## ABSTRACT

Universal Mobile Telecommunication System (UMTS) is an evolution from GSM that supports third generation (3G) ability. UMTS uses WCDMA access technology with direct sequence wideband CDMA system. WCDMA supports data services with fluctuate speed, so that it can support Bandwidth on Demand (BoD) services. To fulfill customers need, there was developed a technology that support their needs, that is MIMO (Multiple Input Multiple Output) system. This system allowed us to obtain the use of high bandwidth efficiency. So it can be used to cover the wide of bandwidth transmission need.

In this Final Project, MIMO system contains of two transmitter antennas and two receiver antennas. The system uses STBC (Space Time Block Code) scheme. The STBC MIMO 2x2 scheme is compared with performance of MIMO 2x1, SIMO 1x2, and SISO 1x1 on the AWGN channel modeling and fading Rayleigh channel in UMTS FDD system release 99. System simulation was done using Matlab 7.0.1 program.

From the simulation result, STBC MIMO 2x2 system, relatively has good performance if compared with SIMO 1x2, MISO 2x1 dan SISO 1x1 systems. In velocity at 60 km/hour, the diference of SNR resulted from STBC MIMO 2x2 if compared with a system without diversity is aproximately 19 dB. The diference of SNR obtained between using SIMO 1x2 and using system without diversity is aproximately 16 dB. And the use of MISO 2x1 that is compared with system without diversity will be achieved diference of SNR up to 12 dB.