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A NOVEL TECHNIQUE FOR PAPR AND BER PERFORMANCE WITH PEAK CLIPPING FOR 5G COMMUNICATIONS

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Abstract- A novel waveform with high spectral efficiency, low cost, and fewer drawbacks of multicarrier systems is still being sought after for use in 5G and future wireless communication systems. In order to enhance the peak to average power ratio (PAPR) performance on various waveforms suggested in the literature for 5G and beyond, the amplitude clipping approach is investigated in this paper. The technology under investigation combines amplitude clipping with different waveforms. Reduced BER considered satisfactory when compared to prior work as a result of our findings, it can be said that when the signal-to-noise ratio rises, the bit error rate (BER) declines. Using the proposed DFT-based selective planning technique, PAPR has also been reduced. We provided an OFDM architecture using 1024-QAM and 1024-IFFT/FFT that may effectively reduce Bit Error Rate (BER) and enhance Signal-to-Noise Ratio performance. When compared to earlier work, a satisfactory reduction in BER was discovered. Our findings show that the Bit Error Rate (BER) decreases when the Signal-to-Noise Ratio rises.

Keywords: PAPR, BER, Amplitude Clipping, DFT spread, Signal to Noise Ratio etc.

I. INTRODUCTION

When 5G deployments start, the essential demand of high data-rate multimedia applications can be met with optimum bandwidth and power-efficient modulation techniques. Digital modulation techniques are critical in a broader sense for generating high data speeds with effective use of bandwidth and power. The basis for 5G and other upcoming wireless communication technologies is the dependability of the modulation techniques being used. Data rates, channel impairment resistance, bandwidth, power, and efficiency characterise the optimum use of the constrained spectrum by enabling improved information efficiency, and these factors all affect how well a digital modulation system transmits information [1-2].

The multi-carrier modulation technique known as OFDM is orthogonal frequency division multiplexing. Because the carriers are orthogonal to one another and several carriers distribute the data among themselves, OFDM offers significant bandwidth efficiency. This transmission method's key benefit is its resistance to channel fading in wireless communication environments. It is intended to be a special case of the FDM system. Each communicating source and user pair are given a sub-band of bandwidth that is somewhat bigger than the bandwidth required by each source in FDM. The entire bandwidth available to the system is divided into non-overlapping frequency sub-bands in FDM [3-4].

The guardband, or additional bandwidth, enables systems to use less expensive filters. In this case, it is referred to as multi-code transmission. The separate sub-channels may be multiplexed using frequency division multiplexing (FDM), also known as multi-carrier transmission, or they may be based on a code division multiplex (CDM), also known as a code division multiplex (CDM). The main drawbacks of FDM include the requirement for bandpass filters, which are pricy and difficult to construct and design (keep in mind that these filters are typically required in both transmitters and receivers). Another disadvantage is that nonlinear amplification results in the creation of out-of-band spectral components that could interfere with other FDM channels in many practical communication systems [5] and Linear amplifiers are more difficult to construct [6].

While bandwidth efficiency refers to the most effective use of the available spectrum while yet allowing for additional information, data-rate refers to the maximum amount of information that can be conveyed via a channel. At maximum power, dependable information transfer is referred to as power efficiency. All of these parameters might not be able to be optimized at once in reality. When power efficiency is the goal, for example, lower order modulation is employed, which results in lower bandwidth efficiency and lower data rates. As a result, various modulation scheme expectations are traded off. These factors are optimized and traded off when designing digital radio frequency (RF) systems, depending on the application [7,8,9]. While developing a terrestrial microwave radio link, bandwidth efficiency with low bit-error-rate (BER) is given substantial attention because the RF stations are coupled to a power source. Power efficiency and receiver cost/complexity are not big issues when only a few receivers are required. Cellular communication, however, primarily focuses on power efficiency because to the short battery life of mobile devices [10]. In mobile communication, power and cost efficiency are more limited than bandwidth efficiency.

