

ABSTRACT

In digital communication system, coding technique is used to get the power efficiency and modulation technique is used to get the bandwidth efficiency. However, the usage of coding technique is causing the redundant bit so it needs larger bandwidth. The usage of modulation technique such as M-ary Phase Shift Keying (MPSK) can increase the bandwidth efficiency but reduce the power efficiency.

In consequence, the method which can solve the bandwidth efficiency and power efficiency is needed. Modulation technique which combines coding technique and modulation technique is Trellis Coded Modulation (TCM). Hopefully, the usage of coding technique Trellis Code Modulation (TCM) will increase the performance of system.

In this final project, TCM-QPSK system is combined with the diversity technique on receiver for the purpose of increasing the performance of wireless communication system. From the simulation results can be found that TCM-QPSK system which is combined with MRC diversity technique on receiver gives diversity gain 2.9 up to 5.9 dB over AWGN channel and 3.7 up to 7.8 dB over multipath fading channel. While for TCM-QPSK system which is combined with SC diversity technique on receiver gives diversity gain 0.2 up to 1.8 dB over AWGN channel and 1.9 up to 4 dB over multipath fading channel.

Also from the simulation result can be found that TCM-QPSK system using MRC diversity can tolerate the phase error with variance about 0 up to 30°. While for TCM-QPSK system using SC diversity will be better operated by minimizing the time refresh measurement.

Key words : Trellis Coded Modulation, Maximal Ratio Combining, Selective Combining