ABSTRACT

Multiple access is one of the important characteristic in cellular system. By *multiple access*, each of user are given channel and occupy the different channel. In CDMA 2000-1x, the data will be transmitted by the spreading process, so that become known as *multiple access*. Each of user consider signal separately, which is the other users as interferer or as known *Multiple Acces Interference* (MAI). If number of interferer are increase, it causes quality of receive signal will decrease. In CDMA 2000-1x has near far problem caused by different distance between user and base station, so BTS received power don't same from each of user. Both of MAI and near far problem can decrease with Multi User Detection (MUD) technique.

In this Final Project comparing between CDMA 2000-1x use MUD to Conventional system. In MUD, Minimum Mean Square Error is one of the classification suboptimum Multi User Detection (MUD). MMSE detector, will decrease MAI effect significantly. Kalman Filter is a methode which based on measurement noise. Kalman Filter has two steps, there are predict and correct. It is causes Kalman Filter as one of methode which rely on minimizing Minimum Mean Square Error (MMSE). Kalman Filter can minimize estimation error, that can decrease MAI effect, so that can improve performance of CDMA 2000-1x system.

 From simulation result, it can be concluded that performance system of CDMA 2000-1x using MMSE MUD with Kalman Filter better than conventional system. When mobility user 120 km/h, with Kalman Filter, for getting 10^{-3} BER need SNR about -3.9 dB. Meanwhile, in conventional system for getting 10^{-3} BER need SNR 0.8 dB. It means betterment SNR between conventional system and MMSE MUD with Kalman is about 4.7 dB SNR.

Key Word : CDMA 2000-1x, Multi User Detection, Minimum Mean Square Error, Multiple Access Interference, Kalman Filter