Crest factor reduction techniques for 4G/5G waveforms

Objectives:

Peak To Average Power Ratio (PAPR) Reduction In OFDM Based 4G/5G Signals.

Introduction:

High peak-to-average-power ratio is one of the major drawbacks of OFDM scheme and it forces the PA at the transmitter to work at reduced efficiency. In order to prevent the excessive energy consumption, the OFDM-signal is required to be processed before the transmission such that its peak power can be reduced. In this regard, several techniques are presented in the previous chapter and clipping is found to be the most suitable method for the real-time applications. It is proven to be one of the most effective and computationally simplest methods.

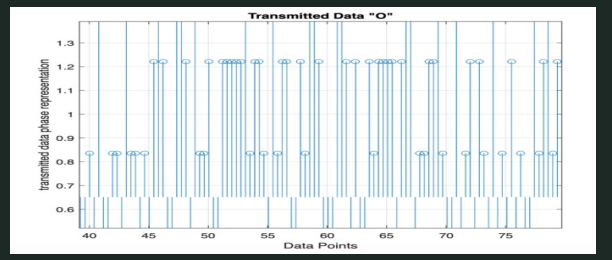
Methodology:

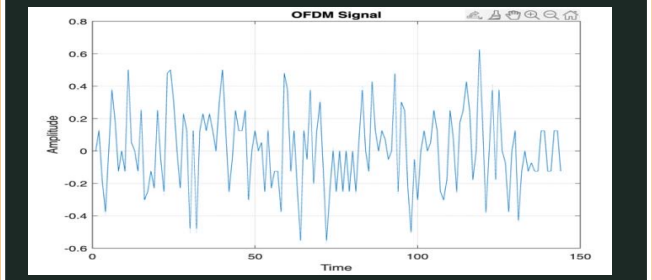
- Taking a QPSK signal Constellation and setting its parameters.
- Performing QPSK Modulation after seeing Transmitted Signal.
- Arranging the matrix data of Pre-OFDM signal.
- Using Clipping as a PAPR Reduction Technique.
- To show effect of PA we will add some random complex noise.
- Showing the transmitted signal after passing through HPA.
- Taking output figure of transmitted OFDM signal passing through HPA (with clipping/without clipping).
- Final step to pass the normal and clipped signal through the channel.

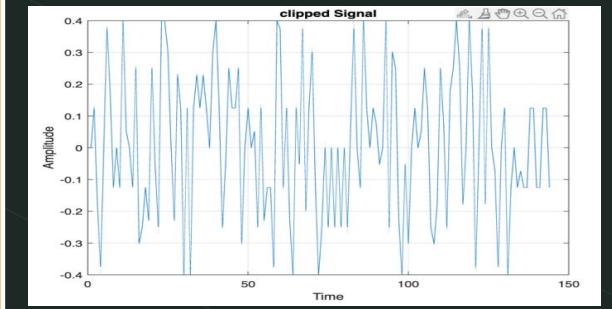
Results:

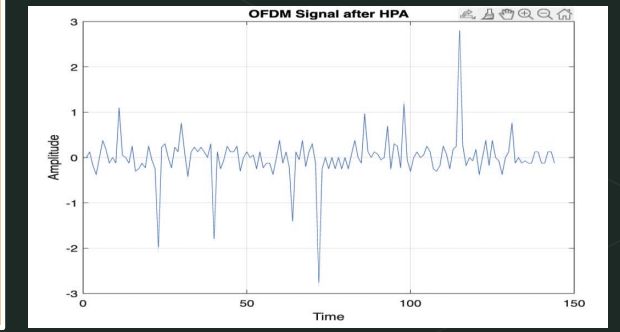
PAPR of original signal in=**20.6920 db.**

PAPR of clipped signal in=**5.6330 db.**









Conclusion:

We analyzed and compare the reduction in PAPR and the resultant error due to this.

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