ABSTRACT

The development of *wireless* access technology has rapidly evolved to meet the communications needs of users who require high speed, large capacity *(broadband),* and high mobility to the *broadband mobile communication.* One technology can meet these needs is WiMAX *(Worldwide Interoperability Microwave Access).*

MIMO-OFDM technology has been applied in WiMAX, and various techniques such as in MIMO *space-time block code* and *spatial multiplexing* is included therein. An adaptive technology like adaptive MIMO switching plays an important role in the transfer of MIMO techniques to be used. AMS is expected to improve performance of *mobile* WiMAX to the *user* that moves away from the *transmitter*. Compromise and *trade-off* between *diversity gain* and *multiplexing gain* is performed to obtain both the advantages of each mode of MIMO *spatial multiplexing* and STBC in MIMO adaptive.

In this final assignment, we conducted a comparative analysis of the performance of MIMO techniques above and adaptive MIMO system when the ratio Eb/No and BER can be achieved. Simulations performed with different user conditions i.e. at a speed of 0, 3, 30 and 120 km/h and the number of different users, one and four users.

The simulation results show that, for a single user MIMO adaptive speed always leads to a variety of MIMO STBC mode, as well as to the condition of four users. For a single user system, adaptive MIMO requires Eb/No 4.3 dB higher on average from the MIMO STBC. For a system with four users, require adaptive MIMO Eb/No larger on average 3.1 dB of MIMO STBC.

Keywords: **WiMAX, MIMO-OFDM, Space Time Block Code, Spatial Multiplexing, Adaptive MIMO**