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Secure Transmission Scheme in Device-to-Device Multicast Communications

Authors : Bangwon Seo

Abstract : In this paper, we consider multicast device-to-device (D2D) direct communication systems in cellular networks. In multicast D2D communications, nearby mobile devices exchanges, their data directly without going through a base station and a D2D transmitter send its data to multiple D2D receivers that compose of D2D multicast group. We consider wiretap channel where there is an eavesdropper that attempts to overhear the transmitted data of the D2D transmitter. In this paper, we propose a secure transmission scheme in D2D multicast communications in cellular networks. In order to prevent the eavesdropper from overhearing the transmitted data of the D2D transmitter, a precoding vector is employed at the D2D transmitter in the proposed scheme. We perform computer simulations to evaluate the performance of the proposed scheme. Through the simulation, we show that the secrecy rate performance can be improved by selecting an appropriate precoding vector.

Keywords : device-to-device communications, wiretap channel, secure transmission, precoding
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