

Chairman's Welcome Message

Encouraging the active scientific dialogue between specialists in the field of Impedance Spectroscopy from different backgrounds and fields of science and technology is the aspired aim of the international workshop on impedance spectroscopy (IWIS).

Scientists working in different fields of research, such as electro chemistry, material science, biology and medicine, electronics and sensors meet together and present recent developments and findings. Tutorials give a good overview of special basics all around the method and make this challenging measurement method better accessible. An exhibition informs about the latest news concerning measurement equipment and devices. These are the main components of this annual international workshop taking place at Chemnitz University of Technology.

The IWIS workshop has established itself as a platform for promoting experience exchange and networking in the scientific and industrial field. In its fifth edition the IWIS workshop includes almost fifty contributions from 12 countries in eleven sessions, four plenary talks and seven tutorials. Selected contributions from the workshop are published within the book series Lecture Notes on Impedance Spectroscopy by Taylor & Francis. The series aims to highlight new advances and presents different approaches in dealing with impedance spectroscopy including modeling, measurement and applications.

We thank all contributors for the interesting contributions, for confidence and for promoting the scientific exchange all around impedance spectroscopy.

The organization of the workshop has requested a considerable effort of the organizing team from the chair for measurement and sensor technology which makes it possible to organize this international event actually within Chemnitz University of Technology. Additionally the Workshop was co-organized by the Chemnitz School of Metrology (CSMe.V.).

We thank the IEEE Instrumentation and Measurement Chapter Germany for the technical support of the event. We would also like to thank the IEEE Instrumentation and Measurement society for providing us the opportunity of a talk of Mr. Y. Wang as distinguished lecturer.

We would like to thank you for choosing IWIS 2012 and for coming to Chemnitz!

Prof. Olfa Kanoun
General Chair

IWIS 2012 Organizers

General Chair

Olfa Kanoun

Honory Chair

H.-R. Tränkler

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General Information

The City of Chemnitz

Chemnitz, more than 800 years old, is situated in the heart of Saxony. The city is the third-largest in Saxony and is designated as "City of Modernity". Developed at the time of Classical Modernism, it became the "Manchester on Saxony", giving impulses to the development of business and science. The influences of the cultural and architectural Modernism are visible so that Chemnitz is today city with many interesting facets. Fascinating architecture reflects the changing times and spirit of those things which have shaped the city: industrial monuments, redeveloped Gründerzeit residential quarters such as Kassberg, Villa Esche or the city centre, which has been completely modified since reunification, constructed by Helmut Jahn, Hans Kollhoff and Christoph Ingenhoven, bridge the gap from yesterday to today and to tomorrow.



Bars & Restaurants

If you want to spend one evening in the nice city-center of Chemnitz, there is a couple of nice bars and restaurants around. You may want to try the following:

Don – Jakobikirchplatz 4, www.don-chemnitz.de
Tillmanns – Brückenstraße 17, www.tillmanns-chemnitz.de
Turm Brauhaus – Neumarkt 2, www.turmbrauhaus.de
La Bouchée – Innere Klosterstraße 9, www.la-bouchee.de
Buono – Theaterstraße 7, www.bouno-chemnitz.de
Henrics – Theaterstraße 11, www.henrics-lounge.de
Janssen – Schloßstraße 12, www.janssen-restaurant.de
Brazil – Innere Klosterstraße 10, www.restaurant-brazil.de
Café Moskau – Straße der Nationen 56, www.cafemoskau-chemnitz.de
Diebels Fasskeller – An der Markthalle 3, www.fasskeller.de
Ratskeller – Markt 1, www.ratskeller-chemnitz.de
Bar Mozart – Strasse der Nationen 56, www.mozartbar-chemnitz.de
Esperanto – Carolastraße 7, www.esperanto-network.de
Maroon – Ulmenstraße 16, www.maroon-bar.de
City Pub – Brückenstraße 17, www.tower-pub.de
Schalom Restaurant – Carolastraße 5, www.schalom-chemnitz.de

Conference Venue

The International Workshop on Impedance Spectroscopy will take place at the Campus of Chemnitz University of Technology. You can find it at:

Chemnitz University of Technology
Neues Hörsaal und Seminargebäude
Room N113
Reichenhainer Straße 90
09126 Chemnitz

Social Event – Fire and Water

16:15-21:30

After the last lecture on Wednesday a bus is waiting at 16:10 for the ones who want to take part in the trip to the browncoal mining area south of Leipzig.

