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Joint power loading and phase shifting on signal constellation for transmit power saving on OFDM/OFDMA systems (Article)

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Abstract

Power loading and phase shifting are generally applied separately to improve the performance of OFDM / OFDMA digital communication systems. In this paper, we propose a new method by combining the two to save transmit power. The channel information feedback used on prior power loading is just a channel gain, so in our method, channel state information at the transmitter (CSIT) feedback is a complex quantity. The magnitude of the channel is used to adjust the power allocation of each subcarrier, while the information on the channel phase is used to adjust the phase shifting. Our proposed method uses the principle of channel equalization but we apply in the transmitter. The first step in our research, we derive mathematical equations in the system model to obtain the ideal quality of communication. Next, to get curves that state the quality of the system, we do simulations with the help of computing software. From the simulation results, when the CSIT works perfectly, the resulting performance in terms of the probability of error is equal to the system passing through the AWGN channel, which means the maximum power savings. Although CSIT is not perfect but can still get power savings on the transmitter side. The more accurate CSIT, the greater the power saving is obtained. For low level modulation, 70% accuracy can get maximum power savings. The simulation results also show that the application of the propose method has a much better performance compared to the application of channel equalization on the receiver. © International Journal on Advanced Science Engineering Information Technology.

Author keywords

[CSIT](#) [OFDM/OFDMA](#) [Phase shifting](#) [Power loading](#) [Power saving](#)

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