

## ABSTRACT

*WiMAX Release 2.0 (IEEE 802.18m) is one of the mobile WiMAX that is able to serve users with high mobility. The capability of the system to serve users with high mobility should be balanced with a quality of the information signal. The movement of the users may decrease the quality of the information signal because this movement can affect the channel propagation conditions in unpredictable manner. On the other hand, the capacity of propagation channel must also be considered carefully. To overcome this problem, AMC (Adaptive Modulation and Coding) can be applied. Applying AMC technique, the quality of the information signal and the propagation channel capacity can be maintained. Another way to overcome these problems is the application of different types of MIMO or AMS (Adaptive MIMO Switching).*

*To solve those problems, this thesis analyzed effect of AMC and AMS techniques integrated in mobile WiMAX Release 2.0 system. The implementation of the combination techniques of AMC and AMS was conducted to respond the changing condition of channel propagation. The analysis of these combination*

*techniques was conducted by means of simulation to generate BER graph to SNR and the capacity of propagation channel.*

*Implementation of combination techniques of AMC and AMS in mobile WiMAX Release 2.0 systems was able to improve both the system performance in terms of BER and the capacity of propagation channel. At the user speed of 0 km / h, to achieve a BER of  $10^{-3}$  with AMC-AMS system requires a SNR of 66.21 dB and the propagation channel capacity of 439.8897 Mbp/Hz. When the user speed was 3 km/h, to achieve a BER of  $10^{-3}$  with AMC-AMS system required a SNR of 55.37 dB and the propagation channel capacity of 367.8704 Mbps/Hz. When the user speed of 60 km/h, to achieve a BER of  $10^{-3}$  with AMC-AMS system required a SNR of 58.47 dB and the propagation channel capacity of 24.27914 Mbps/Hz. At the user speed of 120 km/h, to achieve a BER of  $10^{-3}$  with AMC-AMS system required a SNR of 60.56 dB and the propagation channel capacity of 25.147 Mbps/Hz.*

*Keywords: WiMAX Release 2.0, AMC, AMS, BER, SNR, and propagation channel capacity.*