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MIMO-FBMC/OQAM using IIC and MIMO-IIC in LTE channel

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Iterative decoding has been widely used to achieve reliable high data rate transmission for broadband multi-carriers communication systems. However, in Multiple- Input Multiple-Output Orthogonal Frequency Division Multiplexing (MIMO-OFDM) systems with insufficient cyclic prefix (CP), due to the inter-symbol interference (ISI) and inter-carrier interference (ICI) resulting from other transmitted signals, there are significant challenges for efficient receiver design under the effect of the time-variant Long-Term Evolution (LTE) multipath channel. It means that the system performance may be degraded. In this work, iterative interference cancellation (IIC) and MIMO-IIC are proposed using a Low-Density Parity-Check (LDPC) decoder for MIMO filter bank multicarrier based offset QAM (MIMO-FBMC/OQAM) and MIMO-OFDM systems under the effect of a time-variant LTE multipath channel. To eliminate the ICI/ISI interference from the received signal, IIC and MIMO-IIC are used to cancel the undesirable components by using the estimated decoded signal of the current and second stream respectively. The bit error probability is compared with that of the conventional MIMO-OFDM system with insufficient cyclic prefix (CP) under different environments. The results obtained indicate that IIC and MIMO-IIC can effectively mitigate error floors introduced by channel variation and insufficient CP with high bandwidth efficiency.

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