

## ABSTRACT

Communication technology has developed very fast recently. Third Generation Partnership Project (3GPP) has introduced LTE as the next generation of mobile networks which can fulfill the demand of mobile communications. LTE is a broadband wireless communications with a high data rate. LTE has 100 Mbps data rate for LTE downlink systems, However in development this data rate can not be achieved. One of the main problem is resource allocation

Resource Allocation methods has been develop in many research. In development there are some algorithm that usually used for resource allocation problem, for example Round Robin and proportional fair, however these algorithms needs further development because can't maintain quality of service (QOS). Besides these algorithms there are particle swarm optimization algorithms that can be used for resource allocation problem. In previous works explained particle swarm optimization based on particle's displacement to optimal solution and at the same time each particle exchanging information in each iteration and end when the optimal solution achieved.

In this final project, resource allocation is done by using particle swarm optimization based on [3] with MIMO 2x2 system and used Round robin as the comparison. Before the resource allocation, selective combining process is done for select the best path for data transmission. Parameters measured were average user throughput and fairness.

From the simulation results, particle swarm optimization has a better average user throughput and fairness system compared to round robin. In Particle swarm optimization fairness value rose by 0,002746 until 0,030783 compared to round robin. Meanwhile on the other side, the average user throughput in particle swarm optimization algorithm rose 138 kbps until 909,56 kbps compared to round robin algorithm

Keywords: *Resource Allocation, Particle Swarm Optimization, MIMO-OFDM*