

## **ABSTRACT**

In wireless communications, demand to provide high-speed data services with good performance raises new techniques to increase spectrum efficiency and improved signal quality due to frequency selective fading. OFDM is a multi-carrier technique can be used to accommodate all these requirements. But in its development, this OFDM still has some weaknesses such as still large PAPR values and lack of power spectral efficiency improvements, OWDM used to overcome these deficiencies.

In OWDM, inverse wavelet packet transform (IWPT) is used to generate the transmitted symbol on the transmitter and the forward wavelet packet transform (WPT) will restore the transmitted data symbol on the receiver. The OWDM system will divide the frequency band into several sub-bands that independent and isolated spectral called subchannelization.

From the test simulation obtained OWDM give some things that can be compared with OFDM. In BER performance, OWDM provide similar performance to OFDM, but lead in reducing the PAPR. In OWDM case, the smallest PAPR value is produced in small-order wavelet, Coiflet, use few sub-bands and QPSK modulation. And for the best BER performance is produced on a small-order wavelet, Symlet and QPSK modulation. Use many sub-bands are not too made the difference.

From several advantages OWDM is expected to be candidates in designing a new communication system that is more reliable and produce better performance than the previous communication systems.

Keywords:

Wavelet, multi-carrier, multi-rate, orthogonal, Peak to Average Power Ratio (PAPR), OWDM, Bit Error Rate (BER)