

**40th INTERNATIONAL CONFERENCE
ON MICROELECTRONICS,
DEVICES AND MATERIALS**

and the WORKSHOP on
Non-ionizing Electromagnetic Fields
From Overvoltage, Overcurrent and
Electrostatic Discharge Protection to Bioeffects



Slovenia Section



Slovenia Chapter

CONFERENCE PROGRAM

September 29. - October 01. 2004
Maribor, SLOVENIA

MIDEM 2004 SHORT CONFERENCE PROGRAM

DAY/ HOUR	September 29 Wednesday	September 30 Thursday	October 01 Friday
9:00	OPENING	WORKSHOP ON NONIONIZING EM FIELDS Chairperson: B. Cvikl	SESSION ON OPTOELECTRONICS Chairperson: F. Smole
9:15	INVITED PAPER W. Reczek	G.Kovač V.Murko	Coffee Break
9:30	Chairperson: S. Amon	Coffee Break	SESSION ON THICK AND THIN FILMS Chairperson : D. Belavič
9:45	Coffee Break	WORKSHOP ON NONIONIZING EM FIELDS Chairperson: B. Cvikl	SESSION ON CERAMICS, METALS AND COMPOSITES Chairperson: M. Kosec
10:00	SESSION ON INTEGRATED CIRCUITS Chairperson: J. Trontelj	M. Kundi P. Gajsek T. Kotnik	CLOSING OF THE CONFERENCE
10:15	10:30		
10:45	SESSION ON ELECTRONICS Chairperson: M. Topič	LUNCH	LUNCH
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15:15	SESSION ON DEVICE PHYSICS Chairperson: S. Amon	WORKSHOP ON NONIONIZING EM FIELDS REGULAR SESSION Chairperson: I. Tičar	Janez Trontelj,, Faculty of Electrical Engineering, Ljubljana, Slovenia, chairperson
15:30		Coffee Break	Bruno Cvikl, Faculty of Civil Engineering, Maribor, Slovenia, cochairperson
15:45		WORKSHOP ON NONIONIZING EM FIELDS REGULAR SESSION Chairperson: I. Pompe	Marija Kosec, Jožef Stefan Institute, Ljubljana, Slovenia
16:00			Marko Hrovat, Jožef Stefan Institute, Ljubljana, Slovenia
16:15			Slavko Amon, Faculty of Electrical Engineering, Ljubljana, Slovenia
16:30			Marko Topič, Faculty of Electrical Engineering, Ljubljana, Slovenia
16:45			Cor Claeys, IMEC and KU Leuven, Belgium
17:00			Gerhard W. Herzog, Technische Universitaet, Graz, Austria
17:15	VISIT TO THE TECHNICAL MUSEUM FALA		Miloš Komac, Ministry of Education, Science and Sport, Republic of Slovenia
17:30			Helmut Stiebig, Institute of Photovoltaic, Jülich, Germany
17:45			Peter Panjan, Jožef Stefan Institute, Ljubljana, Slovenia
18:00			Stane Pejovnik, Faculty for Chemistry and Chemical Technology, Ljubljana, Slovenia
18:15			
18:30			
18:45			
19:00			
19:15			
19:30			
19:45			
20:00	VISIT TO VINAG WINE CELLAR	CONFERENCE DINNER HOTEL PIRAMIDA	
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ORGANIZER

MIDEM - Society for Microelectronics, Electronic Components and Materials

Dunajska 10, 1000 Ljubljana, SLOVENIA

CONFERENCE SPONSORS

Ministry of Education, Science and Sport of the Republic Slovenia

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IEEE, Slovenia Section

CONFERENCE PROGRAMME COMMITTEE

Janez Trontelj,, Faculty of Electrical Engineering,
Ljubljana, Slovenia, **chairperson**

Bruno Cvikl, Faculty of Civil Engineering,
Maribor, Slovenia, **cochairperson**

Marija Kosec, Jožef Stefan Institute, Ljubljana,
Slovenia

Marko Hrovat, Jožef Stefan Institute, Ljubljana,
Slovenia

Slavko Amon, Faculty of Electrical Engineering,
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Marko Topič, Faculty of Electrical Engineering,
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Slovenia

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Slovakia

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Poland

Zsolt Vitez, Technical University, Budapest,
Hungary

Monika Jenko, Institute for Metals and
Technology, Ljubljana, Slovenia

electronics, Devices and Materials, Ljubljana, Slovenia. These conferences have always attracted a large number of Slovene and foreign experts working in these fields, as well as attracted distinguished guest speakers. Once a year our scientists have the opportunity to present their activities and research results to domestic audience and to discuss news, trends and problems related to their fields of work with colleagues from abroad.

