PORTO SEIA'20

6th International Conference on Sensors and Electronic Instrumentation Advances

&

2nd IFSA Frequency & Time Conference

Conference Programme

23-25 September 2020
Porto, Portugal

Organized by:

IFSA

Message from Chairman

On behalf the Organizing Committee we would like to welcome you to the 6th International Conference on Sensors and Electronic Instrumentation Advances (SEIA' 2020) and 2nd IFSA Frequency & Time Conference (IFTC' 2020), in Porto, Portugal. This conference umbrella is a forum for presentation, discussion, exchange of information and latest research and development results in both theoretical and experimental research in sensors, transducers (including frequency output sensors), sensor instrumentation, measurements and their related fields. It brings together researchers, developers, and practitioners from diverse fields including international scientists and engineers from academia, research institutes, and companies to present and discuss the latest results in the field of sensors and measurements. The first SEIA conference was held in Dubai (UAE), 21-22 November 2015; the second – in Barcelona (Spain), 22-23 September 2016; the third – in Moscow (Russia), 20-22 September 2017, the fourth - in Amsterdam (The Netherlands), 19-21 September 2018 and the fifth – in Canary Islands (Tenerife, Spain), 25-27 September 2020.

Next to all the technical subjects, a major function of this series of events lies in the opportunities for meeting colleagues. This aspect of our IFSA events has always been giving high marks and we continue to pay much attention to it. Coffee breaks, welcome cocktail reception, Gala Dinner are the best opportunity for social contacts.

Both conferences are organized by the *International Frequency Sensor Association (IFSA)* - one of the major professional association serving for the sensor industry and academy during 20 years, in technical cooperation with the IFSA Group company: *IFSA Publishing S.L.* (Spain), and media partners: open access journal MDPI *Sensors* (ISSN 1424-8220), open access journal *Sensors and Materials* (ISSN 0914-4935, e-ISSN 2435-0869), *Journal Soft Measurements and Computing* (ISSN 2618-9976) and *MyDearDrone.com*

We trust that you will find the SEIA' 2020 and IFTC' 2020 conferences professionally rewarding and stimulating as well as enjoyable. Welcome to SEIA' 2020 and IFTC' 2020 !

Prof., Dr. Sergey Y. Yurish
SEIA' 2020 & IFTC' 2020 Chairman

Registration

The Registration Desk is open in the *Holiday Inn Porto Gaia* hotel:

- Tuesday, 22 September, from 20:00-20:30 (in the hotel's lobby)
- Wednesday, 23 September, from 8:45-18:00 (near the *Pocinho* meeting room)
- Thursday, 24 September, from 8:45-18:00 (near the *Pocinho* meeting room)
- Friday, 25 September, from 8:45-12:00 (near the *Pocinho* meeting room)

Conference Venue

The Conference will take place on 23-25 September 2020 in the *Holiday Inn Porto Gaia* hotel, conference room *Pocinho.*

Language

The official language of the Conference is English. There will be no simultaneous interpretation.

Insurance and Liability

The conference organizers do not accept responsibility for any individual, medical, travel or personal insurance policies as necessary.

Conference Identification Tag

The Organizing Committee request that you wear your identification tag (badge) at all times during the conference. Your conference identification tag will serve as your admission to all conference paper presentation sessions.

Coffee/Tea Refreshment

Coffee/tea will be served at the times indicated in the programme.

Special Issues of journals

Selected papers from both conferences will be published in special issues of open access *Sensors & Transducers* journal (ISSN: 2306-8515, e-ISSN 1726-5479) in both: print and electronic formats; MDPI *Sensors* journal (ISSN 1424-8220), electronic format or in *Sensors and Materials* (ISSN 0914-4935, e-ISSN 2435-0869) in print and electronic formats. All authors of selected papers will be invited after the conference by the Chairman to submit their extended papers into the appropriate journals.

'Advances in Sensors: Reviews' Book Series

The limited number of full-page papers published in the *Sensors & Transducers* journal will be selected by the journal's Editorial Board to extend into book chapters for the '*Advances in Sensors: Reviews*', Book Series, Vol. 8. This open access book volume will be published in 2021. The first seven volumes published in 2012-2019 have accepted by all Sensors Community with a great enthusiasm.

