Jordan University of Science and Technology

Capacity of correlated Nakagami-m fading channels with diversity combining techniques

Authors: S. Khatalin, and J. P. Fonseka

Abstract: We derive closed-form expressions for the capacity of dual-branch maximal ratio combining, equal gain combining, selection combining, and switch and stay combining (SSC) diversity systems over correlated Nakagami-m fading channels. Because the final capacity expressions contain infinite series, we truncate the series and present upper bounds on the truncation errors. We also derive an expression that can be used to numerically determine the optimum adaptive switching threshold for the capacity of a dual-branch SSC system over correlated Nakagami-m fading channels. However, a closed-form expression for the optimum adaptive switching threshold is derived for the case of independent branches. The corresponding expressions for Rayleigh fading are obtained as a special case of Nakagami-m fading. Finally, numerical examples are presented for illustration.