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DESIGN AND OPTIMIZATION OF AN OFDM TRANSMISSION SYSTEM FOR OPTICAL FIBER USING VARIOUS NETWORK ARCHITECTURES

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Abstract - Wireless technology is one of the new developments in the field of communications and also wireless technology provides efficient data transfer and an increasing 4G and 5G networking framework in recent scenario. The definition of a multi-carrier modulation is specified by an OFDM system. The OFDM is affected by the disadvantage of high PAPR i.e. Peak to average power ratio. In this paper analysis of several strategies have been discussed: SLM (Selected Mapping), PTS (Partial Transmit Sequence), Tone Reservation, Clipping and Filtering, etc. to reduce the PAPR effect in OFDM systems. The study of various PAPR reduction strategies involves specific parameters such as distortion rate, data size, power increase etc.

KeyWords: *OFDM, PTS, SLM, BER, PAPR, PSK, QAM, CDF.*

I. INTRODUCTION

The demand for high-speed data transfer now has risen following strong growth in the market for wireless technology. Owing to the constant invention of a large number of wireless devices for efficient transmission wireless communication has evolved suddenly. Such wireless devices have internet access, distortion of the data transmission faces and thus the distortion factor is high. Today's digital world has wireless tools that make humanity's daily lives easier. OFDM systems are based on the fundamental idea that they are multi- component modulated systems. It's a form of signal modulation that provides a high rate of stream modulation and a range of gradually modulated orthogonal space carriers are supplied. [1]. High spectral efficiency, [23] enhanced device output for efficient drive, and bandwidth efficiency are the key advantages of using the OFDM Scheme. This can handle multipurpose interference and ISI, i.e. Inter-symbol interference. Interference. The new results analyzed indicate that there are multiple limitations on OFDM applications. One of the main drawbacks is the poor PAPR efficiency of OFDM systems[9]. Different strategies including selective mapping are discussed in this article [3], [4],[5 Tone allocation, clipping and scanning, compounding etc. PTS (Partial Series Transmission). It is used in optical tv and video, DSL Internet and mobile phones. OFDM Networking Infrastructure networks, and 4 G internet communications [5-12].

II. RELATEDWORK

The paper [13] has analyzed PAPR's reduction in the PTS technique. Searching for PTS A systematic search for the optimal combination of phase rotation factors was simulated Step variables, as we saw, increased difficulty searching when the number of subblocks increased Exponential has also growing. Authors used GA (Genetic Algorithm) and PSO (Particle Swarm Optimization) algorithms to solve this obstacle to produce the best performance Low-complexity phase rotation element. The results of a simulation of the algorithms are applied Practical approach to the balance between reduction in PAPR and machine complexity. In turn, GA It greatly decreases PAPR output over time than PSO and traditional PTS, however, PSO is slightly less computational complex than GA and therefore execution timealso less in PSO algorithm[13].

The effortlessnessby wireless technology; the number of individuals who are conscious concurrently increases rapidly. Usage and successful use of technologies. This growing number of mobile users contributes to strong demand for high-definition TV, high-speed broadband, cellular broadband service[14, 15] Video conferencing, internet and smartphone photos. Orthogonal frequency multiplexing division (OFDM) is a simple and efficient broadband approach, one of the simplest multi-package transmission techniques. as the channel is split into one carrier transmission systems. Subchannels with long symbolic durations for parallel data transmission. The inter-symbol interference (ISI) calculation may also be encapsulated by adjusting the narrow fading frequency channel to a flat fading path. [16,17].

The fluctuation of high dynamic range or power output that is seen as a maximum to average. The efficiency of OFDM system is increased through these restrictions. The OFDM system has to transmitted through a high power amplifier to protect non-linear to address this disadvantage. a signal to overcome the above mentioned signal distorted negative effects of the battery life Issue, a number of methods, such as cuts and filters [18] and iterative cuts[19], were proposed, compounding [20], coding[21], interleaved [22], tone-reservation[23], tone-injection [24], active-constellation extension[25], selective-mapping(SLM)[26], [27] Partial transmission series (PTS). PTS is a form of non-dislocation by which data block inputs are broken into multiple sub blocks, PTS All of which have PTS and the implementation of the IFFT. These substrates are weighted or scrambled with multiple IFFT outputs Factors of rotation adding the various signals of the applicant. The minimum PAPR is essentially Transmission signal is selected[28]. Where a PTS is needed, complexity must be implemented taking into account the fact that the transmitter efficiency increases exponentially with an important parameter of transmitting sequence. The number of sub- sequences should therefore be restricted to a set of finite numbers for the rotation of this vector. According to diligent analysis, data on rotation factors to be submitted to the receiver as a candidate signal is limited by the high system sophistication of the PTS element[29] and includes side details as well.

