

Guest Editorial



Dear Reader,

This special issue you are now reading is a continuation of, I may say, traditional and fruitful cooperation between ICECom conference and the Radioengineering journal.

This special issue consists of ten selected papers which were originally presented at ICECom 2010 - 20th International Conference on Applied Electromagnetics and Communications which was held in Dubrovnik (Croatia), 20 - 23 September 2010. Conference papers were limited in length. Here you can find their extended versions in which the authors present their research results in more depth and detail. The papers are not focused on a narrow topic, but the topic list is rather "broadband" and it reflects the one of the ICECom 2010.

Let me briefly introduce the ICECom conferences. ICECom continues the tradition of meetings which have been organized since the early 1970s. In 1997 a small group of enthusiasts reorganized the traditional meetings of the chapter for Radiocommunications of the KoREMA Society (KoREMA = Croatian Society for Communication, Computing, Electronics, Measurement and Control) to an international conference. Since then, ICECom has been organized as a biennial, and lately as triennial event. The topics covered by ICECom conferences are constantly updated in order to present the state of art in the fields of antenna modeling and design, computational methods in electromagnetics, mobile and personal communications, radar systems and remote sensing, radio navigation and positioning, propagation of EM waves, RFID, electromagnetic compatibility, antenna measurements, fiber optic systems, THz technology, metamaterials, etc.

The first group of papers in this special issue is about antennas. The development of wireless body area networks draws attention to antennas suitable for these systems. The antennas have to be flexible enough to be worn and have to work efficiently in the proximity of the user's body. In the paper by *P.J. Soh et al.* PIFAs on different textile materials have been investigated both theoretically and experimentally. *I. Dioum et al.* presented meandered monopole antennas for LTE handsets. Two antennas were implemented on a single handset in order to use the benefits of MIMO configuration. A successful technique to decouple the handset antennas was proposed, which increased the MIMO capacity. The paper by *L. Dussopt et al.* presents two circularly polarized transmit-arrays at 60 GHz. By choosing the operating frequency of 60 GHz, the authors look at future high-capacity broadband personal and local area networks. Compared to other antenna solutions the proposed arrays show promising characteristics in terms of efficiency, polarization purity, light weight and low cost.

Efficient numerical analysis of antennas and arrays which gives accurate results is a must in contemporary antenna design. However, the computation time can drastically increase when the structures are large in terms of wavelength. In the paper by *F. De Vita et al.* an efficient full-wave method for analyzing large structures like reflectarrays is presented. The method maintains the accuracy of the standard method of moments but drastically improves the computation efficiency in terms of both memory and computational time.

The group of four system- and application-oriented papers is introduced by the paper by *C. Pfeiffer et al.* In this paper the authors present a multi-channel reader for sensor networks. It achieves shorter readout times, it has MIMO beamforming capability and improved angular separation performance. In their paper, *G.A.E. Vandenbosch et al.* report the design and fabrication of a fully integrated conformal phased array with beam steering capability for wireless sensor nodes. Education of future engineers is an important task. The students will much easier grasp the theoretical concepts through laboratory exercises. A simple and readily applicable open-source-based platform for demonstrating sensor network applications in a student lab is presented in the paper by *A. Dikovic et al.* The paper by *W.J. Krzysztofik et al.* discusses the application of nested reverberation chambers for measurement of material shielding effectiveness.

New technologies and applications require new materials, both natural and artificial, which is the topic of the last two papers. The paper by *M. Durán-Sindreu et al.* presents broadband microwave CPW filters based on particles like open split ring resonators and open complementary split ring resonators. The authors introduce an improved model of the particle, resulting in better agreement between calculated and measured results. In the paper by *S. Costanzo et al.* a polymer material with low dielectric constant, low loss tangent, and stable behavior up to THz frequencies is used to manufacture millimeter-wave microstrip structures, circuits and antennas.

At the end, let me thank the Editor-in-Chief and the whole Editorial Board for entrusting me of this special issue. Many thanks go to the authors who have contributed to this special issue and to the reviewers who have watched over the quality of the papers.

I hope you will enjoy reading this special issue. Maybe it will incite you to come to Dubrovnik to the next ICECom in September 2013.

Zagreb, 14 November 2011

Davor Bonefačić
University of Zagreb
Faculty of Electrical Engineering and Computing
Zagreb, Croatia