We will have insigth into opencast browncoal mining, the land rehabilitation after closing of the mines up to their current use as „Neuseenland“ after flooding the open pits.

At 17:15 we will visit the first station, the active mine „Vereinigtes Schleenhain“. At the viewing point we will get an idea of the dimensions of the mine, we will see four bucket-wheel excavators doing their job excavating

up to ten million metric tons brown coal each year. Passing power plant Lippendorf we move further to visit Cape Zwenkau. It is embedded in the beautiful countryside that was build around the flooded open pits.



Neuseenland (©Landkreis Leipzig)

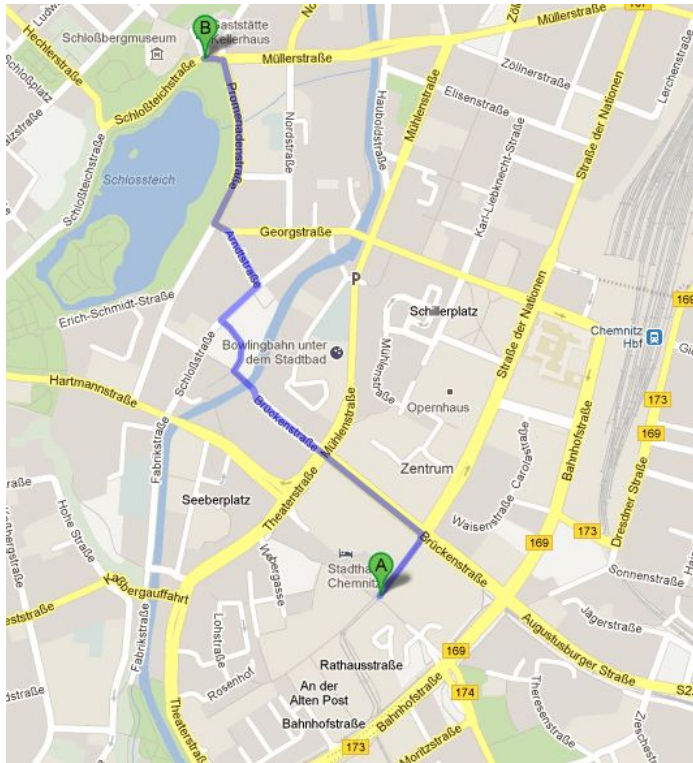
At 18:15 we will have a one hour boat trip giving us a another view one the history of mining in the area from the past up to the new recreation area that arose from the unused mining areas. On the boat we'll have a nice buffet for dinner that we'll proceed at the harbor. At 20:30 our bus is going back home to Chemnitz.

Special Dinner – „Miramar - vom Schloßberg“

19:30 - 23:00

The Special Dinner will be held at the „balcony“ of Chemnitz at restaurant „Miramar“. In the park with its old chestnut and lime trees next to the Chemnitz castle we will enjoy a wonderful mediterranean buffet. From there we'll also have a wonderful view over the Schloßberg area and Chemnitz at night.

The restaurant Miramar can be reached from the city center by a 20 minutes walk through the city: The buffet and water is included into the conference fee, all other beverages must be paid by yourself.



Way from city center to restaurant Miramar

Travel to Chemnitz

You can reach Chemnitz University of Technology via car and train.

By Car from Autobahn A72:

- Take the motorway exit 'Chemnitz Süd'
- Use B173 / Neefestraße direction 'Stadtzentrum'
- After 1 km turn right on the B169 / 'Südtring'
- After 5.5 km use exit 'Reichenhainer Straße' direction 'Technische Universität'
- You'll reach campus after 1.5 km, the conference venue is on the left side

By Car from Autobahn A4:

- Take the motorway exit 'Chemnitz Mitte'
- Use B95 and go straight ahead until B95 turns left - don't turn left

- Go ahead on 'Gustav Freytag Straße' and turn right at the 'Reichenhainer Straße'
- After 1.3 km you'll reach campus, the conference venue is on the right side

By train:

- Get off at Chemnitz central station and use tram 6 or 522 direction 'Zentralhaltestelle'
- Get off the tram at Station 'Roter Turm'
- Use Bus 51 direction 'Altchemnitz' or 'Reichenhain'
- Get off at 'TU Campus Reichenhainer Straße'

Airport:

- The next nearby Airports are Dresden and Leipzig
 - From airport Dresden go A4 direction Chemnitz/Erfurt.
 - From airport Leipzig-Halle go on A14 direction Dresden, at 'Dreieck Nossen'
- go on A4 direction Chemnitz/Erfurt. Proceed as described above.

