

ABSTRACT

Interference is one of the problems in cellular communication. OFDM in LTE downlink makes a guarantee for interference mitigation for overlapping subcarriers. Otherwise, inter-cell interference can happen because of the adjacent cell. LTE performance itself (spectrum efficiency and data rate achievement) is limited by interference from inter-cell interference, especially for users in the cell edge.

Inter-cell interference coordination (ICIC) is one of the issues in interference mitigation in cellular communication based on Orthogonal Frequency Division Multiplexing Access (OFDMA). Some of the techniques in ICIC are Frequency Reuse 1, Frequency Reuse 3, Partial Frequency Reuse, and Soft Frequency Reuse. In this writing, there is a simulation of Physical Resource Block (PRB) allocation based on that ICIC scheme using the Hungarian Algorithm as an optimal allocation algorithm. This simulation shows PRB allocation to UE, average sector throughput and cell edge throughput, and also average user throughput and fairness index.

From the results of simulation, Reuse 1 scheme has average sector throughput 4.355 Mbps, cell edge throughput 49.583 kbps and average fairness index 0.739. Reuse 3 scheme has average sector throughput 1.997 Mbps, cell edge throughput 302.448 kbps and average fairness index 0.324. PFR 1.3 scheme has average sector throughput 3.348 Mbps, cell edge throughput 63.883 kbps and average fairness index 0.694. SFR scheme has average sector throughput value that is likely with Reuse 1. Increment or decrement of average sector throughput depends on the effective reuse factor of SFR. SFR fairness index for low PRB (number of PRB equal with UE) is low, but it has high fairness index for high PRB (widest bandwidth). Generally, SFR 2.75 has the best performance than the other schemes because it has high cell edge throughput and average sector throughput and good fairness index in high PRB.

Keywords: PRB, inter-cell interference coordination, frequency reuse, Hungarian Algorithm