Horng et al. used heuristics in the literature PSO-PTS of the OFDM method suggested in [30] by Wen in order to try to combine low-complex step factors optimally and minimize computational complexity but marginally PAPR rates. The authors in [31] Presented an OFDM scheme using a sub-optimal PTS process, PSO was based on a reasonable result of PAPR and complexity but a low number of iteration for optimum step weighting variables. In [32] they also focused on the PTS-OFDM method, which provided a new way to solve PSO-based computational difficulties, but with consideration of PAPR the findings were almost completed. The GA-PTS combination with a PCGA has provided the least PAPR but the load is still a little high because of the difficulty. [33].

Furthermore, relative to OFDM GA and PSO algorithms in PTS, the GA offers a decrease in PAPR, albeit at the cost of computational complexity and vice versa in PSO [34][35]. The algorithm called Fireworks Algorithm (FWA) outperforms the above two algorithms [36] for further detail. This suggested that several evolutionary PTS-based search optimization algorithms, which are PSO optimization and genetic algorithms (GA) Search numbers, be reduced. [34]. This paper specifically shows two well known OFDM parameters that are PAPR and computational complexity by considering such two algorithms. A numerical analysis has led to better PAPR for which system.

Authors proposed in the paper[37] that PAPR be used as a mixed- numerology method for analytical expression. A new expression is re-examined to approximate the PAPR CCDF, which can be extended not only to the mixed-numerology method, but to the NCOFDM. Therefore, the effect of power distribution on PAPR has been studied. The result reveals that in PAPR distribution sub bandwidths instead of subcarrier numbers play a crucial role. Simulations have been carried out to show that the theoretical expression introduced for PAPR relates in a positive way to the standardized mixed numerology method based on OFDM.

Two new techniques have been proposed to reduce the PAPR of a Modified CP-OFDM numerology signal. The first is a supplemental, OFDM symbolic ICEF algorithm, which cancels inter-numerology interferences with the PAPR reduction, making them consistent with standard WOLA-based spectral shaping. The second method, which integrates ICEFs, such as fast-replacement processing (FC), operates on the FC blocks instead of the OFDM symbols. This method thus helps the PAPR to be limited by any input signal since it relies on the block-specific processing, regardless of the input signal, inherent in FC processing.

In terms of PAPR elimination, PAPR-MSE and pollution levels the efficiency of both systems was analyzed and the results in mixed numerology operations was outstanding. The two systems presented allow the PAPR of mixed-number signals to be successful, which is essential to the current 5 G NR radio interface and to contact over and above 5 G [38]. An SSD (Signal Space Diversity) Blind SLM Technique was tested for OFDM systems. The two RCQD constellations (rotated and cyclically Q-delayed) involved in the PAPR algorithm have been developed to facilitate the development of a theoretical system. [39]. The paper [40] presented a new way of reducing PAPR by using two PAPR approaches, TRC and SLM algorithms. The first is the transformation of a TRC signal into an OFDM signal. After multiple steps, using a cascaded SLM procedure the resulting signal with a reduced PAPR value is treated by a sequence of stages. Value created for minimal PAPR. The product of the simulation

different number of carriers (N) and different modulation schemes show that the proposed technique provides a better PAPR reduction value than of TRC and SLM methods separately.

In addition to that, it outperforms the PTS method for a different number of carriers and different modulation schemes. Future works are possible by employing higher iterations to get possible lowest PAPR value. Also, optimizing techniques can be adopted to enhance the reduction of PAPR as in Genetic Algorithm and Particle Swarm Optimization. The research paper in [41] describes a modified partial transmitted sequence (MOPTS) algorithm using uniform Riemann matrix (C) rows for step sequences with discrete cosine transformation (DCT) in a timeline for reducing the PAPR multiple module in several orthogonal frequency (OFDM), following distribution of an infection Since the original PTS (ORIPTS) algorithm uses random step sequences and repetitive process creation [41].

