ABSTRACT

The requirements of high spectrum efficiency, high performance, high data rate and new services have motivated the evolution in wireless cellular technology. One of them is multi-carrier spread spectrum (MC-SS) method which is the combination between spread spectrum and multi-carrier transmission (OFDM). On the other hand, in the CDMA based multiple accesses where several users occupy the same time slot and frequency, there are high potential MAI occurs.

Therefore, some methods are developed to minimize MAI problems. One of those is the multi user detection (MUD) method. There are various kind of MUD method which depends on the desired system complexity and performance. Decorrelating detector is one of the suboptimum MUD which minimizes the MAI by multiplying the output of dispreading signal with spreading code cross correlation matrix which is used.

In this final assignment, the performance of decorelating detector for MC-CDMA system has been simulated and analyzed. The simulation result indicate that as the number of user increase as well as the user mobility consequence in poor performance of the MC-CDMA receiver either using decorelating detector or not, but with decorrelating detector is better. Decorelating detector provides the improvement of MC-CDMA system performance. This is indicated by the 4.66 dB SNR improvement assuming 6 active users, 5 km/h user's velocity and using 8 sub-carriers.

Key words: MC-CDMA, MAI, decorrelating detector