Power Allocation with Max-min Fairness for Multicast in Heterogeneous Network


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Abstract—In this paper, we formulate the problem to guarantee a max-min fairness for multicast in an orthogonal frequency division multiple access (OFDMA)-based heterogeneous network (Het-Net) by managing the power allocation at base stations (BSs) of coexisting macrocell and picocells, where different common messages are, respectively, transmitted from BSs to their served user equipments (UEs) in the same frequency. Due to non-linear and non-posynomial constraint in the problem, it is difficult to solve the problem in a closed form. However, in the case of high operating signal to interference plus noise ratio (SINR) region, we simplify the problem to a corresponding GP problem, which brings forth a suboptimal power allocation algorithm to guarantee a max-min fairness for multicast among the cells in the Het-Net. Simulation results demonstrate the minimum transmission rate for multicast among the cells in Het-Net can be improved efficiently by the proposed algorithm.

Keywords—Multicast, fairness, heterogeneous network, power allocation, OFDMA