For OFDM signals with rotated constellations an initial PAPR reduction technique is suggested in [42]. The symbol is centered on two sets of two revolving constellations with two angles. The optimal signal in terms of PAPR reduction is transmitted between many different step sequences. The receiver needs to approximate the transmitted phase series to prevent spectral efficiency losses. Simulation tests demonstrate the importance of choosing rotary angles and detection algorithm performance [42].

The PAPR reduction technique has been proven to be higher than the timespan because it is able to decrease PAPR without distorting the transmitted signals, and therefore not to create a distortion of the band or radiation from the band. PTS is the best frequency field approach to minimize PAPR in contrast to others, among other possible frequency domain strategies. PTS is less method for distortion even before the phase transformation is performed PTS separates frequency vector into many sub-blocks. The key challenge with this scheme is increasing difficulty due to the increased number with subblocks, the amount of step factors chosen and the quantity of secondary data to be transmitted for original signal recovery The decreased device difficulty PTS is recommended for PAPR reductions of OFDM signals. The system is used for OFDM and MIMO-OFDM.

The proposed approach reduces the numerical complexity by computing the step weighting cycle. This approach is primarily aimed at reducing PAPR and mitigating the difficulty of the subblocks. The difficulty of PTS in comparison to the growing number of subblocks is the requirement for further IFFT operations for subblocks. The approach suggested therefore obtains the substantial reduction in PAPR with few subblocks compared to PAPR with large numbers of PTS subblocks. In contrast to the standard PTS system, the results of the simulation showed that this model will reduce the PAPR to approximately 5,98 dB. [43].

In the paper [44], eight PAPR reducing strategies were analyzed and compared. It has been found among the above studied techniques that no technology is totally successful in reducing PAPR from current techniques and is the best for the OFDM method. Specific considerations, such as data rate management, computing complexity, BER and signal strength, often need to be considered before choosing the correct PAPR technique. It is therefore suggested to propose a PAPR framework and build a network / model which supports OFDM Systems after comparing current conventional methods [44].

Authors suggested in the document[45] that BF could be paired with an efficient reduction of antenna-power cap and PAPR using a null space on a MIMO channel in a large multiuse transmission MIMO-OFDM. In the proposed method, a BF(Block Filtered) matrix is initially omitted to reduce the power difference between antennas. The applicable BF matrix is chosen by calculating the achieved throughput and cost function for a per-antenna power restriction and the quasi-optimal BF matrix is checked with the FA to obtain the maximum possible metric. The resulting efficient PAPR reduction method further reduces the PAPR thus decreasing data output loss due to the interruption from the CF algorithm's PAPR reduction signal, limiting only the zero area of the MIMO channel to the PAPR reduction signal propagation. The findings of the simulation have shown that it increases PAPR versus output Compared to conventionally based BF(Block Filtered) characteristics [45].

A precoder matrix for the OFDMA uplink is extracted from the discreet OFDM block spectrum model, incorporating the relationship between the data symbols to prevent spectral leakage power as much as possible. Meanwhile, by making columns of the precoder matrix without degrading the potential for spectral leak deletion, the OFDM Block PAPR can be reduced with high probability. In comparison, an iterative decoding algorithm completely exploits the range of frequencies to achieve appropriate BER efficiency for practical use. To decode the precoded symbols, the receiver requires a small amount of SI, but at most two integers per block are as high. As SP and PSCI have the same capacity to inhibit spectral leakage, they are overcome by the proposed approach in PAPR. The proposed precoder provides better power suppression efficiency, decreased PAPR and increased efficiency than CC, SW and SC-FDMA [46].

For uplinking large MIMO networks, the question of reducing BER with PAPR restriction was considering in the proposed paper[47]. The required precoding matrix condition for BER minimization has been obtained by formulating the optimizing problem. The matrix of all-one singular values could give a potential solution to the derived necessary condition. A suboptimal precoding is proposed in order to reduce the BER with PAPR restriction efficiently, taking two steps to construct the precoding matrix: (1) Generate a reduction matrix of PAPR to satisfy the PAPR parameters. 2) Decompose and replace the single values with all of the chosen precoding matrix; Simulations to confirm the necessary precoding have been done. It has been demonstrated, for both single-user and multi-user scenarios, that the proposed precoding could achieve BER minimization with PAPR restriction. In comparison, with a huge number of antennas[47], the precoded device that has been developed is extremely energizing. [47].