Although noise has a substantial impact on digital modulation methods, this flexibility allows for multiplexing many information types at high data rates while maintaining a high level of service (QoS). Digital modulation [11] is classified based on the fluctuation in the transmitted signal's amplitude, phase, or frequency with respect to the digital message signal. When the transmitted signal's amplitude or phase is altered in relation to the message signal, the resulting signal is referred to as amplitude shift keying (ASK) or phase shift keying (PSK), respectively. ASK and PSK are referred to as linear modulation techniques since they follow the superposition and scaling concepts. When the transmitted signal frequency is different from the message signal, frequency shift keying results (FSK).

A microstrip patch antenna's performance is also enhanced by the defective ground structure (DGS) by altering the ground plane of antenna design. Etching a defected shape of the ground plane makes DGS antenna. Imperfections in the ground plane will change the current distribution, leading to controlled excitation and the propagation of electromagnetic waves over the substrate layer [12]. Because FSK employs a non-linear modulation technique, it is less spectrally efficient than linear modulation techniques [13].

Hence, linear modulation techniques are extensively employed in wireless communications [14]. The transmitted signal's amplitude and phase change in proportion to the digital message signal when using the more advanced modulation technique known as quadrature amplitude modulation (QAM). QAM and quadrature phase shift keying (QPSK) are extensively used in communication protocols due to their excellent bandwidth and power efficiency when compared to other digital modulation techniques. Moreover, because M-ary QAM uses less power than M-ary PSK modulation, it is advised in today's wireless communication standards [15].

The major contribution provided by the proposed technique are-

- To proposed 512/1024 QAM Technique to achieve high levels of spectrum usage efficiency
- To incorporate DFT Spreading and Trellis Coding Constellation shaping in proposed work for flexible bandwidth allocation and low-complexity equalization.
- To perform Amplitude Clipping to reduces the peak level of the input signal to a predetermined value.
- Improve the PAPR and BER performance for the proposed designed system..

The remaining sections of this original scientific paper are organized as follows: Section I contains introduction and defines the need of OFDM. Following a discussion of some of the major optimizations as mentioned in Section II, Section III presents a proposed technique that has been suggested for current scenario, objective of research. While the simulation results and discussion are provided in Section IV, Section V concludes the work along with overall research findings.

II. LITERATURE SURVEY

Together with digital amplitude modulation for transmission, digital phase modulation techniques attracted a lot of research attention in the late 1950s. By taking into account both the amplitude and phase modulations for transmission, it was an extension to the amplitude modulation. C. R. Cahn [16] first proposed the QAM in 1960. Hancock and Lucy expanded on Cahn's work in [17], where it is discovered that arranging the constellation points on the concentric circles with fewer points in the inner circle and more points in the outer circles might increase the performance of a circular constellation.

It is commonly known that Chang first presented the fundamentals of OFDM in 1966[18] and was successful in getting a patent for them in January of 1970. Eventually, Saltzberg examined the OFDM performance and discovered that crosstalk was the system's major flaw. The staggered QAM (SQAM) approach can still maintain orthogonality even though each subcarrier in the main OFDM system overlapped with the neighborhood subcarriers. The issue will, however, become apparent if more subcarriers are necessary. Early OFDM implementations allowed for up to 34 subcarriers, which allowed for 34 symbols to be appended with redundancy and a guard time interval to remove inter symbol interference (ISI) [19].

But, if more subcarriers were needed, the modulation, synchronization, and coherent demodulation would result in an extremely complex OFDM scheme that would cost more money to implement. A modified OFDM scheme was put forth by Weinstein and Ebert in 1971 [20] and used the discrete Fourier Transform (DFT) to create the waveforms for the orthogonal subcarriers. By using inverse DFT (IDFT) modules and digital-to-analog converters, their plan greatly decreased the implementation complexity. In their suggested paradigm, the IDFT in the transmitter modulated baseband signals, which were subsequently demodulated by DFT in the receiver. As a result, all of the subcarrier overlapped in the frequency domain while maintaining their orthogonality thanks to DFT modulation.

Peled and Ruiz first introduced cyclic prefix (CP) or cyclic extension for OFDM systems in 1980[21]. In their design, fully-loaded OFDM modulation is replaced with cyclic extension in place of the traditional null guard interval. As a result, the subcarriers' orthogonality was ensured. This novel method can significantly reduce ICI (Inter Carrier Interference) while trading off transmission energy efficiency. As a result, it is now a part of the current IEEE standards.