Taxi

If you need a taxi in Chemnitz call: +49 371 369 000

Getting Around in Chemnitz

All buses and trams in Chemnitz meet at the Central Bus Station ('Zentralhaltestelle').

Information about public transport and timetables you can find here:

www.cvag.de

www.opnvkarte.de

Getting from the Hotel Mercure to the university:

Take a 5 to 10 minute walk to the bus station 'Roter Turm', closely located to the hotel Mercure and take the bus line 51 or E51 into direction 'Chemnitz, Altchemnitz' or 'Chemnitz, Reichenhain'. The station at the university is named 'TU Campus' and is directly in front of the entrance to the university.

Internet Access

During the event wireless network is available at the campus site. Please use the following registration information to login:

Network name – special

WPA key – IS12-mst

If you have problems connecting to the network please ask organizers for help.



Map of City Centre

Exhibition

During the workshop the following exhibitors will be present:



Agilent Technologies

AMETEK®

BELLTEC Ing. Büro Glocke
Messtechnik für Forschung und Industrie

GAMEC

Analysentechnik

 **scio
spec**
scientific instruments

Vötsch Industrietechnik

ZAHNER MESSYSTEME

Program

Wednesday, September 26th, 2012

The workshop takes place in the central lecture hall room N113.

8:00 - 8:30 **Registration**

8:30 - 9:20 **Tutorial 1**

Fundamentals of electrochemistry
Abram Krebs, Gamry Instruments

9:30 - 10:20 **Tutorial 2**

Properties of coatings from the point of view of EIS
Werner Strunz, ZAHNER-Elektrik

10:30 - 11:20 **Tutorial 3**

Local Electrochemical Impedance Spectroscopy
I. Frateur, Université Pierre et Marie Curie, France

11:30 - 12:20 **Tutorial 4**

Modeling of Impedance Spectra
Uwe Tröltzsch, Chemnitz University of Technology

10:30 - 11:20 **Lunchbreak**

13:20 - 14:10 **Tutorial 5**

Nonlinear parameter estimation
Paul Büschel, Chemnitz University of Technology

14:20 - 15:10 **Tutorial 6**

Electronics and Signals in Impedance Measurements
Prof. M. Min, Tallinn University of Technology

15:20 - 16:10 **Tutorial 7**

Impedance measurement methods from DC to THz
B. Schweiger, Agilent Technologies

16:20 **Social program**

Thursday, September 27th, 2012

8:00 - 8:30 **Registration**

8:30 - 8:45 **Opening**

8:45 - 9:30 **Plenary Talk** - Impedance Studies And Modelling Of Solid Oxide Fuel Cells (SOFC); *Ellen Ivers-Tiffée, Dino Klotz, Andre Weber*

Session 1a - Batteries 1 Chair: Ellen Ivers-Tiffée

9:30 - 10:30 Use Of Electrochemical Impedance Spectroscopy And In-situ XRD For Characterization Of Cathodes For Li-sulfur Batteries; *Norbert Wagner, Natalia Cañas, Kei Hirose, Andreas Kaspar Friedrich*

Fractional Identification Of The State Of Charge Of A Li-ion Battery Cell; *Marius Eckert, Cheng-Nian Xiao, Sören Hohmann*

Determination Of The Distribution Of Relaxation Times; *Paul Büschel, Sebastian Bergt, Thomas Günther, Uwe Tröltzsch, Olfa Kanoun*

Session 1b - Bioimpedance 1 Chair: Jörg Himmel

9:30 - 10:30 System For Bioimpedance Signal Simulation From Pulsating Blood Flow In Tissues; *Rauno Gordon, Ksenija Pesti*

Impedance Spectroscopy Study Of Healthy And Atelectatic Lung Segments Of Mini Pigs; *Susana Aguiar Santos Michael Czaplík, Steffen Leonhardt*

Evaluation Of A Swine Model For Impedance Cardiography - A Feasibility Study; *Mark Ulbrich, Sören Weyer, Jens Mühlsteff, Marian Walter, Steffen Leonhardt*

