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Multiblock Tone Reservation Method to Reduce Peak to Average Power Ratio of OFDM Signal

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ABSTRACT

The offset quadrature amplitude modulation-based orthogonal frequency-division multiplexing(OQAM-OFDM) signal can producing large amount of peak to average power ratio(PAPR).OQAM-OFDM system cannot be efficiently reduced PAPR in existing method. In this paper, OQAM-OFDM system proposed for worldwide interoperability for microwave access (WiMAX) technology. The key idea of WiMAX technology is to transmitting the higher data rates in very long distance by minimum amount of PAPR reduction. The multiblock tone reservation method (MB-TR) scheme used to reducing PAPR with the help of weighted least square algorithm, which is producing the peak cancelling signal to adjacent data blocks. Simulation results and analysis show that the WiMAX technology used by OQAM-OFDM system for reducing PAPR with lower computational complexity.

Index Terms: Offset quadrature amplitude modulation-based orthogonal frequency-division multiplexing (OQAM-OFDM), Peak to average power ratio (PAPR), Multiblock tone reservation (MB-TR), Weighted least square algorithm, Randomizer and RS-CC Encoder.

1. INTRODUCTION

Orthogonal frequency division multiplexing (OFDM) used to High data rate transmission system, it considers about the multipath delay spread, very high spectrum efficiency and power efficiency. Digital audio broadcasting (DAB), Digital video broadcasting (DVB), Long term evolution (LTE) and European Telecommunications Standards data rates communications. When OFDM system used to rectangular window they can producing large spectral side lobe and transmission rate reduced by cyclic prefix insertion.

Offset quadrature amplitude modulation based orthogonal frequency-division multiplexing (OQAM-OFDM) utilizes a prototype filter. It can have very low spectral side lobe and less sensitive to the frequency offset. The conventional OQAM-OFDM systems provide the spectral side lobe, which increase the spectral efficiency at significantly. Without help of the CP, OQAM-OFDM system overcomes the multi-path fading channel very efficiently and also improving the data rate. In already we can used to the OFDM system, it have more PAPR. This drawback can overcome by using OQAM-OFDM system in digital broadcasting systems. The OQAM-OFDM technique can improve 13% data rate compared to OFDM systems.

OQAM-OFDM systems can also provide to higher peak to average power ratio similar to OFDM. The different method can proposed to reduce the peak to average power ratio in previous methods such as clipping, active constellation extension (ACE), partial transmit sequence (PTS), tone reservation (TR).It cannot effectively eliminating overlapped signals with multiple adjacent data blocks and these can considering the PAPR reduction in OQAM-OFDM systems. The high power amplifier (HPA) can use in OQAM-OFDM system, these will be producing nonlinear distortion and clipped noise.

2. PROPOSED SYSTEM

In this paper, we propose a novel multiblock tone reservation (MB-TR) scheme to WIMAX technology by using OQAM-OFDM system. Which can reduce the peak to average power ratio in adjacent data blocks? OQAM-OFDM system can eliminate the peak cancelling signal and these can producing the peak-cancelling signal with the help of weighted least square algorithm (WLS).