In order to suppress inter symbol interference (ISI) and ICI [22], which may have been caused by a channel distortion, synchronization fault, or phase error, Hirosaki proposed an equalization method in 1980. Hirosaki's high-speed OFDM system, which used voice-band spectrum, also included QAM modulation, pilot tones, and trellis coding techniques.

Cimini devised a pilot-based technique to lessen the multipath and co-channel interference in 1985 [23]. A subcarrier -selective allocation mechanism was proposed by Kalet in 1989 [24]. He distributed more data by using "excellent" subcarrier s that are close to the transmission frequency band's centre since they will experience less channel distortion. OFDM systems have been used for high data rate communications since the 1990s. The carrier frequency in the IEEE 802.11 standard can reach 2.4 GHz or 5 GHz. Nowadays, research focuses on OFDM working at increasingly higher frequencies. As an illustration, the IEEE 802.16 standard suggests even greater carrier frequencies between 10 GHz and 60 GHz.

Frequency diversity can be utilized with coded OFDM, which also offers improved resistance to impulsive noise and quick fades. The high PAPR of OFDM is one of its main flaws. This restricts the transmission range and necessitates a significant input power back-off for the transmit amplifiers. The drawbacks of OFDM far outweigh its advantages in a lot of low-cost activities. Block codes are used for the first time in [25] to address the issue of jointly resolving the PAPR and the error-correcting code design problem.

The most popular constellations in various communication standards are QAM and QPSK. Moreover, M-ary QAM is frequently used in many contemporary communication standards since it has a higher bandwidth and power efficiency than the Mary PSK constellation [26]. An numerous communication protocols that use a range of QAM constellations and constellation orders. For a multichannel system, the author of [35-36] proposed an orthogonally multiplexed QAM system based on DFT. Authors examine the multi-carrier system and the use of higher-order QAM constellations in [37]. In [38], authors used Golay sequences to produce 16-QAM using scaled 4-PSK signals in order to lower the peak-to-average envelope power ratio for OFDM systems. The pairwise error probability of the system across slow fading channels was calculated in [39] by analysing the bit-interleaved coded OFDM packet transmission with adaptive modulation. According to three different CSI scenarios for QAM constellations, authors in [40] devised loading methods to reduce the transmit power of an OFDM system with rate and error probability limitations [44,45]. Using transmit power and its allocation constraints, transmission is used to maximize energy efficiency [46].

Novel Optical OFDM Transceiver Structures is a 2020 project by Dayou Qian, Neda Vijetic, and Ting Wang [47]. In this research, it is suggested that the work be done as the per-channel data rate targets in these situations continue to climb towards 10 + Gb/s due to the ever-increasing bandwidth demand in optical access/metro networks [1]. Unlike to wider networks, however, such capacity improvements in access/metro applications must adhere to strict cost and complexity constraints. Because to its extremely high specular efficiency, linear dispersion tolerance, and effective FFT-based implementation, optical orthogonal frequency division multiplexing (OFDM) has recently become a realistic option for reducing the capacity of next-generation access/metro systems [41]. In a recent experiment, optical OFDM was combined with polarization multiplexing (POLMUX) to achieve 5.6 bits/s/Hz spectrum efficiency over a 640 km transmission distance [42-43]. This result, as well as all previously published results on POLMUX-OFDM transmission, however, depends on the use of coherent detection, which, because it necessitates the use of a polarization controller, an optical phase locked loop, and a narrow line-width local oscillator, noticeably increases the complexity of the receiver and is consequently unsuitable for cost-sensitive business/metro applications.

"21-GHz Single-Band OFDM Transmitter with QPSK Modulated Subcarriers" is a piece of work by S. Herbst, S. Bayer, H. Wernz, and H. Griesser published in 2021[48]. Researchers suggested the use of multilevel formats for 40G and 100G transmission, which increased both the specular density of the optical signals and bitrate for a single wavelength by factors of 4 and 10, respectively. In actuality, the advancement of larger data rates on a single wavelength is mostly driven by the increase in spectrum efficiency and its possible cost benefits. owing to its narrow spectrum. A proposed modulation technique to increase the spectral efficiency of optical single mode fibre is called orthogonal frequency division multiplexing (OFDM).

