

ABSTRACT

The utilization of Multiple-Antenna on transmitter and receiver, known as a Multiple-Input Multiple-Output Technique, considered to be able to increase system performance of physical layer, that are increasing the capacity, getting gain diversity and reducing interference. Recently, there are many MIMO Techniques developed where channel information is available only in receiver but rarely in transmitter. When the transmitter know channel state information (CSI), this knowledge extensively can be exploited to improve the performance of MIMO systems. One of MIMO techniques that use knowledge of channel in the transmitter to reach the shanon capacity is MIMO based on singular value decomposition (MIMO-SVD). On another side, Orthogonal Frequency Divison Multiplexing (OFDM) is a well-known method in a wireless communication with high data-rate, because this method will alter channel condition from frequency selective fading into flat fading condition. The combination of these techniques, called MIMO-OFDM, become a focus for many reseachers today because this system can work in a broadband application with high datarate.

This final project will investigate how knowledge of the channel at the transmitter can improve the MIMO-OFDM performance. It will be compared between SVD-OFDM system (CSI known by Tx) and STBC-OFDM (CSI unknown by Tx). This simulation will follow IEEE 802.11a standard with only acomodate a fix rate (12 Mbps) for all simulation.

The simulation result show that SVD-OFDM 2x2 have better performance than STBC-OFDM 2x2 about 1.5 dB in doppler frequency 12.5 Hz. For addition number of antenna, simulation result show that SVD-OFDM 4x4 have better performance than SVD-OFDM 2x2 about 3 dB doppler frequency 0 Hz.

STTELKOM