

## ABSTRACT

Orthogonal Frequency Division Multiple Access (OFDMA) is a multicarrier modulation technique where multiple users (multiple user) access to the same source. Multiple users in OFDMA systems leads to the question of how the distribution of transmit power and bandwidth to each user. Radio Resource Management so necessary given the limited transmit power from the Base Station and channel propagation conditions are always changing on each user that can affect the amount of throughput at the receiver.

In this final project tries to evaluate existing research using algorithms DSA (Dynamic subcarrier Allocation) algorithm is the Maximum C/I<sup>[7]</sup> and the algorithm DPA (Dynamic Power Allocation) algorithm is Waterfilling<sup>[10]</sup>. Therefore, in my final project, trying to combine the two algorithms , which would be in an analysis of throughput and best fairness of each algorithm. Speed of the user who used random from 10-100 km / hours which is modeled through Rayleigh AWGN channel type, with random user spacing 1-5 km to the BS. Modulation used in the Final Project is a fixed modulation is 16 QAM and guarantees BER  $10^{-3}$ .

In the simulation results that the system uses an algorithm that produces an average user maximum throughput is Maximum C/I algorithm 1254 Mbps, then Joint DSA+DPA Algorithm 1230 Mbps, followed Waterfilling Algorithm 262.1 Mbps for user random. But fairness is achieved Waterfilling Algorithm is better than the other two algorithm. By varying the number of users, throughput system for three algorithm tends to increase and fairness system tends to fall

**Keywords: OFDM, OFDMA, Watterfilling, Maximum C / I, Joint DSA + DPA, Dynamic subcarrier Allocation , Dynamic Power Allocation, throughput, fairness, BER**