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Generalized Diversity Reception in the Presence of Multiple Distinct Interferers: An Outage Performance Analysis

Abstract:

The analytical performance evaluation of various coherent diversity combining reception techniques in the presence of multiuser interference is presented into this paper. Particularly, the outage probability of the generalized selection combining (GSC) and its two extreme cases, namely the maximum ratio combining (MRC) and the selection combining (SC), are evaluated. The multiple interferers undergo independent and non-identically distributed Nakagami-m fading channels, with distinct average received powers and arbitrary fading scales. New analytical outage expressions are presented including several channel fading conditions regarding the desired user's signal. Although the proposed approach is formed as an infinite series representation, it includes only simple elementary and Gamma functions, while it delivers a rapidly converging formula achieving a sufficiently high precision level. Moreover, the derived computational complexity of this function is thoroughly discussed, while a corresponding comparison with another popular technique indicates the usefulness of the proposed approach. Finally, the accuracy of the approach is verified with the aid of selected numerical results accompanied with equivalent simulation ones.