Forty-three papers and six invited presentations in six sessions and included workshop will be presented during three days from Wednesday to Friday. Sessions of the Conference are: Integrated Circuits; Electronics; Device Physics, Modelling and Technology; Workshop on Non-ionizing Electromagnetic Fields, Optoelectronics; Thick and Thin Films and Ceramics Metals and Composites.

Beginning in 1998, workshops dedicated to a special field were incorporated to the programme of the MIDEM Conferences. During the workshop, five to seven invited speakers present papers on the chosen topics from different aspects within their special field, thus offering the audience valuable information. Time for thorough discussions is provided between invited presentations. Conference attendees are encouraged to present their research results in the Conference session dealing with the dedicated topic. Attendance at the workshop is included in the Conference registration fee.

**This year the Workshop is on Non-ionizing Electromagnetic Fields:
From Overvoltage, Overcurrent and Electrostatic Discharge Protection
to Bioeffects**

CONFERENCE VENUE

The Conference is held from September 29th to October 1st, 2004, in Hotel Piramida, Maribor.

CONFERENCE PROCEEDINGS

Invited and accepted papers are published in the Conference Proceedings distributed at the Conference registration.

LANGUAGE

The official Conference language is English.

REGISTRATION

The registration fees are as follows:

- FULL registration fee: **250 EUR(*)**
- MIDEM Society members, MIDEM Sponsors: **200 EUR**

(*) full registration fee applies to non MIDEM society members only and includes a two year full MIDEM Society membership

The fee includes Conference Proceedings and free access to all Conference events (visit to the museum Fala, visit to the Vinag wine cellar and Conference dinner).

Accompanying persons who do not take part in the conference may join other conference events at an extra charge (visit to Vinag wine cellar: 15EUR, conference dinner: 30EUR, additional conference materials: 100 EUR)

Undergraduate students have free access to all Conference sessions on submitting their study papers. For other Conference events there will be an additional charge.

SOCIAL EVENTS

Do not miss the opportunity to visit Vinag wine cellar, organized for Wednesday, September 29th at 20:00.

As well, a guided visit to the museum Fala is organized for Wednesday, September 29th at 17:00.

The Conference dinner will be held on Thursday, September 30th at 20:00 in hotel Piramida.

ACCOMMODATION

There are several possibilities to find accommodation in Maribor.

However, we recommend hotel Piramida.

Please send your room reservations indicating "for MIDEM 2004 Conference", directly to:

Hotel PIRAMIDA
Ulica Heroja Šlandra 10
2000 Maribor
Phone: +386 (0)2 234 44 00
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Fax: +386 (0)2 234 43 60
E-mail: piramida@termemb. si

Programme and Organizing Committee, MIDEM 2004 Conference

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Conference Web page: <http://paris. fe. uni-lj. si/midem/conf2004/>

CONFERENCE ORGANIZING COMMITTEE

Igor Pompe, MIDEM, Ljubljana, Slovenia,
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Maribor, Slovenia

Igor Tičar, Faculty of Electrical Engineering and
Computer Science, Maribor, Slovenia

Dean Korošak, Faculty of Civil Engineering,
Maribor, Slovenia

Iztok Šorli, MIKROIKS d. o. o., Ljubljana,
Slovenia

GENERAL INFORMATION

The 40th International Conference on Microelectronics, DEvices and Materials, MIDEM 2004, continues the tradition of annual international conferences organized by the MIDEM, Society for Micro-

Contact person for the Workshop on Non-ionizing Electromagnetic Fields: From Overvoltage, Overcurrent and Electrostatic Discharge Protection to Bioeffects

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CONFERENCE PROGRAM

WEDNESDAY, SEPTEMBER 29

09:00 WELCOME AND OPENING CEREMONY

09:15 SESSION ON INTEGRATED CIRCUITS
CHAIRPERSON: S. Amon

09:15 INVITED PAPER

09:15 W. Reczek
An Insight View of Current Semiconductor Developments

10:00 COFFEE BREAK

10:15 SESSION ON INTEGRATED CIRCUITS
CHAIRPERSON: L. Trontelj

10:15 J. Goljevšček, D. Raič, D. Strle
Measurement System for Testing ASIC Circuit and Reading Data from ASIC in Real Time