Depending on how the subcarriers are modulated and demodulated, there are many variations of optical OFDM that can be classified. The optical approach modulates/demodulates the subcarriers individually, whereas the electrical variant very efficiently generates and demodulates all modulated carriers in the electrical domain using Fast Fourier Transforms (FFT) using a single modulator and an optical frontend for the conversion into an optical signal and vice versa. Eletrical approaches provide a greater number of subcarriers due to their lower optical complexity, which is advantageous for an intrinsically parallel, low-complexity receiver architecture when combined with the right computational extension. Contrarily, the optimal variation of OFDM necessitates large scale optical integration even for a limited number of subcarriers in order to enable a stable and cost-effective output.

Future FFT-based OFDM systems will be able to modulate huge bitrates with a single optical modulator by being able to generate fast analogue signals from their digital image (i.e., very high speed digital-to-analogue (DA) converters are needed). A combination of independently modulated sub-bands in the frequency domain has been used to generate all OFDM signals up to this point with a bandwidth greater than 16 GHz [23, 4].

2021[49] proposed tests by R. Schmogrow et al For the generation and reception of high-speed optical OFDM signals, offline processing was used [31,32,33,34,35] since real-time processing is difficult. The all-optical FFT processing method might be used at the highest bit rates. Elec-troni-c processing becomes necessary for lower sub-carrier spatial frequencies because optical filter restrictions prevent optical processing. Recently, peak data rates of 8.36 Gbit/s [26] and 12.1 Gbit/s [27] have been achieved using real-time DSP-based coherent OFDM transmitters using quadrature phase shift keying (QPSK) on the sub-carrier level. There has also been demonstrated a coherent real-time 3.55 Gbit/s OFDM receiver. The first real-time

OFDM transmission connections with intensity modulation attained data speeds as high as 11.25 Gbit/s [28] rating at a sampling rate [29-30] of 25 G Samples/s.

2020 [50] Orlandos Grigoriadis et al, Digital data is transmitted using an enormous number of subchannels or subcarriers in an OFDM scheme. Every channel is orthogonal to every other channel. They are narrow banded and closely spaced. To achieve high spectral efficiency, the sub-channels are separated as little as feasible. Due of its capability to manage multipath interference at the receiver, OFDM is being deployed. The primary outcomes of multi propagation are these two [13]. Inter Symbol Interferencing (ISI) and frequency-selective fading [15]. The abundance of narrow band sub-carriers in OFDM gives more than enough "flat" channels. Consequently, basic equalizing techniques for each channel can be used to address the fading. Moreover, a multi-carrier modulation can achieve the same data rates as a single-carrier modulation at a lower symbol rate. Each channel's symbol rate can be lowered to the point where each symbol is longer than the impulse response of the channel. This gets rid of ISI. The wide dynamic range of the signals being sent and the sensitivity to frequency mistakes are the two fundamental drawbacks of OFDM[51].

P. Venkata Saicharan, "Performance Study of Clipping Methods for 5G NR higher-order UFMC-QAM Systems", 2020 [52]. Clipping techniques are not advised for UFMC-QAM systems with 10-bit and 9-bit QAM schemes to reduce PAPR. The BER performances of both systems have deteriorated, while PAPR has somewhat decreased. The UFMC system really functioned well with lower order QAM schemes like 4-QAM. A BER of 0 can still result in a PAPR margin of around 5dB even when the signal is clipped to 50% of its maximum value. When the QAM method is enlarged, the signal is more susceptible to noise because more bits are sent at once. This may have contributed to the performance decline [52]. Easy Clipping is suitable for use in real-world scenarios due to its acceptable PAPR reduction and BER performance. The systems did exhibit a decent BER response that remained constant for all clipping levels. Deep clipping and smooth clipping performed well, but the BER loss is too great. Even at very high SNR and in an AWGN channel, the DC & SC systems cannot produce a sound BER. This might be due to the clipping functions' extreme nonlinearity. The BER performance of CC is consistently superior to that of DC and SC. Overall, we may infer that clipping of any kind is inappropriate for UFMC systems with higher order QAM schemes since none of them offered a reliable PAPR reduction and respectable BER performance. Conventional Clipping does not considerably enhance the finished HPA's design, although having decent performance. Consequently, it's crucial to investigate different PAPR reduction strategies, such as NLCM and DFT spreading, to see how they impact PAPR reduction.