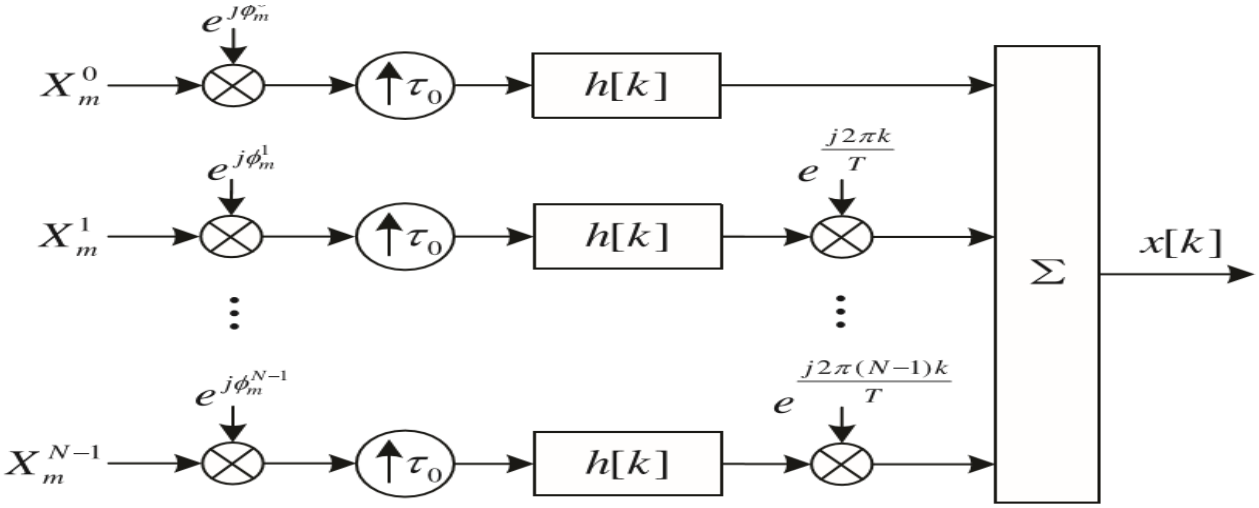

Fig.1. Baseband OQAM-OFDM transmitter

3. BLOCK DIAGRAM

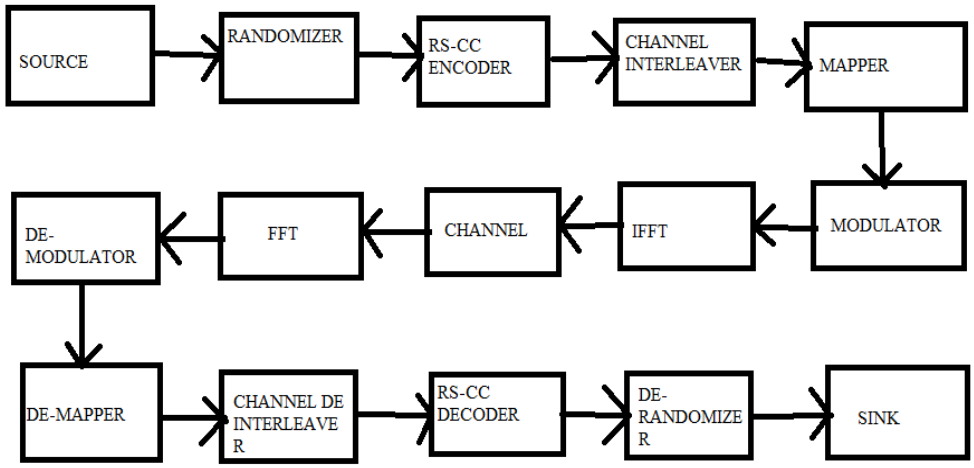

Fig.2. Block Diagram of Proposed Method

SOURCE

A place from which data is taken. Many computer commands involve moving data. The place from which the data is moved is called the source, whereas the place it is moved to is called the destination or target. If you copy a file from one directory to another, for example, you copy it from the source directory to the destination directory. The source and destination can be files, directories, or devices that is, printers or storage devices. The node on a network from which data is sent to its destination.

A) RANDOMIZER

Randomization is the process of making something random, Randomization is not haphazard. Instead, a random process is a sequence of random variables describing a process whose outcomes do not follow a deterministic pattern, but follow an evolution described by probability distributions. For example, a random sample of individuals from a population refers to a sample where every individual has a known probability of being sampled. This would be contrasted with nonprobability sampling where arbitrary individuals are selected.

