ABSTRACT

Fading is amplitude fluctuation of transmitted signal. One solution to reduce the fading effect is diversity. In diversity used more than one links to transmit information. One application of diversity is relay diversity. Basically relay diversity is a solution that use some relays to receive signal from transmitter and retransmit the signal to receiver. Relay has some characteristic, they are amplify-and-forward or decode-and-forward.

This Final Project simulates the WCDMA downlink system using relay diversity over fading channels. In simulation used Rayleigh fading channels and decode-and-forward relay. All received signals in MS are combined by EGC (Equal Gain Combining). Simulation is done on system without relay and system with relay, the numbers of relay are 1-Relay, 2-Relay, 3-Relay, and 4-Relay. Simulation is based on different user velocity, Spreading Factor, and number of user.

Simulation results based on different user velocity, Spreading Factor, and number of user indicate that relay can increase WCDMA downlink performance. With relays, the BER of system can be improved. On the other hand, system with relay needs Eb/No lower than Eb/No of system without relay to achieve the same BER.

Keywords: relay, downlink, BER, and Eb/No.