10:30 D. Raič
Pipelined Accumulator Arrays

10:45 A. Sešek, J. Trontelj
Instrumentation Amplifier for Front-end Sensor Signal Processing

11:00 D. Strle
Offset and 1/f Noise Voltage Reduction Techniques

11:15 M. Maček
1/f Noise in Boron Doped Polycrystalline Silicon Resistors

11:30 SESSION ON ELECTRONICS

CHAIRPERSON: M. Topič

11:30 B. Glažar, M. Jankovec, M. Topič

Development of an Accelerometer-based Inclination Sensor

11:45 M. Možek, D. Vrtačnik, D. Resnik, U. Aljančič, M. Pavlin, S. Amon

Smart Pressure Sensor Calibration System

12:00 J. Podržaj, D. Strle

Ultra High Precision Temperature Measurement System using USB Interface

12:15 K. Baša, A. Žemva

Design and Implementation of USB to CAN Interface

12:30 F. Kopač, A. Trost, A. Žemva

Implementation of Adaptive Huffman Coding in MPEG Video Compression

12:45 LUNCH

14:45 SESSION ON DEVICE PHYSICS AND MODELLING

CHAIRPERSON: S. Amon

14:45 U. Merc, F. Smole, M. Topič

Differences Between Group and Tunneling Velocity and Impact on Coherent Electron Transport in Superlattices

15:00 D. Korošak, B. Cvikel

On the Role of the Interface Charge in Non-ideal Metal-semiconductor Contacts

15:15 M. Koželj, B. Cvikel, D. Korošak, R. Jecl

Investigation of Carrier Transport Dependence on Density of traps of ICB Deposited Organic Semiconductor Schottky Junctions

15:30 B. Cvikel, M. Koželj, D. Korošak, R. Jecl

The Effect of Organic Semiconductor Interface Charges and Interfacial Dipoles on Schottky Junctions C - U Electrical Characteristics

15:45 M. Koričić, P. Biljanović, T. Suligoj

Influence of the Charge Sharing Effect on BV_{CEO} vs f_T Trade-off Solution

16:00 M. Bizjak, J. Gasperič, A. Pregelj

Drying of Paper Capacitor Rolls

16:15 U. Aljančič, D. Resnik, D. Vrtačnik, M. Možek, S. Amon

Characterization of Silicon-glass Anodic Bonding

16:30 D. Lombardo, D. Vrtačnik, D. Križaj

Microstructures for Manipulation of Micro and Submicron Particles Using Dielectrophoresis

16:45 D. Korošak, J. Stepanić, D. Markučić, B. Cvikel

Non-conventionally Shaped Piezoelectrical Sensor Configuration for Restricted Characterization of Materials

17:00 VISIT TO THE TECHNICAL MUSEUM FALA

20:00 VISIT TO VINAG WINE CELLAR

THURSDAY, SEPTEMBER 30

09:00 WORKSHOP ON NON-IONIZING ELECTROMAGNETIC FIELDS

CHAIRPERSON: B. Cvikel

09:00 INVITED PAPER

G. Kovac
Basic EMC Phenomena and Worldwide EMC Regulation

09:45 INVITED PAPER

V. Murko
The New, Modern, Integrated Approach to an Effective, External and Internal, Lightning and Overvoltage Protection

10:30 COFFEE BREAK

10:45 WORKSHOP ON NON-IONIZING ELECTROMAGNETIC FIELDS

CHAIRPERSON: B. Cvikel

10:45 INVITED PAPER

M. Kundt
Biological and Health Relevant Effects from Exposure to High-frequency EMFs

11:30 INVITED PAPER

P. Gajšek
Electromagnetic Fields Dosimetry

12:15 INVITED PAPER**T. Kotnik**

Dielectric Power Dissipation in Biological Cells Exposed to RF Fields

13:00 LUNCH**14:45 WORKSHOP ON NON-IONIZING ELECTROMAGNETIC FIELDS**

CHAIRPERSON: I. Tičar

14:45 B. Štravš

Electromagnetic Compatibility (EMC) and Possibility to Suppress Radio Interface

15:00 M. Šegula

Some Practical Solutions in the Field of EMC on the Prepayment Electronic Energy Meter MT131