B) RS-CC ENCODER

Reed Solomon codes are a group of error correcting codes. They are also used in satellite communication. In coding theory the Reed- Solomon codes belongs to

the non-binary cyclic prefix codes. The Reed-solomon code based on the univarite polynomial over the finite fields. It is able to correct mu symbol errors, by adding t check symbols to the data a Reed-solomon data to be check combination of upto t entronous symbols, or correct upto Lt/2 symbols.

C) CHANNEL INTERLEAVER

Interleaving is frequently used in digital communication and storage systems to improve the performance of forward error correcting codes. Many communication channels are not memoryless: errors typically occur in bursts rather than independently. If the number of errors within a codeword exceeds the error-correcting code's capability, it fails to recover the original code word. Interleaving ameliorates this problem by shuffling source symbols across several code words, thereby creating a more uniform distribution of errors. Therefore, interleaving is widely used for burst error-correction.

D) MAPPER

The mapper used to mapping the functions into the corresponding axis such as x-axis and y-axis.

E) MODULATOR

The OQAM-OFDM can be used in the modulation technique with the help of encryption and multiplexing technique to transmitting the signal with the efficient manner. In this type we can used to the multi block tone reservation scheme to the system to minimizing the peak to average power ratio of the system and also these can be producing the peak cancelling signal to the system with help of weight least square algorithm.

F) IFFT

The fast fourier transform technique can be used in the transmitter side which operates at the corresponding functions for frequency domain of the signal can converts into the time domain of the signal. It also allocates the separate time slotting to transmitting the data.

G) CHANNEL

There are two major type channel can be used in this system such as wired channel or wireless channel.

H) HFFT

The fast fourier transform can be located into receiver side of the operations which operates at the reverse operation of the inverse fast fourier transform. The time domain signals again splitting into frequency domain signal of the system.

I) DE-MODULATOR

The OQAM-OFDM demodulation technique can be used to this type for transferring the data with the efficient manner with the help of Decryption and Demultiplexer of the system. In this type we can used to the multi block tone reservation scheme to the system to minimizing the peak to average power ratio of the system and also these can be producing the peak cancelling signal to the system with help of weighted least square algorithm. The Offset Quadrature Amplitude modulation-Orthogonal frequency division multiplexing technique is the efficient method to reduce the peak to average power ratio of the system compared to the other demodulation technique.

J) DE-MAPPER

The Demapper can be used to ploting the values in the corresponding axis for specify the x-axis function and y-axis function of the system in the WiMAX technology.

K) CHANNEL DE-INTERLEAVER

The analysis of modern iterated codes, like turbo codes and LDPC codes, typically assumes an independent distribution of errors. Systems using LDPC codes therefore typically employ additional interleaving across the symbols within a code word. For turbo codes, an interleaver is an integral component and its proper design. Many communication channels are not memoryless: errors typically occur in bursts rather than independently. If the number of errors within a code word exceeds the error-correcting code's capability, it fails to recover the original code word. Interleaving ameliorates this problem by shuffling source symbols across several code words, thereby creating a more uniform distribution of errors. Therefore, interleaving is widely used for burst error-correction.

L. RS-CC DECODER

The RS-CC Decoder can performing reverse process of the RS-CC Encoder systems, These can be checking the system any interferences or errors should be attain at after the signal can transmitted through the channel. Because some amount of error occurs at the channel so Reed-Solomon code can performing the Error correcting technique to the system. By adding t check symbols to the data a Reed-solomon data to be check any combination of

upto t entronous symbols, or correct upto Lt/2 symbols. These are suitable for the multiple burst bit error correcting codes.

