Improving Beam Distribution Evenness in 3-Dimensional Beamforming with Carrier Aggregation

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***Abstract*— The 3-dimensional beamforming is a highly attractive issue in 5G telecommunication. Equipped with 2-dimensional antenna arrays, it allows vertical sectorization within a cell as well as horizontal one, by making a beamforming zone for the corresponding sector. However, there is considerable inequality among the areas of beamforming zone. Since the farther from the base station, the bigger the beamforming zone area is, the farther beamforming zone area is likely support more users than nearer beamforming zone. In this paper, we propose to utilize carrier aggregation (CA) from additional base stations for relieving the uneven beamforming zone area problem and prove this method is more efficient in improving cell throughput especially in mmWave environment. Even if the additional base station is more simple type which offers only a few beamformings, it can effectively improve the equality of UE's radio resource occupation.**

***Keyword*—3D Beamforming, Carrier Aggregation, 5G Telecommunication**

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