

ABSTRACT

High data rate wireless communication with reliable QoS and high capacity system is going to be important thing this time. An OFDM system is a promising solution that increases the communication data rate system by using the limited bandwidth efficiently. Also, in facing the multipath fading, the using of MIMO improves the capacity and performance significantly when through selective channel.

This final task presents performance of STFBC-MIMO-OFDM system, where the performance that's analyzed is ergodic channel capacity of the system. STFBC is a coding scheme that explores different sources, they are : spatial diversity, temporal diversity, and frequency diversity. Based on the previous researches stated that STFBC system has good performance when facing frequency selective fading channel and fast fading channel. Thus, it is important to know the system's performance in system's channel capacity.

Based on the research, when the channel is frequency selective fading or frequency flat fading, the resulted channel capacity is good capacity both, where in the frequency selective fading only decrease 1 bps/Hz compared with frequency flat fading. The channel capacity also reaches the maximum value when the channel condition consists of NLOS component only and appear movement at transmitter or receiver. Based on the research, it also can be stated that the using of CSIT-R increases the channel capacity that is 1 bps/Hz compared with CSIR system at Rayleigh Channel and 4 bps/Hz at Rician channel with $K=100$. But for mobile communication system, it must be considered the feedback delay and complexity at CSIT-R system. From these results it can be taken conclusion that this STFBC-MIMO-OFDM system is suitable for mobile communication, frequency selective or flat fading channel and rich scatterers channel conditions.

Key Words : MIMO, OFDM, STFBC, Diversity, Multipath Fading, Channel capacity