

Abstract

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Performance analysis of modified asymmetrically-clipped optical orthogonal frequency-division multiplexing systems

A modification to the Asymmetrically-Clipped Optical Orthogonal Frequency-Division Multiplexing (ACO-OFDM) technique is proposed through unipolar encoding. A performance analysis of the Bit Error Rate (BER) is developed and Monte Carlo simulations are carried out to verify the analysis. Results are compared to that of the corresponding ACO-OFDM system under the same bit energy and transmission rate an improvement of 1dB is obtained at a BER of 10^{-4} . In addition, the performance of the proposed system in the presence of atmospheric turbulence is investigated using single-input multiple-output (SIMO) configuration and its performance under that environment is compared to that of ACO-OFDM. Energy improvements of 4dB and 2.2dB are obtained at a BER of 10^{-4} for SIMO systems of 1 and 2 photodetectors at the receiver for the case of strong turbulence, respectively