

ABSTRACT

Device-to-Device (D2D) communication system is a communication system where each user communicates directly without passing through the Base Station (BS). D2D communication reuses the Cellular User Equipment (CUE) resource block. The use of resource blocks simultaneously between D2D and CUE can reduce the traffic load on the BS. However, it causes interference and power inefficient D2D communication.

With these problems, this research was conducted to allocate resource block on a single cell with a downlink communication direction using the Hungarian algorithm. After allocating the resource block, the next step is the allocation of power using the Power-based State Action Reward State Action (SARSA) method Power Domain Non-Orthogonal Multiple Access (PD-NOMA). Then a performance comparison is made between the fixed allocation power and SARSA allocation power with the PD-NOMA method.

Based on the simulations performed, the resource block allocation scheme with SARSA power allocation provides better performance compared to the scheme resource block allocation with fixed power allocation. Where the average Sum data rate is obtained by varying the number of D2D pairs with a value of 2.89×10^7 bps, power efficiency 2.89×10^5 bps/mwatt and spectral efficiency 8.04 bps/Hz.

Kata Kunci: Device-to-device, Resource Block, Power Domain Non-Orthogonal Multiple Access.