

## ABSTRACT

MIMO system has been widely trusted by many sides as a solution to provide services with high data rate, wide bandwidth and also good quality performance. Along with the technology development, this system is combined with *Orthogonal Frequency Division Multiplexing* (OFDM) system which proposed to combat the frequency selective fading channel effect in a high data rate transmission system. Combination of these two system called MIMO-OFDM seems to offer a very promising ground for the research targeted for the future telecommunication development.

This final project will compare the performance between two MIMO method, which are *Space-Time Block Codes* (STBC) method and *Space-Time Trellis Codes* (STTC) method in MIMO OFDM 2x2 system with inserting pilot channel estimation, implemented in IEEE 802.16e WiMAX standart with BER vs SNR as the performance parameter watched in 0, 3, 10, 30 rpm user speed, and 10, 100, 200 times inserting pilot period .

From the simulation, STTC's performance is better than STBC's in observated focus is the BER targeted  $10^{-4}$ . The performance increment of STTC method usage is about 1.05– 2.62 dB. Besides, increment of the user speed in range 0 – 30 kph can decrease the system performance about 0.4 - 4.93 dB.

Keywords : MIMO OFDM, STBC, STTC, inserting pilot channel estimation.