ABSTRACT

Cellular system currently experiencing rapid growth. One of them is WCDMA, which is one standard in broadband generation (3GPP). In WCDMA cellular communication system is still having some problems like the DS-CDMA systems, it is the inter symbol interference (ISI) and Multiple Access Interference (MAI). All disorders that occur due to the destruction orthogonalitas spreading code used and the users of the plural in the WCDMA system.

One technique that can reduce the interference contained in the WCDMA mobile communication system is multiuser detection (MUD). Multiuser detection is used to detect the information of the user signals simultaneously transmitted and received simultaneously with a signal based on the worst channel condition. In this research will analyze the performance of WCDMA that uses combining suboptimal linier MUD (MMSE) and suboptimal nonlinear MUD (PIC). Because with combine the MMSE and PIC MUD will be optimized to handle the MAI on the WCDMA system than using one of the MUD.

In this final project has analyzed the performance of WCDMA system based on MMSE and PIC multiuser detection. The results of this study indicate that the performance of the merger of two MMSE-PIC multiuser detection is much better than not using a MUD. To achieve the BER 10^{-4}, W-CDMA systems using MMSE-PIC only requires SNR 6 dB. While W-CDMA systems that do not use a MUD can not be achieved BER 10^{-4} in range SNR -5 dB to 10 dB. The performance of MMSE-PIC will also decrease with increase in the number of users, and increasing the speed of the user.

Keyword : WCDMA, MUD, PIC, MMSE, ISI