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; whether it is for FDD or TDD WCDMA supports data services with fluctuate speed, so that it can support Bandwidth on Demand (Bod) services. As we know, multipath fading phenomenon is one of the main characteristic in wireless communication system. Antenna diversity is a technique that is effective enough to decrease multipath fading effect. The uses of transmit diversity hopefully able to gain broadband communication services quality rising.

In this final task will be observed about analysis of transmit diversity application on UMTS FDD release 99 by using *Space Time Transmit Diversity* and *Time Switch Transmit Diversity* schema. Total of the antenna that will use in this observation is 2Tx-1Rx on each schema. This observation will compare the performance of those diversity techniques toward a system without diversity in every channel condition. Analysis is done by making computer simulation on Matlab 7 program using roaring multipath fading Rayleigh channel AWGN design.

From simulation result, it obtains that the uses of transmit diversity is able to give better performance from *Universal Mobile Telecommunication System* (UMTS), this shows by the existence of diversity gain. For the *Space Time Transmit Diversity* schema the diversity gain is ± 12,8 dB (seen from BER 2 x 10^{-2}), while for *Time Switch Transmit Diversity* schema the *diversity gain* is ± 7,2 dB (seen from BER 1,76 x 10^{-2}). And also spreading gain is ± 10,2 dB (seen from BER 10^{-3}). This interrelated with the uses of each schema, where *Time Switch Transmit Diversity* uses only for *Synchronization Channel* that is not experiencing spreading process.