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SLOVENSKÁ TECHNICKÁ  
UNIVERZITA V BRATISLAVE  
FAKULTA ELEKTROTECHNIKY  
A INFORMATIKY

# 2011



## INSTITUTE OF ELECTRONICS AND PHOTONICS

**ANNUAL REPORT**  
**SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA**

# INSTITUTE OF ELECTRONICS AND PHOTONICS

<http://www.fei.stuba.sk>



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## **Director of the Institute:** **prof. Ing. Daniel Donoval, DrSc.**

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## Departments of Institute of Electronics and Photonics

### **Electronic Devices**

Department chair: doc. Ing. Ladislav Harmatha, PhD.

### **Electronic Systems**

Department chair: prof. Ing. Alexander Šatka, PhD.

### **Integrated Circuit Design and Test**

Department chair: prof. Ing. Viera Stopjaková, PhD.

### **Optoelectronics and Laser Technique**

Department chair: prof. Ing. Jaroslav Kováč, PhD.

### **Sensors and Microsystem Technique**

Department chair: prof. Ing. Ivan Hotový, DrSc.

### **Surface, Interface and Nanostructure Analysis**

Department chair: doc. Ing. Jozef Liday, PhD.

### **Wireless Communication and Multimedia Technique**

Department chair: Ing. Vladimír Štofanič, PhD.

## I. STAFF

### **Professors:**

prof. Ing. Igor Baláž, DrSc. (Professor emeritus), prof. Ing. Juraj Breza, PhD., prof. Ing. Otto Csabay, DrSc. (Professor emeritus), prof. Ing. Daniel Donoval, DrSc., prof. Ing. Daniela Duračková, PhD., prof. Ing. Ivan Hotový, DrSc., prof. Ing. Jaroslav

Kováč, PhD., prof. Ing. Florián Makáň, PhD. (Professor emeritus), prof. Ing. Robert Redhammer, PhD., prof. Ing. Alexander Satka, PhD., prof. Ing. Viera Stopjaková, PhD., prof. RNDr. Vladimír Tvarožek, PhD., prof. Ing. František Uherek, PhD.

### Associate Professors:

doc. Ing. Peter Hajach, PhD., doc. Ing. Ladislav Harmatha, PhD., doc. Ing. Ján Hribík, PhD., doc. Ing. Ján Janík, PhD., doc. Ing. Ján Jakobovič, PhD., doc. Ing. Peter Kordoš, DSc., doc. Ing. Vladimír Kudják, PhD., doc. Ing. Peter Kulla, PhD., doc. Ing. Jozef Liday, PhD., doc. Ing. Oldřich Ondráček, PhD., doc. Ing. Peter Podhoranský, PhD., doc. Ing. Rudolf Smánek, PhD., doc. Ing. Ľubica Stuchlíková, PhD., doc. Ing. Martin Tomáška, PhD., doc. Ing. Marian Veselý, PhD., doc. Ing. Milan Žiška, PhD.

### Assistant Professors:

Ing. Zdenko Brezovič, PhD., Ing. Elena Cocherová, PhD., Ing. Martin Daříček, PhD., Ing. Miroslav Hagara, Ing. Zuzana Krajičková, PhD., Ing. Peter Kubinec, PhD., Ing. Marek Kukučka, PhD., Ing. Branislav Lojko, PhD., Ing. Fedor Mika, PhD., Ing. Marián Minárik, PhD., Ing. Jozef Petrek, PhD., Ing. Anna Pribilová, PhD., Ing. Jozef Púčík, PhD., Ing. Vladimír Štofanič, PhD., Ing. Erik Vavrinský, PhD.

### Senior Scientists:

Ing. Dalibor Búč, doc. Ing. Peter Fuchs, PhD., PhD., Ing. Magdaléna Kadlečíková, PhD., Ing. Juraj Racko, PhD., Ing. Jaroslava Škriniarová, PhD., doc. Ing. Bedřich Weber, PhD.

### Scientific Workers:

Ing. Peter Benko, PhD., Ing. Aleš Chvála, PhD., Ing. Soňa Flickyngerová, PhD., Ing. Martin Florovič, PhD., Ing. Lenka Gajdošová, PhD., Ing. Jaroslav Kováč, jr., PhD., Ing. Alexander Kromka, PhD., Ing. Libor Majer, PhD., Ing. Juraj Marek, PhD., Ing. Marián Marton, PhD., Ing. Ivan Novotný, PhD., RNDr. Vlastimil Řeháček, PhD., Ing. Marian Vojš, PhD.

### Research Workers:

Ing. Juraj Brenkuš, RNDr. Alena Grmanová, Ing. Milan Kempný, Ing. Jozef Mihálov, Ing. Miroslav Mikolášek, Ing. Peter Vogrinčíč

### Technical Staff:

Mgr. Michaela Balážová, Bohumil Frey, Jozef Ivan, Jozef Král, Bc. Ivana Prokopová, Gabriela Vránová

### PhD. Students:

Ing. Daniel Arbet, Ing. Jana Benková, Ing. Michal Blaho, Ing. Martin Boriš, Ing. Tomáš Brath, Ing. Marek Černý, Ing. Jaroslav Dzuba, Ing. Pavol Gašpierič, Ing. Gábor Gyepes, Ing. František Horínek, Ing. Juraj Hotový, Ing. Peter Horňák, Ing. Pavol Hronec, Ing. Ondrej Kádár, Ing. Peter Kalianko, Ing. Ivan Košč, Ing. Mário Kotlár, Ing. Mário Krajmer, Ing. Peter Kupec, Ing. Radovan Kurinec, Ing. Anton Kuzma, Ing. Filip Lazišťan, Ing. Pavol Michniak, Ing. Martin Mišun, Ing. Marián Molnár, Ing. Lukáš Nagy, Ing. Michal Nemeč, Ing. Peter Olšovský, Ing. Miroslav Petrák, Ing. Miroslav Petrus, Ing. Tibor Plecho, Ing. Martin Predanoc, Ing. Patrik Príbytný, Ing. Juraj Priesol, Ing. Karol Rendek, Ing. Jakub Rybár, Ing. Ivan Rýger, Ing. Ján Šebok, Ing. Vladimír Sedlák, Ing. Eduard Šipoš, Ing. Ľubomír Sládek, Ing. Roman Šramatý, Ing. Abdullah Sultan, Ing. Ľuboš Staňák, Ing. Peter Telek, Ing. Ľubomír Vančo, Ing. Marián Varga, Ing. Roman Záluský

## General Information

The Institute of Electronics and Photonics of Slovak University of Technology in Bratislava is active in fields

of microelectronics, wireless communications, IC and system design, signal processing, optoelectronics, photonics, sensors and multimedia techniques. Its membership in EUROPRACTICE project provides access to advanced TCAD modelling and simulation as well as IC and systems design tools (Synopsys, Cadence). Structure and device characterization and failure analysis either by electrical (I-V, C-V, DLTS measurements in a wide temperature range with optional magnetic field, microwave characterization) or analytical tools (SEM, EBIC, CL, AES, AFM, SIMS, micro-Raman spectroscopy) is another strong field of institute activities. The comparison and good correlation of experimental and simulated results is used for physical models calibration, physical interpretation of obtained experimental results and prediction of the properties of new semiconductor devices and IC's. The solved projects comprise the thin film sensors and subsequent signal processing for biomedical applications, healthcare and environmental applications, analogue and mixed-signal design, smart power MOS device design and characterization, GaN based devices, organic semiconductor transistors and LED's, diamond layers and carbon nanotubes growth. The well equipped laboratories, expertise and enthusiasms of the institute staff ensure the successful solution of scientific and applied research projects. There are about 40 teachers and researchers and more than 40 PhD students at the institute. They actively participated in projects within 5th, 6th and 7th FP calls as well as ENIAC-JU, NATO and COST projects. More than 20 projects funded by national authorities and/or within bilateral international collaboration are being solved at the institute yearly. As for education, the institute provides two study programs Electronics and Automotive Electronics in the undergraduate study, and two study programs Microelectronics and Radio and Electronics at the graduate study stage. For PhD study, the institute provides Microelectronics and Radio and Electronics study programs.