III. PROPOSED WORK

Before beginning this project, all of the different OFDM basic system blocks are studied. However, the Fast Fourier Transform (FFT) and Inverse Fast Fourier Transform blocks that make up the OFDM system's processing block are given special emphasis (IFFT). These blocks are theoretically introduced so that you may understand what is going on behind them. Each block's implementation and configuration are also demonstrated Fig 1 and Fig 2. The multi-carrier OFDM Tx/Rx subsystem uses M-QAM modulation schemes primarily comprised of 16-QAM, 32-QAM, 64-QAM, and 128-QAM modulations. This also involves the orthogonal space-time trellis code. While dealing with digital transmission, it is important to bear in mind the SNR and BER. The system that is in charge often used 512/1024 QAM with various FFT points.

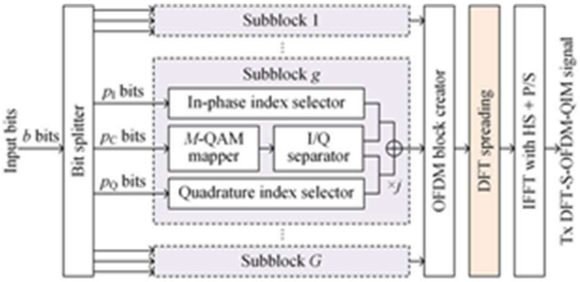

Fig. 1 Proposed OFDM transmitter

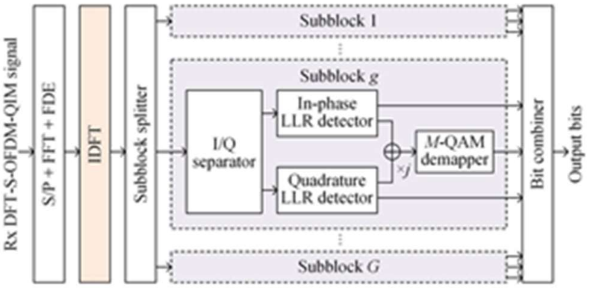

Fig. 2 Proposed OFDM Receiver

However, creating an OFDM signal with a large number of subcarriers following the analogue method presented before leads to an extremely complex architecture involving many oscillators and filters at both the transmit and receive ends. In present-day OFDM transmissions, though, this complexity is reduced by transferring it from the analogue to the digital domain.

To see this, take Equation (1), where just one OFDM symbol of the signal s(t) is sampled at an interval of Ts/N sec . Then, the nth sample of s(t) becomes:

$$s(nT_s/N) = \sum_{k=0}^{N-1} c_k\, e^{\frac{j2\pi f_k n T_s}{N}} = \sum_{k=0}^{N-1} c_k\, e^{\frac{j2\pi kn}{N}} = \mathcal{F}^{-1}\{c_k\} \tag{1}$$

where Ƒ is the Fourier transform, and n € [1, N]. Thus, it can be said that the discrete value of the transmitted OFDM signal s(t) is merely a simple N-point inverse discrete Fourier transform (IDFT) of the information symbol. The same case can be applied at the receiver, where the received information symbol will be a simple N-point discrete Fourier transform (DFT) of the received sampled signal.

Algorithm:

- M is the number of constellation.
- Create a regular QAM and set the counter to 1.
- Move one row of the generated regular QAM to the X axis **if** M=8/9/10 then.
- **else**
- The generated regular HQAM should be moved one row to $\sqrt{3}/4$ of the X-axis above.
- **if**
- Use the formula d_{vs}=*squareroot(3)* to create rows on either side of the x-axis.
- **else,** Determine the constellation's centre.
- Compute the energy ***(E_c)*** of every potential constellation point and add it to an array ***E_c*** while ***l <= M.***

- Determine *min((1<=j<=M)) | {z}* **$E_c(j)$,** and set the constellation point to the j^{th} index coordinates.
- *l = l + 1.*
- ***end***

