

ABSTRACT

The rapidly evolving condition of telecommunication technology development is needed for the global human being who communicates at all times for various purposes. Until now, the most advanced mobile telecommunication technology is 4G Long Term Evolution (LTE). The technology brings advantages on the higher data rate transmission so that the communication will be more actual. Behind these advantages there is a scheme that is very influential on the reliability of 4G LTE standard, the Single Carrier Orthogonal Frequency Division Multiple Access (SC-FDMA).modulation system.

The problem with the Long Term Evolution (LTE) system is the allocation of resource allocation and allocation of power. The resource allocation process is needed to allocate the resource block for the service quality to the user to be optimal. While the allocation of power becomes a problem because of the need for optimal power for each user.

In this final paper, the used algorithm is Particle Swarm Optimization algorithm to allocate resource to user with comparing Waterfilling resource allocation technique with the scheme of Equal Power Allocation to increase performance.

Based on the results, the scheme which uses waterfilling technique has better fairness index system than equal power allocation, but it has average user throughput and lower spectral efficiency. In the fairness parameter of the system, it has an average improvement value of 0,155. The average user output throughput and spectral efficiency parameters get maximum value on the EPA scheme without using the waterfilling power allocation technique, with average user throughput average of 8.78 Mbps and spectral efficiency of 3,41 bps in all test scenarios.

Keywords: LTE, SC-FDMA, Waterfilling, Particle Swarm Optimization, Equal Power Allocation, Physical Resource Block.