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IEEE Journal of Selected Topics in Signal Processing
Special Issue on Hybrid Analog - Digital Signal Processing for Hardware-Efficient Large Scale Antenna Arrays

5G and beyond systems necessitate the exploitation of high-gain MIMO beamforming/precoding by using large antenna arrays at both the base stations and the mobile units to deliver the high data rates promised. The high cost and power consumption of radio frequency (RF) components such as high-resolution analog-to-digital converters (ADCs) makes dedicating a separate RF chain for each antenna prohibitive, and thus the conventional, fully digital baseband (BB) processing becomes infeasible. This is further pronounced in emerging applications such as the internet of things (IoT) involving massive connectivity. Hybrid analog-digital (AD) processing provides a key solution for allowing a reduced number of RF chains and low-specification RF components, where the transceiver processing is divided into the analog and digital domains. This special issue seeks to bring together contributions from researchers and practitioners in the area of signal processing for wireless communications with an emphasis on new methods for hybrid AD signal processing architectures and transmission. We solicit high-quality original research papers on topics including, but not limited to:

- Fundamental limits of communication by hybrid AD architectures;
- Hybrid AD signal processing techniques for large scale MIMO systems;
- Signal processing techniques robust to low-specification RF components and hardware imperfections;
- Reduced RF chain implementations through parasitic arrays and load modulated MIMO;
- Adaptive transmission / reception techniques for parasitic, reflect, phased, load modulated and other hybrid massive antenna array structures
- Channel modelling for hybrid AD large scale antenna systems;
- Studies and optimization of antenna topologies for massive MIMO deployment with hybrid AD transmission;
- Efficient channel state information (CSI) acquisition techniques for hybrid AD transmission;
- Beamspace MIMO transmission;
- Distributed multi-cell hybrid AD transmission;
- Novel applications of hybrid AD signal processing, including security, energy harvesting, IoT among others;
- Hybrid RF antenna arrays for K, V, W and mmWave frequency bands, including wideband designs;

In addition to technical research results, we invite very high quality submissions of a tutorial or overview nature. We also welcome creative papers outside of the areas listed here but related to the overall scope of the special issue. Prospective authors can contact the Guest Editors to ascertain interest on topics that are not listed above.

Prospective authors should visit <http://www.signalprocessingsociety.org/publications/periodicals/jstsp/> for information on paper submission. Manuscripts should be submitted using the Scholar One (Manuscript Central) system at <http://mc.manuscriptcentral.com/jstsp-ieee>. Manuscripts will be peer reviewed according to the standard IEEE process.

Manuscript Submission:	September 1, 2017
First review completed:	November 1, 2017
Revised manuscript due:	January 1, 2018
Second review completed:	February 1, 2018
Final manuscript due:	March 1, 2018
Publication date:	May 2018

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