

ABSTRACT

Ultra Wide Band (UWB) is a wireless application technology which currently draws the attention of international community and Federal Communications Commission (FCC) has decided that operation frequency for UWB is within UWB 3.1GHz – 10.6GHz. UWB has many advantages which one of them is the ability to providing high speed data transmission with low transmission power. Hence the implementation of UWB technology is aptly applied within indoor environment. Multiband-OFDM UWB approaching technique is the best choice for bandwidth efficiency and durability towards narrowband interference. Nevertheless, the proper channel modeling for communication type using UWB is Saleh-Valenzuela indoor channel model.

In this case, there are two types multipath channels which are analyzed, they are channel within the condition of Line of Sight (LOS) for Channel Model 1 (CM1) and channel mode for condition of Non Line of Sight (NLOS) for CM2, CM3, and CM4. Even though indoor communication is still vulnerable towards error during transmission process, that's why Forward Error Correction (FEC) coding is used to correct occurred error due to the interception during transmission process. Reed-Solomon (RS) coding is one of the FECs which is able to correct error burst. While Convolutional Code (CC) is able to correct error which occurred randomly.

From the simulation may be concluded that the using of either Reed-Solomon or Convolutional coding is able to enhance the improvement of Multiband-OFDM UWB system performance within S-V channel where CM4 has the best performance comparing to the other S-V channel modes. This has been proven within CM4 Multiband-OFDM using CC(2,1,7) for BER 10^{-5} target resulting gain as much as 4,2 dB while using RS(63,43,6) resulting better coding gain CC(2,1,7) as much as 0.5 dB.

Key Words : Orthogonal Frequency Division Multiplexing(OFDM), Ultra Wide Band (UWB), Reed-Solomon, Convolutional Code, Bit Error Rate(BER), Signal to Noise Ratio (SNR), Saleh-Valenzuela (S-V), CM (Channel Model).