

# Power allocation and cooperative jamming for enhancing physical layer security in opportunistic relay networks in the presence of interference

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## Abstract:

In this paper, the impact of cochannel interference on the secrecy performance of dual-hop decode-and-forward relaying is investigated. In particular, the outage and intercept probabilities are obtained for the opportunistic relay selection (ORS) model in the presence of nonidentical interfering signals under a single/multiple passive eavesdropper(s) attack. Moreover, the proposed work enhances physical layer security performance of ORS model using cooperative jamming (CJ) techniques. Therefore, new closed-form expressions are derived for the intercept and outage probabilities of the CJ-ORS model in the presence of interference over Rayleigh fading channels. Moreover, the analyses are generalized to the case of multiple eavesdroppers where closed-form expressions are derived for the intercept probability. To reveal more insights on the proposed work secrecy performance, asymptotic closed-form expressions for the intercept and outage probabilities are obtained. Using these asymptotic expressions, a power allocation optimization problem is formulated and solved for enhancing the system security. The derived analytical formulas herein are supported by numerical and simulation results to clarify the main contributions of the paper. The results show that, although the cochannel interference increases the system outage probability, it might improve the system secrecy performance. Moreover, the proposed CJ-ORS model is shown to enhance the system secrecy performance compared to ORS model. Copyright © 2017 John Wiley & Sons, Ltd.

## Reference:

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