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Guest Editors' Note

This special issue of *Microwave Review* is dedicated to Professor Bratislav Milovanović who celebrated his 65th birthday in November this year. His outstanding results in the field of science, technological development and higher education classified professor Milovanović as one of the leading world experts that enjoy a high reputation in the field of microwave technique and, more broadly, in the field of telecommunications. Professor Milovanović is a full professor at the Faculty of Electronic Engineering, University of Niš. He is a member of the Serbian Scientific Society, a full member of Academy of Engineering Sciences of Serbia, the president of the Serbian Society for Microwave Technique, Technologies and Systems, the president of the IEEE MTT-S Chapter of Serbia and Montenegro, the president of the ETRAN Society Chairmanship, the president of Advisory Council of Republic Agency for Electronic Communications, a member of the Administrative Committee of the Serbian Telecommunication Society and a member of the Editorial board of the *Microwave review*. He was founder and first president of the ETRAN Committee for Microwave and Submillimeter Technique (now ETRAN committee for microwave technique, technologies and systems).

According to the number and quality of published scientific papers Professor Milovanović is one of the most successful Serbian scientists in the field of telecommunications. His papers are characterized by a richness of ideas, the right choice of the problems to investigate and original scientific approaches to problems solving in the fundamental and applied research. There is no doubt that his research influenced the development of certain scientific disciplines in the fields he has been engaged and from that point of view, he has significantly contributed to the development of Serbian science.

He is the author of a large number of laboratory and industrial prototypes and new methods for the characterization of specific telecommunication circuits and systems, particularly in the field of microwave technique and satellite and cable television. As a project leader and active participant in a number of scientific-research, research-development and innovation projects in the ICT field he has added a valuable contribution to the development and implementation of new telecommunications networks and services.

Professor Milovanović is the founder and leader of prestigious research group for microwave technique that has achieved remarkable scientific and educational results. In this group under his leadership 11 doctoral dissertations, 17 master theses and more than 150 graduate diploma works have been defended, while he currently supervises 5 doctoral dissertations. Some of these scientists are now working with scientific-research institutions and companies around the world but still maintain ties and have a very strong cooperation with prof. Milovanović and his group. Professor Milovanović is founder of

several teaching and scientific research laboratories, among them the most prestigious is the Laboratory for microwave technology and satellite television at the Faculty of Electronic Engineering, unique research laboratory in the country. He is also responsible for the design of modern and advanced programs for a number of subjects on bachelor, master and doctoral studies in the field of telecommunications. As a distinguished professor and head of the Department of Telecommunications, he has given the greatest contribution to the promotion of the Faculty of Electronic Engineering in Niš at the national and international levels.

Abilities of Professor Milovanović, as the founder and the chairman of all the past eleventh International IEEE Conferences on Telecommunications in Modern Satellite and Broadcasting Services (TELSIKS) –one of leading scientific conferences in the field of telecommunications in Central and Southeastern Europe, and the chairman and co-chairman of the past thirteenth international conferences ICEST, came to the fore in a very remarkable way. He has significantly contributed to the rise of these conferences and to setting high organization standards and quality of the conference papers, fostering novel scientific and technical minds within the scientific topics of the conference.

Finally, the guest editors of this special issue of Microwave Review would like to add some personal note and express their sincere pleasure of having opportunity to closely collaborate with Professor Milovanović during all these previous years, first as PhD students and later as his co-workers, and great gratitude on his contributions in providing an excellent research and educational environment in which both guest editors have worked and progressed in their careers, hoping that this joint successful collaboration will continue in years to come.

The guest editors would like to thank all authors of the papers who have accepted to contribute to this special issue of Microwave Review. Most of them have been working closely with Professor Milovanović in the past.

In this special issue there are 16 scientific papers together with the report on TELSIS 2013 Conference, giving also an insight of twenty years long tradition of this conference. The first four papers are in the field on antenna modeling and design. The first paper, whose author is W.J. Krzysztofik with the Wroclaw University of Technology, Poland, provides a comprehensive overview of recent developments of different fractal structures from antennas to metamaterials and their application in the rapidly growing field of modern communication, especially mobile systems. Some interesting numerical results of the circuit- and field antenna and metamaterials parameters and their comparison with measurements are presented and discussed. Authors of the second paper are M. Milijić with the University of Niš, A. Nešić with the IMTEL-communication, Belgrade and B. Milovanović with the University of Niš, all from Serbia. This paper presents the design of printed antenna array in the form of symmetrical pentagonal dipoles with high side lobe suppression. Special attention is given to the symmetrical tapered feed network, consisting of impedance transformers that in theory can provide side lobe suppression better than 44 dB at the operating frequency. In the third paper, a novel very efficient iterative method which converges toward exact method of moment solution, but without dealing with large matrices, is described. It allows carrying on an electromagnetic analysis of arbitrary and isolated antennas on large conducting objects. The authors of this paper are M.S. Tasić and B. Kolundžija, both with the University of Belgrade, Serbia. The fourth paper, whose authors are T. Dimitrijević, J. Joković, N. Dončov and B. Milovanović, all with University of Niš, Serbia, explores applicability of the integral cylindrical TLM method to the accurate but efficient modeling of coax-fed microstrip antennas used in some realizations of circular path antenna and cavity-backed inverted microstrip antenna. Paper investigates the optimal feed position in providing the best matching of the antennas and gives comparison of obtained numerical results with conducted measurements.

The fifth paper in this special issue discusses the recent advances, design challenges, practical limitations, and solutions of recent advances in health monitoring using wireless technologies and presents also an example of contactless health monitoring system. Authors of this paper are D.M. M.-P. Schreurs,

M. Mercuri, P.J. Soh, G. A.E. Vandenbosch, all with the Katholieke Universiteit Leuven, Belgium, while P.J. Soh is also with the University Malaysia Perlis, Malaysia.

