A Study On Different Techniques For PAPR Reduction In OFDM System

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Abstract— **The increasing demand on high bit rate and reliable wireless and wire line system has junction rectifier to several new rising modulation techniques. one among the techniques are going to be Orthogonal Frequency Division Multiplexing (OFDM), that offers reliable high bit rate wireless system with cheap complexness. the first reasons OFDM is most popular in most high information measure potency transmission systems ar as a result of it effectively resist Inter Symbol Interference (ISI) and is powerful towards multipath weakening.**
Orthogonal Frequency Division Multiplexing (OFDM) could be a digital transmission methodology developed to satisfy the increasing demand for higher knowledge rates in communications which might be utilized in each wired and wireless environments. This thesis describes the problem of the height to Average Power magnitude relation (PAPR) in OFDM that could be a major downside, and presents new and variations to existing algorithms to cut back it.

*Index Terms*— **OFDM, PAPR, PTS, SLM.**

I. INTRODUCTION

A accepted downside of the orthogonal frequency division multiplexing (OFDM) system is that the doable incidence of high peak to average power magnitude relation (PAPR). several techniques are planned to mitigate the PAPR downside. apart from the signal distortion techniques like clipping[2], peak windowing[3] and companding,[4] redundancy is required to manage PAPR. The redundancy based mostly PAPR reduction techniques embody selective mapping [9], partial transmit sequence [10], tone reservation[11], tone injection[12] and coding[13],etc info. The unwanted effects occurring to the distortion techniques may be relieved with the penalty of the reduced transmission rates owing to introduction of redundancy. The essential plan of choosing selective-mapping (SLM) technique is to get many OFDM symbols as candidates so select the one with all-time low PAPR for actual transmission. Most widely used strategies are clipping and peak windowing the OFDM signal once a high PAPR is encountered. But these strategies distort the initial OFDM signal leading to a rise within the bit error likelihood. There are different strategies that don't distort the signal. Two of those strategies may be listed as Partial Transmit Sequences and SLM. The principle behind these strategies is to transmit the OFDM signal with all-time low PAPR worth among variety of candidates all of that represent constant info.

II. LITERATURE SURVEY

The OFDM technique divides the total bandwidth into many narrow sub-channels and sends data in parallel. It has various advantages, such as high spectral efficiency, immunity to impulse interference and, frequency selective fading without having powerful channel equalizer. But one of the major drawbacks of the OFDM system is high PAPR. OFDM signal consists of lot of independent modulated subcarriers, which created the problem of PAPR. It is impossible to send this high peak amplitude signals to the transmitter without reducing peaks. So we have to reduce high peak amplitude of the signals before transmitting.

In 2014 [1], author proposed High Peak-to-Average Power Magnitude Relation (PAPR) may be a major disadvantage of Orthogonal Frequency Division Multiplexing (OFDM) systems. A brand new companding theme is planned to scale back PAPR by remodeling the statistics of the companded signal into exponential distribution with adjustable parameters. The planned theme will enhance the Bit Error Rate (BER) performance considerably by minimizing the companding distortion in the reduction of PAPR. Moreover, with the introduction of associate degree inflection purpose and rework parameters, the planned theme can give a lot of flexibility within the PAPR reduction, and so achieves an improved exchange among the PAPR reduction, BER and power spectral density (PSD) performance. With a theoretical analysis given, the parameter choice criteria square measure derived.
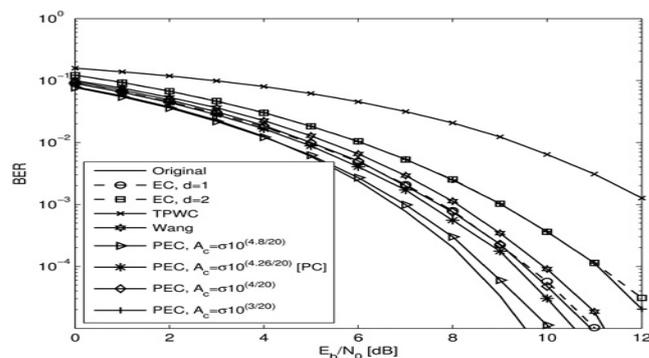
Graph 1.1 –between noise and different BER values

Simulation results verify that the planned theme will considerably improve the BER and PSD performance whereas reducing PAPR effectively.

In 2013 [2], Communication is one in all the numerous features of existence. All the method through the innovation in era and its increasing burden, swift development has occurred among the communication field. Electrical quantities, that were initially transferred within the continuous sphere, area unit derived any and any within the distinct sphere living. In favor of increased diffusion, distinct rate influences area unit being substituted through multi rates. Multi rate arrangements like CDMA and OFDM area unit used frequently in apply. Among the OFDM arrangement, orthogonally placed subcarriers area unit accustomed embrace the information from the spreader facet to the recipient side. The quality of ISI are often overcome by the existence of guard band during this arrangement and by superior quantity of subcarriers the result of noise gets diminished. On the opposite hand the large Peak to Average Power magnitude relation of those pointers has many objectionable possessions on the arrangement.