IV. SIMULATION AND RESULTS

We present the simulated PAPR results for an OFDM transmitter with 1024 subcarriers employing 512 QAM and 1024 QAM for the basic system and the coded system, respectively, in this section. In every simulation, a sequence of 50,000 OFDM symbols is taken into account. Moreover, a sample factor of 8 is used. To demonstrate the impact of the constellation shaping, calculated the PAPR's complementary cumulative density function (DF), which is indicated by the following experiment:

The formula: *DF (PAPR0) = Pr(PAPR >PAPR0)*

In addition to this section, several simulated results, such as PAPR and BR for 512 QAM and 1024 QAM, are obtained and various stages of proposed work are displayed as in Fig 3 Transmitted Data Representation, Fig 4 OFDM Signal, Fig 5 Amplitude Clipped Signal, Fig 6 and Fig 7 Signal after HPA.

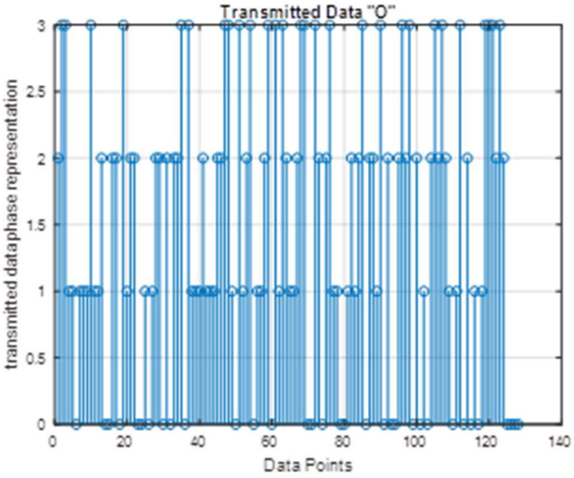

Fig 3 Transmitted Data representation

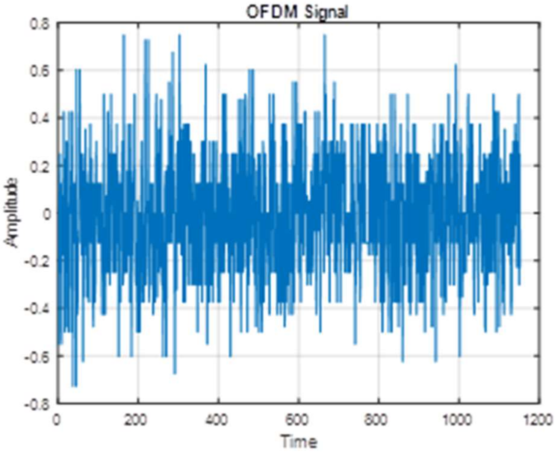

Fig 4 OFDM Signal

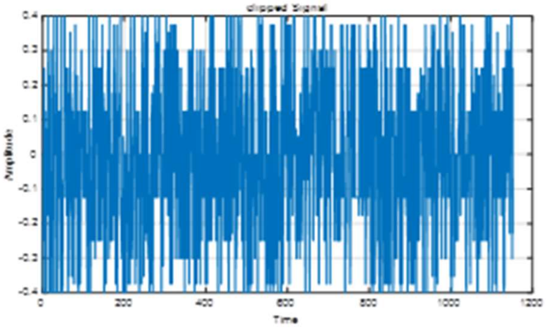

Fig 5 Amplitude Clipping signal

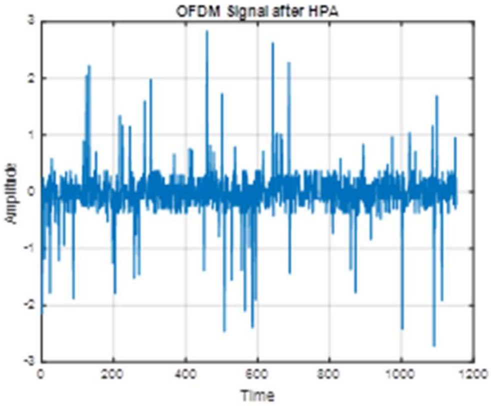

Fig 6 OFDM Signal After passing through HPA

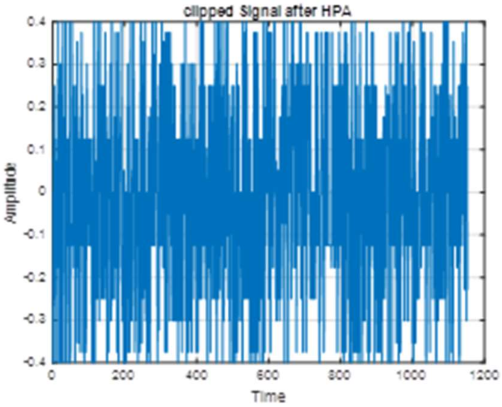

Fig 7 OFDM clipped Signal after HPA

In order to fit the linear section of the input-output transfer characteristic of the power amplifier feeding the antenna and prevent nonlinear distortions, it is intended to limit the dynamics of the transmit signal. We gain in shaping but not in coding as a result. Any errors brought on by channel noise could corrupt all of the data in the frame when N is large. We have established that this combination is effective, with each component providing the specific advantages anticipated.

