

ABSTRACT

Ultra Wideband (UWB) is a wireless application technology which is operated in 3.1-10.6 GHz and its fractional bandwidth is larger than 0.2 UWB which results many advantages, as followed: (a) higher data rate, (b) power pathloss and more resistable againts multipath propagation, (c) more simplified transceiver and cheaper in cost, (d) low transmition power and low interference, (e) transmiton security is good.

Supported with its low transmiton power, UWB may be applied in indoor which the channel condition has more multipath components, causing UWB requires additional system so that it would be resistable againts the multipath channel condition. Rake receiver has been proven as a system performance booster in this multipath channel condition.

The existing condition in this research is to determine the performance of singleband DS-UWB by implementing M PPM. The comparative mapping is 2, 4, 8, 16 and 32 PPM. Mapping using indoor channel with Saleh Valenzuela channel modelling and using Rake receiver at the receiver.

The conclutions from the simulation are 32 PPM mapping provides better performance than 16, 8, 4 and 2 PPM mapping. That is it needs 4.6 dB of $\text{BER} = 10^{-3}$ / $\text{BER} = 10^{-2}$ on CM1. Beside that, the performance of DS UWB system can be improved using Rake receiver with 6 rake fingers. It needs 8.4 dB of $\text{BER} = 10^{-3}$ / $\text{BER} = 10^{-2}$ on CM1.

Key words: DS-UWB, PPM, Rake receiver, Saleh Valenzuela