MAIN RESEARCH FIELDS

- Electric machines and equipment modeling, simulation, optimal design and testing (EME)
  Keywords: electric machines, electric equipment, field calculation, optimal design, computer aided testing.

- Power electronics and motion control (PEMC)
  Keywords: electric machines and drives, power electronics, speed and position control, digital control.

- Switched reluctance motor drive (SRMD)
  Keywords: electric machines and drives, reluctance motor, power electronics, digital control.

- Power industrial electric drives (PIED)
  Keywords: electric machines and drives, power electronics, speed control.

- Electrical lighting and Electrotechnologies (ELE)
  Keywords: electromagnetic fields, applied electrostatics, welding, electrothermal processes, ultrasonics, power electronics, lighting devices.

- Logic of the creative process (LCP)
  Keywords: logicization, algorithmization, cybernettization, inventics, innovation.

Researches are organized in the centre New system of intelligent motion of the electric machines.

---

Researches in ELECTRIC MACHINES AND EQUIPMENTS MODELLING, SIMULATION, OPTIMAL DESIGN AND TESTING

FIELD DESCRIPTION

Electric machines modeling including saturation and frequency effect both in the lumped parameter or distributed parameter (field distribution) forms are paramount for global optimization design and new computer - aided testing and parameter identification methods, modeling and simulation.

ACTIVITIES AND RESULTS

Since 1980 aggressive theoretical and experimental work on ever better electric machine modeling, simulation, optimal design, testing and parameter identification has been taking place with the results of two U.P.T. codes for optimal design of large power a.c. machines and a few new testing and parameter identification techniques for electric machines. Most of the work resulted in prototypes tested (or built) in cooperation in industrial partners.

Due to the long time collaboration with the Faculty of Automation and Computer Science from Timișoara, in the field of data acquisition systems and digital signal processing, the D-109 Laboratory was affiliated at the research center in automation and computer science (Prof. dr. ing Ștefan Preitil)

RESEARCH TEAM

- Acad. Toma DORDEA
- Prof. dr. eng. Marius BIRIESCU
- Prof. dr. eng. Elena NICA
- Prof. dr. eng. Marius BABESCU
- Prof. dr. eng. Vladimir CREŢU
- Lect. dr. eng. Mihai MICEA
- Eng. Marţian MOT
- Eng. Gheorghe MADESCU
- Eng. Ileana TORAC

RESEARCH OFFERS

Advanced design methods of large a.c. machines including saturation and frequency effects, coupled with dynamic simulation, advanced design methods for ultrahigh torque induction motors, new design methods for capacitor induction motors, computer - aided parameters identification - software and hardware - for electric machines, consulting on large power electric machines design and testing.

CONTACT PERSON

Prof. dr. eng. Marius Biriescu
E-mail: biri@d109lin.utt.ro

---

Researches in INTELLIGENT MOTION CONTROL

FIELD DESCRIPTION

Intelligent motion control integrates motors, static power converters, digital controllers, sensors in systems that perform industrial motion automation with high efficiency (low losses).

ACTIVITIES AND RESULTS

Research activities on linear and rotary motors & drives since 1975 with numerous prototypes built and tested. Integration of intelligent motion systems in Romanian industries up to 2000 kW units since 1994

Various applications of power electronics in energy conversion and digital control concerned with: wind and hydraulic energy conversion systems into electric energy by means of variable speed operation, starter-alternators with digital control designed for hybrid and electric vehicles, and PM machines-based digital control systems up to 150 rpm

RESEARCH BENEFICIARIES

Various Romanian industrial companies such as: BEESPEED AUTOMATIZĂRI Timișoara, UCM Reșița, AZOMURES Tg. Mureș, AQUATIM Timisoara, SE Iernut, ELECTROCENTRALE Deva, CNCSIS, ANSTI etc.
External co-operations: Aalborg University Denmark, EBM Papst Germany, Casino University Italy