15:15 M. Martinjak, L. Filipič, J. Nastran

Transformer Leakage Inductance Influence on Conducted Emissions

15:30 J. Čurk

Recent Developments in Power System Protection

15:45 V. Murko

Lightning and Overvoltage Protection in Buildings: Comparison and Advantages of New Technical Solutions

16:00 COFFEE BREAK**16:30 WORKSHOP ON NON-IONIZING ELECTROMAGNETIC FIELDS**

CHAIRPERSON: I. Pompe

16:30 A. Pregelj, A. Pirih, A. Štagoj, M. Bizjak, V. Murko, F. Breclj

Pretentious Measurements of Self-extinguishing Performances at Gas Arrester Development

16:45 L. Filipič, M. Martinjak

The Role of Y Capacitor Placement in Switch Mode Power Supplies

17:00 G. Kovač, M. Marinč, M. Petrič

Feed Through Filtering Technology

17:15 A. Pirih, A. Pregelj

Contribution to Mathematical Modelling of Metal-oxide Surge Arresters Based on Exact Analysis of Parasitic Inductive Influences

17:30 S. Bernik, N. Daneu, A. Rečnik
Grain-growth Control in ZnO-based Varistor Ceramics**17:45 S. Bernik, J. Alič, A. Tavčar, M. Koprivšek, M. Cergolj**
A Novel Multifunctional Protection Element - Integrated Varistor**18:00 M. Koprivšek**
Switching Principles in Electrical Circuits and Use of New Materials**20:00 CONFERENCE DINNER - HOTEL PIRAMIDA****FRIDAY, OCTOBER 1****09:00 SESSION ON OPTOELECTRONICS**
CHAIRPERSON: F. Smole**09:00 M. Vukadinović, G. Agostinelli, D. Goldbach, Ruud E. I. Schropp, F. Smole, M. Topić**
Silicon Heterojunction Solar Cells: N-type Versus P-type Bulk Material**09:15 G. Černivec, M. Vukadinović, J. Krč, F. Smole, M. Topić**
Influence of Surface Recombination on Characteristics of CIGS Solar Cell**09:30 A. Žunič, M. Jankovec, D. Strle, F. Smole, M. Topić**
Noise Characterization of the I_f Converter in the optoASIC**09:45 D. Vrtačnik, D. Resnik, U. Aljančič, M. Možek, S. Amon**
Fabrication and Characterization of One-dimensional PSD**10:00 D. Resnik, U. Aljančič, D. Vrtačnik, M. Možek, S. Amon**
Monolithic Silicon Benches for Optical Fibre Alignment**10:15 COFFEE BREAK****10:30 SESSION ON THICK AND THIN FILMS**
CHAIRPERSON: D. Belavič**11:00 M. Hrovat, D. Belavič, J. Cilenšek, J. Holeček**
Thick Film Resistors with High Non-linear Resistivity vs. Temperature Characteristics**11:15 M. Hrovat, D. Belavič, J. Holeček, J. Cilenšek, L. Golonka, A. Dziedzic, J. Kita**
Preliminary Characterisation of PTC Thick Film Resistors on LTCC Substrates**11:30 M. Santo Zarnik, J. Gramc, J. Fajfar-Plut, D. Belavič, P. Svasta, C. Ionescu, Norocel-Dragos Codreanu, V. Golumbeanu**
A Thick-film Planar Transformer for a DC/DC Converter**11:15 SESSION ON CERAMICS, METALS AND COMPOSITES**
CHAIRPERSON: M. Kosec**11:15 G. Dražič, S. Novak, N. Daneu, K. Mejak, G. Vekinis**
Analytical Electron Microscopy of SiC Continuous-fibres / SiC-based Matrix Composite**11:30 A. Benčan, B. Malič, M. Kosec**
Characterization of Lanthanum Ruthenate as Electrode for Ferroelectric Thin Films Prepared by Solution Synthesis Technique**11:45 B. Malič, J. Bernard, D. Jenko, J. Holeček, M. Kosec, A. Barzegar, D. Damjanović**
Alkaline-earth Doped (K,Na)NbO₃ Ceramics**12:00 S. Bernik, S. Rustja, J. Zawadzka, K. Prociow, W. Mielcarek**
Preliminary Investigations of the Phases in the Ba-Bi-O System and the Influence of their Addition on the Characteristics of ZnO Ceramics**12:15 F. Koplan**
A Method for a Quick Measurement of the Thermal Dependence of the Magnetic Properties of Hard Magnetic Materials**12:30 CLOSING OF THE CONFERENCE**