

ABSTRACT

High Speed Broadband Wireless Access service is an unavoidable need as the demand toward this service is rapidly increased recently and more and more for the upcoming years. Thus, people mobility also demanding a reliable system, to bolster the high speed data service. Because of that, the system is supposed to able to provide a solution for the abovementioned challenge, which is the ability of providing a High Speed Broadband Wireless Access service to more than user both while the user at the fixed point or while moving.

The used of MIMO has been believed to increase the system performances. One of the MIMO scheme is Spatial Multiplexing, which is a scheme that offers benefit such data rate increment. For modulation technique, OFDMA is employed. Because the system works for more than one user, it has a multiuser behavior, so that is why OFDMA chosen. The combination of MIMO and OFDMA was expected to provide a better performance to the system. The standard employed is IEEE 802.16e standard.

In this final project, the MIMO OFDMA system will be analyzed based on IEEE 802.16e standard. The parameter used are BER, where the system will be seen from both downlink and uplink side. At the downlink side, the influence of user movement in certain speed toward the BER, so is the allocation of more than one sub-channel will be seen. Meanwhile at the uplink side, how is the influence the number of the user whom accessing the system at once.

From the simulation, it shows that the user movement with the speed until 50 km/hours using SNR less than 20 dB. While the allocation of some sub-channel to one user was not really influence the performance. The more users accessing the channel at once could decreased the system performance, it could be seen by degradation about 4 dB if there are three and ten users accessing the system at once.

Keyword : MIMO, OFDMA, Spatial Multiplexing, IEEE 802.16e and BER