## II. EQUIPMENT

### II. 1 Teaching and Research Laboratories

- Cleanrooms for Advanced Thin Film Technology (photolithography, plasma etching and deposition)
- Laboratory of Diagnostics of Compound and Organic Semiconductor Structures
- Diamond Thin Laboratory
- Carbon Nanostructure Laboratory
- Laboratory of Integrated Circuits and System-on-chip Design and Test
- Laboratory of Raman Spectroscopy
- Laboratory in Medical Engineering
- Laboratory of Audio and Video Technologies
- Laboratory of Electronic Power Measurement
- Laboratory of Signal Processors and Microcontrollers Applications
- Laboratory of Wireless Communication and Navigation
- Semiconductor and Thin Film Device Modelling and Simulation Lab
- SEMITEST – Semiconductor Structure Properties Investigation
- Technology of Compound and Organic Semiconductor Structures I
- Technology of Compound and Organic Semiconductor Structures II
- Laboratory of Electrochemical and Corrosion Measurements and Surface Analysis
- Lab of RF/microwave Measurements, Modelling and Design
- Laboratory of Sensors and Microsystem Technology
- Laboratory of Surface and Thin Film Analysis
- Laboratory of Thin Film Technology
- LED Lab
- Echoic Acoustical Chamber
- ENVIRO Lab
- Digital Signal Processing Laboratory (education)
- Laboratory ESF – EDUCTV (education)
- Laboratory of Analogue and Digital Television (education)
- Laboratory of Analogue Circuits and Systems and Navigation (education)
- Laboratory of Antennas and Wave Propagation (education)
- Laboratory of Audio Engineering (education)
- Laboratory of Digital Circuits (education)
- Laboratory of Electroacoustics (education)
- Laboratory of Electronic Devices and Circuits (education)
- Laboratory of Electronic Measurement (education)
- Laboratory of Integrated Circuits and Semiconductor Structures Design (education)
- Laboratory of Medical Electronics Instrumentation (education)
- Laboratory of Microwave Applications (education)

- Laboratory of Microwave Fundamentals (education)
- Laboratory of Microwave Measurements (education)
- Laboratory of Optical Measurements (education)
- Laboratory of Power Radio Electronics (education)
- Laboratory of Radio Communication Technology (education)
- Laboratory of RF Circuits and Systems (education)
- Laboratory of Security Technique (education)
- Laboratory of Sensor Systems and Microsystem Technology (education)
- Laboratory of Signal Processing (education)
- Laboratory of Signal Processors and Microcontrollers (education)
- Laboratory of Solid State Physics and Quality Management (education)
- Measurement of Electronic Circuits (education)
- Measurement of Electronic Devices and Systems (education)
- Measurement of Electronic Structures and Device Animation (education)
- Optoelectronic Lab (education)

### II. 2 Special Equipment, Instruments and Tools

- Computer Controlled System for I-V and C-V Measurements and Analysis (from 20 to 800 K)
- Hall and four point probe setup, DSLab.s.r.o.
- Photovoltaic Cell Testing Light Source Model 16S-002 300 W, Solar Light Company, Inc.
- Six-Port Reflectometers and Automatic Impedance Matching System for High-Power Industrial Applications
- European Customer Training Centre – Texas Instruments (DSP TMS320C2xx, TMS370, TMS320C5x, TMS320C6xxx, MSP430)
- Precise Registration / Calibration Electricity Meter
- Precise Digital Network Analyzer and Standard Meter PEM 6711
- DL8000 Digital Deep Level Transient Spectrometer, BIO-RAD system
- Microwave Network Analyzer HP 8408 S + HP83421A Lightwave Source (20 GHz)
- Microwave Network Analyzer (40 GHz) Agilent E8363 B (temperature range: RT – 400K) RFOV measurements
- Semiconductor Parameter Analyzer, Agilent 4155C
- Arbitrary Function Generator TEKTRONIX AFG3252 (240 MHz, 2 channel)
- Digital Oscilloscope TEKTRONIX TDS20225
- Digital Oscilloscope TEKTRONIX DPO4104B (1GHz, 4 channel)
- DSA 8200 Digital Serial Analyser Sampling scilloscope with TDR Module
- Digital Pulse Generator DTG5334
- SUSS Manual Prober PM5, SUSS MicroTec, Test Systems
- Experimental System for Low-frequency Noise

Measurement

- Micromanipulators with Nanotips for Measurement and Testing of Electronic Devices, and Manipulation of Micro-/nano-objects
- Atomic Force Microscope, Park XE-100
- SEM cold cathode microscope JEOL JSM 7500
- Raman Spectrometer (ISA-Jobin Yvon-Dilor-Horiba)
- X-ray Photoelectron Spectrometer (VG Microtech)
- Spectroscopic Ellipsometer Angstrom Advanced PHE 102
- Surface Profiler Dektak 150 (Veeco)
- Talystep S112 Profilometer
- Auger Electron Spectrometer (Varian) equipped with EX 05 VG ion gun
- Suss KSM MJB 3HP mask aligner – Mask aligner Suss MA/BA 6 for broad-band and i-line optical contact photolithography
- Compact Plasma System – PECVD, Plasmalab 80Plus, Oxford Instruments Plasma Technology
- Modular Cluster System – RIE, PlasmalabSystem 100, Oxford Instruments Plasma Technology
- RF RIE etching system Plasma PE 200
- Ozone/UV cleaner SAMCO UV-2
- Sputter Etcher XNE-01 (Secon)
- Sputtering Unit Perkin-Elmer Ultek/Randex 2400/8L
- The dicing saw ADT 7100
- Adhesive Die Bonder Cammax DB 600
- Manual Ball Bonder K&S 4700
- Vacuum System B55.3 Hochvakuum Dresden with magnetron sputtering sources
- Arc Discharge Reactor for CNT Growth (home made)
- CVD Reactor for CNT Growth (home made)
- RTA Rapid Thermal Annealing (home made)
- Contact Angle Measurement System (home made)
- Equipment for Emission Measurements (home made)
- Leak Detector, SmartTest
- XILINX and ALTERA (xiClone) Systems - boards and SW, Development Kits, Xilinx ISE6.3i
- VisualDSP++ SHARC Processor Development Tools, ADSP-21364 and ADSP-TS201S Evaluation Kits, Analog Devices donation
- MC9S08LC60/36 Demonstration Board + complete CodeWarrior Development Studio for HC08 and HC12, FreeScale donation
- Sonnet – Planar Structures Electromagnetic Simulator, University licence

