

Abstract

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SLM Technique Based on Particle Swarm Optimization Algorithm for PAPR Reduction in Wavelet -OFDM Systems

Orthogonal frequency division multiplexing (OFDM) system has high spectral efficiency and immunity to frequency selective fading channel. So, it has been widely used in modern wireless communication systems. However, the major drawback of OFDM system is the high peak-to-average power ratio (PAPR) of the transmitted signal for large number of subcarriers. Selected mapping (SLM) is one of the most well-known techniques to reduce the PAPR in OFDM system, since it can achieve a good PAPR reduction without signal distortion. Moreover, SLM technique can be used with wavelet-OFDM (WOFDM) system to enhance the PAPR performance, while maintaining most of the advantages of the conventional OFDM system. In this paper, an effective PAPR reduction technique using SLM-WOFDM based on particle swarm optimization (PSO) algorithm is proposed. PSO is applied to SLM-OFDM and SLM-WOFDM systems for searching the optimum phase rotation factors. The systems evaluation shows that the proposed PSO based SLM-WOFDM system provides better PAPR reduction compared to PSO based SLM-OFDM, SLM-WOFDM, and conventional SLM-OFDM systems.