ABSTRACT

In the next few years, wireless systems will need more complex communication tools. Where bandwidth requirements varies, from narrow band to very wide band. On the other hand, the main problem in wireless communication is the multipath fading caused by propagation channel environment. With the combination of MIMO (multiple input multiple output) and MC CDMA (multicarrier code division multiple access), it is possible to achieve spectral efficiency and link reliability (BER with a minimum SNR).

This degree thesis evaluates the performance of MIMO-MC CDMA-RAKE receiver system on Rayleigh-distributed mobile propagation channel that influenced by user mobility, the number of subcarrier and the number of RAKE.

From the MIMO-MC CDMA-RAKE receiver system simulation, we can conclude that RAKE implementation gives more enhancements rather than increasing the number of subcarriers. In order to achieve BER $=10^{-3}$, the performance increased 0.3 dB when the number of subcarriers varies. While varying the number of RAKE fingers will increase the performance 0.7 dB. Because increasing the number of subcarrier will also gives more interferences to the system instead of increasing the number of RAKE fingers.

Keywords: MIMO, MC CDMA, RAKE receiver.