Abstract

In this paper, the MIMO full-duplex system is proposed to remove self-interference signal using modified DFT based channel estimation technique. In SISO full-duplex systems only single transceiver can transmit data on either side simultaneously whereas in MIMO full-duplex systems multiple transceivers can transmit data simultaneously from both sides. During MIMO full-duplex transmission self-interference and circuit impairments may occur, to avoid such noises digital cancellation technique is used which is a lowest complexity self-interference cancellation technique in all full-duplex systems. In this technique receiver auxiliary chain and its copy circuit called ordinary receiver chain is used to cancel out the both self-interference and its circuit impairments. Noise added during wireless channel is suppressed by using passive suppression technique and Gaussian noise, phase noise and quantization noise is eliminated by the active cancellation technique. So, combination of active cancellation and passive suppression techniques are used to eliminate the circuit impairments. The proposed channel estimation technique is used to cancel out the self-interference produced at the output of both auxiliary and ordinary receiver chains. By using digital self-interference cancellation technique
the amount of self-interference cancelled is 37dBm higher than the receiver noise floor. The achievable rate and throughput of MIMO full-duplex system is 28 bits/sec/Hz and 1049.04 Mbps respectively which is very large when compared to MIMO half-duplex, SISO full-duplex and SISO half-duplex systems.

References

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Index Terms

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Keywords

Full-duplex system, Digital self-interference, MIMO, Channel capacity, Throughput, Spectral efficiency