**RESEARCH TEAM**
- Prof. dr. eng. Ion BOLDEA
- Assoc. prof. dr. eng. Nicolae MUNTEAN
- Lect. dr. eng. Lucian TUTELEA
- Lect. dr. eng. Alexandru HEDEȘ
- Assist. eng. Cristian LASCU
- PhD student Ioan Şerban
- PhD student Cristian Pitic
- PhD student Marcel Topor
- PhD student Răzvan Ancuţi
- PhD student George Iliescu
- PhD student Vasile Coroban

**RESEARCH OFFERS**
HARDWARE: Integration of intelligent motion control systems in various industries from process identification to commissioning and service. Prototyping of new systems for given specifications.
SOFTWARE: Electric motor - linear and rotary - design software aids (ELECTROMOTOR SOFT) in the form as software licensed products by request.

**CONTACT PERSON**
Prof. dr. eng. Ion BOLDEA
E-mail: boldea@lselinux.utt.ro

---

**Researches in POWER INDUSTRIAL ELECTRIC DRIVES**

**FIELD DESCRIPTION**
Power electric drives with variable speed are useful to increase productivity and quality in various processes and require means for speed control invariably. The load requirements are very specific and the best solution depends notably on the application.

**ACTIVITIES AND RESULTS**
Since 1980, with emphasis on overhead cranes using various static power converters, research efforts have been developed to define, design, build and test power drives with variable speed. New design methods and converter realizations have been obtained both with rotary or linear motors.

**RESEARCH BENEFICIARIES**
Mechanical works Timisoara, Ministry of Education, PROMPT Research Institute.

**RESEARCH TEAM**
- Prof. dr. eng. Eugen SERACIN
- Prof. dr. eng. Gheorghe PĂPUŞOIU
- Eng. Ioan GHIUR
- Eng. Sorin MUŞUROI
- Eng. Liviu BĂJAN

**RESEARCH OFFERS**
Optimal design methods for power industrial drives, current inverter power drives, linear motors conveyors.

**CONTACT PERSON**
Prof. dr. eng. Eugen Seracin
E-mail: seracin@et.utt.ro

---

**Researches in ELECTRIC LIGHTING AND EQUIPMENT FOR ELECTROTECHNOLOGIES**

**FIELD DESCRIPTION**
Modern lighting sources and lighting devices, optimal lighting design, power electronics for electric lighting, electrotechnologies - based on electromagnetic or electrostatic fields are widely used in the fabrications manufacturing systems and include electrothermal processes, welding power sources, power ultrasonics, electrostatic etching etc.

**ACTIVITIES AND RESULTS**
Since 1980 notable research efforts have been devoted to investigate induction - the welding process and the power sources, new electric welding and ultrasonics power electronics sources. A few prototypes have been built and tested.

**RESEARCH BENEFICIARIES**
Ministry of Research, ISIM Timișoara

**RESEARCH TEAM**
- Prof. dr. eng. Ioan ŞORA
- Lect. dr. eng. Dan NICOARĂ
- Lect. dr. eng. Alexandru HEDEȘ
- Assist. eng. Adriana TRĂISTARU
RESEARCH OFFERS
Low weight power electronics, including high-frequency power transformers, arc welding power sources, advanced power electronics ultrasomics sources (from research to prototyping), consulting in electrotechnologies and electric lighting devices.

CONTACT PERSON
Prof. dr. eng. Ioan Şora
E-mail: isora@et.ut.ro

Researches in LOGIC OF THE CREATIVE PROCESS & CREATIVE ENGINEERING EDUCATION

FIELD DESCRIPTION
In our days the logicization and algorithmization of creative processes constitute an important direction of development of innovation paradigm and they frames into the inventology domain following the efficientization of original technical creation. Therefore the integration of the paradigm of innovation into the engineering education is requested.

ACTIVITIES AND RESULTS
The researches concerning the complex development of inventics as a science of technical creation and as an educational discipline started in 1994 had as a result the elaboration of some general models of system concerning the object, the processuality and resources of technical creation, aimed to support the creative thinking and acting.

