ABSTRACT

MIMO is a diversity technique that uses multiple antennas at both transmitter and receiver to get the capacity and gain diversity. Space Time Block Codes is one of the MIMO transmission scheme to get the optimum of spatial diversity at the MIMO channel. Diversity increased according to the number of antenna at both transmitter and receiver. To get the received uncorrelated signal at space diversity, there are need large separation between adjacent antennas. It becomes the problem while dimension of the separated antennas are limited.

Polarization diversity designed to radiate with orthogonal radiation polarization to create uncorrelated channel. That diversity does not need large separation between adjacent antennas. This final assignment compared and analyzed the performance of MIMO system using dual polarized antennas and vertically polarized antenna. There are three configuration of antenna; they are VV-VV, VV-VH, and VH-VH. MIMO system that used is Space Time Block Code Alamouti scheme with two antennas at both transmitter and receiver. Spatial Channel Model (SCM) is the channel modeling that used at this final assignment.

From the simulation result, MIMO STBC system using dual polarized and vertically polarized antennas have the same performance for the V=0 km/jam. While the user move with velocity vector, MIMO STBC system using vertically polarized with spacing 2λ at the transmitter and spacing $0.5\ \lambda$ at the receiver have a better performance. But when the antenna spacing changed to $1\ \lambda$, dual polarized antennas give a better performance for the MIMO STBC system. For the velocity of user are 30 km/jam, BER 10^{-4} need 10.5 dB of SNR. There are different performance about 1dB than using vertically polarized antenna that is 11.5 dB.