The low-complicated SLM and PTS schemes are introduced with the 16-bit QAM and QPSK modulation to which the transmitted PAPR value in the MIMO-OFDM SFBC systems. Simulation of 2 broadcast antennas in MIMO-OFDM SFBC device, the consequence of QPSK moduled data signal Type-1 Points and the SLM system have essentially identical outcomes that include the best solution to PAPR and Bit Error Rate as compared with other QAM and QPSK modulated signaling schemes in [48]. The authors suggest a highly efficient and scalable peak power reductions method with near-disappearing redundancy for orthogonal frequency division multiplexings (OFDM). The latest method operates for an infinite number of unregulated signal covers and sets.

The key target in[49] is the combination of partial transmission sequences (PTS) in order to reduce the peak-to-average power reduction [49].

The paper [50] suggested and evaluated the radical pseudo-random SPS for PTS OFDM. The new proposal demonstrates exactly the same PAPR as the effects of simulations of C = 2 and 4. The efficiency of the suggested method vs the best-performing pseudo-random SPS [50]. The paper [51] suggests two step weighting strategies with low machine difficulty for PTS. Both approaches are aimed at simplifying the estimation for candidate sequences and thus reducing code complexity. In addition, if all methods are combined, the computational complexity will be reduced further. Theoretical analyzes and simulation results show that PTS with GPW or / or RPW will reduce not only considerably the computational complexity compared to O-PTS but also achieve the same PAPR efficiency. [51].

Because of its high data speeds, its multi-track robustness and its spectral quality, OFDM is an important multicarrier modulation technique for wired and wireless applications. Given these benefits, it has the key downside of generating high PAPR, which induces nonlinar distortions and spectral expansion of the transmitter PA into saturation. The literature contains a broad range of PAPR reductions which significantly decrease PAPR at the cost of decreased BER, decreased power transmission, reduced bit rate and increased complexity. In this report, several important aspects of the PAPR reduction strategies and their effects on a variety of crucial design factors were addressed. Several statistical formulas of absolute critical value were presented such as PAPR statistics and OFDM signal distribution.

Authors also shown that in all conditions no particular approach is the safest, and the appropriate methodology should be chosen on the basis of device specifications and available resources. For eg, signal distortion technologies and particularly cutting and filtering are the most challenging in machine complexity in OFDM systems with large number of sub-carrying systems ($N \geq 256$) while at the same time achieving a good PAPR decrease. When future Wireless Systems are expected to use OFDMs with a larger number current sub-carriers to reach higher rates of data and mobility, the problem of PAPR reduction is becoming more relevant.

This means that a thread full of fascinating work opportunities is the problem of designing PAPR reduction programs for OFDM systems, which are capable of minimizing the problem with maximum output compensations, including minimal complexity and cost.

In order to discuss recent work and to contribute initially, this review also offers an exhaustive collection of references to the subject of PAPR reduction methods, updates previously existing surveys with models, complexity measures, and treatment of the problem under the transmitted power constraint. The authors strongly conclude that this analysis would support scholars, OFDM device architects, programmers and engineers as a valuable pedagogical tool by recognizing the latest research developments in the field of the reduction in the PAPR of OFDM systems , various technologies available and their trade-offs to more effective and realistic solutions. [52].

III. PAPR IN OFDMSIGNAL

The input Transmit signals that be modeled using either PSK or QAM, i.e., in the OFDM System Model. Inverse Fast Fourier Transform (IFFT) is a phase shift main or square amplitude modulation, and the transmitter. Such signals can be high in a time domain with high peak to mean power in contrast with OFDM systems; in comparison with Single Carrier systems. The transmitter-side is orthogonal sub-carriers which are produced. The high PAPR is due to sink waves andnon-constant envelopes being summed up. High PAPR deletes the signal for ADC's and DAC 's noise quantization and decreases the power amplifier 's performance .. And in a very wide linear field, RF power amplifiers need to be controlled, the signal peaks are reached and skewed by a non-linear field. There are a number of techniques for PAPR reduction as Cumulative distribution, i.e. (CDF), tests the output of any PAPR reduction technique.