RESEARCH TEAM
➢ Prof. dr. eng. Stefan BARTZER

ACTIVITIES AND RESULTS
Efficient systemic and transdisciplinary approaches of technical creation's problems and engineering education, strategy elements and innovation tactic and technologic transfer, especially in the electrotechnical systems domain.

CONTACT PERSON
Prof. dr. eng. Ștefan Bartzer
E-mail: sbartzer@et.ut.ro

MAIN PUBLICATIONS

PUBLISHED PAPERS


PhD THESIS DEFENDED

1. Dodin, Marian The Influence of High Level Time and Space Harmonics on Induction Machines, PhD advisor: Prof. dr. eng. Dordea Toma

2. Popa Gabriel, Contributions Regarding the Improvement of Industrial ElectroFilters Parameters for Biphasic Gas – Solid Particles Systems, PhD advisor: Prof. dr. eng. Şora Ioan

3. Giurgiu Valentin, Contributions Regarding the Transients of AC Electric Drives, PhD advisor: Prof. dr. eng. Seracin Eugen
DEPARTMENT OF ELECTROTECHNICS

MAIN RESEARCH FIELDS

- Galvanomagnetic effects studies  
  **Keywords:** transducers, circuits
- Special topics in electrical circuits  
  **Keywords:** circuits, networks
- Numerical simulation of electromagnetic fields  
  **Keywords:** electric & magnetic field, FEM, BEM
- Electromagnetic energy in industrial applications and electromagnetic field and high frequency waves in non homogenous medium  
  **Keywords:** electromagnetic field, energy, microwaves, laser waves
- Technical applications of magnetic liquids  
  **Keywords:** magnetic field, forces, geometry improvement

Researches in **GALVANOMAGNETIC EFFECTS STUDIES**

**FIELD DESCRIPTION**
The domain refers to the analysis of electrical field in Hall plates and the behavior of Hall generator as a non-reciprocal circuit component. Also it refers to the determination of parameters of the Hall generator as function of the direction of magnetic induction.

**ACTIVITIES AND RESULTS**
We have developed computing methods of the electric field in the Hall plates. Introduction of the couple of system of transfer parameters components into the investigation has completely elucidated the problem of the Hall generator non-reciprocity, allowing for a most general formulation of the condition of non-reciprocity. They were achievement wattmeters Hall, ampermeters Hall, tesllameters Hall, and others.

**RESEARCH TEAM**
- Prof. doc. dr. eng. Constantin ŞORA, head of the team
- Prof. dr. eng. Ioan De SABATA
- Prof. dr. eng. Avram HELER
- Prof. dr. eng. Ioan VETREŞ

**RESEARCH OFFERS**
Consulting on the achievement of the Hall generator and for calculation of the electric field in the Hall plates

Researches in **SPECIAL TOPICS IN ELECTRICAL CIRCUITS**

**FIELD DESCRIPTION**
Lossy antireciprocal systems, like Hall plates, OA gyrators and DC-DC power converters. The second topics concern reliability optimization of medium power distribution networks.

**ACTIVITIES AND RESULTS**
Special features of the two-port transfer parameters of lossy antireciprocal systems, like Hall plates, OA gyrators and DC-DC power converters, were studied. Research has been done for the efficient grounding-faults detection in isolated-neutral distribution networks and the simulation of transients triggered by such fault. Some of the results are used for efficient trimming of the network’s protective relays.

**RESEARCH TEAM**
- Prof. dr. eng. Dumitru TOADER, head of the team
- Prof. dr. eng. Ştefan HĂRĂGUŞ
- Prof. doc. dr. eng. Constantin ŞORA
- Lect. dr. eng. Constantin BLAJ
- Assist. eng. Ildiko TATAI
- Assist. eng. Daniela VESA

**RESEARCH OFFERS**
Tools and strategies for efficient detection of grounding-faults in isolated-neutral medium voltage distribution networks.

