

correspond to the proposed method, the RCF algorithm and the original OFDM system. As shown in Fig. 5.

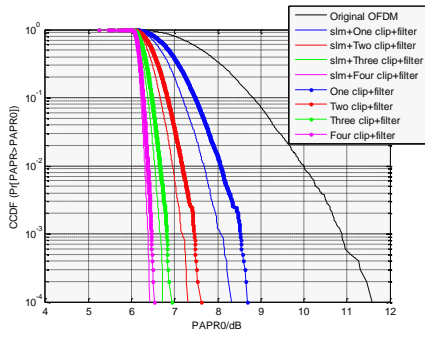


Fig. 5 CCDF of the PAPR for the Original OFDM System, the RCF Scheme and the Proposed Algorithm with N=128 and QPSK Modulation

In Fig. 5, the “one clip+filter” stands for a RCF operation. The CCDF of the PAPR is shown respectively in the original OFDM system, the only RCF applied system, and the joint scheme method applied system.

It can be seen that the PAPR of the traditional OFDM system is up to 11.5dB when at the 0.01% CCDF probability level. The PAPR reduces to 8.7dB and 8.3dB while applying the RCF technique and the joint scheme respectively. Compared the PAPR of the RCF algorithm with the joint scheme, it can be observed that the proposed method is superior to the RCF algorithm clearly. Further, the PAPR reduction is about 0.4dB and 0.3dB, and can up to 8.3dB and 7.3dB when RCF scheme is adopted once and twice respectively. In addition, when RCF scheme is adopted for three and four times, the PAPR of the proposed method can be dropped to 6.4dB and 6.7dB.

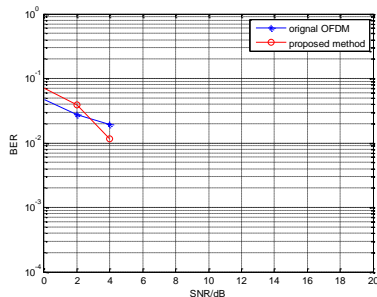


Fig. 6 The BER Performance of Original OFDM System and the Proposed Method with N=128 and QPSK Modulation

In Fig. 6, the BER performances of the original OFDM system and the proposed method are shown. It can be seen that they can generate similar BER performance characteristics. When the SNR is equal to 0dB, it signifies that the signal power is equal to noise power. At this time, the BER is about 6% in the original OFDM system in Fig. 6, and the BER becomes 8% with the proposed method. It can be seen that the BER performance gets better when the number of the

subcarriers is less. It demonstrates that the proposed method produces little distortion.

From the simulation results, it can be seen that much PAPR reduction is obtained than those in the system only with RCF scheme. And the BER performance is almost identical to that in the original OFDM system. So the method proposed in the paper proves to be very effective.

VI. Conclusion

In this paper, a kind of method combining SLM with RCF algorithm for PAPR reduction is proposed. It makes full use of advantages of the two algorithms. There are prominent advantages in the proposed method. Firstly, compared with the PAPR in the original OFDM system, the PAPR reduction is evident. Secondly, the BER performance doesn't worsen and is even identical to that in the original OFDM system when different modulation schemes and different number of subcarriers are used. Furthermore, the proposed method is simple to implement and has no limitations on the system parameters such as the number of subcarriers, modulation mode, and so on.

In addition, in the past, OFDM was used rarely in WSN. With the progress of communication technology and digital circuit manufacture level, OFDM has gradually used in WSN either. So we must pay great attention to the application of OFDM in WSN.

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