IV. VARIOUS PAPR REDUCTION TECHNIQUES

In 1996, Bamul, Fischer and Huber first published the paper developing the 'Selective mapping technique.'[3] The OFDM method does not deform and effectively reduce PAPR, so SLM is a most attractive reduction technique. In that technique each of the stage sequences multiplies the input data blocks for the generation of alternative sequences of input symbols. In IFFT operation each alternative I / P data sequence is continuously processed and then the lowest PAPR signal for transmission is selected[11]. A technique used to decrease PAPR effect is a technique used for mapping in OFDM Systems. To access the data block on the receiver side, SII (Side Information Index) should be transmitted. This process is a kind of phase rotation.

Utilizing the Special Mapping Method (SLM), the data input is separated into sub-data blocks under N. It is converted by serial and parallel transformers into a sequential data stream. A parallel conversion is indicated for multiplying the OFDM data block by unit with step order.

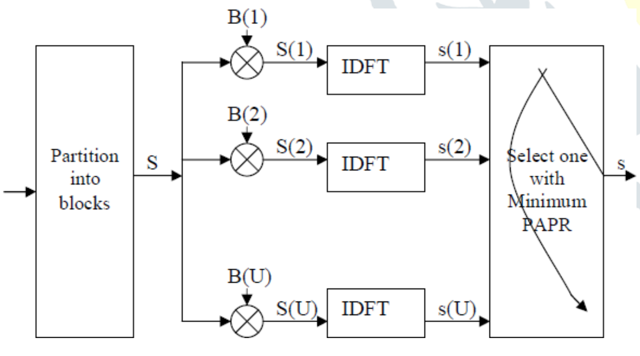

Figure 1: The Block Diagram of SLM Scheme

The input data is divided into sub-data blocks below length N using chosen mapping technique (SPM) and is transformed in the parallel data stream by means of serial to parallel transformer. The OFDM storage block is multiplied by element with step series when the data is translated in parallel.

$$P^u = [P^1, P^2, P^3, \ldots.. P^U] \quad (1)$$

Where u= [0, 1, 2….U], to make OFDM data blocks to be phase rotated. Therefore X (u) expressed as,

$$X(u)=[xo(u),x1(u),.........xN\text{-}1(u)]T$$

$$=[P0(u)xo,P1(u)X1, \quad PN\text{-}1(u)XN\text{-}1]T$$

$$=P(u)x(2)$$

After rotation of data blocks, the rotated OFDM data blocks are similar, which have been provided with known phase sequence, and are unmodified OFDM data blocks. Now, with the aid of IFFT, frequency domain signal is transformed to the time domain X (u). The main idea behind this technique which enables the lowest PAPR signal to be picked at the end of the transmitter from various phase sequences with the same details. The technique Partial Transmission Sequence (PTS) is widely used for reducing PAPR In addition to the rotation of a step, the principle of this PAPR reduction technique is designed to develop the efficient signals and to pick one with a low PAPR [8]. The high value of PAPR affects system capacity due to multi-carrier propagation. Therefore, the high value of PAPR. is needed to be decreased, in this section an approach called PTS (Partial Transmission Sequence) which reduces to some extent thePAPR.

This research introduces a novel ICI reduction algorithms under the various channel environments such as AWGN, Rayleigh and also Rician. Simulation results will be compared with existing and proposed schemes under these channel specifications I hope that the Rayleigh with PNNs perform far better than the AWGN and Rician channel distributions in terms of Bit Error Rate (BER) and Carrier interference Ration (CIR) performance.

