ABSTRACT

The development of wireless technologies is increasing. The technology need with a wideband and can be applied to high mobility also increases. Long Term Evolution is one of technology that is able to provide wideband and high mobility. In downlink side, LTE uses OFDM modulation technique. But OFDM method need to know channel condition before demapping information signal. Channel Estimation is one of solution that can be done because with channel estimation techniques, channel condition can be predicted by using pilot signals. Many channel estimation methods that have been done in previous thesis, such as the *Least Square* (LS), *Maximum likehood* (ML), and *Minimum Mean Square Error* (MMSE). But thats channel estimation methods have poor performance when be applied high mobility services like LTE.

The solution that offered in this thesis is channel estimation with parametric channel modelling. This channel estimation technique is not only estimate the channel coefficients from the pilot signals received as another channel estimation method. In parametric channel estimation scheme, channel parameters such as the number of paths and the channel multipath delays estimated before estimating the channel coefficients so that it has a better accuracy. In this thesis, channel estimation with parametric channel modeling applied in LTE OFDM MIMO communication systems. Parameters of simulation using downlink LTE standard for transmittion bandwidth 10 MHz. This thesis use AWGN and Rayleigh Fading channel to simulate channel model with parameters according to ITU-R M 1225 standard.

The simulation results in this thesis showed performance improvement of LTE OFDM system when use parametric channel estimation model. At user mobility 3 kmph, 30 kmph, 60 kmph, and 120 kmph this channel estimation method can improve system performance 0,8 dB, 3,3 dB, 2,3 dB and 1,8 dB than system with spline channel estimation scheme for BER of 10^{-5} .

Keywords: Channel estimation, Parametric Channel Modeling, LTE, OFDM, MIMO, SFBC