

A Novel 5G TDD Cellular System Proposal based on Multipath Division Multiple Access

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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 time division duplexing (TDD) cellular system based on multipath division multiple access (MDMA) with 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 for suppressing multiple access interference. The system concept is demonstrated by computer simulations. In addition, the associated transceiver architecture and a TDD time slot structure are presented for practical system concerns. Moreover, it is shown through analysis that the total average data throughput equals 3.8 Gbps and the system can achieve a bandwidth efficiency of 19 bps/Hz/cell on 200 MHz transmission bandwidth.

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



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