While drawing the curve for the OFDM signal, the standard 512 QAM constellation without shaping is used. The OFDM signal is represented by this curve with lines. This 1024 QAM signal uses six rings for the broadcast antenna and constellation shaping. Using constellation shaping, which is a modified version of 1024 QAM constellation shaping with 36 super-rings for two transmit antennas, the continuous line corresponds to the OFDM signal. We can state that the newly proposed constellation shaping algorithm with 36 super-rings performs nearly as well as the algorithm for six rings in order to condense the discussion regarding the PAPR simulated results in Fig 9 .

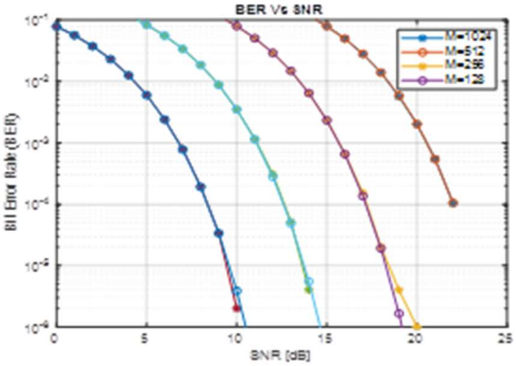

Fig 8 BER Graph for 256 QAM OFDM Base Vs Proposed

Table 1 provides us the values of Bit error rate at various Signal to Noise ratio for the method we used.

Table I Bit Error rate at Various SNR consideration

S.No.	SNR (dB)	Clipping Ratio 256 QAM 2048 FFT	Bit Error rate [52]	Proposed Work 1024 QAM 1024 FFT
1	0	0.82	0.0004	0.0006
2	5	0.84	0.0002	00.59
3	10	0.86	0.0002	0.000038
4	15	0.88	0.0004	0.000
5	20	0.9	0.0002	0.000
6	25	0.92	0.00	0.000
7	30	0.94	0.00	0.000
8	35	0.96	0.00	0.000
9	40	0.98	0.00	0.000

The OFDM block includes 64 bits. In the 1024 QAM OFDM system with shell mapping, the first 32 bits select the shell using the algorithm that select the 1024 QAM indexes,. Next, the selected sixteen 1024 QAM symbols are transmitted using the space frequency OFDM scheme. The BER performances for the 1024 QAM-OFDM SVD system with shell mapping and its corresponding 512 QAM reference system, both presenting a spectral efficiency of4 b/s/Hz per subcarrier, As functions of the average SNR.