#### **EDA Tools via EURO PRACTICE**

- Synopsys TCAD Sentaurus A\_2007.12
- Synopsys Analogue Simulation and Modelling (HSpice)
- Cadence IC Package
- Mentor Graphics Full Suite
- Dolphin Integration Smash HDL & SLED

#### **Design Kits:**

- AMS 0.35  $\mu\text{m}$
- TSMC 90 nm

#### **Running on:**

- IBMx3400 Quad Core E5335 server (Linux),

Workstations SunBlade 1000, 2 pc Sun Ultra 10 (all Solaris), HP Proliant ML 370 - HP ML370G5 QC E5420 (Linux), and 21 PCs Core Duo/Quad (WinXP/Linux)

## **III. TEACHING**

### **III. 1 Undergraduate Study (Bc.)**

Subject, semester, hours per week for lectures and for seminars or practical exercises, name of the lecturer:

Logic Systems (two weeks part)  
(1st sem., 4-1 h) D. Ďuračková  
Materials for Electronics  
(3rd sem., 3-2 h) D. Donoval  
Electronic Devices and Circuits  
(3rd sem., 3-2 h) R. Redhammer  
Design and Reliability of IC and Systems  
(3rd sem., 3-2 h) D. Ďuračková, V. Stopjaková  
Electronic Systems  
(3rd sem., 3-2 h) M. Žiška  
Electronic Devices and Circuits  
(3rd sem., 3-2 h) V. Kudják  
Optoelectronics and Laser Technique  
(4th sem., 2-2 h) F. Uherek  
Electronic Devices  
(4th sem., 2-2 h) Ľ. Stuchlíková  
Quality Management  
(4th sem., 2-1 h) M. Žiška  
Systems for Objects Security and Safety  
(4th sem., 3-2 h) V. Tvarožek, I. Hotový  
Signals and Systems  
(4th sem., 3-2 h) O. Ondráček  
Digital Techniques  
(4th sem., 2-2 h) J. Hribík  
Optoelectronics  
(5th sem., 3-2 h) F. Uherek  
Microelectronics  
(5th sem., 2-2 h) D. Donoval, J. Breza  
Sensor Systems for Automobiles  
(5th sem., 2-2 h) V. Tvarožek  
Electronic Circuits  
(5th sem., 3-2 h) F. Mika  
Electronic Devices and Circuits  
(5th sem., 3-2 h) R. Redhammer  
Quality Management  
(5th sem., 2-1 h) M. Žiška  
Analog Circuits  
(5th sem., 3-2 h) V. Štofanič, M. Minárik  
Microwave Engineering  
(5th sem., 3-2 h) V. Štofanič, M. Minárik  
Radiocommunications Techniques  
(5th sem., 2-2 h) P. Podhoranský  
Electronic Circuits  
(5th sem., 3-2 h) J. Hribík, M. Daříček  
Systems of Digital Signal Processing  
(5th sem., 2-2 h) O. Ondráček, A. Šatka

Bachelor Project 1  
 (5th sem., 0-4 h) F. Uherek, O. Ondráček  
 Principles of IC Design  
 (6th sem., 2-2 h) D. Ďuračková  
 Digital and Pulse Circuits  
 (6th sem., 3-2 h) F. Mika  
 Sensorics  
 (6th sem., 2-2 h) V. Tvarožek  
 Audio and Video Technology  
 (6th sem., 2-2 h) A. Přibilová, P. Podhoranský  
 Microwave Engineering and Radio Communications  
 (6th sem., 3-2 h) P. Podhoranský  
 Microprocessor Techniques  
 (6th sem., 2-2 h) B. Lojko  
 Bachelor Project 2  
 (6th sem., 0-8 h) F. Uherek, O. Ondráček

### III. 2 Graduate Study (Ing.)

#### Study Program "Microelectronics"

Team Project  
 (1st sem., 0-6 h) F. Uherek, L. Stuchlíková  
 Computer Circuit Analysis  
 (1st sem., 2-2 h) M. Tomáška  
 CAD of Electronic Devices  
 (1st sem., 2-2 h) D. Donoval  
 Electronic Measurement of Devices and Systems  
 (1st sem., 2-2 h) A. Šatka  
 Programmable ICs  
 (1st sem., 2-2 h) J. Jakabovič  
 Scientific Communication  
 (1st or 2nd sem., 1-0h) F. Uherek, D. Donoval, J. Breza  
 Vacuum Electronics and Technique  
 (1st sem., 2-1 h) M. Veselý  
 Analog IC Design  
 (1st sem., 2-1 h) L. Majer  
 Diploma Project 1  
 (2nd sem., 0-6 h) D. Donoval  
 Computer Aided IC Design  
 (2nd sem., 3-2 h) V. Stopjaková  
 Applied Optoelectronics and Lasers  
 (2nd sem., 3-2 h) J. Kováč, F. Uherek  
 Nanoelectronics  
 (2nd sem., 3-2 h) R. Redhammer  
 Industrial Electronics  
 (2nd sem., 3-2 h) A. Šatka  
 Structures of IC  
 (2nd sem., 2-2 h) M. Žiška  
 DSP Circuits and Methods  
 (2nd sem., 2-1 h) A. Šatka  
 Optical Communication Systems  
 (2nd sem., 2-1 h) F. Uherek  
 Diploma Project 2  
 (3rd sem., 0-6 h) D. Donoval  
 Sensor Microsystems  
 (3rd sem., 2-2 h) V. Tvarožek  
 Diagnostics of Integrated Circuits and Systems  
 (3rd sem., 2-2 h) V. Stopjaková

Spectroscopic Methods of Analysis and Inspection of Matter  
 (3rd sem., 3-1 h) J. Breza  
 RF Circuit Design  
 (3rd sem., 2-1 h) M. Tomáška  
 Physical Electronics of Solids  
 (3rd sem., 2-1 h) M. Veselý  
 Superconductor Electronics  
 (3rd sem., 2-1 h) J. Breza  
 Microsystems Technology  
 (3rd sem., 2-1 h) I. Hotový  
 Integrated Optoelectronics  
 (3rd sem., 2-1 h) J. Kováč  
 Diploma Project 3  
 (4th sem., 0-8 h) D. Donoval

