

Preface

With the rapid development of Mobile Internet and Internet of Things (IoT), the fourth generation (4G) wireless communication systems cannot accommodate some ever-increasing challenges, such as the spectrum crisis and huge energy consumption. Therefore, research on the fifth generation (5G) wireless communication networks has attracted increasing attention, which are expected to be deployed around 2020. Compared to 4G, 5G networks are supposed to provide greatly enhanced capacity, spectral efficiency, energy efficiency, cost efficiency, mobility, data rate, connection density, etc., with much reduced end-to-end latency. To meet 5G requirements, we need dramatically new network architectures and technologies, such as heterogeneous ultra-dense networks, massive multiple-input-multiple-output (MIMO), and millimeter wave communications. The evaluation and testing technologies should also be re-designed to face challenges in 5G wireless communication networks.

This Special Focus of SCIENCE CHINA Information Sciences is devoted to covering the advances in network architectures, radio technologies, and evaluation technologies for 5G wireless communication networks. The special focus contains the following nine invited and contributed papers:

- 1) Recent advances and future challenges on massive MIMO channel measurements and models
- 2) Power allocation for massive MIMO: impact of power amplifier efficiency
- 3) Impact of RF mismatches on the performance of massive MIMO systems with ZF precoding
- 4) Channel capacity investigation of a linear massive MIMO system using spherical wave model in LOS scenarios
- 5) Joint user grouping and resource allocation for uplink virtual MIMO systems
- 6) Energy efficient design for multiuser downlink energy and uplink information transfer in 5G
- 7) Concurrent transmission for energy efficiency of user equipment in 5G wireless communication networks
- 8) Sectorization based pilot reuse for improving net spectral efficiency in the multicell massive MIMO system
- 9) 5G green cellular networks considering power allocation schemes

Finally, we would like to express our sincere appreciation to all the authors for submitting their manuscripts to this special issue. Moreover, we would like to express our deepest gratitude to all the anonymous reviewers for delivering high-quality and timely review comments. We would also like to thank Ms. Jing FENG in the SCIENCE CHINA Editorial Office for her support and input.

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