ABSTRACT

Today, the demand for all types of wireless services is increasing. So, new generation of wireless mobile radio system is needed to provide higher capacity and data rate. Beside that, this system can too coexist with devices operating at various frequency bands. Ultra Wideband (UWB) communication system can offer solutions of these problems. With its wide bandwidth, UWB has potential to offer a higher capacity and data rate. And with its low power consumption, UWB has potential too to coexist with narrowband radio systems operating in the same spectrum without causing undue interference.

With low power transmit, UWB system is more suitable to use in indoor channel indoor channel. Indoor channel condition that has more multipath component causing the UWB system need addition system so that it can robust more towards the multipath channel condition. Rake receiver and Multiple Input Multiple Output (MIMO) had already proven can increase the system performance in multipath channel condition.

In this final project is done experiment to performance analysis of DS-UWB MIMO system with M-PSK modulation using Rake receiver on indoor channel. Indoor channel that used in this experiment is Saleh Valenzuela channel. Beside that, in this experiment, mapper that used is M-PSK (M=2,4,8) and amount of finger Rake receiver that used are 2,4 and 6-finger Rake. So mapper and Rake finger that give better performance in DS-UWB MIMO system can be knew.

From the simulation result can be noticed that BPSK mapper gives better performance in DS-UWB MIMO system on Saleh Valenzuela channel by require Eb/No in the amount of 1,8 dB to reach BER 10^{-4} on CM-1. Beside that, DS-UWB MIMO system with using Rake receiver gives better performance. Amount of finger Rake receiver in DS-UWB MIMO system in this simulation that gives better performance is 6-finger Rake, that require 2,4 dB to reach BER 10^{-4} on CM-1.

Key words: DS-UWB, MIMO, M-PSK, Rake Receiver, Saleh Valenzuela