PTS

SLM
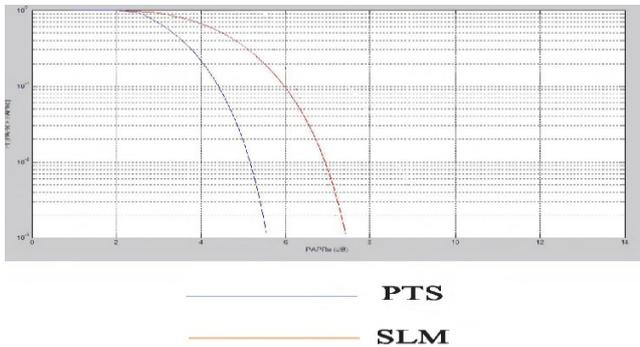
Graph 1.2: between levels of Partial Transmit Sequence & Selective Mapping

In this paper numerous ways area unit planned to diminish PAPR in the OFDM arrangement as a result this arrangement can be warned further frequently plus successfully.

Another author [3] in 2012 proposed Orthogonal Frequency Division Multiplexing (OFDM) is verified technology in fashionable wireless communication as a result of its high rate, a lot of immunity to delay unfold. During this paper, we have a tendency to projected probabilistic threshold Selective Mapping Technique that has low PAPR. The simulation result shows that changed technique has higher PAPR reduction performance.
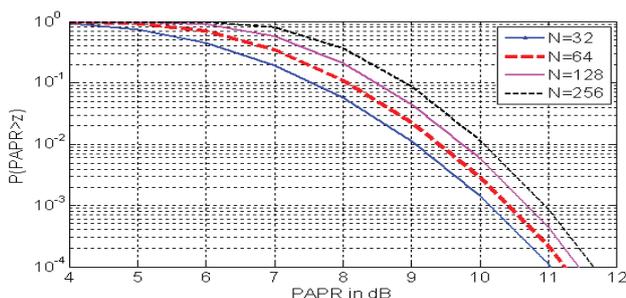
Graph 1.3 PAPR reduction in for noise values

In 2011 [4], author worked on A new DSI-SLM method for PAPR reduction in OFDM system state that the phase sequence and dummy sequences added to the signal improves the PAPR reduction in OFDM signals whereas less hardware resources and less time are required to achieve the desired result. High PAPR is the main drawback of OFDM systems. DSI method and SLM method are two of the most promising techniques to reduce PAPR.
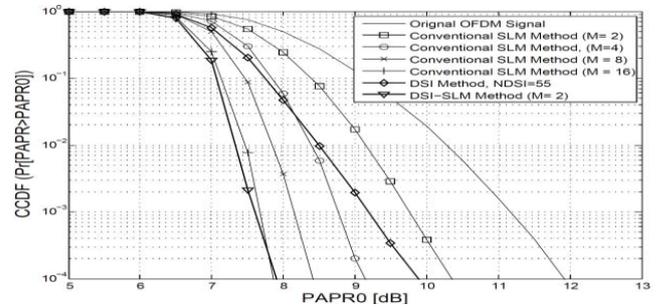
Graph 1.4 PAPR reduction on different noise values.

III. Comparison of all work-

Comparison of different method based on parameters				
PARAMETER	**COMPANDING**	**SLM**	**PTS**	**DSI**
BER	increased	more	decreased	more
SNR	reduced	average	less	Less
Complexity	More	less	more	Average
performance	Average	good	better	Decreased
PAPR	Average	decreased	more	Less
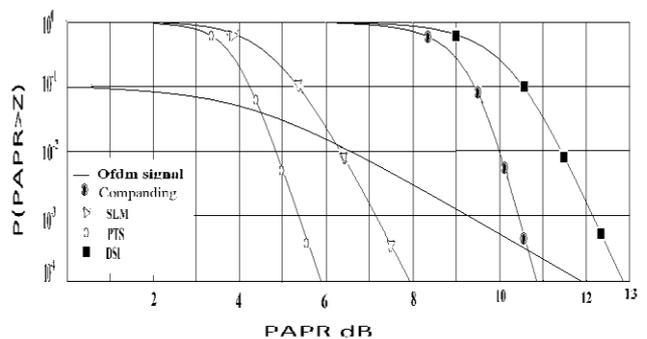
Graph 1.5 Comparison graph of all previous methods

III. CONCLUSION

As shown in comparison table High Peak to Average Power Ratio (PAPR) is still a most important challenge in Orthogonal Frequency Division Multiplexing (OFDM) system. Survey based on different techniques conclude that in SLM method if paper is decreased the BER OR SNR is increased and in other methods like PSLM, Companding if all parameters are give better performance then complexity of system is increased .so we proposed a new technique using DCT that typically concentrate on reduction of PAPR & BER and also try to make our design less complex compare to pervious work

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