#### Study Program "Radio and Electronics"

Digital Signal Processing  
 (1st sem., 3-2 h) O. Ondráček  
 Microcontrollers  
 (1st sem., 2-2 h) P. Fuchs  
 Communication Electronics  
 (1st sem., 3-2 h) V. Kudják  
 Design and Engineering of Electronic Systems  
 (1st sem., 3-2 h) B. Lojko, Z. Brezovič  
 Recording Techniques  
 (2nd sem., 3-2 h) P. Podhoranský  
 Radiocommunication  
 (2nd sem., 3-2 h) J. Petrek  
 Signal Processors  
 (2nd sem., 3-2 h) P. Fuchs  
 Antennas and Radiocommunication Routh  
 (2nd sem., 3-2 h) V. Štofanič  
 Applied Electroacoustics  
 (2nd sem., 3-2 h) A. Přibilová  
 Telemedical Technology  
 (2nd sem., 3-2 h) M. Kukučka, Z. Krajčušková  
 Diploma Project I  
 (2nd sem., 0-6 h) O. Ondráček  
 Biosignals and Biosystems Analysis  
 (2nd sem., 3-2 h) J. Púčik  
 Diploma Project II  
 (3rd sem., 0-6 h) O. Ondráček  
 Diagnostic Methods and Systems in Medicine  
 (3rd sem., 3-2 h) M. Kukučka, J. Púčik  
 Sound Technology  
 (3rd sem., 3-2 h) A. Přibilová  
 Influence of Electromagnetic Radiation on Biological Objects  
 (3rd sem., 3-2 h) E. Cocherová  
 Radiocommunication Technologies and Networks  
 (3rd sem., 3-2 h) J. Petrek  
 Digital Television  
 (3rd sem., 3-2 h) P. Podhoranský  
 Team Project  
 (3rd sem., 0-8 h) O. Ondráček  
 Diploma Project III  
 (4th sem., 0-8 h) O. Ondráček

### III. 3 Undergraduate and Graduate Study (Ing.) for Foreign Students in English

Telemedical Technology

Z. Krajčušková

Signal Processors

B. Lojko

Electronic Measurement, Instruments and Systems

J. Hribik

Radiocommunication Technologies and Network

J. Petrek

Power Radioelectronics

J. Hribik

Diagnostic Methods and Systems in Medicine

M. Kukučka

Digital Television

M. Hagara

Diploma Project 1, II

O. Ondráček, J. Hribik, Z. Krajčušková

### III. 4 Distance Study

Electronics

(3rd sem., 3-2 h) Ľ. Stuchlíková

Electronic Devices and Circuits

(3rd 5th sem., 1-0h) V. Kudják

## IV. RESEARCH PROJECTS

### IV. 1 National Projects

#### National Competence Centre

– **INTELINSYS** – Competence Centre for Smart Technologies towards Electronization and Informatization of Systems and Services, OPVaV, ITMS 26240220072 (2011-2014), coordinator: R. Redhammer

#### National Centres of Excellence

– **SMART 2** – Support of Centre of Excellence for Smart Technologies, Systems and Services II, AŠF EÚ MŠ SR, ITMS 26240120029 (2010-2012), coordinator: R. Redhammer, D. Donoval

– **NanoNet** – Centre of Excellence for Design, Preparation and Diagnostics of Nanostructures for Electronics and Photonics, AŠF EÚ MŠ SR, ITMS 26240120010 (2009-2011), coordinator: F. Uherek

– **NanoNet 2** – Centre of Excellence for Design, Preparation and Diagnostics of Nanostructures for Electronics and Photonics 2, AŠF EÚ MŠ SR, ITMS: 26240120018 (2010-2012), coordinator: F. Uherek

#### National R&D and Educational Projects within Ministry of Education (MŠ SR – VEGA, KEGA) and Development and Research Agency (APVV) Actions

– Organic semiconductor devices characterization and technology development, VEGA 1/0851/11 (2011-2014), coordinator: J. Jakabovič

- Research and optimization of selected properties of advanced electronic structures and devices prepared on wide band gap materials, VEGA 1/0866/11, (2011-2014), coordinator: D. Donoval
- Research of supperhard nanocomposite films for stressed joints under increased temperature in biomedicine, VEGA 1/0264/11, (2011-2014), coordinator: M. Vojs
- Advanced Parametric Test Methods for the Reliability Enhancement of Mixed-signal Integrated Circuits and Systems, No. VEGA 1/0285/09 (2009-2012), coordinator: V. Stopjaková
- Development of Special Methods of Characterization and Diagnostics of Advanced Semiconductor Micro-/nano-structures and Devices, No. VEGA 1/0716/09 (2009-2012), coordinator: A. Šatka
- Electro-physical Properties and Technological Issues of Si, GaN and ZnO Semiconductor Materials and Structures for a New Generation Of Electronic Devices and Circuits, No. VEGA 1/0507/09 (2009-2012), coordinator: L. Harmatha
- Development and Characterization of Advanced Nano-dimensional Structures Based on Compound and Organic Semiconductors for Applications In Microelectronics and Photonics, No. VEGA 1/0689/09 (2009-2012), coordinator: J. Kováč
- Nanostructured Thin Film Systems for MEMS Sensor Applications, No. VEGA 1/0553/09 (2009-2011), coordinator: I. Hotový
- Thin Films Of Transparent Conductive Oxides for Photovoltaic Solar Cells, No. VEGA 1/0220/09 (2009-2011), coordinator: V. Tvarožek
- Nanotechnologies - Synthesis of Carbon Nanotubes and Nanocomposites on Natural Catalysts, No. VEGA 1/0746/09 (2009-2011), coordinator: M. Kadlečiková
- Modelling and Simulation of Electrical Properties of Structures Based on Wide Band Gap semiconductors, No. VEGA 1/0601/10 (2010-2011), coordinator: J. Racko
- Optimized Ohmic Contacts to p-GaN, Contribution to Quantitative Auger Analysis Of Group III Nitrides, No. VEGA 1/0779/10 (2010-2011), coordinator: J. Liday
- Sensoric structures based on carbon and ZnO layers for electrotechnical applications - investigation of their properties No. VEGA 1/1102/11 (2011-2014), coordinator: M. Veselý
- Patterning and nanostructuring of diamond and DLC layers for electronic applications, No. VEGA 1/1103/11 (2011-2014), coordinator: R. Redhammer
- Investigation of high-stability oscillators with piezoelectric resonators under simultaneous excitation of multiple modes of vibrations, No. VEGA 1/0055/10, (2010-2011), coordinator: V. Štofanič
- Combined Scanning Transient Microscope, No. VEGA 2/0063/11, (2011-2013), coordinator: J. Hribik
- Educational and Training Support of Soft Skills for Undergraduate Students Of FEI and FIIT STU, No.

