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Realization of Constant Envelope OFDM Using Quantization and CPM Technique

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Abstract

Orthogonal frequency division multiplexing (OFDM) is used in many wireless communication. The important drawback of this modulation is its high peak-to-average power ratio (PAPR). In this paper, a new modulation scheme of constant-envelope OFDM (CE-OFDM) is proposed. This scheme uses a combination of OFDM, quantizer and continuous phase modulation (CPM) to achieves 0 dB PAPR. The statistical signatures of signals, based on system parameters such as the length of discrete Fourier transform (DFT) and the number of quantization levels are presented. There are two sources of noise in proposed CE-OFDM scheme: quantization noise and channel noise. The theoretical analysis of these noises is presented. Moreover, the bit error rate (BER) performance of CE-OFDM over additive white Gaussian noise (AWGN) is analyzed. The simulation results show that the proposed system has unity PAPR and the symbol error rate (SER) performance of CE-OFDM is the same as the theoretical analysis.

Keywords: OFDM, Constant envelope, Quantization, CPM, PAPR

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