Abstract

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A Generalized Spatial Modulation System Using Massive MIMO Space Time Coding Antenna Grouping

Massive multiple input multiple output (MIMO), also known as a very large-scale MIMO, is an emerging technology in wireless communications that increases capacity compared to MIMO systems. The massive MIMO communication technique is currently forming a major part of ongoing research. The main issue for massive MIMO improvements depends on the number of transmitting antennas to increase the data rate and minimize bit error rate (BER). To enhance the data rate and BER, new coding and modulation techniques are required. In this paper, a generalized spatial modulation (GSM) with antenna grouping space time coding technique (STC) is proposed. The proposed GSM-STC technique is based on space time coding of two successive GSM-modulated data symbols on two subgroups of antennas to improve data rate and to minimize BER. Moreover, the proposed GSM-STC system can offer spatial diversity gains and can also increase the reliability of the wireless channel by providing replicas of the received signal. The simulation results show that GSM-STC achieves better performance compared to conventional GSM techniques in terms of data rate and BER, leading to good potential for massive MIMO by using subgroups of antennas.