

## ABSTRACT

Nowadays, telecommunication is growing very fast, specially in cellular communication. There are some cellular technology that introduced, in this time GSM (*Global System For Mobile Communication*) is the most used by user.

In mobile communication system, radio wave propagation must be considered because it can influence signal quality received by MS. To reduce the effect of multipath propagation, we can use diversity technical, for example *space diversity*, *frequency diversity*, *time diversity* and others.

In this final Task, *Transmission Diversity Time Delay* will be simulated and hope will be increase Signal Received Level (RSL), that evaluated to various areas type : urban, suburban and rural, also BER and Throughput in MS that later be compared to *transmission diversity*. And the influence of *Transmission Diversity Time Delay* to the efficiency of spectral GSM system.

From this simulation, we can see that performance of *Transmission Diversity Time Delay* is better than Transmit Diversity. Performance's improvement is around 12 dB to get BER  $2 \times 10^{-2}$  and about 4-5 dB compared with GSM standard, to get BER  $10^{-3}$ . The Quality is become lower as increasing of the velocity that makes the need for C/I is higher. The weakness of TDTD system is using two Carrier Units to support amount of user which is same with conventional GSM system.