

ABSTRACT

Ultra-wideband (UWB) communication techniques have attracted a great interest in both academia and industry. This is due to the potential advantages of UWB transmissions such as: (a) High data rate (b) Low pathloss and immunity to multipath propagation (c) Less complex transceiver hardware (d) Low power and low interference (e) security. Federal Communications Commission (FCC) have contended that frequency operate for UWB 3.1GHz - 10.6GHz.

The problem emerge when we deal with channel propagation. In conventional sistem, high data rate can cause bandwidth transmission become wide even more wide than coherent bandwidth in channel, as a result signal can be incured by frequency selektive fading which is can distort the delivered information signal. By exploiting the OFDM technique in UWB sistem can solve that problem. It is because the characteristic of OFDM technique that can split the overal bandwidth into several smaller bandwidth. But because there is a regulation that limiting the power transmission, it can causing the OFDM UWB sistem is more sensitive with channel propogation condition.

The performance of OFDM UWB sistem analysed in Rayleigh channel model. In this Final Assignment applied two methode to increase the performance of OFDM UWB sistem such as: precoding techniques and Space Time Block Code (MIMO) technique. The simulation result show that OFDM UWB sistem can give good performance in Rayleigh channel, it can proved that in data rate 480 Mbps OFDM UWB sistem need SNR 10 dB to get BER 10^{-4} . the simulation result also show that MIMO technuiqe can improve the performance OFDM UWB sistem equal to 3.3 dB in BER 10^{-4} , and a precoding technique can increase the performance OFDM UWB sistem in frequency Doppler 9.5 Hz more than 9 dB in BER 10^{-1} .