Organizing Committee

Chairmen

Prof., Dr. Sergey Y. Yurish *(IFSA, Spain)*
Dr. Daneshmand Malayeri, Amin *(Asia-SAME, UAE)*

Advisory Chairmen

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Prof. Svetlana V. Prokopchina *(Financial University, Russia)*
Prof. José Miguel Pereira (Instituto Politécnico de Setúbal, Portugal)
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Dr. Marius Gheorghe *(Ideal Aerosmith, Inc., USA)*
Dr. Paolo Dabove *(Politecnico di Torino, Italy)*

Conference and Publication Manager

Mrs. Tetyana Zakharchenko *(IFSA Publishing, S.L., Spain)*

Welcome Cocktail

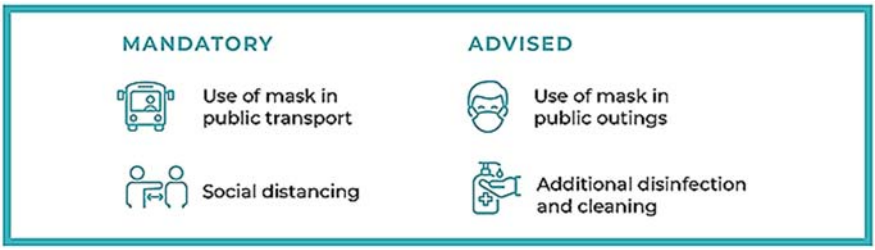
22 September 2020, Tuesday (20:00-21:45). The Welcome Cocktail will take place in the *Holiday Inn Porto Gaia* hotel's lobby. Do not miss this opportunity to say the first "hello" to attendees and committee members.

Please do not forget to collect your badge (ID tag) at the registration desk before the Welcome Cocktail. The registration desk will be opened in the *Holiday Inn Porto Gaia* hotel's lobby from 20:00 to 20:30.

Gala Dinner

24 September 2020, Thursday (20:00-22:30). The Gala Dinner will take place in the *Holiday Inn Porto Gaia* hotel.

Travel Measures in Portugal due to COVID-19



https://reopen.europa.eu/en/map/PRT

Keynote Speakers

Prof., Dr. Carlo Massaroni
Università Campus Bio-Medico di Roma, Italy

Wearable Sensors and Unobtrusive Technologies for Biomedical Applications *

Abstract

Wearable and unobtrusive monitoring systems are rapidly evolving and used in the biomedical field, from patient vital signs monitoring, to exercise activity tracking and performance assessment. With the emerging of miniaturized and cost-effective sensors, contact-based and contact-less vital sign sensing is enabling a wide range of potential applications from remote healthcare and home patient monitoring to cardiovascular monitoring and stress prediction of workers and performances of athletes. This talk will cover some recent technological development in this field and discuss some significant challenges that need to be addressed.

Short Biography:

His research is focused on the design and test of soft sensors and wearable devices based on conductive elements and fiber optic sensors for vital signs monitoring and the development of contact-less technologies for remote physiological monitoring of patients and users. He serves as Chair of the TC *'Wearable Sensors*' of the IEEE Sensors Chapter Council Italy Section, and he is Member of TC *'Wearable Biomedical Sensors and Systems*' and *'Biomedical Imaging and Image Processing*' of the IEEE EMB. He is a member of the editorial boards of MDPI *Sensors* and *Frontiers in Digital Health*, Guest Editor of several special issues in the field of sensors for biomedical applications, and he serves as TCP members and Chair in several international Conferences. Prof. Carlo Massaroni is IEEE Member, IEEE EMBS, IEEE IMS.

* This keynote presentation is technically sponsored by the Italy Chapter of the IEEE Sensors Council

Prof. José Miguel Dias Pereira
Polytechnic Institute of Setúbal, Portugal

Industrial Measurements, Communications and Protocols

Abstract

The presentation pretends to make a link between the past and the future of Industrial Measurements, Communications and Protocols, and includes two main parts. The first part focuses several topics that are related with the measurement of electrical and non-electrical quantities and the second part includes a summary of the main protocols that are used in instrumentation and control (I&C) networks. In the end of the presentation, the audience should understand the main challenges associated with industrial measurement, identify the main characteristics of I&C protocols that are used in industrial networks, as well as, the requirements that must be considered to choice the right instrumentation and measurement solution, in terms of performance and cost, for a specific industrial measurement application.