10:30 - 11:00 **Coffee Break, Exhibition**

Session 2a - Batteries 2 Chair: Norbert Wagner

11:00 - 12:20 Application Of The Electrothermal Impedance Spectroscopy To A Li-ion Pouch Cell; *Jan Philipp Schmidt, Michael Dippon, André Weber, Ellen Ivers-Tiffée*

Method For Parameterization Of Impedance-based Models With Time Domain Data Sets; *Meike Slocinski*

Understanding The Impedance Of 18650 Cells By Experimental Cell Measurements; *Jörg Illig, Jan Philipp Schmidt, Michael Weiss; André Weber; Ellen Ivers-Tiffée*

State Space Model For The Simulation Of The Nonlinear, Fractional Behaviour Of Batteries; *Uwe Tröltzsch, Yanqun Fang, Paul Büschel, Kanoun Olfa*

Session 2b - Bioimpedance 2 Chair: Olfa Kanoun

11:00 - 12:20 Optimal Electrode Positions To Determine Bladder Volume By Bioimpedance Spectroscopy; *Thomas Schlebusch, S. Nienke, S. Leonhardt*

Using Electrical Impedance Spectroscopy For Position Resolved Characterization Of Bone Tissue; *Stefan Schaur, Gernot Kronreif, Bernhard Jakoby*

Comparison Of Microelectrode Sensing Configurations For Impedimetric Cell Monitoring; *Claudia Caviglia, Marco Carminati, Arto Heinskanen, Marco Vergani, Giorgio Ferrari, Marco Sampietro, Thomas Lars Andresen, Jenny Emnéus*

Influence Of A Sliding Contact On Impedance Monitoring In A Smart Surgical Milling Tool; *Christian Brendle, Steffen Leonhardt, Annegret Niesche, Alexander Korff, Klaus Radermacher*

12:20 - 13:20 **Lunch, Exhibition**

13:20 - 14:05 **Exhibitors Presentations**

14:05 - 14:20 **Short Break**

14:20 - 14:40 **Plenary Talk** - On The Quality Of Electrical Contacts Between Carbon Nano-tubes Or Nano-fibers In Composite-materials; *Rolf Pelster*

Session 3a - Dielectric properties of solids Chair: Wuqiang Yang

14:40 - 15:20 Optimization Of Hop Drying And Conditioning With An Electromagnetic Moisture Sensor; *Christof Hübner, Sebastian Heister, Tino Wagenknecht, Christian Euringer, Michael Friedl*

Analysis Of Coupled Hydraulic And Dielectric Material Properties Of Soils: A Multivariate Approach; *Norman Wagner, Frank Daschner, Alexander Scheuermann, Moritz Schwing*

Session 3b - Materials research Chair: A. Sezai Sarac

14:20 - 15:20 Studies Of Ortho-phenylenediamine Electropolymerization On Platinum Disk Microelectrode By Electrochemical Impedance Spectroscopy And Its Impedance Responses Toward Hydrogen Peroxide And Ascorbic Acid: *Aziah Ahmad Ariffin, Zainiharyati Mohd Zain, Mohd Zu Azhan Yahya*

AC Conductivity Studies Of Nanocrystalline Lithium Ferrite Doped With Bismuth And Lead Oxides; *Rajesh Cheruku, Lakshmi Vijayan, G. Govindraj*

Magnetocaloric Effects In Manganites With Perovskite Structure; *Abdelwaheb CheikhRouhoua, W. CheikhRouhou-Koubaa, M. Koubaa*

15:20 - 16:20 **Poster Session**

16:20 - 16:40 **Plenary Talk** - Electrical Capacitance Tomography For Imaging Industrial Processes; *Wuqiang Yang*

Session 4 - Dielectric properties of liquids Chair: Christof Hübner

16:40 - 17:40 Characterization Of Low-concentration Glucose/lactate Aqueous Mixtures Via Mm-waves; *Matthias Riedel*

Suspension Medium Conductivity - Measurement In Presence Of Cells Or Particles Using Microstructured Electrodes; *Ingo Tobehn, Thomas Frank, Arndt Steinke, Dieter Beckmann, Andreas Barthel, Uwe Pliquett*

Measurement Procedure For The Dynamic Determination Of Total Hardness Of Water During The Washing Process; *Roman Gruden, Daniel Sanchez, Olfa Kanoun*

