Editorial

Small Antennas: Miniaturization Techniques and Applications 2016

Wenhua Yu,¹ Yingsong Li,² and Manos M. Tentzeris³

¹2COMU Inc., Fairfax, VA, USA

²College of Information and Communications Engineering, Harbin Engineering University, Harbin 150001, China

³School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA 30308, USA

Correspondence should be addressed to Wenhua Yu; wenyu@2comu.com

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The development of small antennas for modern communications, for both portable terminals and radar purposes, has been widely studied over many years. In recent decades, this topic is experiencing an ever increasing concentration, thanks to the antenna miniaturization techniques and printed antenna techniques. Recently reported antenna techniques pave the way to new added-value designs of small antennas for mobile devices and military applications and even for healthcare detections and enable full exploitation for the integration of the antenna and radio frequency front-ends. However, the antennas used in modern communication equipment have unique challenges in design theory and in implementation, which need new development in the antenna design and geometry design in small antenna creation.

The papers included in this special issue provide a wide view of small antenna designs, which includes the antenna designs and applications in communication system. This special issue comprises the antenna designs for long-term evolution (LTE), radio-frequency identification (RFID), global navigation satellite system (GNSS), and mobile devices. Additionally, the optimal electric dipole antenna model and its application have also been included in this special issue.

As for the LTE antenna design, the authors created a spiral slotted microstrip antenna to meet the requirements of 700 MHz band application, which can also be used for terrestrial digital television. The antenna has been well designed and measured for obtaining good impedance

and gain. For mobile communications, a quad-band slot antenna and a dual-polarization antenna have been reported and investigated in detail. The quad-band slot antenna has been presented for personal communications service (PCS), universal mobile telecommunications system (UMTS), wide-band code-division multiple access (WCDMA), Bluetooth, wireless local area networks (WLAN), and worldwide interoperability for microwave access (WiMAX) applications and the dual-polarization antenna has been developed for 1801 MHz–1827 MHz applications. Also, an RFID antenna has been designed for ultrahigh frequency (UHF) at 860–960 MHz, which has been verified by both simulation and experiments. The results demonstrated that the UHF RFID antenna can provide a read range of 3 m–4 m with a minimum threshold power of 23–26 dBm. Furthermore, a dielectric resonator antenna (DRA) array has been presented herein for giving a good service for GNSS to exploit the potentialities of precise and reliable navigation. The antenna operates at E5/L5, L2, and E6 bands with an overall footprint of only 3.5". In addition, an optimal electric dipole antennas model has been presented, analyzed, and measured in a through-the-earth communication system to obtain a vertical transmission depth about 30 m.

We hope that this special issue can give useful information and light the antenna designs within the minimization and high performance and can attract much more attention by the academia and industrial community to pursue further investigations to promote the rapid design of small antennas.

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Wenhua Yu
Yingsong Li
Manos M. Tentzeris