ABSTRACT

IEEE standard 802.16e is a standard of WiMAX (Worldwide Interoperability for Microwave Access) technology that specified to mobile user and it's very compatible in NLOS (Non - Line Of Sight) condition. This WiMAX standard is developed as an air interface for BWA application that work in licensed band at frequency range 2 – 6 GHz. Mobile WiMAX standard designed for increasing user's services that support full mobility.

NLOS condition and user's mobility will degrade Quality Of Service of mobile WiMAX. One of feature that can be integrated to mobile WiMAX is adaptive modulation system. Adaptive modulation will make WiMAX system to adjust its signal modulation schemes depending on SNR condition of radio link.

In this final project, adaptive modulation algorithm is designed in Rayleigh channel condition for IEEE standard 802.16e. This algorithm is developed from basic algorithm, which is fixed threshold adaptation algorithm. This fixed threshold use one set of threshold to change the modulation scheme. Proposed algorithm use a several sets of threshold based on user's speed and these threshold changed adaptively too.

From simulation results, proposed algorithm give better performance compare with fixed modulation about 2-13 dB. Beside that, other performance of proposed algorithm given at BER target 10^{-3}, has SNR target 8.7 dB, 13.5 dB and 19.3 dB for user's speed 3, 30 and 60 km/h. If convergence be observed for proposed algorithm, this algorithm can work well at speed 3km/h where convergence time (3.88 ms) smaller than coherence time (43.3 ms).