- KEGA 3/7413/09 (2009-2011), coordinator: M. Žiška
- Design and preparation of a new course “Circuits and systems of precise time and frequency” and innovation of the course “Radionavigation systems”, No. KEGA 3/7411/09, (2009-2011), coordinator: V. Štofanič
- Center of Excellence of Nano-/Micro-electronic, Optoelectronic and Sensoric Technologies (CENAMOST), VVCE 0049-07, coordinator: D. Donoval
- Growth of Nanowires for Photovoltaic Application, APVV-0301-10 (2011-2014), coordinator: J. Kováč
- Advanced materials, process and structures of organic electronics, APVV-0262-10 (2011-2014), coordinator: D. Donoval
- Metal-oxide-metal structures for resistive based nanoscale memory cells, APVV-0509-10 (2011-2014), coordinator: L. Harmatha
- Multifunctional detector arrays based on micromechanical structures, APVV-0190-10 (2011-2014), coordinator: I. Hotový
- Nanostructures and devices for integrated photonics, APVV-0424-10 (2011-2014), coordinator: J. Jakabovič
- Towards next generation of III-N High-Electron Mobility Transistors, APVV-0104-10 (2011-2014), coordinator: J. Kuzmík, IEE SAS, local coordinator: M. Tomáška
- Cooperation Center for the Transfer of Innovative Technologies From Research to Industry, No. APVV SUSPP-0008-09 (2009-2013), coordinator: F. Uherek
- Study of Diamond and Diamond-like Carbon Properties for Electrochemical and Bio-sensoric Applications, No. APVV LPP-0094-09 (2009-2012), coordinator: V. Tvarožek
- Biocompatible Thin Films for Medical Application, No. APVV LPP-0149-09 (2009-2012), coordinator: M. Veselý
- Characterization of Electrical Properties of HEMT and MOSFET Transistors on AlGa(InAlN)/GaN Heterostructures Supported by 2/3-D Modelling and Simulation, No. APVV LPP-0195-09 (2009-2012), coordinator: D. Donoval
- Design, Research and Preparation of Advanced Electronic Systems to Be Used to Improve Quality Of Life, No. APVV VMSP-P-0127-09 (2009-2011), coordinator: D. Donoval
- Advanced MEMS Chemical Sensors for Extreme Conditions, No. APVV-0655-07 (2008 – 2011), coordinator: T. Lalinský, IEE SAS, local coordinator: I. Hotový
- Metal oxide nanostructured arrays for gas sensing, DAAD (2011-2012), coordinator: I. Hotový
- Nanostructured Materials for Advanced Technological Applications, DAAD (2011-2012), coordinator: M. Veselý
- Modern Methods of Digital Signal Processing in Radio Electronics, Biomedicine, Electronic Measurement, Multimedia and Vehicular Technology,

- No. AV-4/0012/07, (2007-2012), coordinator: P. Fuchs.
- Portable AC Current and Voltage Source for Electronic Electricity Meters Testing, No. AV-4/0012/07, (2007-2012), coordinator: J. Hribik
- Applied research of plasmathermic processes Operational programme of EU, Geothermal Anywhere Ltd. and STU in Bratislava, IMTS 26240220070, (2011-2013), coordinator: P. Podhoranský

## IV. 2 International Projects

### Projects within the 7th EC Framework Program and ENIAC JU

- **END** - „Models, Solutions, Methods and Tools for Energy-Aware Design“, ENIAC JU No. 120214 (2010-2014). Coordinator: STMicroelectronics Italy. Local coordinator: D. Donoval
- **MAS** - “Nanoelectronics for Mobile Ambient Assisted Living (AAL) Systems“, ENIAC JU No. 120228 (2010-2013). Coordinator: Dr. W. Dettmann, Infineon Technologies, Germany. Local coordinator: V. Stopjaková
- **IDESA-2** – “Implementation of widespread IC design skills in advanced deep submicron technologies at European Academia“, FP7-ICT-CSA No. 246906, (2009-2012). Coordinator: Dr. Bart De Mey, IMEC, Leuven, Belgium. Local coordinator: V. Stopjaková
- **EURO-DOTS** - “European Doctoral Training Support in Micro/Nano-electronics“, FP7-ICT-2009-5 No. 257051, (2010-2012). Coordinator: H. E. Maes, IMEC, Leuven, Belgium. Local coordinator: D. Donoval
- **MORGan** - “Materials for Robust Gallium Nitride“, FP7-NMP-2007-LARGE-1 No. 214610 (2008-2011). Coordinator: Dr. S. Delage, Alcatel Thales, France. Local coordinator: J. Kováč
- **SMAC** – “SMARt systems Co-design“, FP7-ICT-2011-7, No. 288827 (2011-2014). Coordinator: Dr. Salvatore Rinaudo, ST Microelectronics, Italy. Local coordinator: D. Donoval
- **ERG** - “Energy for a green society: from sustainable harvesting to smart distribution, equipment, materials, design solutions and their applications“, ENIAC JU No 270722-2 (2011-2014). Coordinator: Francesco Gennaro, STMicroelectronics Italy. Local coordinator: J. Kováč
- Project no 119 “Synthesis and doping of zinc-oxide thin films by RF sputtering and ion implantation“, EC Integrating Activity Support of Public and Industrial Research Using Ion Technology (SPIRIT) under EC contract no. 227012 (V. Tvarožek)

### Bilateral projects

#### Projects within the bilateral cooperation

##### Slovakia – Czech Republic

- METACARBON - Investigation of Electrical and Optical Properties of Nanodiamond and Diamond-like



- Carbon Thin Films, APVV CK-CZ-0139-09 (2010-2011). Cooperating institution: Institute of Physics, CAS Prague. Coordinators: Z. Remeš (IP CAS), M. Veselý
- Materials and Components for Protection of Environment, ZČU-OZP (2006-2011). Cooperating institution: West Bohemian University, Pilsen. Coordinators: P. Šutta (WBU), V. Tvarožek

#### Projects within the bilateral cooperation

##### Slovakia – Italy

- NANOMIXSENS - Nanostructured Mixing Metal Oxides for MEMS Gas Sensors, APVV SK-IT-0030-08 (2009-2011). Cooperating institution: Italian National Council of Research, Institute for Microelectronics and Microsystems. Coordinators: S. Capone (INCR), I. Hotový

#### Projects within the bilateral cooperation

##### Slovakia – Poland

- MICROHET - Technology and Characterization of Advanced Semiconductor Heterostructures for Micro and Optoelectronic Devices, APVV SK-PL-0017-09 (2010-2011). Cooperating institution: Wrocław University of Technology. Coordinators: M. Tlaczala (PWR-TUW), J. Kováč
- Estimation of the finger positions in a virtual keyboard space and detection of clicking events, the contract for the realization of the project for Samsung Electronics Polska Sp. z o. o., Poland, (2011), coordinator: M. Hagara

#### Projects within the bilateral cooperation

##### Slovakia – Serbia

- DOSUZOFI - Doping and Surface Modification of Zinc-oxide Thin Films, APVV SK-SRB-0012-09 (2010-2011). Cooperating institution: VINCA Institute of Nuclear Sciences, Laboratory for Atomic Physics, Belgrade. Coordinators: M. Milosavljević, (VINCA), V. Tvarožek

#### Projects within the bilateral cooperation

##### Slovakia – China

- Fabrication of Infrared Sensitive Organic Field Effect Transistors, (2010-2011). Cooperating institution: Lanzhou University. Coordinators: Yingquan Peng, (LU), J. Jakabovič

#### Project within the bilateral co-operation

##### Slovakia – Austria

- Characterization of Advanced Materials for Novel Technologies, No. 2010-05-15-0001 Austrian and Slovak Scientific and Educational Cooperation (2010-2011). Cooperating institution: JKU Linz. Coordinators: C. Simbrunner (JKU), J. Breza

