

## ABSTRACT

One of W-CDMA system development is in receiver. Multiuser system receivers consist of optimal receiver and sub optimal receiver. Optimal receiver is very complex. Thus the development is conducted to find sub optimal receiver which its performance approaches optimal receiver but the complexity is lower than it.

Successive Interference Cancellation (SIC) is an algorithm that used in sub optimal receiver. Receiver with SIC algorithm will detect all users one by one. There is cancellation process, that cancel signal effect of the first detected signal from all received signals and subtract the complexity of the user that will be detected next. In this final research. The performance of W-CDMA is analyzed single-user, two-user, three-user systems. This also analyzes the performance comparison between conventional and system with SIC algorithm.

Simulation results show that the condition of modeled channel influence the performance of single-user system. Meanwhile, the condition of modeled channel depends on relative mean power and relative delay of each tap in channel. The best performance of single user system is occurred in speed 50 Km/h, BER target is achieved at -8.91 dB. Three-user system with SIC gives 66.67% BER improvement at 7 dB SNR. In two-user system with SIC, the  $10^{-3}$  BER is achieved at SNR  $\pm$  (-3.48) dB while in three-user system with SIC, it is achieved at SNR  $\pm$  1.18 dB. The increasing of active users will effect the performance of conventional system and system with SIC algorithm.

Key words: W-CDMA, Successive Interference Cancellation, Cancellation