Abstract

Multi-carrier Code Division Multiple Access (MC-CDMA) has been an attractive technique for wireless communication because it offers high data rate, high spectral efficiency, large system capacity, less transmit power and less implementation complexity. But due to Carrier Frequency Offset (CFO), which comes into account due to asynchrony between transmitter and receiver local oscillators or by Doppler Effect due to high mobility, orthogonality among the subcarriers gets affected resulting in Inter Carrier Interference (ICI) which leads to rapid degradation in performance of MC-CDMA system. In this paper, the performance of Uplink MC-CDMA system with Zero forcing- frequency domain Equalization (ZF-FDE), conventional MMSE equalizer and Modified MMSE-FDE using Walsh-Hadamard spreading sequence in multipath fading channel has been analyzed. Simulation has been performed using 32 subcarriers and 64 subcarriers for these equalization techniques. Simulation results confirm excellent performance of the Modified MMSE-FDE which outperforms the conventional MMSE equalization and ZF-FDE. The further improvement in performance is achieved by employing 64 subcarriers instead of 32 subcarriers. Numerical equations and simulation results are given to support the analysis.
Interference Mitigation in MC-CDMA System with CFO compensation based Modified MMSE-FDE Technique

- Tavel, P. 2007 Modeling and Simulation Design. AK Peters Ltd.

Index Terms

Computer Science

Communication

Keywords

MC-CDMA  CFO  MMSE-FDE  ZF  ICI  Walsh-Hadamard Sequence