- Institute of Physics, Slovak Academy of Sciences, Bratislava
- Institute of Informatics, Slovak Academy of Sciences, Bratislava
- Department of Psychology, Comenius University, Bratislava
- Semikron, Vrbové
- Applied Precision, Bratislava
- LOX Technologies, Piešťany
- University of Žilina, Žilina
- Danubia NanoTech, Bratislava
- Bratislava Development Center (BDC), ON Semiconductor, Bratislava
- Analog Devices, Bratislava
- Logomotion, s.r.o., Piešťany
- eLce, s.r.o, Bratislava
- Nanodesign, s.r.o, Bratislava
- R-DAS, s.r.o, Žilina
- POWERTEC, s.r.o., Bratislava
- ARETA PRO s.r.o., Bratislava
- E.T.K.M., s.r.o., Bratislava
- Sylex s.r.o., Bratislava
- OMS s.r.o.
- PHILIPS, Bratislava
- Special Software and Systems, Bratislava
- AOS, Liptovský Mikuláš
- Intenzíva, Education and training centre, Bratislava
- Applied Meters, Inc., Prešov
- Geothermal Anywhere, a.s., Bratislava
- HIS SENZOR Ltd., Prešov
- Institute of Metrology Bratislava
- MIRONIX Bratislava
- University of Technology, Košice
- Krížik GBI jsc, Prešov
- Institute of Measurement Science, Slovak Academy of Sciences, Bratislava
- University Hospital, Bratislava - Prof. Dérer Hospital, Bratislava, Ružinov Hospital, Bratislava
- Office for Public Procurement (ÚVO), Bratislava
- Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava
- Slovak Institute of Technical Normalization, Bratislava
- Faculty of Medicine, Comenius University, Bratislava
- Faculty of Pharmacy, Comenius University, Bratislava

## V. 2 International Cooperation

- Czech Technical University, Prague, Czech Republic
- Technical University of Brno, Department of Microelectronics, Czech Republic
- West Bohemian University, New Technology Center, Pilsen, Czech Republic
- IMEC Leuven, Belgium
- STMicroelectronics Italy
- Infineon Technologies, Germany
- Johannes Kepler Universität Linz, Linz, Austria
- Technical University Ilmenau, Germany

## V. COOPERATION

### V. 1 Cooperation in Slovakia

- International Laser Centre, Bratislava
- Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava

- Hungarian Academy of Sciences Budapest, Hungary
- Universität Leipzig, Fakultät für Physik und Geowissenschaften, Fakultät für Chemie und Mineralogie, Leipzig, Germany
- Technical University Vienna, Austria
- Technical University Munich, Germany
- Institute of Scientific Instruments, Czech Academy of Sciences, Brno, Czech Republic
- University of Athens, Department of Physics, Greece
- Regensburg University, Germany
- Institut für Schichtund Ionen Technik Jülich, Germany
- Faculty of Microsystem Electronics and Photonics, Wroclaw University of Technology, Poland
- Institute of Solid State Physics, Technical University Graz, Graz, Austria
- Physikalisches Institut, Universität Würzburg, Germany
- Imperial College, Department of Materials, London, UK
- Istituto per la Microelettronica ed i Microsistemi CNR, Lecce, Italy
- Umweltsensortechnik GmbH, Geschwenda, Germany
- City University of Hong Kong, Hong Kong, China
- Technische Universität, Bergakademie Freiberg, Institut für Theoretische Physik, Freiberg, Germany
- National Hellenic Research Foundation, Theoretical and Physical Chemistry Institute, Athens, Greece
- Photeon Technologies GmbH, Bregenz, Austria
- Eberhard Karls Universität, Institut für Angewandte Physik, Tübingen, Germany
- Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic
- Institute of Nuclear Sciences, Laboratory for Atomic Physics, Belgrade, Serbia
- Lanzhou University, Lanzhou, China
- ÚO FVT, Brno, Czech Republic
- VŠB Ostrava, Czech Republic
- TU Pardubice, Czech Republic
- Agilent Technologies, Inc., Santa Clara, CA, USA
- Texas Instruments, Inc, USA
- URE AV CR, CR
- URSI Prague, CR
- TEXAS INSTRUMENTS Deutschland GmbH, Freising, Germany
- SAMSUNG Electronics, Poland
- European Organization for Nuclear Research (CERN), Beams Department, RF Group, Feedback and Beam Control Section
- Ilmenau University of Technology, Germany
- Institute of Photonics and Electronics of the ASCR, Czech Republic
- Microwave Laboratory, UCL, Louvain-la-Neuve, Belgium
- III – V lab, Alcatel –Thales, Paris, France

### V. 3 Collaboration with industry and other institutions:

- Development of digital calibration / registration electricity meter in cooperation with Křížik GBI Inc., Prešov, (2007-2012) coordinator: P. Fuchs
- Development of electronic calibration station EKS-03 in cooperation with Applied Meters Inc., Prešov, (2005-2011), coordinator: P. Fuchs
- Development of portable AC current and voltage source for electronic electricity meters testing in cooperation with Applied Meters Inc., Prešov, (2008-2012), coordinator: J. Hribik
- Development of combined scanning transient microscope in cooperation with Institute of Physics, Slovak Academy of Sciences, Bratislava, (2011-2013), coordinator: J. Hribik
- Design and implementation of the original nerve stimulator in cooperation with Department of neurosurgery, Faculty of Medicine, Comenius University, Bratislava, (2011-2013), coordinator: P. Fuchs
- Software development for analyses of influence of cognitive dysfunction on postural instability in cooperation with University Hospital Bratislava under the grant MZ 2007/67-FNsPBA-05, (2007-2012), coordinator: J. Púčík



## VI. THESES

### VI. 1 Master theses

Master theses supervised at the Department of Microelectronics. The names of supervisors are in brackets.

- [1] Blaho M.: Electrical characterization MOS-HFET transistors based on GaN (J. Kováč)
- [2] Bindics, B.: Uncertainty sources analysis of measurement results at calibration of quartz resonator oscillators (M. Minárik)
- [3] Csókás P.: CMOS as part of e-learning (Ľ. Stuchlíková)
- [4] Čižnár Pavol.: Creating robust test limits when measuring trailing current of semiconductor diodes (M. Žiška)

