

ABSTRACT

WiMAX standard is a technology which is able to carry NLOS (Non-Line of Sight) condition. One of privilege WiMAX is adaptive modulation system that can be integrated on its. Adaptive modulation is a technique to change modulation format base on instant variant in channel condition. Adaptive modulation can increase adaptation of bad channel condition and the system will get near to good channel condition with received SNR (Signal to Noise Ratio). Adaptive modulation use QPSK with code rate $\frac{1}{2}$ and $\frac{3}{4}$, 16 QAM with code rate $\frac{1}{2}$ and $\frac{3}{4}$, and 64 QAM with code rate $\frac{2}{3}$ and $\frac{3}{4}$. Channel condition can be estimated in receiver by feedback and next step will be done prediction. One of way to predict next modulation is Prediction Linier Method using MMSE (Minimum Mean Square Error) base on received SNR (Signal to Noise).

In this final project, adaptive modulation research and analysis is done in SUI (Stanford University Interim) channel, type 1 for rurlal areas, type 3 for sub urban areas and type 6 for urban areas. Adaptive modulations SNR range values are taken from fixed modulation range value. Beside that, user mobility speed will affect fixed modulation and adaptive modulation performance. Simulation is done according to 802.16e standard. The important prediction output of transmission parameter is SNR with BER performance.

Simulation result show that using adaptive modulation for BER 10^{-3} target gives better performance than fixed modulation, in SUI 1 is 0.35 dB well enough and also SUI 3 is 1.95 dB but SUI 6 get worse 3.22 dB. Although SNR is match within BER target values for adaptive modulation in SUI 1 is 11.55 dB, SUI 3 is 15.875 dB and SUI 6 is 27.1 dB.