Researches in **NUMERICAL SIMULATION OF ELECTROMAGNETIC FIELDS**

**FIELD DESCRIPTION**
The use of numerical methods for solving electromagnetic and thermal fields in technical devices: galvanomagnetic devices, electromagnets and permanents magnets systems, magnetoelastic and high DC currents transducers, electrical machines, induction heating equipments.
ACTIVITIES AND RESULTS
Optimal design of special purposes electromagnets, high sensitivity relays with permanent magnets. Analysis of the electromagnetic and thermal field in induction heating equipments.

RESEARCH TEAM
- Prof. doc. dr. eng. Constantin ŞORA
- Prof. dr. eng. Ioan De SABATA
- Prof. dr. eng. Ioan VETREȘ
- Prof. dr. eng. Dumitru RADU
- Prof. dr. eng. Ștefan HĂRĂGUȘ
- Prof. dr. eng. Ioan BERE
- Assoc. prof. dr. eng. Eugen BĂRBULESCU
- Assoc. prof. dr. eng. Dumitru IRIMIA
- Assoc. prof. dr. eng. Mariana TITIHĂZAN
- Lect. dr. eng. Constantin BLAJ
- Lect. dr. eng. Marian GRECONICI
- Assist. eng. Daniela VESA

RESEARCH OFFERS
Optimal design of electromagnetic devices using numerical methods. The study of electromagnetic and thermal fields in induction heating devices. Dielectrics in high frequency electromagnetic fields.

RESEARCH TEAM
- Prof. dr. eng. Nicolae BOGOEVICI
- Prof. dr. eng. Dumitru DABA
- Prof. dr. eng. Dumitru TOADER
- Prof. dr. eng. Ștefan HĂRĂGUȘ
- Assoc. prof. dr. eng. Dumitru IRIMIA
- Lect. dr. eng. Marius GRECONICI
- Lect. dr. eng. Constantin BLAJ
- Assist. eng. Ildiko TATAI

RESEARCH OFFERS
Optimization of consume rate of electromagnetic energy in rolling-mill plants. The calculation of thermoelectrical effects. Propagation in homogenous medium of the electromagnetic waves, with the evaluation of electromagnetic energy.

Researches in TECHNICAL APPLICATIONS OF MAGNETIC LIQUIDS

FIELD DESCRIPTION
The magnetic liquids have found a large interest in technical applications such as: magneto gravimetric separation, magnetic bearings and seals, pressure and flow transducers, accelerometers, inclinometers, accelerometers. Most of these applications are based on the magnetic field forces, depending on the magnetic properties of magnetic liquid and the geometry of the devices. The research of our group is concerned with the adequate magnetic liquids and geometry of the devices, in order to improve their performances.

ACTIVITIES AND RESULTS
The analytical and numerical evaluation of the magnetic field that acts on the shaft of cylindrical bearings represents the main research of the group. There has been investigated the cylindrical bearing with permanent magnetized shaft and magnetic liquid, and the cylindrical bearing with alternating poles (sandwich type structure). An approximate analytical expression of the magnetic force that acts on the shaft has been established, analyzing the influence of the geometrical design of bearing and the magnetic properties of the liquid. The analytical results have been compared with the numerical results.

RESEARCH TEAM
- Prof. dr. eng. Ioan DE SABATA
- Lect. dr. eng. Marian GRECONICI
- Lect. dr. eng. Barbu NICOARA
- Lect. dr. eng. Constantin BLAJ

RESEARCH OFFERS
Magnetic field computation for magnetofluidic devices. Forces and energy evaluation in magnetic liquids. Geometry design improvement of ferrofluidic devices, based on field calculation.

