

A performance analysis of hybrid V-BLAST/space-time block code and V-BLAST/space-frequency OFDM

ABSTRACT

In this paper, two hybrid multiple-input multiple-output (MIMO) orthogonal frequency division multiplexing (OFDM) transceiver schemes are introduced by combining the vertical Bell-labs layered space-time (V-BLAST) with Alamouti's space-time block codes (STBC) and V-BLAST with space-frequency codes (SF), denoted V-BLAST/STBC and V-BLAST/SF respectively. The MIMO-OFDM system consists of four transmit and four receive antennas is modeled over Monte-Carlo time-variant channel model in the delay spread of 200ns and different maximum Doppler frequency. Special training sequences are used in the least square (LS) channel estimation method to obtain a desirable crest-factor of the transmitted training signal and eliminate the influence of inter-symbol interference (ISI) on the channel estimation performance. The symbol error rate (SER) performance of V-BLAST/STBC OFDM and V-BLAST/SF OFDM is analyzed. Simulation results show that the SER performance of V-BLAST/SF OFDM outperforms V-BLAST/STBC OFDM in MIMO channel model with high Doppler frequency.

Keyword: Space-time block codes; Space-frequency; Inter-symbol interference; V-BLAST