ABSTRACT

Ultra-wideband (UWB) is a wireless technology application that operates on 3,1 –

10,6 GHz frequency and has transmission bandwidth bigger than 500 MHz. In 2002,

Orthogonal Frequency Division Multiplexing (OFDM) is purposed by 802.15.3a as the

IEEE standard for physical layer on UWB communication. OFDM method in UWB is able

to overcome selective fading that can damage information. UWB has many advantages

such as high data rates, low path loss, low power transmit, and low interference.

With low power transmit, UWB system is more appropriate to use in indoor

channel. Indoor channel condition that has more multi-path component causing the UWB

system needs addition system so it can robust more towards the multi-path channel

condition. Multiple Input Multiple Output (MIMO) had already proven can increase the

system performance in multi-path channel condition.

In this final project is done experiment to know the effect of MIMO application on

OFDM UWB system in Saleh-Valenzuela channel. In this research, the variation number

of transceiver is used and comparing the performance of two detectors, Zero Forcing (ZF)

V-BLAST. and

From the simulation result can be noticed that by using MIMO gives better

performance than without MIMO on OFDM UWB by giving 4,5 - 6 dB on BER 10⁻⁴. And

by using MIMO 2x4 can gives performance improvement than MIMO 2x2 by giving 3 –

3,5 dB diversity gain to reach BER 10⁴. And about the comparison of two detectors, V-

BLAST has better performance than ZF that around 3.1 - 3.6 dB for BER 10^{-3} .

Key word: MIMO, OFDM UWB, Saleh-Valenzuela, V-BLAST, ZF.