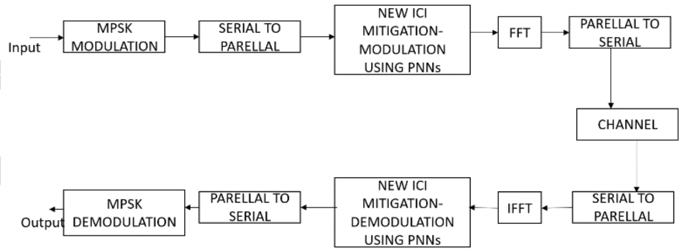

Fig. 2 Proposed ICI mitigation block diagram

This research have proposed an optimal and sub-optimal scheme for SSR ICI cancellation scheme to improve the CIR performance. The scheme is based on SSR ICI self cancellation scheme, in which a data is modulated at two symmetrically placed subcarriers i.e. $k^{th}$and N-1- k^{th} and utilizes a data allocation of (1,-ƛ) to improve CIR performance. To further reduce the effect of ICI, received modulated data signal at $k^{th}$and N-1- k^{th} subcarriers are combined with This researchights 1 and -ξ. The ƛ and ξ are the optimal values resulting in maximum CIR. The optimum values of ƛ and ξ are the function of normalized frequency offset i.e. for every normalized frequency offset; there exist a unique value of ƛ and ξ. This process requires continuous CFO estimation. To overcome this problem, This research have proposed a suboptimal approach to find suboptimal values. The obtained sub-optimal values (λ_{so}, ξ_{so}) are independent of normalized frequency offset. Thus, the proposed scheme does not require any CFO estimation or feedback circuitry and hence eliminates the requirement of complex hardware circuitry.

In the proposed scheme at the transmitter a data allocation (1,-$\boldsymbol{\lambda}$) is utilized at k^{th} and $N-1-k^{th}$ subcarriers .i.e.

$$X(N-1) = -\lambda X(0), X(N-2) = -\lambda X(1), \ldots\ X(N-1-k) = -\lambda X(k)$$

Hence, the received data signal at the k^{th} subcarrier is

$$Y'(k) = \sum_{l=0}^{\frac{N}{2}-1} X(l)S((l-k) - \lambda S(N-1-l-k)) + W(k) \quad (10)$$

After Combining the received data at k^{th} and $N-1-k^{th}$subcarriers with weight 1 and -µ, we have

$$Y''(k) = Y'(k) - \mu Y'(N-1-k) \quad (11)$$

$$Y''(k) = \sum_{l=0}^{\frac{N}{2}-1} X(l)[S(l-k) - \lambda S(N-1-l-k) - \mu S(l+k+1-N) + \mu\lambda S(k-l) + W(k) - \mu W(N-1-k)] \quad ; k = 0,1,2,\ldots\ldots, \frac{N}{2}-1 \quad (12)$$

Thus, CIR of proposed optimal SSR ICI self cancellation scheme is given by

$$CIR_c = \frac{|-\mu S(2k+1-N) + (1+\lambda\mu)S(0) - \lambda S(N-1-2k)|^2}{\sum_{l=0, l\neq k}^{\frac{N}{2}-1} |-\mu S(l-N+k+1) - S(l-k) - \lambda S(N-1-l-k) + \mu\lambda S(l-k)|^2} \quad (13)$$

The optimal values of $\boldsymbol{\lambda}$ and µ have been found by using an optimization technique known as Nelder Mead Simplex Algorithm. The optimum values of $\boldsymbol{\lambda}$ and µ are calculated for $\varepsilon \epsilon[0.03,0.25]$ at a very small interval of $\Delta\varepsilon$ which results in maximum CIR for the givenε. Thus for everyε, we have a unique optimal value of and $\boldsymbol{\lambda}$ and µ these are denoted by(λ_0, μ_0). The optimum values(λ_0, μ_0) are to be used for data allocation and combining the data atk^{th} and$N-1-k^{th}$ subcarriers to maximize the CIR of the OFDM system. But, this will require a continuous CFO estimation.

$$CIR_p(\varepsilon, \lambda_0, \mu_0) = \begin{bmatrix} CIR_p(\varepsilon_1, \lambda_{01}, \mu_{01}) & \cdots & CIR_p(\varepsilon_v, \lambda_{01}, \mu_{01}) \\ \vdots & \ddots & \vdots \\ CIR_p(\varepsilon_1, \lambda_{0v}, \mu_{0v}) & \cdots & CIR_p(\varepsilon_v, \lambda_{0v}, \mu_{0v}) \end{bmatrix} \quad (14)$$

