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Crest Factor Reduction in MC-CDMA Employing Carrier Interferometry Codes

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Balasubramaniam Natarajan,^{Aff1}

Corresponding Affiliation: Aff1

Email: bala@eece.ksu.edu

Carl R Nassar,^{Aff2}

Email: carln@engr.colostate.edu

Aff1 Department of Electrical and Computer Engineering, Kansas State University, Manhattan, KS 66506-5204, USA

Aff2 Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO 80523-1373, USA

Abstract

This paper addresses signal compactness issues in MC-CDMA employing carrier interferometry codes using the measure of crest factor (CF). Carrier interferometry codes, applied to N -carrier MC-CDMA systems, enable $2N$ users to simultaneously share the system bandwidth with minimal degradation in performance (relative to the N -orthogonal-user case). First, for a fully loaded ($K = N$ and $K = 2N$ users) MC-CDMA system with practical values of N , it is shown that the CF in downlink transmission demonstrates desirable properties of low mean and low variance. The downlink CF degrades when the number of users in the system decreases. Next, the high CF observed in the uplink is characterized and the poor CF in a partially loaded downlink as well as uplink is effectively combated using Schroeder's analytical CF reduction techniques.

Keywords

carrier interferometry, multicarrier CDMA, crest factor, peak-to-average power ratio