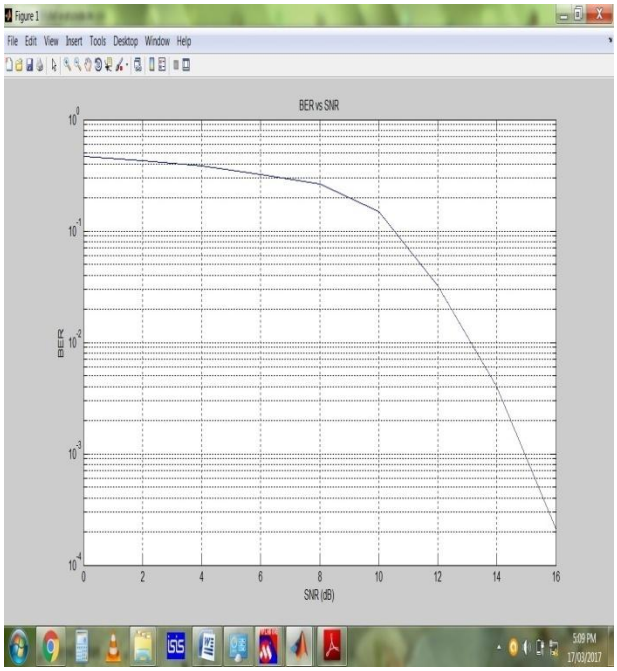

Fig.3. OFDM signal with PAPR

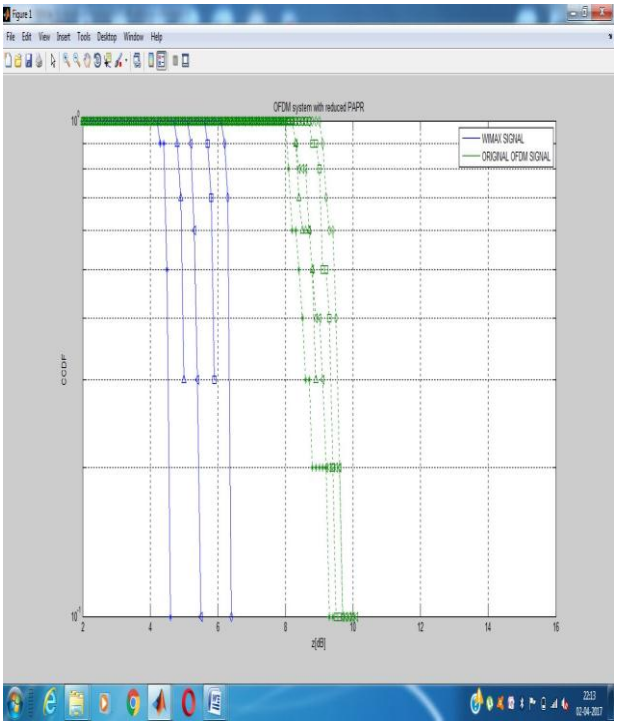

Fig.4. Reduced PAPR signal by using different modulation technique

M. DE-RANDOMIZER

The De-Randomizer can perform the reverse process of the Randomizer which is selecting the corresponding number in the system. The minimum and maximum values set limits on the range of values that might appear in a random number table. The minimum value identifies the smallest number in the range; and the maximum value identifies the largest number. For example, if we set the minimum value equal to 12 and the maximum value equal to 30, the Random Number Generator will produce a table consisting of random arrangements of the numbers in the range of 12 to 30.

N. SINK

The sink can located at the receiver side of the system which operates at the corresponding signal can received with the allocating period of the signals.

4. CONCLUSION

The high data transmission rate system can be transmitting into long distance upto 30 miles or 50 kms with the help of WiMAX technology. The Offset quadrature amplitude modulation-Orthogonal frequency Division Multiplexing Technique is further used in the modulation technique. The peak to average power ratio also minimized by using Multiblock tone reservation scheme in OQAM-OFDM system. The WiMAX technology used in 4G wireless connection, so the system can connect with satellite by direct connection and the data also is transferring in high security.

5. FUTURE WORK

The major drawback of this system is very expensive to install, but it provides more security compared to other methods. Now I can implement in this method in software but it can also implemented into hardware. This method is used to 4G wireless system only for secure data transmission with the direct connections of satellites.

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