Measurement Results of Frequency Offset in DVB-C2 Receiver

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***Abstract*— In this paper, we show the measurement results of frequency offset (FO) estimation in Digital Video Broadcasting for Cable version 2 (DVB-C2) receiver which uses orthogonal frequency-division multiplexing (OFDM). Because FO causes inter-carrier interference (ICI) in a multicarrier system, it should be estimated and compensated to improve the performance of a multicarrier receiver. FO can be divided into fractional frequency offset (FFO) and integer frequency offset (IFO) if FO is normalized to subcarrier spacing. The implemented FO estimator consists of FFO and IFO estimator. FFO estimator uses cyclic prefix (CP) in time domain and is implemented using coordinate rotation digital computer (CORDIC) algorithm. IFO estimator uses the correlation with unique synchronization sequence (USS) of preamble in frequency domain. First, we simulate the mean square error (MSE) of FO compensation algorithm w.r.t additive white Gaussian noise (AWGN) channel with computer simulation. Next, we implement FO estimator using in field programmable gate arrays (FPGAs). The implemented FO estimator has the resolution of 1 Hz approximately from measurement results of it.**

***Keyword*— Frequency offset, CORDIC, unique synchronization sequence, FPGA**

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