

ABSTRACT

Needing for high transfer rate is the main focus in develop communication technology nowadays. Either wireline or wireless will increase their performance in transfer rate. OFDM (Orthogonal Frequency Division Multiplexing) is a technique wich make high transfer rate comes possible in wireless communication. OFDM system makes overlapping between one subcarrier to other subcarriers possible to execute in condition each subcarriers and other are orthogonal, then it makes the utilizing of the bandwidth becomes very efficient. However, OFDM also has a few weaknesses, such as Intercarrier Interference (ICI). ICI is a condition when one subcarrier with other experience interference at the receiver. This is caused by carrier frequency offset (CFO), or there are friction of frequency between transmitter and receiver. Another mainly happen problem is in the high mobility condition where Doppler Spread phenomenon makes the value of CFO getting worst that caused the orthogonality between subcarriers damaged.

In this research, interleaving technique does to the bit stream before them in to the modulator block, the purpose of this is to modify bit arrangement. ICI Self Cancellation technique also did to reduce the problem wich caused by ICI. By observing bit error rate (BER) to E_b/N_0 and bandwidth efficiency, this model can be analyse in this research. Self cancellation method is known since 2001. Basically, this method does by way of added redundancy on every subcarrier then it's be used to correct each other in the receiver. However, in this research not all of the subcarriers are created the redundancy. The purpose of this is to save the using of bandwith.

Based on calculation and simulation result, modified OFDM system that are scheme 2, scheme 3 and scheme 4 work by giving correction to the BER value on QPSK and 64QAM. Meanwhile on 16QAM, the three schemes only give correction to the BER value in certain E_b/N_0 value. The three schemes also improve the bandwidth efficiency if compared with OFDM system scheme 1 or OFDM system which use ICI *self cancellation*.

Keywords: OFDM, ICI, CFO, SC, *interleaving*