Effects of Transmit Diversity on a Discrete Wavelet Transform and Wavelet Packet Transform-based Multicarrier Systems

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Abstract

This paper proposes a MIMO-WPT-based multicarrier system with feedback from the receiver to the transmitter carrying the channel state information (CSI), whereby a steering matrix can be defined to enhance robust performance against multipath fading effects at the receiver. This relies on the time-scale localization of wavelet bases, and is demonstrated in terms of bit error rate performance. In contrast to sinusoidal carriers WP have very narrow side lobes, with most energy contained in the main lobe; this makes the proposed system less susceptible to inter-carrier interference. The main contribution of this work is the evaluation of system parameters using different wavelet families, order of filters and number of elements to balance overall performance and cost of the system, and to provide a reliable system with a high data-rate.

References

Index Terms

Computer Science Information Sciences

Keywords

MIMO, Wavelet, Transmit Diversity, Beam-forming, Multicarrier System