PERFORMANCE COMPARISON OF DOPPLER SPREAD ESTIMATION METHODS FOR OFDM (ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING) SYSTEMS

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ABSTRACT

Doppler Spread will cause a widening of the spectral signal information so disturbing orthogonality between subcarrier or called Inter Carrier Interference (ICI) in OFDM systems. Estimating Doppler Spread will be useful to know the magnitude of the effect of Doppler Spread on the system and helps to improve the optimization of the transmission of signaling information as well as helping to develop algorithms that can minimize the effects of ICI. Many methods have been applied to estimate the Doppler Spread. However, the algorithms used and their performance tends to be difficult implemented and inaccurate. Therefore we need a method of estimation that has the best performance among the methods used by the Doppler Spread and Eb/No parameter.

The estimation method used is the Phase Difference and Newton polynomials. In this study, Doppler Spread estimation using comb-type pattern in the insertion of the pilot, then used the estimated channel is Piece-wise linear with slope 2. The delay specification is assumed channel model ITU Vehicular recommendation and mobile-to-fixed Zheng Xiao II model. At the ITU Vehicular channel, there are 6 tap that have differently delay profile and average power.

After doing research, it can be concluded that the estimation results from both methods would be more accurate if the channels are assumed multipath Rayleigh fading than Rician fading. There is no ICI at AWGN channel, evidenced with no change the channel weights over time sample.

Key words : Doppler Spread, ICI, Phase Difference, Newton Polynomials, Eb/No