Short Biography:

J. M. Dias Pereira was born in Portugal in 1959. He received his degrees in Electrical Engineering from the Instituto Superiaor Técnico (IST) of the Technical University of Lisbon in 1982. In 1995 he received the MSc degree, in 1999 – PhD degree, and in 2008 he was approved by unanimity in the Aggregation proofs. All the academic degrees the he obtained are in the area of Electrical Engineering and Computer Science and sub-area of Instrumentation and Measurements. Dr. Pereira is the Principal Coordinator Professor of the Polytechnic Institute of Setúbal, Portugal. He has published over 220 articles in journals and conference proceedings, 1 book and 14 book chapters, and is a co-inventor of 3 patents. He gives its best contribution to IEEE as an author, reviewer, in the past, as co-editor-in-Chief of *IEEE Instrumentation & Measurement* magazine and nowadays as an Associated Editor of *IEEE Transactions on Instrumentation and Measurements*.

Dr. Radislav A. Potyrailo
Principal Scientist
GE Global Research Center, Niskayuna, NY, USA

Contemporary Impedance Sensors: Extraordinary Performance Boost by Cross-Pollination Between Electronics and Mathematics

Abstract

Diagnostics of viral infections from breath, outdoor and indoor air quality, industrial safety, homeland security – are some examples of unmet gas monitoring needs. These and other application scenarios push the limits of existing detection concepts where we may reach their fundamental performance limits. This talk will stimulate your senses by (1) posing fundamental questions on principles of gas sensing and (2) by demonstrating on how modern multidisciplinary research addresses these questions by building sensors with previously unthinkable capabilities. We will present new sensor-design criteria that allow high sensor stability and multi-gas detection with individual sensors. We will analyze our approach to boost performance of the most popular gas sensors – semiconducting metal oxide (SMOX) chemiresistors. Our simple excitation scheme based on contemporary electronics brought highly desired features such as linear sensor response ($R^2 > 0.99$), dynamic range of six decades of gas concentrations, 50-fold improvement in the limit of detection, and cancelled effects from ambient temperature over - 25 to 50 ^oC. We lab-tested our excitation scheme with numerous volatiles and did field validations in wireless sensor network, drone-based, and wearable formats. We will conclude with a perspective for future needs and with the 2050 roadmap for ubiquitous gas monitoring.

Short Biography:

Dr. Radislav Potyrailo is a Principal Scientist at *GE Global Research* in Niskayuna, New York, leading the growth of wireless, wearable, and harsh environment sensing technologies for GE applications. He holds Optoelectronics degree from Kiev Polytechnic Institute and PhD in Analytical Chemistry from *Indiana University*. He has developed sensing technologies for GE Healthcare, Water, Security, Corporate Environmental, Consumer & Industrial, Energy, Transportation, and

other GE businesses. Radislav has been serving as a Project Leader on numerous GE programs and as a Principal Investigator on US Government programs. He has 100+ granted US Patents and 150+ publications, coauthored/coedited eight books, and serves as an editor of the *Springer* book series Integrated Analytical Systems. Dr. Potyrailo is Senior Member of IEEE and Fellow of SPIE.

Conferences' web sites:

http://www.seia-conference.com
&
http://www.iftc-conference.com

Sponsors and Media Partners:

IFSA Publishing

sensors
an Open Access Journal by MDPI

SMC Soft Measurement and Computing
Scientific journal

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Programme at Glance

Day 1: 23 September 2020, Wednesday

Time/Date	23.09.2020 Wednesday
	Conference Room Pocinho
8:45-9:00	Registration
9:00-9:15	Opening Session *
9:15-10:00	Keynote Speaker I Carlo Massaroni **Wearable Sensors and Unobtrusive Technologies for Biomedical Applications** *(Università Campus Bio-Medico di Roma, Italy)*
10:00-10:30	*Coffee Break*
10:30-12:30	Regular Session: **Gas Sensors and Air Quality Monitoring**
12:30-13:30	*Lunch*
13:30-14:15	Keynote Speaker II Radislav A. Potyrailo **Contemporary Impedance Sensors: Extraordinary Performance Boost by Cross-Pollination Between Electronics and Mathematics** *(GE, USA)*
14:15-16:30	Virtual Session (7 papers): **Chemical and Physical Sensors**
16:30-17:00	*Coffee Break*
17:00-19:00	Regular Session: **Sensor Polymer Materials and Biosensors**

* Must attend session.

