

## ABSTRACT

In the wireless communication system, as the demand of high data rate services increased for real time with good performance make to initiate technique for improve the spectrum efficiency and signal quality improvement. That demand can be solved with using MIMO (Multiple Input Multiple Output) technique which was combined with multicarrier OFDM (Orthogonal Frequency Division Multiplex). Using a multiple antenna system which is known as MIMO (Multiple Input Multiple Output) with STBC scheme also earn to maximize the link reability of wireless communications through channel fading by diversity method at antenna transmitter. However, many times signal reference from user realized interference from other signal which occupy in same band frequency. That thing can be solved which using beamforming technique on antenna.

Beamforming technique was defined in using weight iterative with adaptive algorithm. This final assignment, MIMO OFDM system using beamforming technique with user that approach and leave system can influence angle of arrival, so can be explained that beam can follow user movement.

From the simulation result, combined adaptive beamforming technique with MIMO OFDM can improve the performance. in that technique, a change angle of arrival on movement user not significant influence in performance system. This is explaining that beamforming technique will direct that beam to user reference. In MIMO 2x2 system, using adaptive beamforming or not can be influential for BER value result, to reach BER value =  $10^{-4}$ , MIMO 2x2 with adaptive beamforming technique was needed SNR = 9,5 dB, while which not using that technique, value of SNR can not be reached. In MIMO 4x4 system, to reach BER value =  $10^{-4}$ , it was needed 9 dB for SNR value. That SNR value acceptable on MIMO 4x4 system with adaptive beamforming technique or not.