For dual branch SC, the derivations are based on very accurate SER approximation for both MQAM and MPSK. The derived expressions can reduce to study the BER performance over other fading channels such as; Rayleigh, Weibull, and Nakagami-m, as special cases. Numerical results are also provided for the derived expressions and they show close match with Monte-Carlo simulations, especially for the case of dual branch SC.