ABSTRACT

To meet the ever increasing data rate requirements of mobile users, 3GPP Long Term Evolution targets a spectrum reuse 1 to achieve higher system capacity and spectrum efficiency. However, frequency reuse 1 causes inter-cell interference (ICI) by the users using the same frequency in adjacent cells in these orthogonal frequency division multiplexing (OFDM) systems particularly the users at the cell edge experience high ICI. Soft Frequency Reuse is a method that had been used to reduce ICI in LTE networks.

In this final project, power allocation is analyzed in LTE-downlink system based on SFR where will be doing an optimizing subcarrier and power allocation process by varying the number of major subcarriers and minor subcarriers and transmit power of major and minor subcarriers based on value of α which is a comparison between adjacent inner cell transmit power and adjacent outer cell transmit power. The aim of used algorithm is to find the major and minor subcarrier allocation and their transmit powers so that the system throughput is maximized.

Simulation results show that the total system throughput maximum that $\alpha = 0.9$ achieved is higher than other value of α which is equal to 12795000 bit/s. For value of SINR from $\alpha = 0.9$ is -4.8858 dB for value of SINR minor subcarriers before algorithm runs and increases for value of SINR minor subcarriers after algorithm runs which is equal to 5.0982 dB. At the same time, for value of SINR from $\alpha = 0.9$ is -15.3071 dB for value of SINR major subcarriers before algorithm runs and increases for value of SINR major subcarriers after algorithm runs which is equal to -5.8210 dB.

Keywords: SFR, Power Allocation, Single Cell SFR Optimization, Throughput, SINR