A Performance Analysis of MIMO-OFDM/TDM in a Peak-limited Multipath Fading Channel

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Abstract:

Recently, multiple-input multiple-output (MIMO) orthogonal frequency division multiplexing (OFDM) combined with time division multiplexing (OFDM/TDM) based on frequency domain equalization (FDE) has been proposed to improve the performance of conventional OFDM-based relaying in terms of high peak-to-average power ratio (PAPR) and the bit error rate (BER). The PAPR problem, however, is not completely eliminated and thus, the effect of peak-limited channel is not negligible. In this paper, we present the BER performance analysis of MIMOOFDM/ TDM in a peak-limited and frequency-selective channel. The theoretical equalization weights in a nonlinear channel for MIMO-OFDM/TDM are derived to capture the negative effect of peak-limitation. Performance analysis presented in this paper was confirmed by the computer simulation and it was shown that the achievable BER performance of MIMO-OFDM/TDM in a peak-limited and frequency-selective channel is a function of the OFDM/TDM design parameter.