

## ABSTRACT

The development of communication technology lately is growing very rapidly, this along with the growing demands of communication technology user in different services. Third Generation Partnership Project Long Term Evolution (3GPP LTE) is a form of mobile communication technology development in order to serve the voice communication, image, data and also multimedia services on mobile communication devices with better service quality. In mobile communication systems will have the dynamics of the mobile channel so that the propagation channel modeling needs to overcome them.

In this thesis the authors predict the downlink propagation channel in the Long Term Evolution (LTE). Here used one of the empirical propagation models, named COST 231 Walfisch-Ikegami to predict the dynamics of the LTE downlink channel on the system and to analyze the problems caused by multipath effect on the performance of LTE.

The difference of distance users simulation result show that LTE downlink system performance is best when the user distance as far as 1000 m in LOS conditions with pathloss 109.04 dB to achieve the target BER  $10^{-3}$  in SNR of 13.17 dB, and the worst performance reached when the user distance 5000 m in the NLOS condition with 173.61 dB pathloss achieved the target BER  $10^{-3}$  in SNR 15.20 dB. For the user's speed simulation there are differences that influenced by the Doppler shift value in the channel which is causes a decrease in the LTE downlink system performance.

**Keyword:** Long Term Evolution, Walfisch Ikegami, Pathloss, Doppler Shift, Bit Error Rate