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Adaptive Threshold Adjustment of Clear Channel Assessment in LAA Down Link

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Abstract : In long-term evolution (LTE), the carriers around 5GHz are planned to be utilized without licenses to further enlarge system capacity. This feature is termed licensed assisted access (LAA). The channel sensing (clean channel assessment, CCA) is required before any transmission on these unlicensed carriers, in order to make sure the harmonious co-existence of LAA with other radio access technology in the unlicensed band. Obviously, the CCA threshold is very critical, which decides whether the transmission right following CCA is delivered in time and without collisions. An improper CCA threshold may cause buffer overflow of some eNodeBs if the eNodeBs are heavily loaded with the traffic. Thus, to solve these problems, we propose an adaptive threshold adjustment method for CCA in the LAA downlink. Both the load and transmission opportunities are concerned. The trend of the LAA throughput as the threshold varies is obtained, which guides the threshold adjustment. The co-existing between LAA and Wi-Fi is particularly tested. The results from system-level simulation confirm the merits of our design, especially in heavy traffic cases.

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