Here, $CIR_p(\varepsilon_1, \lambda_{01}, \mu_{01})$ corresponds to maximum value of CIR for $\varepsilon_1$and so on and

$$v = \frac{(\varepsilon_H - \varepsilon_L)}{\Delta\varepsilon} + 1 \quad (15)$$

Where, $\varepsilon_H\ and\ \varepsilon_L$are the lowest and the highest possible values of the normalized frequency offset. Here, we have considered $\varepsilon_H = 0.25$ and$\varepsilon_L = 0.03$. To avoid the problem of continuous ε estimation, sub-optimal pair (λ_{so}, μ_{so}) amongst all (λ_0, μ_0) has been found by using the following criterion as

$$(\lambda_{so}, \mu_{so}) = \max_{\lambda_0, \mu_0} \left[p - \frac{\sum_{j=1}^{p}(p - CIR(\varepsilon_j, \lambda_0, \mu_0))}{v} \right] \quad (16)$$

In the above expression, p represents the maximum CIR of a particular row of the matrix given by (14) and the second term represents the mean deviation of the CIR of that row from the peak (p) of that row. Thus irrespective of the value ofε, (λ_{so}, μ_{so})can be used for data allocation and combining to get a sub-optimal CIR performance. The Probabilistic Neural Network (PNN) model, described by D.F. Specht in [26], is a neural implementation of the Parzen windows [27] [28] probability density approximation method, mainly (but not exclusively) oriented toward classification problems. It was originally devised to provide a neural tool capable of very fast training on real-world problems; as compared with the backpropagation, for a given level of performance, the speedup reported was about 200 000:1. The simplicity of the structure and its theoretical foundations are further advantages of the PNN model. However, when designing a hardware implementation, the user is faced with severe drawbacks, mainly related to the constructive criterion used for training. For instance, in practical applications, a property needed for the training procedure is often re-trainability. In other words, if the performance of the trained network is not satisfactory on new patterns, the procedure should be able to learn these patterns without need for restarting from scratch. The basic algorithm, though theoretically very well-suited to this purpose, in practice poses a limit to this ability, in that the network is allowed to grow indefinitely. The problem of implementing a PNN has been approached in different ways. Among others, in [29] the author of the model described an alternative architecture combining the Adaline [30] with the PNN. In [31] P. Burrascano proposed the application of the Learning Vector Quantization [32] algorithm to the PNN, by fixing the number of pattern units, which play the role of prototypes for vector quantization. The figure 3 represents the PNNS.

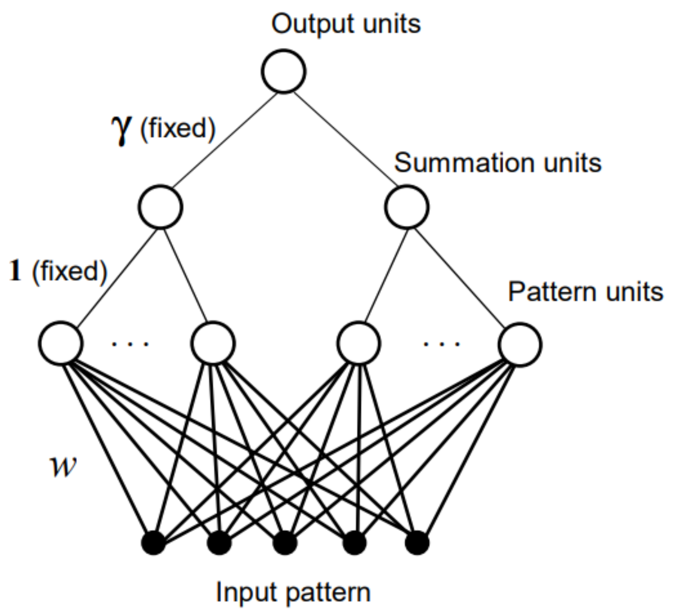

Figure 3 The PNN scheme. Heavy lines indicate adaptable weights

In this paper, we have considered an OFDM system with N=256 subcarriers and QPSK modulation scheme is used to modulate each of the subcarriers. The simulation model of the OFDM system is shown in Fig.1. The computer simulation using MATLAB are performed to evaluate CIR and BER performance. Fig. 2 shows the CIR performance of standard OFDM system, SSR ICI self-cancellation, Proposed SSR ICI self cancellation using optimal & sub-optimal approach. Fig. 4 shows BER performance of the standard OFDM system, conventional SSR ICI self cancellation and the proposed SSR ICI self cancellation using sub-optimal approach.

