

## ABSTRACT

Broadband Wireless Access (BWA) is a technology which advantages are wide coverage services, large capacities and good quality service. Nowadays, BWA technology has various kinds of superior products and one of them is Worldwide Interoperability for Microwave Access (WiMAX). WiMAX has been evolved from fixed WiMAX to mobile WiMAX.

Mobile WiMAX, which standard is IEEE 802.16e, is not only use for mobile user but also Non Line of Sight (NLOS) channel. The reason is IEEE 802.16e has been supported by some of innovative technology applications in order to cope the problem. One of the innovative technologies is Sub-Channelization. Sub-Channelization used in mobile WiMAX are Full Usage Subcarrier (FUSC) and Partial Usage Subcarrier (PUSC).

This final assignment analyzes the comparison performance between sub-channelization technique FUSC and PUSC in IEEE 802.16e mobile WiMAX on downlink. Simulation is done based on the number of user and the velocity of user. The result of simulation shows that system with different user velocity (0, 3, 30 and 120 km/hour), the faster user, the higher error bit value. And FUSC give BER repairmen  $\pm 50\%$  for same  $E_b/N_0$  value. Meanwhile, system with different number of user (1, 8, 16 and 32 users), FUSC can give performance correction for  $\pm 0.37$  dB. This condition is caused by FUSC process is subcarrier permutation while PUSC process are cluster permutation and subcarrier permutation. Thus, process period of PUSC is longer than FUSCs. Hence,  $E_b/N_0$  of PUSC is greater than FUSC. In conclusion, FUSC give better performance for different number of user and user velocity.

Key Words: Mobile WiMAX, Sub-Channelization, FUSC, PUSC, Downlink.