

ABSTRACT

Nowadays and in the future, wireless communication system obliged for high speed data rate and voice transmission, good bandwidth efficiency and also have a reliable ability through the channel condition which have multipath fading effect. Mobile communication system Multi-Carrier CDMA (MC-CDMA) is a combination between multicarrier modulation technique and spread spectrum technologies (CDMA), MC-CDMA as a wireless digital communication system trusted to have good reliability in multipath propagation and good to overcoming frequency selective fading. MC-CDMA also good to increase spectral efficiency using orthogonal carrier. In generally, communication systems have 3 components, there are transmitter, receiver, and transmission media (channel). MC-CDMA system, in the receiver side need combiner block that good to restoring receive signal.

This final task have been analysed the comparison between linier adaptive combining scheme and non linier adaptive combining scheme. Linier adaptive combining using RLS (Recursive Least Square) algorithm and LMS (Least Mean Square) algorithm. Whereas non-linier adaptive combining using DFE-LMS (Decision Feedback Equalizer-LMS) algorithm. The purpose of this final task is to know about the performance and convergence of RLS, LMS dan DFE-LMS method. Convergence rate, Mean Square Error (MSE) and Bit Error Rate were the main parameter in analyzing adaptive combining algorithm.

From simulation result using 64 subcarrier in AWGN or Rayleigh channel to get $BER = 10^{-3}$, shows that RLS algorithm scheme have lowest level of performance than DFE-LMS algorithm or RLS algorithm. In AWGN channel, RLS scheme need $SNR = 5.6$ dB to get $BER = 10^{-3}$, LMS scheme need $SNR = 4.8$ dB and DFE-LMS need $SNR = 4.6$ dB. While in Rayleigh channel, RLS scheme need $SNR = 8.7$ dB, LMS scheme need $SNR = 7.6$ dB and DFE-LMS need $SNR = 6.6$ dB. But in Convergence rate, RLS scheme give the fastest convergence rate than LMS scheme and DFE-LMS scheme. RLS scheme need 110 iteration to convergent, LMS scheme need 600 iteration and DFE-LMS need 900 iteration.