19:30 - 23:00 **Special Dinner**

Friday, September 28th, 2012

8:30 - 9:15 **Plenary Talk** - Impedance Spectroscopy For Resonant Sensors - Challenges Behind The Scene; *Ralf Lucklum*

Session 5a - Magnetic phenomena Chair: Ralf Lucklum

9:15 - 10:35 Magnetic Field Topologies For Fast Impedance Mapping Of Biological Tissue; *Maral Heidary Dastjerdi, Olfa Kanoun, Dirk Rüter, Klaus Thelen, Jens Weidenmüller, Jörg Himmel*

Precise Eddy-current Measurements: Improving Accuracy Of Determining Of The Electrical Conductivity Of The Metal Plates; *Olev Märtens, Raul Land, Mart Min, Marek Rist, Rauno Gordon, Andrei Pokatilov*

Imaging Impedance Spectroscopy By High Resolving Multi Frequency Eddy Current Methods; *Henning Heuer*

Wireless Impedance Spectroscopy Of Open Loop Micro Coils Using Anti-Helmholtz Coil; *Adnan Yousaf, Leonhard Reindl*

Session 5b - Interfaces and coatings Chair: Rudolf Holze

- 9:15 - 10:35 Application Of The Dynamic Mode In Nanoimpedance Spectroscopy; *Artur Zielinski*
Impedance Measurements At Sol-gel-based Polysiloxane Coatings On Aluminium And Its Alloys; *A.A. Younis, W. Ensinger, R. Holze*
Electrochemical Impedance Spectroscopy Of Substituted Polythiophene Films; *A. Sezai Sarac*
The Determination Of The Critical-pigment-volume Concentration Using Relaxation Voltammetry; *Werner Strunz, Carl Albrecht Schiller, Jörg Vogelsang*

10:35 - 11:00 **Poster Session, Exhibition, Coffee Break**

Session 6 - Impedance data analysis Chair: Uwe Tröltzsch

- 11:00 - 12:20 Automated Wire Fault Location; *Qinghai Shi, Olfa Kanoun*
Development Of Hybrid Algorithms For EIS Data Fitting; *Alexander Bondarenko*
CASP, VASP: Non-linear Impedance Methods For The Determination Of Generalized Corrosion Rates; *Nicolas Murer, Jean-Paul Diard, Sébastien Benoît, Claude Montella*
Influence Of The Variation Of Fuzzy Algorithms Parameters On The Quality Of Hv Cable Insulation Properties Modeling Subjected To Thermal Aging; *L. Bessissa, L. Boukezzi, T. Zakaria, D. Mahi, A. Boubakeur*

12:20 - 13:20 **Lunch, Exhibition**

Session 7 - Measurement circuits Chair: Mart Min

- 13:20 - 14:40 A Nonlinear Impedance Normal; *Hannes Nordmann, Martin Kiel, Dirk Uwe Sauer*
A Comparison Of Different Current Sources For Multi-frequency Impedance Spectroscopy; *Xiaosha Zhao, Steffen Kaufmann, Martin Ryschka*
A High Accuracy Bioimpedance Measurement System; *Steffen Kaufmann, Gunther Ardel, Martin Ryschka*

Miniaturized Time Domain Reflectometer For Infrastructure Monitoring; *Dennis Trebbels, Christof Hübner, Franz Königer, Rainer Schuhmann*

14:40 - 14:55 **Closure**

14:55 **End of Conference**

Publications of the International Workshop on Impedance Spectroscopy:

O. Kanoun (Ed.): Lecture Notes on Impedance Spectroscopy: Measurement, Modeling and Applications, Vol. 3, ISBN 978-0-415-64430-3 (Hbk), ISBN 978-0-203-07512-8 (eBook), 2012

O. Kanoun (Ed.): Lecture Notes on Impedance Spectroscopy: Measurement, Modeling and Applications, Vol. 2, ISBN 978-0-415-69838-2 (Hbk), ISBN 978-0-203-13772-7 (eBook), 2011

O. Kanoun (Ed.): Lecture Notes on Impedance Spectroscopy: Measurement, Modeling and Applications, Vol. 1, ISBN 978-0-415-68405-7 (Hbk), ISBN 978-0-203-61075-6 (eBook), 2011

A book of the same series will be published based on selected contributions from the IWIS 2012.

Notes: _____
