ABSTRACT

The increasement number of cellular users can cause traffic density in Base Station (BS). Device to device (D2D) communication is a solution to overcome the cellular traffic at BS. D2D communication is direct communication between devices without using a central BS so can reduce the the traffic load. CU dan D2D user will share the same Resource Block (RB), but has lackness that will cause interference.

In this study offered a solution by maximizing Energy Efficiency (EE) in D2D communication under downlink in the system Heterogeneous Network (HetNet). Resource allocation to reduce iterference by using Greedy Algorithm. Two small cell base stations (SB) were added, it is SB1 (1st SB) and SB2 (2nd SB) so the algorithm could be written as greedy algorithm with SB1SB2 and it was compared with greedy algorithm (without the addition of SB1 and SB2). In this study using two scenarios that is making variation of D2D user and variation macro cell base station (MB).

Based on the simulation result, greedy algoritm with SB1SB2 has less performance than greedy algoritm. The result greedy algorithm with SB1SB2 got value of sum rate 1.89 x 10^8 bps, value of spectral efficiency 10.48 bps/Hz, value of *fairness* CU 0.6258, value of *fairness* total 0.4953. The other side, greedy algoritm with SB1SB2 has higher power efficiency and the results is 13.86%.

Keywords : *D2D Communication*, *Energy Efficiency*, *HetNets*, *Greedy Algorithm*