

## ABSTRACT

At this time OFDM systems (Orthogonal Frequency Division Multiplexing) is growing rapidly. Because this technique can make the carrier frequencies orthogonal each other, so they can save bandwidth without causing ICI (Intercarrier Interference). OFDM technology is applied to the OFDMA (Orthogonal Frequency Division Multiple Access). OFDMA is a multiple access technique that provides a multiplexing operation for sending data to many users either downlink or uplink-subchannel-subchannel. In simple OFDMA divides several different subcarriers to multiple users. So, we need research on radio resource allocation (subcarriers) at this OFDMA system.

Channel condition (response) of each user affects the process of radio resource allocation in this OFDMA system. In this research, the auction algorithm algorithms allocation and dynamic subcarrier assignment (DSA) with the variation of user speed is 3 km / h, 15 km / h, 50 km / h, and 120 km / hour. AWGN and Rayleigh fading are used for modeling channel in the research using Matlab R2008a. Calculating parameters described the radio resource allocation, fairness, the maximum data rate, and BER for every user.

The result of this simulation show that for users with a speed of 120 km / h have the channel condition is more fluctuative (volatile) than the user with a low speed (3 km / h). With a variety of users, the radio resource allocation also varies. At the auction algorithm allocation is more fluctuative (volatile) than the DSA. This is because the auction algorithm more concern to user channel response in the bidding process, although also concerned with equity allocation, so it has effect to fairness. Fairness (equity) in the DSA is better than the auction algorithm. This affects the maximum data rate at auction larger than the DSA. The value of bit error ratio (BER) in this simulation shows that users with higher speed have a worse value than a lower-speed users.

**Keywords: OFDM, OFDMA, Radio Resource Allocation, Auction Algorithm, DSA, subcarrier, maximum data rate, BER**