Cooperative MIMO Applied Null Beamforming to Self in Full-Duplex Wireless Communication System and Its Implementation

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***Abstract*—This paper proposes a full-duplex wireless communication system applying cooperative multiple-input multiple-output (Co-MIMO). This proposal solves self-interference (SI) in full-duplex wireless communication systems by applying the block diagonalization used in multi-user MIMO (MU-MIMO). Therefore, there is no need for a radio frequency (RF) canceller, which has a large hardware size and is difficult to extend to MIMO. Furthermore, higher throughput can be achieved by applying Co-MIMO, in which multiple access points work together to communicate. We also introduce the implementation of the proposed method using a field-programmable gate array (FPGA) and software-defined radio (SDR) in this paper. It shows that SI cancellation can be realized by using them. The proposed method is implemented based on the IEEE 802.11n frame format as an example. In the experiment, a total of 30 [dB] SI cancellation is confirmed with a transmission power of -12 [dBm]. The SI cancellation amount can be further increased by increasing the transmission power.**

***Keyword*—Cooperative MIMO, Full-Duplex Wireless Communication, Self-Interference Cancellation**

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