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Secrecy Analysis in Downlink Cellular Networks in the Presence of D2D Pairs and Hardware Impairment

Authors : Mahdi Rahimi, Mohammad Mahdi Mojahedian, Mohammad Reza Aref

Abstract : In this paper, a cellular communication scenario with a transmitter and an authorized user is considered to analyze its secrecy in the face of eavesdroppers and the interferences propagated unintentionally through the communication network. It is also assumed that some D2D pairs and eavesdroppers are randomly located in the cell. Assuming hardware impairment, perfect connection probability is analytically calculated, and upper bound is provided for the secrecy outage probability. In addition, a method based on random activation of D2Ds is proposed to improve network security. Finally, the analytical results are verified by simulations.

Keywords : physical layer security, stochastic geometry, device-to-device, hardware impairment
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