ABSTRACT

The growing level of high data communication needs then formed a technology LTE (Long Term Evolution). With high data rate transmission bandwidth is narrow but becomes the problem to be solved. Problems on the broadband experience is made selective signal fading and also there sprectum high efficiency ratio, and if the user is experiencing the movement so that there is signal degradation.

This problem can be solved in various ways adding MIMO system can overcome the problems of broadband. Used is the STBC MIMO, spatial multiplexing, MIMO and adaptive. Therefore, this final project uses the SC-FDM uplink MIMO-LTE techniques to do research. MIMO is expected to increase the performance adaptive-LTE Uplink. LTE, which is used in this system is LTE realist 8, with SC-FDM specification selecting 5MHz bandwidth so that it uses 512 subcarriers, QPSK Mapper, and ½ convolutional code. The system is simulated by movement of the user rest to move quickly with AWGN and Rayleigh channel. Performance parameters of each MIMO is a comparison of Eb/N0 and Bit Error Rate (BER).

The simulation results for MIMO STBC can overcome the increase in the channel BER and small scale Rayleigh fading with diversity techniques, while the spatial multiplexing MIMO unstable to cope with a bad channel condition and requires great energy to achieve a higher BER. However, adaptive MIMO still give better performance to obtain a low BER. Seen from the simulation results for speed 120km/h (BER 10-3) if the results obtained using the MIMO STBC Eb / No 7.8 dB, while for SM 16dB and adaptive 7 dB. The simulation results for stationary users (BER 10-3) by using STBC 8dB, BC 14 dB, and adaptive 5.2dB. This is because the MIMO adaptive based on a fixed threshold adjust each speed. Adjustments between STBC and spatial multiplexing is performed to obtain a low BER performance.

Keywords: LTE, SC-FDM, Space Time Block Code, Spatial Multiplexing, Adaptive MIMO