On ICI Canceller for Mobile OFDM DTV Receivers

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***Abstract*— In mobile environment, the performance of OFDM mobile receivers is degraded severely because of Inter-Carrier-Interference (ICI) caused by Doppler Spread. So ICI canceller is an important task for designers of mobile OFDM receivers. [1] and [2] proposed an efficient method to reduce ICI. The main idea of this method is to linearly approximate time varying channel within one OFDM symbol. Then a large ICI matrix equation is given. However, in [1] and [2], the estimated values of the channel transfer function—the diagonal of the ICI matrix is corrupted by ICI. Consequently, the equalized signal still is distorted. In this paper, we propose an iterative method to improve performance of the conventional method in [1] and [2]. We implement Jacobi iteration method to solve the big ICI matrix equation. Thereby, we are able to implement ICI canceller by a simple FIR filter rather than finding the inverse of ICI matrix. Next, at second iteration of Jacobi method, we improve the accuracy the diagonal by removing ICI from pilot symbols and re-estimating the channel transfer function. Simulation results for ISDB-T mode 3 demonstrated that our method could double performance of the conventional method under TU-6 channel and Doppler Spread. The improvement is better for two paths and one path Doppler channel.**

***Keyword*— Inter-Carrier Interference (ICI), Jacobi Iteration, Orthogonal frequency-division multiplexing (OFDM).**

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