

ABSTRACT

3GPP LTE is an evolution of UMTS in response to growing demand for high-quality multimedia services in accordance with user expectations. Problems that occurred in LTE is found in high data rate requirements that require wide bandwidth transmission. In addition, broadband problems that make the signal having selective fading and there are also spectrum high efficiency ratio, and also if the user experiencing the movement so that there is signal degradation.

This problem can be solved by performing channel estimation on the receiving side to obtain a more accurate signal performance. The research was conducted on-LTE downlink using LMMSE channel estimation in MIMO OFDM systems using SFBC scheme. Estimation using LMMSE method is expected to improve performance-LTE downlink. LTE, which is used in this system is the LTE realist 8, using a bandwidth of 20MHz with 2048 subcarriers, QPSK Mapper, and $\frac{1}{2}$ convolutional code. The system is simulated by the movement of the user 3 km / h to move fast 120 km / h and using AWGN and Rayleigh channel model. Performance parameters is shown by comparison of Eb/N0 and Bit Error Rate (BER).

The simulation results LMMSE channel estimation can improve system performance LTE MIMO SFBC OFDM is shown with the best signal quality when compared with simple estimates for each user speed changes. LMMSE channel estimation gives the best performance when the user speed 3 km / h with EB / No of 9.2 dB at BER of 10^{-3} . When a user speed of 30 km / h achieved the target BER of 10^{-3} with Eb / No of 9.7 dB and 11.4 dB when the user speeds of 120 km / hour. The use of LMMSE channel estimation can improve system performance with an average value of Eb / No of 0.2 dB at target BER of 10^{-3} .

Keywords: LTE downlink, MIMO OFDM, SFBC, LMMSE, Channel Estimation