

## ABSTRACT

The increasement number of users of technology and mobile networks can cause traffic density in Base Station (BS). The increasement number of cellular network users affect the cellular traffic at Base Station (BS). Device-to-Device (D2D) communication are offered a good solution to overcome this problem. D2D communications could let the users communicating without traversing the BS, so that could reduce the traffic load. In the other hand, D2D communication has lackness which is susceptible to interferences, thus research need to be conducted for minimizing the interferences.

In this study, it offered a solution to minimize interference by allocating Resource Block (RB) using greedy algorithm and allocating power using mixed strategy algorithm. In this scenario, all user equipment (UE) using SC-FDMA scheme.

This study varying two different possible scenario, the first scenario is varying the DUE pairs and the second is varying the cell radius. Based on the result, when system use power allocation by mixed strategy algorithm, the performance of parameter performances are having a very good result. The result of sumrate when it variate the number of DUEs is  $3.773 \times 10^8$  bps with percentage increasement 133.76% better than without mixed strategy, Power efficiency's result is  $9.22 \times 10^4$  bps/mWatts with percentage increasement 216.76% better than without mixed strategy, Spectral efficiency's result is 3.777 bps/Hz with percentage increasement 133.76% better than without mixed strategy, and total power's result is 4785.15 mWatts with percentage 12.99% more efficient than without mixed strategy.

**Keywords :** Device-to-Device, Mixed Strategy, Sumrate