

ABSTRACT

Multiple Access Interference (MAI) is one of the problem which tends to limits the capacity in CDMA system. It occurs due to *semiorthogonal* characteristic of spreading codes corresponding to each active user. In addition, the channel effect cause the degradation to the spreading codes orthogonality. MAI effect cause the problem to the system when the power level of corresponding user dominates the others. In this case, the low level of corresponding user signal will possibly covered due to *Near far effect*. *Multiuser detection* is the method used in receiver such that, it can obtain the the *Spreading Wafeform* of the entire user and jointly detect the corresponding user signal.

In this final project, the combination of two scheme of suboptimal linear and nonlinear *Multiuser detection*, that is, *Successive Interference Cancellation (SIC)* and *Decorrelator Detector* are discussed. The objective is to obtain detection process of user signal. We evaluate the performance by taking into account *Bit Error Rate (BER)* versus *Signal to Noise Ratio (SNR)* and *User Mobility*.

The simulation result show that the combination between two scheme DBSIC multiuser detection provide better performance compared with single multiuser detection. It is indicated by 10^{-5} BER achievement at 10 dB SNR. On the other hand, applying each SIC or decorrelator require 15 – 20 dB SNR. In addition, for asynchronous transmission DBSIC show large performance achievement compared with synchronous transmission. For the large number of user and in high mobility environment, DBSIC performance decrease.