Reduction the Peak-to-Average Power Ratio in CDMA-OFDM Systems

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ABSTRACT

The performance of the Companding technique for reducing the Peak-to-Average Power Ratio (PAPR) in the CDMA-OFDM transmitted signals is investigated, and simulation are performed to calculate it ’ s effectiveness, where the calculation criterion is based on a CCDF of 10-3. Companding technique composed of a compressor in the transmitter side to reduce the dynamic range of the amplitude variation, and a expander in the receiver side to restore the original amplitude dynamic range. Four compressing transfer functions, μ-law, Linear log, Piecewise linear and Error function are considered in the thesis, and their performance in reducing the PAPR of the CDMA-OFDM signal are calculated. From our simulation results, we find that these four compressing transfer functions are able to reduce the PAPR at least 3 dB for the CDMA-OFDM signal having a spreading factor of 8 and a sub carrier number of 128. For a spreading factor of 16 and a sub carrier number of 256, the PAPR reduction is at least 2.5 dB. The loss in energy efficiency due to the compressing process is between 1.2 and 2.2 dB for a BER of 10-3. Considering the trade off between the PAPR reduction and loss in energy efficiency, the Piecewise linear and Error function methods produce better overall performance than the others.

Keywords : PAPR, Companding, CCDF, compressor, expander

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