ABSTRACT

Device-to-device (D2D) communication is seen as a potential technology to be implemented in fifth-generation cellular communication systems (5G NR). Various studies related to D2D schemes on 5G NR have been widely published. However, most of the existing research does not take into account the interference effect caused by other users when allocating resource blocks. Interference between D2D users in a communication system with large capacities such as 5G NR, cannot be ignored.

In this research, a D2D group-casting scheme with relay is proposed, Where in a main cellular cell there are four D2D groups on the edge of the cell. The main focus of this research is the determination of the optimal relay position in the D2D group by testing the system towards predefined scenarios. The consideration of optimal relay position is based on the point which has the optimum SINR and outage probability value.

Based on the simulation results, it is found that the optimal relay position for each D2D group is different. This is based on the optimum value of each performance parameter obtained, especially SINR and outage probability. From the simulation results, the average SINR value is obtained at 9.708 dB, and the average outage probability value is obtained at 0.1064.

Keywords: Device-to-device, group-casting, relay, resource block, interference