Multipath Division Multiple Access for 5G Cellular System based on Massive Antennas in Millimeter Wave Band

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***Abstract*—Evolving from the 3G and the 4G communication systems, the 5G system demands both high system capacity and high data rate. A novel TDD cellular system architecture based on massive antennas in millimeter wave band is proposed in this paper. The system is built on multipath division multiple access which is a method to use massive antennas at BS along with the RAKE receiver and the Pre-Rake transmitter to achieve a processing gain to suppress multiple access interference. The system concept is demonstrated by computer simulations. Moreover, it is shown through analysis that the system capacity and the aggregated data throughput could be boosted up to a considerable level. In addition, the associated transceiver architecture and the TDD frame structure are presented for practical system concerns.**

***Keyword*—5G communication, cellular system, millimeter wave, massive antennas, system capacity**

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