Day 2: 24 September 2020, Thursday

Time/Date	24.09.2020 Thursday
	Conference Room Pocinho
8:45-9:00	Registration
9:00-9:15	Daily Notices *
9:15-10:00	Keynote Speaker III Jose Miguel Dias Pereira **Industrial Measurements, Communications and Protocols** *(Polytechnic Institute of Sebutal, Portugal)*
10:00-10:30	*Coffee Break*
10:30-12:30	Regular Session: **Sensor Systems and its Applications**
12:30-13:30	*Lunch*
13:30-15:30	Regular Session: **Temperature and Magnetic Sensors**
15:30-16:00	*Coffee Break*
16:00-18:00	Regular Session: **Sensors Applications**
20:00-23:00	*Gala Dinner*

* Must attend session.

Day 3: 25 September 2020, Friday

Time/Date	25.09.2020 Friday
	Conference Room Pocinho
8:45-9:00	Registration
9:00-11:00	IFTC Session: **Frequency & Time**
11:00-12:30	*Coffee Break & Poster Session* *(Conference Room Pocinho)*
12:30-13:00	Closing Session *

* Must attend session.

Technical Conference Programme

Day 1
23 September 2020, Wednesday

Regular Session: Gas Sensors & Air Quality Monitoring
(Room *Pocinho*):

Chairman: Dr. José Ribeiro
(University of Porto, Portugal)

1. **Development of quartz crystal microbalance based sensor for real-time ozone monitoring** (virtual presentation)
   Marianne Guillemot, Christel Ravera, Blandine Castel and Christelle Ghazaly and Eddy Langlois *(France)*

2. **Beehive air measurements using E-nose – practical aspects** (video presentation)
   A. Szczurek, M. Maciejewska *(Poland)*

3. **Detection and discrimination of formaldehyde with CuO/SnO_2 dual layers MOS gas sensors operated with a pulsed temperature modulation**
   Aymen Sendi, Pierre Fau, Katia Fajerwerg, Myrtil L. Kahn and Philippe Menini *(France)*

4. **Graphene-loaded tin oxide nanofibers for low temperature detection of air pollutants**
   Sergio Masa, Esther Hontañón and Diego Robés *(Spain)*

5. **Comparison of a low-cost system based on electrochemical and optical sensors for air quality monitoring against reference methods**
   Patricia Arroyo, Félix Meléndez, Sergio Rodríguez, José Ignacio Suárez, Selena Carretero, María Cerrato, Eduardo Pinilla-Gil and Jesus Lozano *(Spain)*

6. **Calibration of a low cost sensor for PM2.5 using a reference PM monitoring station** (Video presentation)
   Mariana R. Villarim, Douglas De F. Medeiros, Cleonilson P. de Souza, Larissa C. De S. Medeiros, Márcia H. Pontieri, Nataly A. dos Santos and Orlando Baiocchi *(Brazil, USA)*

Virtual Session: Chemical and Physical Sensors

(Room *Pocinho*):

Chairman: Dr. Sergey Y. Yurish
(International Frequency Sensor Association (IFSA), Barcelona, Spain)

1. **Hydrogen peroxide vapor sensor based on zinc oxide**
   Vladimir Aroutiounian, Mikayel Aleksanyan, Valeri Arakelyan, Gohar Shahnazaryan and Gevorg Shahkhatuni *(Armenia)*

2. **Quick fabrication of integrated sensor interface by inkjet printing of logic gates and graphene inks**
   Reza Kamali-Sarvestani *(USA)*

3. **High energy photo-neutron interrogation of uranium with tensioned metastable fluid detectors**
   Nathan Boyle, Brian Archambault and Rusi Taleyarkhan *(USA)*

4. **Novel, VOC-free-renewable solid-state biopolymer detector for mid-to-extreme radiation field monitoring**
   Rusi Taleyarkhan, Nathan Boyle and Alexander Bakken *(USA)*

5. **Modelling of photoresponse components induced by laser pulse across a p-n junction**
   Steponas Ašmontas, Aurimas Čerškus, Jonas Gradauskas, Oleksand Masalskyi, Aldis Šilėnas, Algirdas Sužiedėlis and Ovidijus Žalys *(Lithuania)*

6. **Sensitive planar microwave diodes on the base of ternary AlxGa1-xAs semiconductor compounds**
   Maksimas Anbinderis, Algirdas Sužiedelis, Steponas Ašmontas, Jonas Gradauskas, Aldis Šilėnas, Andžej Lučum and Aurimas Čerškus *(Lithuania)*

7. **A miniature multi-sensor system and it's application in a condition monitoring**
   Mathias Rollett, Ernst-Johann Theussl, Paul O'Leary, Robert Fruhmann and Björn Ellensohn *(Austria)*

