



Introduction to the ACTA IMEKO issue dedicated to selected papers presented in the 18th IMEKO TC4 Symposium

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This manuscript is a brief introduction to the ACTA IMEKO issue dedicated to selected papers presented in the 18th IMEKO TC4 Symposium which took place in Natal, Brazil in September 2011 together with IX Semetro.

Keywords: IMEKO TC4 Symposium; Measurement of Electrical Quantities; Natal; Brazil

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1. INTRODUCTION

The articles presented in this issue were selected by the IMEKO TC4 Board from the papers presented at the 18th IMEKO TC4 Symposium which took place in Natal Brazil in September 2011. The authors were invited in late 2011 to submit extended and updated versions of their papers presented in the Symposium. All of the authors accepted this invitation and papers began arriving into the new ACTA IMEKO online submission system in early 2012 upon which a large number of reviewers quickly began their task of assessing the papers and submitting their recommendations. The final list of 11 published papers in this issue is a good representation of the high quality papers presented in the Symposium. Overall, 27 reviewers were involved in the review process and helped shape the final manuscripts with constructive in-depth reviews that pushed the authors to further improve the papers and their work.

2. ABOUT TC4

The main objective of the IMEKO TC4 (Measurement of Electrical Quantities) is emphasizing both theoretical and practical aspects of research in the field of electrical and electronic measurements. TC4, was officially established in 1984 and since then it has organized at least one Symposium each year and has actively co-operated in the success of the IMEKO World Congresses, which are held every three years. The activities of TC4 allowed more and more researchers to be familiar with the development and use of electrical and electronic instruments for measuring, monitoring and recording electrical signals.

The current members of TC4 are:

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- R. Pallás-Areny (Spain)
- I. Kodjabashev (Bulgaria)
- V. Vujicic (Serbia)
- G. Kreisler (Germany)
- Jae Kap Jung (Korea)
- D. Ilić (Croatia)
- W. Xiaofei (China)
- M. Crețu (Romania)
- S. G. Semenchinsky (Russia)

3. THE ARTICLES

In [1], the authors present an image based system implementing a well-known diagnostic method for the automatic detection of melanomas as support to clinicians. The proposed method, based on a statistical approach, is validated with a large set of real melanoma images.

Impedance circuit identification through spectroscopy is the subject of [2] where the authors use gene expression programming and genetic algorithms for automatic impedance circuit identification. Multiple experimental and simulation results are presented.

The characterization of power quality transient phenomena of DC railway traction supply is presented in [3]. A range of transients typical of DC railway systems are considered and classified according to their time/frequency characteristics. The optimal settings for wavelet analysis, which are almost always referred to AC distribution networks in industrial systems, are adjusted for a DC railway system.

In [4], a novel high-speed multichannel impedance measuring system is presented. The impedance determination is based on the measurement of amplitudes at two distinct frequencies. The imaging capability of the proposed multichannel system was demonstrated using a planar array sensor.

The characterization of the ISDB-Tb critical spectrum mask is addressed in [5], where the authors discuss different test procedures using either a spectrum analyzer or a dedicated digital TV analyzer to measure the ISDB-T transmission mask.

The construction details of a new main two-stage inductive voltage divider for coaxial bridge applications, recently built at Inmetro, is presented in [6]. The design techniques responsible for the small ratio errors of the device and the calibration method employed are detailed.

In [7] the authors describe the development of a low distortion signal generator with a frequency range from 0 to 10 kHz using the direct digital synthesis (DDS) method for ADC characterization.

The development of a new primary standard for the AC-DC current transfer at Inmetro, based on planar multijunction thermal converters is described in [8] with detailed uncertainty analysis.

An electronic approach to homogenize the impedance phase characteristics of heterogeneous GMI sensors is the subject of [9]. The authors present experimental results that demonstrate the effectiveness of the developed homogenization method.

In [10], a mobile measurement system for real time monitoring of environmental pollutions over urban areas is proposed. The approach is based on the use of a set of vehicles, typically employed for public transportation inside urban areas, which are equipped with the developed mobile measurement system. This allows these vehicles to measure, store, and transmit the acquired data to a remote supervisor unit.

A current transformer intended for high precision current-to-voltage transducers was proposed in [11]. It uses a two-stage technique plus an electronic device that cancels the magnetic flux in the compensating core.

4. CONCLUSIONS

It was a great pleasure to act as Guest Editor for this groundbreaking issue of ACTA IMEKO. The effort behind this first issue goes beyond its principal outcome which is the manuscripts and all the work of the authors and reviewers. This first issue was very important to test and fine-tune the online submission system and gain important know-how for the next issues. Personally, I must thank the authors, the reviewers and specially Paul Regtien and Dirk Röske for their support and help with the submission system.

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