ABSTRACT

Multi-Carrier Direct Sequence Code Division Multiple Access (MC-DS-CDMA) system is technique that combined CDMA (*Code Division Multiple Access*) and OFDM (*Orthogonal frequency Division Multiplexing*). MC-DS-CDMA combined CDMA advantage that *anti jamming* and OFDM advantage that *bandwidth efficient,* but overall this technology is suffered to the MAI (*Multiple Access Interference*) especially in uplink direction with high mobility that occur in the radio channel bringing from the reflection and scattering from the signal that crashing obstacle. MAI causing limited capacity in the system.

MAI can be reduced with MUD (*Multiuser Detection*), this technique can separate the received signal from each user. MUD Decorrelator and SIC that used in this final project are supposed to decrease the MAI effect with have result that lower SNR for a certain BER target and it compared to the system after adding MUD with the system before adding the MUD.

The result of this research conclude that combined Multiuser Detection Decorrelator-SIC give the best performance for MC-DS-CDMA uplink system with high mobility, it reach BER 10^{-3} in SNR up to 8dB compare to the sistem that used no MUD reach BER 10^{-3} in SNR 11.3dB and it have gain in performance about 3.3dB. For the large number of user and in high mobility environment, system performance decrease.

Keyword: MC-DS-CDMA, DECORRELATOR, SIC, MUD