Regular Session: Sensor Polymer Materials and Biosensors

(Room *Pocinho*):

Chairman: Dr. Sergey Y. Yurish
(International Frequency Sensor Association (IFSA), Barcelona, Spain)

1. **Multifunctional carbon fiber reinforced polymer composite structures: reinforcing and sensing** (virtual presentation)
   Norbert Forintos and Tibor Czigany *(Hungary)*

2. **Evaluation of electrochromic properties of polypyrrole films modified by phenothiazine derivatives** *(Video presentation)*
   Raimonda Bogužaitė, Vilma Ratautaitė, Lina Mikoliūnaitė and Arūnas Ramanavičius *(Lithuania)*

3. **Insights to electrochemical polymerization conditions effect to electrochromic properties of polypyrrole** *(Video presentation)*
   Vilma Ratautaite, Gintautas Bagdziunas, Almira Ramanaviciene and Arunas Ramanavicius *(Lithuania)*

4. **eSPR: new tool for screening cancer**
   José A. Ribeiro and Carlos M. Pereira *(Portugal)*

5. **Dengue virus serotype detection using cell-free system based biosensor** *(Video presentation)*
   Rooge Suvanasuthi, Sarin Chimnaronk and Chamras Promptmas *(Thailand)*

6. **Application of low-cost pulse radar for heart rate detection in vehicle interior** *(Video presentation)*
   Lucas Broto, Maria Okimoto, Marta Cocron and Alessandro Zimmer *(Germany, Brazil)*

Day 2
24 September 2020, Thursday

Regular Session: Sensor Systems and its Applications
(Room *Pocinho*):

Chairman: Prof., Dr. Manuela Vieira
(ISEL-CTS-UNINOVA, Lisbon, Portugal)

1. **A LVDT based system with SW synchronous detection capabilities**
   Artur Graxinha and José Dias Pereira *(Portugal)*

2. **Automated integration of electronics in smart textiles using ultrasonic soldering**
   Sebastian Micus, Ivan Kirsten, Michael Haupt and Götz Gresser *(Germany)*

3. **Estimation of attenuation coefficients from simulated B-mode ultrasound images and tissue mimicking materials**
   (Video presentation)
   Dinah Brandner, Xiran Cai, Josquin Foiret, Katherine W. Ferrara and Bernhard G. Zagar *(Austria, USA)*

4. **A review on detection of particulate matter using the new developed camera-based optical sensor materials**
   (Video presentation)
   Sama Molaie and Paolo Lino *(Italy)*

5. **Data slicing model proposals for low-availability smart metering equipment** *(Video presentation)*
   Paul-Onut Negirla and Ioan Silea *(Romania)*

6. **Determination of best feature combination for healthcare monitoring system based on evaluation via four distinct machine learning-based methods of analysis** *(Video presentation)*
   Yasutaka Uchida, Tomoko Funayam and Yoshiaki Kogure *(Japan)*

Regular Session: Temperature and Magnetic Sensors,
(Room *Pocinho*):

Chairman: Dr. Pedro V. Mauri
(Instituto Madrileño de Investigación y Desarrollo Rural, Agrario y Alimentario (IMIDRA), Spain)

1. **Intrinsically non-overfitting, nonlinear multivariate calibration: Application to thermocouples**
   Luis Rodrigues, Jorge Ferreira, Fernando Neto da Silva and Nelson Martins *(Portugal)*

2. **Proposal of a reconfigurable sensor for measuring temperature and capacitance** (Video presentation)
   Pedro Carvalahes-Dias, Juan Monsalve-Diaz, Flavio Morais, Adelson dos Santos, Paula Larissa Dias and Jose Siqueira Dias *(Brazil)*

3. **Sensor fusion for accurate human body temperature measurement at a distance** (Video presentation)
   Paul Negirla, Petru Radu and Valentin Suta *(Romania)*

4. **Model based signal processing for angle measurement with a magnetoresistive sensor array** (Video presentation)
   Thorben Schüthe, Oleg Petrak and Karl-Ragmar Riemschneider *(Germany)*

5. **Optimizing a non-contacting high-sensitivity GMR-based current sensor design for low field applications**
   Cristian Leonard Mușuroi, Marius Volmer and Mihai Oproiu *(Romania)*

