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Performance Analysis of PAPR-Reduction in OICF Scheme with Modulation Techniques

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ABSTRACT

Recently, orthogonal frequency division multiplexing has been regarded as one of the core technologies for various wireless communication systems. Especially, OFDM has been adopted as a standard for various wireless communication systems such as wireless local area networks, wireless metropolitan area networks, DAB, and DVB. In this paper present PAPR reduction techniques for QAM modulation techniques. The simulation results shown that our proposed power reduction techniques OICF were proposed to reduce the high Peak to Average Power Ratio values. The Simulations are performed using OICF technique with modulation technique under both AWGN channel. The simulation result shows the relationship between Complementary Cumulative Distribution Function versus PAPR.

KEYWORDS: *OICF, PAPR, OFDM, AWGN*

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I. INTRODUCTION

The wireless communication history, every generation of computers get advanced with new frequency bands, high data rates and non backwards compatible transmission technology. Here as we know 4G is a successor of 3G, i.e. 4G provides internet broadband in computer devices and other mobile devices .Some of the other features you use now are days are parts of it like High definition Mobile TV, Video conferencing, video calling ,accessing mobile internet, IP Telephony(Voice Over Internet Protocol [VIOP] it is the group of technologies which is used to deliver the voice communication through the internet protocol). 4G can be categorized in two types –LTE (Long Term Evolution[first used in Norway, Oslo in 2009]), Mobile WiMAX(firstly used in South Korea in 2006). WiMAX was establishes after 2008. The presented paper proposed PAPR reduction techniques using QCA modulation technology with AWGN.

II. PAPR

Peak to average power ratio (PAPR) is a signal property that is calculated by dividing the peak power amplitude of the waveform by the RMS value of it, a dimensionless quantity which is expressed in decibels (dB). In digital transmission when the waveform is represented as signal samples, the PAPR is defined as in equation 1.1.

$$PAPR = \frac{\max(|S[n]|^2)}{E\{|S[n]|^2\}}, \quad 0 \le n \le N-1 \qquad 1$$

Where S[n] represents the signal samples, $\max(|S[n]|^2)$ denotes the maximum instantaneous power and $E\{|S[n]|^2\}$ is the average power of the signal [1].

A. PAPR Reduction Techniques

There are different techniques to reduce PAPR of OFDM.

- Partial Transmission Sequence(PTS),
- Selective Mapping(SLM),
- Tone Reservation,
- Iterative clipping and filtering,

III. OPTIMIZED-ITERATION-CLIPPING-FILTERING (OICF) SCHEME

As mentioned earlier, iterative clipping and filtering (ICF) of 2K+1 IFFT/FFT operations, where K is the number of iterations, is necessary to obtain the desired clipped signal. Proposed an efficient and fast algorithm for ICF. In target clipped signal was produced through one iteration (of 4 IFFT/FFT operations) with some additional processing (two vector subtractions). They assumed the clipped peaks as a series of parabolic pulses, which is true for large clipping threshold. The processing overhead might still be considerable due to the oversampling (by a factor ≥4) of original OFDM data block.

IV. PAPR REDUCTION ON 4-PSK USING OICF TECHNIQUES

In this performace we are used different FFT (N=64, 128, and 256) with 4-PSK-Modulation, also consdered claping

ration (CR) Y is still set to 2.11, L=8, PAPR with OFDM signal. Figure 1 for N=64, figure 2 for N=128 and figure 3 for N=256 shows the PAPR verses CCDF curves for the signals processed by using the orignal and simplified OICF.

