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Closed-Form Expressions for the Average Channel Capacity of the alpha-mu Fading Model Under Different Adaptive Transmission Protocols

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Abstract: In this paper,we consider a small-scale multipath fading channel following the alpha-mu generalized fading model distribution. We first derive an expression for the amount of fading (AF) for this channel model to show the generalization attribute of this fading model recently reported in the literature. Then, we derive closed-form expressions for the average channel capacity considering this channel distribution under different adaptive transmission protocols, namely the simultaneous power and rate adaptation protocol, the optimal rate adaptation with fixed power protocol, and the channel inversion with fixed-rate protocol. All the obtained expressions are in closed-form and general expressions that can reduce to other channel capacity expressions that are well-known and to some others that are not known for Rayleigh, Nakagami-m, and Weibull, as special cases. The derived expressions in this paper are new and have not been previously reported in the literature.