6. **High sensitivity digital magnetic sensor based on Giant Magneto Impedance** (Video presentation)
   Papa Silly Traore, Aktham Asfour, Pape Abdoulaye Fam and Jean Paul Yonnet *(Senegal, France)*

Regular Session: Sensors Applications

(Room *Pocinho*):

Chairman: Dr. Miguel Fernandes
(ISEL/IPL, Portugal)

1. **3-D indoor wayfinding in large environments using visible light communication**
   Manuela Vieira, Manuel Vieira, Pedro Vieira and Paula Louro *(Portugal)*

2. **Redesign of the vehicle trajectory inside an intersection using visible light communication**
   Manuel Augusto Vieira, Manuela Vieira, Paula Louro and Pedro Vieira *(Portugal)*

3. **Indoor navigation based on visible light communication using an a-SiC:H photodetector**
   Paula Louro, Manuela Vieira and Manuel Augusto Vieira *(Portugal)*

4. **R-testbench: a Python library for instruments remote control and electronic test bench automation** (Video presentation)
   Alexandre Quenon, Evelyne Daubie, Véronique Moeyaert and Fortunato Carlos Dualibe *(Belgium)*

5. **Research on a feature value extraction method using photoacoustic imaging to evaluate predictive maintenance on blood clotting in an extracorporeal circuit** (Video presentation)
   Takahiro Wabe, Yasutaka Uchida and Ryo Suzuki *(Japan)*

6. **Nitrogen, phosphorous and potassium detection in soil using MEMS sensor** (Video presentation)
   Akhil Nair and Alok Verma *(India)*

Day 3
25 September 2020, Friday

IFTC Session: Frequency & Time
(Room *Pocinho*):

Chairman: Dr. Sergey Y. Yurish
(International Frequency Sensor Association (IFSA), Barcelona, Spain)

1. **Hardware implementation and test of a verification system for time-signals and –telegrams** (Online presentation)
   Christoph Ruland and Matthias Schneider *(Germany)*

2. **Opto-galvanic spectroscopy of Kr 84 / Ne transitions in the range of 1270 nm– 1640 nm for use as optical wavelength standards** (Online presentation)
   Ulrich Fischer-Hirchert and Michael Schröder *(Germany)*

3. **Precise frequency and time transfer for square kilometre array** (Video presentation)
   Aniket Hendre *(UK)*

4. **Attenuation of acoustic waves in $LiTaO_3$ crystals** (Video presentation)
   Farkhad Akhmedzhanov, Sirojiddin Mirzaev, Jakhongir Kurbanov and Jamoliddin Nazarov *(Uzbekistan)*

5. **Design of a 4.2 GHz SMR filter for space applications: methodology and practical implementation** (Video presentation)
   Alexandre Clairet, Denis Mercier, Thierry Claret, Florent Bernard, Jaione Galdeano, Emilie Courjon, Thierry Laroche, Christophe Billard and Sylvain Ballandras *(France)*

6. **Evaluation of the performance of optical particle counter for detection of the exhaust particle emission**
   Sama Molaie and Paolo Lino (Italy)

Poster Session (Room *Pocinho*)
25 September 2020

1. **Planar Hall Effect sensors for low field detection and lab on a chip applications**
   Marius Volmer, Marioara Avram, Mihai-Petre Oproiu, Cristian Leonard Mușuroi, Ioana Firastrau and Adrian Bezergheanu *(Romania)*

2. **Automated setup for Van der Pauw resistivity and Hall measurements**
   M. Fernandes, Y. Vygranenko, A. Fantoni and M. Vieira *(Portugal)*

3. **The use of sensors to measure soil moisture, plant temperature and vegetation index for turfgrass vigor evaluation**
   Pedro Vicente Mauri Ablanque, JosÉ Marin Peira, Lorena Parra Boronat, Gregorio De La Horra and Salima Yousfi *(Spain)*

4. **Reference energy measuring system for on-board calibration of EMS installed in locomotives**
   Fernando Garnacho and Jorge Rovira *(Spain)*

5. **Lectin biosensors for the selective detection of cancer glycobiomarkers**
   Luísa Silva *(Mexico)*

6. **Optical design approach of a fully integrated miniature spectrometer**
   Matthias Haupt and Ulrich H.P. Fischer-Hirchert *(Germany)*

7. **Backscattering by closely spaced scatterers using the K matrix data from an active array of N transceivers**
   Necula Stan Maria, Bibicu Dorin and Moraru Luminita *(Romania)*

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