ABSTRACT

Focus of wireless communication recently is to provide high data rate services even for multimedia and internet access. To support that aim, multicarrier modulation is used. OFDM is multicarrier scheme which uses orthogonal subcarriers and overlap one another.

With its advantages, OFDM is used as multiple access system, well known as OFDMA (Orthogonal Frequency Division Multiple Accesss) in WiMAX technology, one of Broadband Wireless Access that is assumed to be the fourth of cellular generation (4G). OFDMA system apply subchannelization, that divides overall bandwith into subchannels and allocates them into different users. With subchannelization, each user is OFDM modulated by its own specific subcarriers, not by all subcarriers in the spectrum. One subchannel consists of some subcarriers, that can be allocated in three ways: group of adjacent carriers, random frequency hopping and adaptive frequency hopping. In this final assignment, subchannelization method used are group of adjacent carriers for downlink and frequency hopping for uplink, the amount of subchannels and subcarriers follows IEEE 802.16e standard.

The research is done to analyze OFDMA system that is implemented in mobile WiMAX IEEE 802.16e standard and simulate some parameters to be analized by software Matlab 7.1

From the simulation result is known that by applying OFDMA in mobile WiMAX, SNR needed is less that 30 dB to get BER 10^{-3} and maximal throughput 3,2 Mbps with velocity of user up to 120 kmph. But this system is susceptible to multiple access interference that cause orthogonality between subcarriers broken because multipath channel and movement from each user.