- [5] Dzuba J.: Dynamic simulation of MEMS piezoelectric pressure sensor (V. Kutiš)
- [6] Firment V.: Measurement and testing of selected parameters of DAB module (M. Žiška)
- [7] Fogas, M.: Modelling of biological effects of RF radiation (E. Cocherová)
- [8] Guemann F.: Utilization of electron beam lithography in micrometer and sub-micrometer scaled Hall probes preparation (J. Kováč)
- [9] Guldan Š.: Preparation and characterization of electrical properties of the organic FETs based on the pentacene (J. Jakabovič)
- [10] Horínek F.: Design of modern electronic modular medical system based on sensing of electrical signals (M. Daříček)
- [11] Hranai M.: Resistive Switching in Metal-Insulator-Metal Structures Using TiO<sub>2</sub> as an Insulator (L. Harmatha)
- [12] Hronec P.: Measurement and analysis of electrical properties of HEMT transistors (J. Kováč)
- [13] Húbek, P.: Camera remote control using RF modules based on Bluetooth and Zigbee (V. Štofanič)
- [14] Choroš R.: Integrated microelectrode system (E. Vavrinský)
- [15] Imro I.: Modeling and simulation of electrical properties and energetical ruggedness of trench MOS transistor (J. Marek)
- [16] Koblíška, J.: Interface for wireless data transfer in band 2.4 GHz with using the communication module DCBT-24N (V. Štofanič)
- [17] Kovalčík D.: Carbon thin films for biomedical applications (M. Marton)
- [18] Kozár M.: Preparation and characteristics of thin film structures based on A-Si:H/C-Ci for use in solar cells (L. Harmatha)
- [19] Kuzma A.: Design and simulation of VCSE lasers properties with nanostructure (F. Uherek)
- [20] Mamojka, J.: Burn-in of electronic devices (Z. Krajčušková)
- [21] Masaryková L.: Activation of thin film surfaces for bioapplications (M. Vojs)
- [22] Mészáros B.: Computer simulation power MOSFET transistor with "DeepTrench" technology (J. Marek)
- [23] Michniak P.: Analysis of diamond structures prepared on different substrates (F. Uherek)
- [24] Motyčák Š.: Numerical simulation of superconductor quantum interference devices (P. Valko)
- [25] Neupauer M.: Characterization of ZrO<sub>2</sub> layers for GaN MOSHFET transistor (L. Harmatha)
- [26] Nováček, M.: Modelling the electrical activity of Excitable cells (E. Cocherová)
- [27] Petrák M.: CAD of analog IC's parametrized cells (M. Tomáška)
- [28] Petrus M.: Analysis of deep energy level in semiconductor structures and devices based on GaN (L. Stuchlíková)
- [29] Pira V.: The properties of 2D photonic optoelectronic devices with structure incorporated in their surface (J. Škriniarová)
- [30] Piták T.: Audio Power Amplifier for Battery Operating Devices (V. Stopjaková)
- [31] Plecho T.: The utilization of passive infrared sensors in safeguarding buildings (M. Kempný)
- [32] Precner M.: The study of properties micro size magnetic objects (R. Srnánek)
- [33] Raffaj M.: Preparation and properties of dye sensitized solar cells (L. Harmatha)
- [34] Ruzsák J.: Characterization of electrical and optical properties of perspective LEDs (J. Kováč)
- [35] Rýger I.: MEMS gas sensors based on saw-HEMT structures (M. Tomáška)
- [36] Schmidt L.: Measuring the optical properties of biological tissues (F. Uherek)
- [37] Stohl K.: Circuit implementation in FPGA for real-time video processing (D. Ďuračková)
- [38] Szádocki, S.: Controlled power supply sources for Class E power amplifiers (J. Hribík)
- [39] Šipoš E.: Diamond and diamond like carbon thin films for electrochemical applications (M. Vojs)
- [40] Valenta D.: Measurement and processing of biosignals (M. Vojs)
- [41] Vančo L.: Application of raman spectroscopy in examining the material basis of historical works of art (M. Kadlečíková)
- [42] Vaškovič L.: Signal processing in frequency range of human speech (D. Ďuračková)
- [43] Víglaská D.: Sputtered transparent conductive oxides of Zn doped by Ga (S. Flicyngnerová)
- [44] Žila K.: The design and application of microelectrodes in biosensorics (E. Vavrinský)

## VI. 2 Doctoral Theses

The names of supervisors are in brackets.

- [1] Daříček M.: Characterization and integration of selected MagFET devices (A. Šatka)
- [2] Donoval M.: Design and verification of IC current test method using MAGFET structures (V. Stopjaková)
- [3] Gajdošová L.: Applicability of diamond and diamond-like carbon thin films as biomaterials (M. Veselý)
- [4] Marek J.: Electro-physical Analysis of Electrical Properties and Energetic Ruggedness of Modern Power Transistors (D. Donoval)
- [5] Sultan Abdullah Mohammad Seddiq: Digital Signal Detection Methods for ECG Signals Oscillations (O. Ondráček)
- [6] Vinduška P.: Cold Electron Emitters Based on Materials Containing the Carbon and Other Materials (J. Janík)

## VII. OTHER ACTIVITIES

### Conferences organised/co-organised by the Institute

- **PAD 2011** – 9th Czech and Slovak PhD conference on Computer Architectures and Diagnostics, Stará Lesná, Slovakia, September 12-14, 2011. Organizing committee co-chair: V. Stopjaková
- Workshop "Contribution of Micro/Nano-electronics and Photonics to Development of Information Society and Quality of Life Enhancement", Hotel Bôrik, Bratislava, Slovakia, November 9, 2011. Organizing chair: D. Donoval

## VIII. MEMBERSHIP IN INSTITUTIONS AND COMMITTEES

### VIII. 1. Membership in National Institutions/Committees

- Member of the Slovak Research and Development Agency (APVV) Boards, Working Group of Technical Sciences (M. Žiška)
- Member of the Slovak Research and Development Agency (APVV) Boards for FP7 and International R&D Cooperation (M. Veselý)
- Head of Office for European Union Programs at Faculty of EE&IT (M. Veselý)
- National Expert for CEEPUS Program (M. Veselý)
- SBIMI, Slovak Society for Biomedical Engineering and Medical Informatics (O. Ondráček)
- Scientific Committee for PhD Study in Electronics, Member (J. Hribik)
- Scientific Committee for PhD Study in Measurement Technology, Member (J. Hribik)
- Scientific Committee for PhD Study in Military Communication and Information Systems, Member (P. Fuchs)
- Scientific Committee Communication and Information Technologies, Member (P. Fuchs)
- SBIMI SLS, Society for Biomedical Engineering and Medical Informatics, Scientific Secretary of SBIMI SLS, Member of Committee (M. Kukučka)
- SBIMI SLS, Society for Biomedical Engineering and Medical Informatics, Member of Committee (Z. Krajčušková)
- SBIMI SLS, Society for Biomedical Engineering and Medical Informatics, Section of Medical Informatics, Scientific Secretary (Z. Krajčušková)
- Association of Alumni and Friends, Faculty of Electrical Engineering and Information Technology in Bratislava, member of Bureau (Z. Krajčušková)
- SBIMI, Society for Biomedical Engineering and Medical Informatics, Member of Committee (E. Cocherová)

- SKBS, Slovak Biophysical Society, Member (E. Cocherová)