As seen from Fig. 5 the CIR performance of the proposed optimal approach is about 20dB better than the conventional SSR ICI self cancellation scheme. However, the proposed sub-optimal approach also provides better CIR scheme performance over conventional SSR ICI self cancellation scheme, proposed suboptimal approach provides a gain of more than 10dB at $\varepsilon = 0.15$over conventional SSR ICI self cancellation scheme. The CIR performance of proposed SSR ICI self cancellation scheme is slightly worse than conventional SSR ICI self cancellation scheme for$\varepsilon\epsilon$[0.03,0.25]. The BER performance of the proposed SSR ICI self cancellation scheme is very much improved in comparison to standard OFDM system and very close to conventional SSR ICI self cancellation scheme.

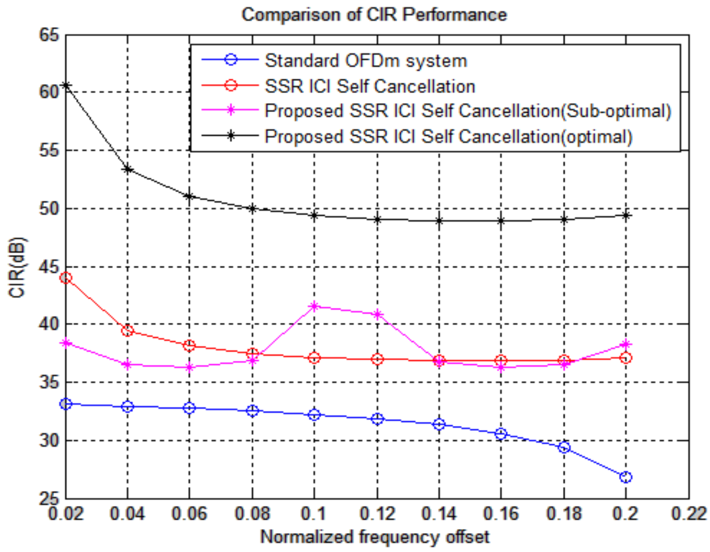

Fig 4 CIR performance Comparison

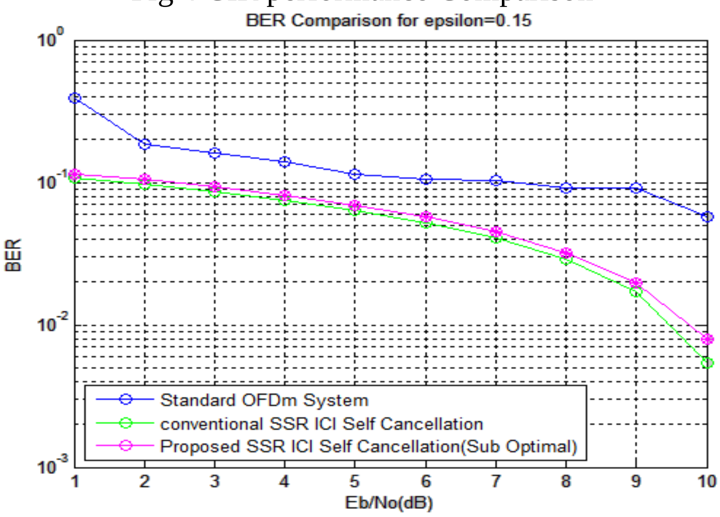

Fig 5 BER performance Comparison

V. CONCLUSION

OFDM is a type of multi-carrier modulating technique, the Orthogonal Frequency Division Multiplexing. Currently, Wireless Communication is emerging, and OFDM systems are used because of their advantages, including high spectral efficiency, increased bandwidth and its multi-path robustness. Yet PAPR, i.e., suffers from the discomfort of the OFDM scheme. Total power ratio peak to total. Several PAPR reduction techniques are reviewed and discussed in this review paper. The techniques are classified into two separate groups. 1. Signal Scrambling 2. Scientific Signal Distortion. In this review paper, several techniques are discussed, such as SLM, PTS, tone reservation, Interference, interleaving, filter and companding. PAPR reduction techniques are analyzed on different parameters. Different PAPR techniques are studied to decrease the PAPR effect, but there is no particular PAPR reduction technique that can decrease this effect for multi-carrier transmission. It is concluded that the system requirements for PAPR reduction technology should be selected.

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