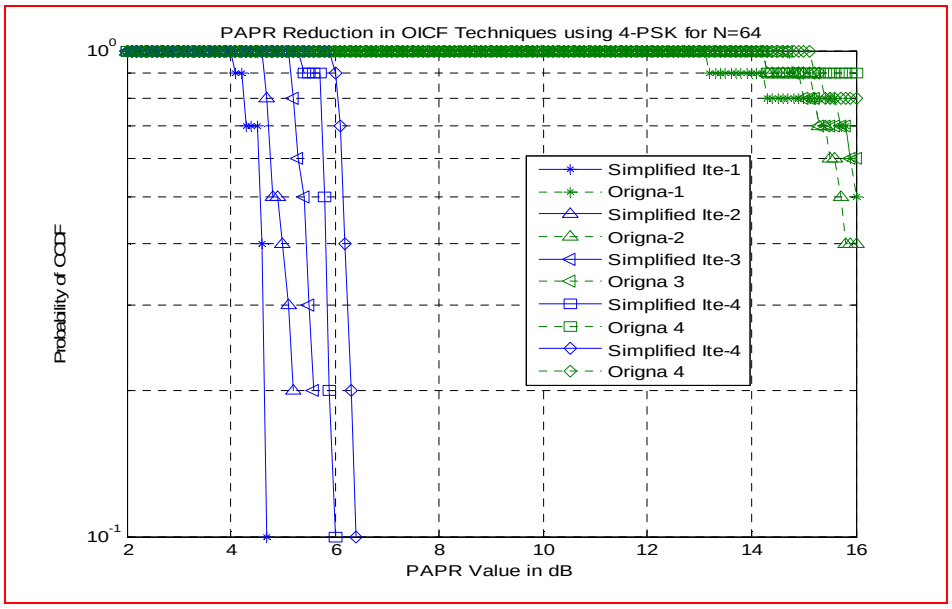

Fig. 1: PAPR Reduction in OICF Tehniques using 4-PSK for N=64

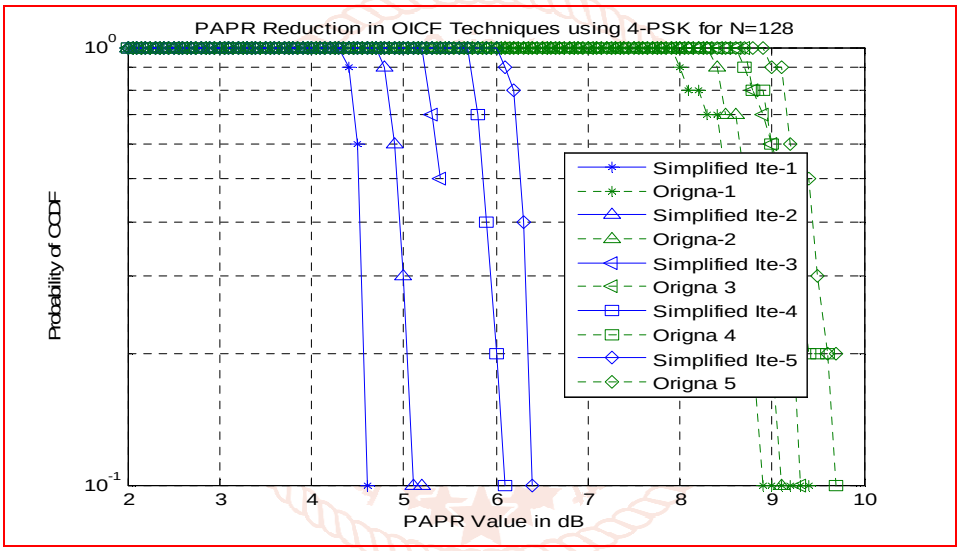

Fig. 2: PAPR Reduction in OICF Tehniques using 4-PSK for N=128

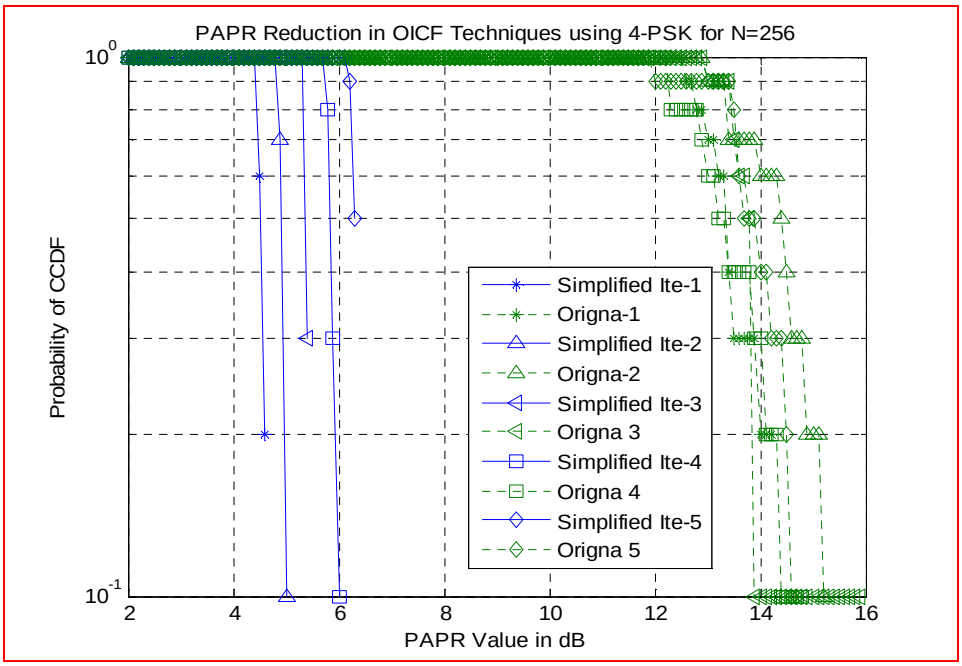

Fig. 3: PAPR Reduction in OICF Tehniques using 4-PSK for N=256

Conclusion:

In the results shows the original OICF 1st iteration and Simplified OICF 1st iteration. The performance at the 10^{-1} clipping probability in simplified OICF, 1st iteration the PAPR 4.6dB for N=128, and another simplified OICF, 1st iteration the PAPR 4.7dB for N=64. In this iteration performance PAPR reduce by 0.1dB batter at 1st iteration in N=128 for using 4-PSK.

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