### VIII. 2. Membership in International Institutions/Committees

- Member of Education and Training Coordination Board and Scientific Community Council of ENIAC JU, (D. Donoval)
- Member of Steering Committee of European Workshop in Microelectronics Education EWME (D. Donoval)
- Member of European Technology Platform PHOTONICS21, Education Working Group WG7 (F. Uherek)
- Member of ISEG (Independent Scientific Evaluation Group) NATO, Brussels (D. Ďuračková)
- Alternate Councillor of IUVESTA (M. Veselý)
- Member of the Steering Committee of IEEE Symposium on Design and Diagnostic of Electronics Circuits and Systems, DDECS (V. Stopjaková)
- EURO PRACTICE membership of the University is managed by the Institute (responsible: M. Veselý)
- IFMBE, The International Federation for Medical and Biological Engineering (O. Ondráček, M. Kukučka, Z. Krajčušková)
- European University Program TEXAS INSTRUMENTS, Member, Lecturer (P. Fuchs)
- International Scientific Committee New Trends in Signal Processing, Member (P. Fuchs)
- Audio Engineering Society (AES), Member, Contact Person of the AES Slovak Section (A. Přibílová)
- URSI, Scientific Secretary, National Committee in Slovak Republic (Z. Krajčušková)
- Czech and Slovak Radioengineering Society, Member (Z. Krajčušková)
- Radioengineering, Proceedings of Czech and Slovak Technical Universities and URSI Committees, Member of Editorial Board (Z. Krajčušková)
- IEEE, The Institute of Electrical and Electronics Engineers, Member (E. Cocherová)
- IFMBE, the International Federation for Medical and Biological Engineering (E. Cocherová)
- Czech and Slovak Radioengineering Society, Member (E. Cocherová)
- URSI, Union Radio-Scientifique Internationale, Member (V. Štofanič)
- IEEE, The Institute of Electrical and Electronic Engineers, Member (V. Štofanič)
- IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, Member (V. Štofanič)
- IEEE Communications Society, Member (V. Štofanič)
- IEEE, The Institute of Electrical and Electronic Engineers, Member (F. Uherek)
- IEEE, The Institute of Electrical and Electronic Engineers, Member (D. Donoval)
- CSSF, Czech and Slovak Photonic Society, Member of Executive Board (F. Uherek)

# IX. PUBLICATIONS

## IX. 1 Journals

- [1] ACHIMOVICHOVÁ, M. M. - BALÁŽ, P. - ĎURIŠIN, J. - DANEU, N. - KOVÁČ, J. - ŠATKA, A. - FELDHOFF, A. - GOCK, E.: Mechanochemical Synthesis of Nanocrystalline Lead Selenide: Industrial Approach. In: International Journal of Materials Research. - ISSN 1862-5282. - Vol. 102, No. 4 (2011), p. 441-445. (in English)
- [2] BALÁŽ, P. - POURGHAHRAMANI, P. - ACHIMOVICHOVÁ, M. M. - DUTKOVÁ, E. - KOVÁČ, J. - ŠATKA, A. - JIANG, J.: Mechanochemical Synthesis and Reactivity of PbS Nanocrystals. In: Journal of Crystal Growth. - ISSN 0022-0248. - Vol. 332 (2011), p. 1-6. (in English)
- [3] BALÁŽ, P. - DUTKOVÁ, E. - ŠATKA, A. - KOVÁČ, J.: Particle Properties and their Modification in Mechanically Activated Reaglar As4S4. In: Acta Montanistica Slovaca. - ISSN 1335-1788. - Vol. 16, No. 2 (2011), p. 149-153. (in English)
- [4] BEHMENBURG, H. - GIESEN, C. - SRNÁNEK, R. - KOVÁČ, J. - KALISCH, H. - HEUKEN, M. - JANSEN, RH.: Investigation of AlN Buffer Layers on 6H-SiC for AlInN HEMTs Grown by MOVPE. In: Journal of Crystal Growth. - ISSN 0022-0248. - Vol. 316, No. 42-45 (2011), p. 42-45. (in English)
- [5] BERNÁT, M. - ŠATKA, A.: Time Domain Reflectometry. In: Posterus. - ISSN 1338-0087. - August (2011), <http://www.posterus.sk/?p=11213>. (in Slovak)
- [6] CEHLÁR, M. - HAXHIU, L. - KELEMEN, M. - KOŠČ, I. - HREHOVÁ, D.: Economy Analysis Methodology of Investments for Opening of New Lignite Mining Field. In: Journal on Law, Economy&Management. - ISSN 2048-4186. - Vol. 1, Iss. 1 (2011), p. 3-15. (in English)
- [7] CHOVAN, J. - UHEREK, F. - KURINEC, R. - ŠATKA, A. - PAVLOV, J. - SEYRINGER, D.: Temperature Characterization of Passive Optical Components for WDM-PON DTTx. In: Advances in Electrical and Electronic Engineering. - ISSN 1336-1376. - Vol. 9, No. 3 (2011), p. 143-149. (in English)
- [8] COCHEROVÁ, E. - KUPEC, P. - ŠTOFANIK, V.: Resonance Properties of the Biological Objects in the RF Field. In: Journal of Physics: Conference Series. - ISSN 1742-6588. - Vol. 329 (2011), Art.No. 012033. (in English)
- [9] DONOVAL, D. - CHVÁLA, A. - ŠRAMATÝ, R. - KOVÁČ, J. - MORVAN, E. - DUA, Ch. - DIFORTE-POISSON, MA. - KORDOŠ, P.: Transport Properties and Barrier Height Evaluation in Ni/InAlN/GaN. In: Journal of Applied Physics. - ISSN 0021-8979. - Vol. 109, Iss. 5 (2011), Art.No. 063711. (in English)
- [10] EICKELKAMP, M. - WEINGARTEN, M. - RAHIMZADEH KHOSHROO, I. - KETTENISS, N. - BEHMENBURG, H. - HEUKEN, M. - DONOVAL, D. - CHVÁLA, A. - KORDOŠ, P. - KALISCH, H. - VESCAN, A.: Electrical Properties of Thermally Oxidized AlInN/AlN/GaN-Based Metal Oxide Semiconductor Hetero Field Effect Transistors. In: Journal of Applied Physics. - ISSN 0021-8979. - Vol. 110 (2011), Art.No. 084501. (in English)
- [11] FLICKYNGEROVÁ, S. - NETRVALOVÁ, M. - ŠUTTA, P. - NOVOTNÝ, I. - TVAROŽEK, V. - GAŠPIERIK, P. - BRUNCKO, J.: Effects of Sputtering Power and Pressure on Properties of ZnO: Ga Thin Films Prepared by Oblique-Angle Deposition. In: Thin Solid Films. - ISSN 0040-6090. - Vol. 520 (2011), p. 1233-1237. (in English)
- [12] GAŠPIERIK, P. - MIKOLÁŠEK, M. - TVAROŽEK, V.: Computer Simulations of Advanced Photovoltaic Solar Cells. In: Energie 21. - ISSN 1803-0394. - Vol. 4, No. 5 (2011), p. 30-32. (in Slovak)
- [13] HAGARA, M. - KULLA, P.: Edge Detection with Sub-Pixel Accuracy Based on Approximation of Edge with Erf Function. In: Radioengineering. - ISSN 1210-2512. - Vol. 20, No. 2 (2011), p. 516-524. (in English)
- [14] HASENÖHRL, S. - NOVÁK, J. - VÁVRA, I. - ŠOLTÝS, J. - KUČERA, M. - ŠATKA, A.: Epitaxial Growth of GaP/InxGa1-xP (xln>0.27) Virtual Substrate for Optoelectronic Applications. In: Journal of Electrical Engineering. - ISSN 1335-3632. - Vol. 62, No. 2 (2011), p. 93-98. (in English)
- [15] HAŠKO, D. - ŠATKA, A. - UHEREK, F. - KOVÁČ, J.: Diagnostic Methods in International Laser Centre. In: Transfer. - ISSN 1337-9747. - Vol. 3, No. 3 (2011), p. 8-9. (in Slovak)
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