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(57) Abstract :

ABSTRACT The Space-Frequency Block Coding (SFBC) based Orthogonal Frequency Division Multiplexing (OFDM) system is particularly well-suited for fast-fading channels. Accurate channel state information (CSI) is essential for effective signal detection. However, in systems with multiple transmit antennas, the pilot symbols can overlap, causing inter-transmitting antenna interference (ITAI). This paper proposes a specialized comb-type pilot design to mitigate ITAI effects. Additionally, this pilot design allows the channel estimation process to involve only simple arithmetic operations at pilot subcarriers, followed by either low-pass interpolation (LPI) or Discrete Fourier Transform (DFT)-based interpolation methods at data subcarriers for accurate channel estimation. Performance comparisons between DFT and LPI-based interpolation methods for the SFBC-OFDM system are conducted based on symbol error rate (SER) over multipath fast-fading channels. Results indicate that DFT-based interpolation outperforms LPI, delivering performance close to that of perfect channel estimation.

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