

ABSTRACT

Device to Device (D2D) is one of the technologies being developed in the telecommunications field. With D2D, communication can be carried out without having to go through a Base Station (BS). This can reduce the work load of BS, where Cellular User (CU) will share resources with D2D. But this will cause interference. So the right allocation of resources is needed to reduce interference.

This study simulates the inverse waterfilling (IWF) algorithm as a joint power control method. This method is used to modify power usage to be more efficient. Equal Power Allocation (EPA) and waterfilling (WF) are compared to IWF. In addition, to allocate the resource block (RB) to the user with the best Channel State Information value and reduce the computational complexity, heuristic algorithm is used that is the greedy algorithm.

The simulation results show that the performance parameters of the data rate, energy efficiency, and spectral efficiency of the IWF Greedy scheme in the changes in number of D2D pair scenario and change in distance of D2D pair scenario get an increase in performance compared to WF Greedy but get a decrease in performance compared to EPA Greedy because the EPA Greedy does not use power control so that performance is better than using power control, but the power used is inefficient. The use of IWF Greedy scheme is recommended for use in D2D communication when using power control method to get a good CSI value but using efficient power.

Keywords: *D2D, Energy Efficiency, Greedy, Invers Waterfilling, Joint Power Control.*