

ABSTRACT

MCCDMA (Multi Carrier Code Division Multiple Access) is the combination of CDMA (Code Division Multiple Access) and OFDM (Orthogonal Frequency Division Multiplexing). MCCDMA systems have high spectrum efficiency, resistance to multipath fading conditions, and supports high-speed data services. While MIMO (Multiple Input Multiple Output), is the use of multiple antenna in both the transmitter and the receiver side. This system can improve the performance of wireless communication systems. MIMO systems can be integrated with the MCCDMA with apply DSTBC scheme (MIMO DSTBC MCCDMA). Given this integration can produce a communication system that has better performance than the conventional MCCDMA system.

This final assignment is analyzed the application of Differential Space Time Block Code (DSTBC) with Multiple Input Multiple Output (MIMO) technique to increase Multi Carrier Code Division Multiple Access (MCCDMA) system performance. The analysis was done by creating a simulation in MATLAB programs in AWGN channel and fading channel conditions independent and identically Rayleigh distributed. The conducted analysis is measure system performance based on performance quality (with the rule of the lower BER on the received signal, the better the performance quality).

The simulation results show that MIMO DSTBC MCCDMA systems provides better performance compared to MCCDMA conventional systems under various conditions the use of channel coding and interleaving, the number of subcarriers and user movement. The simulation results for the effect of using the number of subcarriers shows that in the use of 32, 64, and 128 subcarriers, MIMO DSTBC MCCDMA systems produce performance improvement in a row of about $\pm 12,51$ dB, $\pm 13,16$ dB, and $\pm 15,16$ dB when the BER 10^{-4} . While in simulation of the effect the user movement at speed of 0 km/hour, 2,7 km/hour, and 43,2 km/hour MIMO DSTBC produce performance improvement in a row of about $\pm 3,77$ dB, $\pm 14,06$ dB and $\pm 13,82$ dB when the BER 10^{-4} .

Keywords = MCCDMA, OFDM, CDMA, MIMO, DSTBC, AWGN, Rayleigh.