بسم الله الرحمن الرحيم

قال تعالى:.

(225) اللّهُ لاَ إِلَـهَ إِلاَّ هُوَ الْحَيُّ الْقَيُّومُ لاَ تَأْخُذُهُ سِنَةٌ وَلاَ نَوْمٌ لَّهُ مَا فِي السَّمَاوَاتِ وَمَا فِي الأَرْضِ مَن ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلاَّ بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ وَلاَ يُحِيطُونَ بِشَيْءٍ مِّنْ عِلْمِهِ إِلاَّ بِمَا شَاء وَسِعَ كُرْسِيُّهُ السَّمَاوَاتِ وَالأَرْضَ وَلاَ يَؤُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ (256)

صدق الله العظيم

سورة البقرة الآية من(225 - 256)

# dedication

We dedicate this project to may teach us a word and gave us courage and knowledge and then.

To our parents …

To our brothers …

To our friends (BSC&MSC student)…

To our Academy of Engineering science …

To our Sudan university of science Technology…

To our country…

# *ACKNOWLEDGMENTS*

First of all we will thank our Allah and we would like to express our sincere appreciation and gratitude to my supervisor. Dr Salah Elfaki Elrofai how is desired to creation growing and giving me the opportunity of writing the thesis here at the Chair of Theoretical Information Technology. My most sincere gratitude to professor harmed Ibrahim for such good care, encouragement and patience that highly contributed to the successful finishing of this thesis and also Thanks to my family and friends for their support during my work .

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# ***Abbreviation***

| ***Abbreviation Name*** | ***Abbreviation*** |
|---|---|
| ACK | Acknowledge |
| AWGN | additive white Gaussian noise |
| ADSL | asymmetric digital subscriber loop |
| BER | Bit Error Rates |
| BEP | bit error probability |
| CORDIC | Coordinate Rotation Digital Computer |
| CCDF | complementary cumulative distribution function |
| CTS | clear-to-send |
| CDMA | Code Division Multiple Access |
| DFT | Discrete Fourier Transform |
| DSL | digital subscriber line |
| DMT | discrete multi-tone |
| DAB | digital audio broadcasting |

| ***Abbreviation Name*** | ***Abbreviation*** |
|---|---|
| DSP | digital signal processing |
| DAC | digital-to-analog converter |
| DTVB | digital terrestrial video broadcasting |
| FIR | Finite Impulse Response Filter |
| FLASH-OFDM | Fast Low-latency Access with Seamless Handoff OFDM |
| FDM | frequency division multiplexing |
| FH | frequency hopping |
| FFT | fast Fourier transform |
| GSM | Global System for Mobile telecommunications |
| ICI | inter carrier interference |
| IDFT | Inverse Discrete Fourier Transform |
| IBI | Inter block interference |
| IEEE | Institute of Electrical Electronic Engineering |

| ***Abbreviation Name*** | ***Abbreviation*** |
|---|---|
| ISI | Inter-symbol interference |
| ICI | inter-carrier interference |
| IFFT | Inverse Fast Fourier Transform |
| LTE | Long Term Evolution |
| LAN | Local Area Network |
| LOS | line of sight |
| MAN | metropolitan area network |
| MIMO | multi input multi out put |
| MBWA | mobile broadband wireless access |
| OFDM | Orthogonal Frequency Division Multiplexing |
| OQAM | offset quadrature amplitude modulation |
| OA | operational amplifier |
| PAPR | peak-to-average power ratio |
| QAM | quadrature amplitude modulation |
| RTS | request-to-send |

| ***Abbreviation Name*** | ***Abbreviation*** |
|---|---|
| RF | Radio Frequency |
| SSPA | solid state power amplifiers |
| TDMA | Time division multiple access |
| TWTA | traveling wave tube amplifiers |
| TDM | time-division multiplexing |
| 3GPP | Third Generation Partnership Project |
| 3G | Third Generation |
| VDSL | very high speed DSL |
| VLSI | very large scale integrated circuits |
| Wi-MAX | Worldwide Interoperability for Microwave Access |
| WCDMA | Wide Band CDMA |
| WLAN | Wireless Local Area Network |

# Abstract

In the last years wireless communications have experienced a fast growth. However, wireless channels have some drawback just like the multi-path fading. Orthogonal Frequency Division Multiplexing (OFDM) has been an attractive solution for multi-path fading channels, An important problem of OFDM systems is the high peak-to-average power ratio (PAPR).

There are several ways to reduce the PAPR of OFDM systems .A simple technique is clipping such as circle clipping, and square clipping, those methods are called conventional clipping methods, clipping has an effect called Out-of-band noise (OOB), which degrade the system performance, this noise can be eliminated by filter.

In this project octagonal clipping has been proposed because it is less complex instead of conventional clipping and also using FFT-IFFT filter instead of traditional FIR filters .iterated octagonal clipping and filtering several times in order to reduce to high peak-to-average power ratio (PAPR).

The proposed method has been tested with MATLAB program, the simulation results show that the proposed technique performs better than the existing ones the improvement achieved compared to the old method is equal to 37.3% after third alteration process.

# المستخلص

شهدت الإتصالات اللاسلكيه تتطوراً سريعاً في السنوات الاخيره برغم من أن القنوات الاسلكية لها عيوب مثل الإضمحلال المسارات المتعدده وأصبح المزج بتقسيم التردات المتعامده حل جاذ ب لإضمحلال المسارات المتعدده ومن أهم المشاكل لنظام المزج بتقسيم التردات المتعامد هو إرتفاع نسبه قمم القدره لمتوسط القدره .

هنالك عدة طرق لتقليل إرتفاع نسبه قمم القدره لمتوسط القدره في أنظمه المزج بتقسيم التردات المتعامد من أسهل هذه الطرق تقنيات التقليم مثل تقليم الدائره والتقليم المربع هذ ه الطرق تسمي طرق التقليم التقليدي،التقليم له تاثير يسمي الضجيج خارج النطاق والزي يقلل من أداء النظام هذا الضجيج يمكن ازالته بأستخدام المرشح .

في هذا المشروع تم اقتراح التقليم الثماني بدلاً من التقليم التقليدي لانه اقل تعقيدا .ايضا إستخدام مرشح تحويل فوريل السريع – تحويل فوريل العكسي السريع بدلا من مرشح استجابه النبضه المحدده، تم تكرار التقليم الثماني والترشيح عدد مرات لتقليل ارتفاع نسبه قمم القدره لمتوسط القدره.

الطريقه المقترحه تم اختبارها ومحاكاتها بواسطة برنامج الماتلاب ،و نتائج المحاكاه اوضحت ان الطريقه المقترحه افضل من الطرق الموجوده وبمقارنتها بلطرق القديمه وجد أن التحسين المحقق يساوي % 37.3 من الطريقه القديمه بعد التكرار الثالث.