The next two papers contain research results obtained by using artificial neural network approach. Z. Stanković, N. Dončov, B. Milovanović, all with the University of Niš, Serbia, J. Russers with the Technische Universität München, Germany, and I. Milovanović with the Singidunum University, Serbia, wrote the first paper in the group that presents a correlation matrix trained MLP neural model capable to allow for the efficient DOA estimation of multiple narrow-band stochastic electromagnetic sources in far field. Several examples are provided to verify the proposed approach. Authors of the second paper in this group are V. Đorđević with the Innovation Center of Advanced Technologies, Serbia, O. Pronić, Z. Marinković and V. Marković, all with the University of Niš, Serbia, Uwe Siart with the Technische Universität München, Germany, and C. Chwala and H. Kunstmann, both with the Institut für Meteorologie und Klimaforschung, Germany. This paper deals with a new method for the detection of precipitation based on the received signal level of commercial microwave links. The results show that the proposed method based on focused time-delay neural networks can be used for accurate precipitation detection in significantly shorter time comparing to the existing methods.

The eighth paper in this special issue gives a short review of the six-port theory and techniques for communication and sensing applications, such as signal-related down-conversion, direct modulation, and direction finding techniques. S.O. Tatu with the Institut national de la recherche scientifique - Énergie, Matériaux et Télécommunications, Canada and K. Wu with the École Polytechnique de Montréal, Canada, as authors of this paper, present some of the six-port circuits fabricated in various technologies covering a wide range of microwave and millimeter-wave frequencies and also present the circuit characterization method using accurate network analyzer and on-wafer measurements.

A wireless power transfer system for roadway powered electric vehicles is presented in the ninth paper whose authors are J. Russer with the the Technical University Munich, Germany, M. Dionigi and M. Mongiardo, both with the Università di Perugia, Italy and P. Russer with the Technische Universität München, Germany. The system concept is using inductive coupling of primary coils arranged in a linear array in the roadway to secondary coils in each electric vehicle. The inductive power transfer system is operated as a switched resonant converter controlled by the primary and secondary coil currents to allow power transfer in both directions.

Metamaterials are employed in the tenth paper to produce electromagnetically induced transparency, as a quantum mechanical phenomenon that creates a narrow transparency window in otherwise absorbing medium, to achieve low losses, high dispersion and extreme values of group delay. Authors of this paper are V. Milošević, B. Jokanović, R. Bojanić and B. Jelenković, all with the University of Belgrade, Serbia.

Authors of the eleventh paper, S. Birgermajer, N. Janković, V. Crnojević-Bengin all with the University of Novi Sad, Serbia, present a novel tri-mode asymmetric resonator that consists of a single-mode and a dual-mode. Along with detailed description and analysis of proposed resonator behavior, an analytical procedure for resonance positioning is provided and two tri-band band-pass filters, obtained by using this resonator, have been designed, fabricated and measured.

Synthesis and use of wave digital networks of admittance inverters to efficiently model microstrip structures with gaps discontinuities are presented in the twelfth paper. Authors of this paper are B. Stošić and N. Dončov, both with the University of Niš, Serbia. Derivation of wave digital models of admittance inverters is given in details based on scattering parameter formalism and two-port networks of parallel or series adaptors.

The thirteenth paper in this special issue investigates theoretically and experimentally a binary metal-dielectric metamaterial with a sawtooth profile. A set of analytical solutions defining the electromagnetic fields in such a structure is provided together with the results of experimental fabrication of gradient metamaterial with a sawtooth spatial profile. Z. Jakšić, M. Sarajlić and Ž. Lazić, all with the University of Belgrade, Serbia, M. Dalarsson with the Royal Institute of Technology, Stockholm, Sweden

and D. Randelović, K. Radulović and D. Tanasković, all with the University of Belgrade, Serbia, as authors of this paper, envision the applicability of graded metasurfaces in transformation optics.

New methods for noise parameters measurements for high frequency devices and their modeling are presented in the fourteenth paper whose authors are D. Pasquet, P. Descamps, D. Lesénéchal, all with LaMIPS laboratory, Caen, France. In contrast to the conventional noise parameters measurement methods that use a complicate and expensive set-up, authors present a new measurement method that is using only a modern vector network analyzer without receiver, noise source nor tuner. Also, simple characterization of high frequency devices such as HBT transistor, based on correlation matrix transformation, is given in details.

Authors of the fifteenth paper, A. Caddemi, G. Crupi, E. Fazio, S. Patanè and G. Salvo, all with the Università degli Studi di Messina, Italy, present their main results of an extensive experimental investigation of the microwave transistor behavior under optical illumination. The light sensitivity of tested microwave transistors is investigated in terms of DC, scattering and noise parameters showing that the light exposure affects significantly the tested device behavior such as an increase of the drain current, the transconductance, the forward transmission coefficient and the minimum noise figure, especially at the shorter wavelength.

The last paper in this special issue is devoted to a novel linearization technique for RF power amplifiers based on the modified baseband signal that modulates the fundamental carrier second harmonic. The effects of the proposed linearization method are considered on a single stage power amplifier for quadrature amplitude modulated signals at different input power levels as well as for WCDMA digitally modulated signal. Authors of this paper are A. Atanasković and N. Maleš-Ilić, both with the University of Niš, Serbia, K. Blau with the Technische Universität Ilmenau, Germany, A. Đorić with the Innovation Center of Advanced Technologies, Serbia and B. Milovanović with the University of Niš, Serbia.