Unified MIMO-Multicarrier Designs: A Space–Time Shift Keying Approach

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Abstract

Document Sections

I. Introduction

II. MIMO Systems: State-of-the-Art Contributions and STSK

III. MIMO-MC Designs: Example of the OFDM-Aided STSK

IV. MC STSK Schemes for Dispersive Multiuser Scenarios

V. Successive Relaying-Aided Distributed MC STSK

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Authors

Figures

References

Citations

Keywords

Metrics

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Abstract:
A survey and tutorial is provided on the subject of multiple-input-multiple-output (MIMO) multicarrier (MC) systems relying on the space-time shift keying (STSK) concept. We commence with a brief review of the family of MIMO systems, which is followed by the design of STSK systems in the context of MC modulation-based transmissions over dispersive wireless channels. Specifically, the STSK scheme is amalgamated with orthogonal frequency-division multiplexing, MC code-division multiple access, orthogonal frequency-division multiple access (OFDMA), and single-carrier frequency-division multiple access. We also provide a rudimentary introduction to MC differential STSK employing both conventional differential detection and multiple-symbol differential sphere decoding for the sake of dispensing with channel estimation. We conclude with the design recipes of coherent versus noncoherent MC STSK schemes, complemented by a range of future research ideas.

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