Achievable Average Secrecy Rates over Bank of Parallel Independent Fading Channels with Friendly Jamming

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Abstract : In this paper, we investigate the effect of friendly jamming power allocation strategies on the achievable average secrecy rate over a bank of parallel fading wiretap channels. We investigate the achievable average secrecy rate in parallel fading wiretap channels subject to Rayleigh and Rician fading. The achievable average secrecy rate, due to the presence of a line-of-sight component in the jammer channel is also evaluated. Moreover, we study the detrimental effect of correlation across the parallel sub-channels, and evaluate the corresponding decrease in the achievable average secrecy rate for the various fading configurations. We also investigate the tradeoff between the transmission power and the jamming power for a fixed total power budget. Our results, which are applicable to current orthogonal frequency division multiplexing (OFDM) communications systems, shed further light on the achievable average secrecy rates over a bank of parallel fading channels in the presence of friendly jammers.

Keywords : fading parallel channels, wire-tap channel, OFDM, secrecy capacity, power allocation
Conference Title : ICWCN 2015 : International Conference on Wireless Communications and Networking
Conference Location : Lisbon, Portugal
Conference Dates : April 16-17, 2015