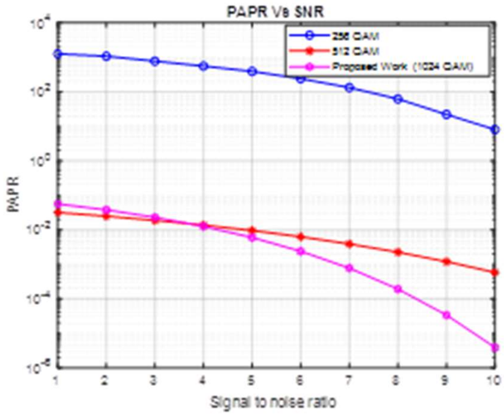

Fig 9 BER Graph for 256 QAM Vs Proposed Work

Hence, the 1024 QAM-OFDM trellis-coded system with shell mapping out performs the reference system for high SNR values in Fig 8. The coding gain of the proposed system over the reference system is about 5 dB, in the case of channel 1 model, and about 4 dB, in the case of channel 2 model, for a BER value of 10-4, and is increasing for lower BER values. A threshold value of the amplitude is set in this process and any sub-carrier having amplitude more than that value is clipped or that sub-carrier is filtered to bring out a lower PAPR value. The clipping approach is the simplest PAPR reduction scheme, which limits the maximum of transmit signal to a pre-specified level. Clipping causes in-band signal distortion, resulting in BER performance degradation.

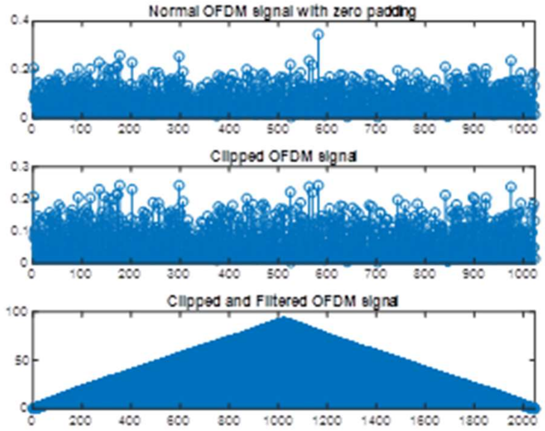

Fig 10 Clipped and Filters OFDM for 1024

Moreover, Clipping results in out-of-band radiation, which imposes out-of-band interference signals on neighbouring channels. Filtering can reduce the out-of-band signals brought on by clipping, but when done with the Nyquist sampling rate in the discrete-time domain, it may affect high-frequency components of in-band signals (aliasing). However, the BER performance will be less compromised if clipping is done for the sufficiently oversampled OFDM signals in the discrete-time domain prior to a low-pass filter (LPF) and the signal goes through a band-pass filter (BPF). Filtering the clipped signal canreduce out-of-band radiation at the cost of peak regrowth. The signal after filtering operation may exceed theclipping level specified for the clipping operation.

Normal OFDM signal with zero padding, Clipped OFDM and Filtered OFDM signal is shown in Fig 10.Again, the proposed system outperforms the reference system by more than 4 dB (for channel 1) and by more than 2 dB (for channel 2), for a BER value of 10-2 and is increasing for lower BER values. The loss of BER performance of the proposed system, in the case of channel 2, as compared to channel1, is determined by the increased frequency selectivity in the case of channel 2 (i.e. there are larger differences between the channel coefficients of neighbouring carriers).Also, it is interesting to note that the reference system performances are not affected by the channel model. Hence, for the proposed reference system, the BER results are identical for both channel models, Table II shows the PAPR values obtained for base and proposed work and Fig 10 represents Clipped signal and Filters for 1024 QAM.

Table II Comparative results of Base and Proposed Work

Base Paper [52]		**Proposed Work**
SNR (dB)	**PAPR**	**PAPR**
1	0.032	0.05
2	0.024	0.037
3	0.018	0.022
4	0.012	0.0125
5	0.009	0.005
6	0.006	0.0023
7	0.0038	0.00077
8	0.0022	0.00019
9	0.0011	0.000036
10	0.0005	0.000038

Here the PAPR of 0.000038 is obtained for SNR of 10 db for simulated results verifies the proposed technique is better as compared to previous works.

V. CONCLUSION

With the aid of 512 QAM and 1024-IFFT/FFT, we provided an OFDM architecture that may easily reduce Bit Error Rate (BER) and enhance Signal-to-Noise Ratio performance. When compared to earlier work, a satisfactory reduction in BER was discovered. Our findings show that the Bit Error Rate (BER) decreases when the Signal-to-Noise Ratio rises. The proposed DFT-based Amplitude clipping selective mapping method has also reduced PAPR.

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