

ABSTRACT

High speed data rate and bandwidth with good quality of service are world's main topic in wireless communications area. It was believed that MIMO OFDM technique were the answer for the problems before. The combination of MIMO-OFDM can improve the performance of system, but this combination is still can not reach the best performance because the channel responses are changes with unpredictable that can cause error.

Channel estimation technique defined as technique to known channel responses. Channel estimation technique that had many applied for MIMO system is done by using the orthogonal properties of Space-Time Block Codes, meanwhile the dimension reduction algorithm had many applied in compression areas, such as picture compression.

This research will investigate the combination of channel estimation using orthogonal STBC properties and dimension reduction algorithm on IEEE 802.16e for WiMAX standardization. User in this research was assumed mobile with speed 0, 3, and 30 km/hour.

From simulation results, adding dimension reduction algorithm can improve the MIMO-OFDM system performance about 1.2 dB and 1 dB for 0, 3, and 30 km/hour of speed. On the other hand, adding the number of symbol as pilot decrease performance system caused overhead factor between number of data and symbol as pilot.

Key words : MIMO OFDM, channel estimation technique, orthogonal properties of STBC, dimension reduction algorithm.