ABSTRACT

The development of telecommunication technology, especially in wireless network is growing very fast. Wireless network has some limitations such as the used of radio resource. Efficient allocation of the resources is systems introduce Third Generation Partnership Project Long Term Evolution (3GPP-LTE) as the standard of Next Generation Network (NGN). 3GPP-LTE uses Single Carrier Frequency Division Multiple Access (SC-FDMA) in the uplink communication because it has several advantages compared to Orthogonal Frequency Division Multiple Access (OFDMA) that is used in downlink communication of LTE.

SC-FDMA has a lower value of Peak-to-Average Power Ratio (PAPR) compared to OFDMA. Therefore, the SC-FDMA has a fairly high complexity. It required an algorithm that can optimize the resource allocation system without increasing complexity of the system.

To develop the study of resource allocation in the uplink communication of LTE technology, this research will simulate the performance of the two algorithms, there are Round Robin algorithm and Heuristic algorithms. The algorithms are simulated to see the level of complexity and performance of the system. The parameters analyzed in the simulation results is the effect of the number of users on the value of spectral efficiency, average datarate, system throughput, fairness index, starvation ratio, and the complexity of the algorithm. The results of this simulation states that Modified Heuristic algorithms can increase the value of fairness index and also reduce starvation ratio without increasing complexity of the algorithm when compared with Heuristic and Round Robin algorithms. The average values of fairness index and starvation ratio in Modified Heuristic algorithm are 0.787 and 2,03%.

Key Words : LTE, *Resource Allocation, SC-FDMA, Round Robin, Heuristic Algorithm*