PUBLICATIONS

PUBLISHED PAPERS
1. Şora, I., Creșterea rezistenței electrice a unei pălăci Hall ca urmare a efectului magneto rezistiv electric, Revue Roumaine de Science et Technologie, Electrotechnique et Energetique, vol. 49, nr. 1, pp. 32-38, Bucharest, 2004
2. Şora, I., Some Remarks about Operational Amplifiers Based Girators and their Passivity


**PHD THESIS**

Ioan Dorin Haţegan: Contribuţii la analiza şi introducerea unei protecţii numerice performante în reţelele electrice de medie tensiune cu neutrul izolat, PhD advisor: Prof. doc. dr. eng. Constantin Şora

**CONTACT**

Prof. dr. eng. Dumitru DABA  
Head of Department  
2, Vasile Pârvan Blv.  
300223, Timişoara, Romania  
Tel: +40-256-403391
## DEPARTMENT OF POWER ENGINEERING

### MAIN RESEARCH FIELDS

- **Electromagnetic Compatibility in Power Systems**
  
  **Keywords:** Electromagnetic field, Environment, Disturbance Source, Electromagnetic interference

- **High Voltage Laboratory Tests and Quality Checking**
  
  **Keywords:** high voltage technique, overvoltages, testing record

- **Modeling and Simulation of Electromagnetic Transients in Power Systems**
  
  **Keywords:** switching and lightning, overvoltages, transient response, simulation

- **Power Apparatus and Equipments**
  
  **Keywords:** power apparatus, electrical equipment, switching devices, protection devices

- **Power Quality**
  
  **Keywords:** harmonic analysis, data acquisition, computer aided statistical research

- **Short-term energy and load curve forecasting**
  
  **Keywords:** energy forecasting, expert system

- **Power System Restructuring**
  
  **Keywords:** power system, energy pool, transmission open access, ancillary services, independent system operator

- **Power System Transient Stability and Voltage Stability**
  
  **Keywords:** power systems, power systems stability, transient stability, voltage stability

- **Electrical Materials**
  
  **Keywords:** ferromagnetic materials, hysteresis loop, transformer iron core, non-linear analyses methods

### RESEARCH TEAM

- Prof. dr. eng. Flavius Dan ŞURIANU
- Prof. dr. eng. Viorel TITIHĂZAN
- Assoc. prof. dr. eng. Ilona Bucataru

### RESEARCH BENEFICIARIES

RN Transelectrică S.A., Timișoara

### RESEARCHES IN ELECTROMAGNETIC COMPATIBILITY IN POWER SYSTEMS

#### FIELD DESCRIPTION

Electromagnetic disturbances analysis, produced by high and low perturbation sources; coupling mode between sources and victims and against perturbation action to protect the energetical field receptors analyses.

#### ACTIVITIES AND RESULTS

- Over-voltage protection equipments, using ZnO varistors
- Mathematics modeling and measurements of induced voltages in two-line circuit and adjacently circuits

#### RESEARCH BENEFICIARIES

RN Transelectrică S.A., Timișoara

### RESEARCHES IN HIGH VOLTAGE LABORATORY TESTS AND QUALITY CHECKING

#### FIELD DESCRIPTION

The purpose of high voltage tests consists of certifying the quality of insulation systems and emitting testing bulletins, optimal computation and experimental testing of insulation disturbance location and characteristic parameters measuring.

#### ACTIVITIES AND RESULTS

- Tests on sparkover voltages (high voltages resistance variable arresters)
- Tests on insulators of glass and composite insulators for a.c. overhead lines (Un > 1000 V)
- Tests on medium voltage 20 kV steel-aluminium conductor insulated with XLPE
- Tests on insulation of welding equipment

#### RESEARCH BENEFICIARIES

SC Electroconstrucția ELCO Oradea S.A., ELECTRICA S.A. Timișoara, ISIM Timișoara

### RESEARCHES IN MODELING AND SIMULATION OF ELECTROMAGNETIC TRANSIENTS IN POWER SYSTEMS

#### FIELD DESCRIPTION

Studies present the statistical results of a switching and a lightning overvoltage performed on electromagnetic transients. The probability of shielding failures and backflashover have been evaluated and compared to the characteristics of transmission lines in service. Overvoltages caused by line energization, single and three phase reclosing have been investigated by statistical approach using ATP - EMTP

#### ACTIVITIES AND RESULTS

In scientific research programs several models have been developed for calculation of switching or lightning overvoltages.
RESEARCH TEAM
- Prof. dr. eng. Corneliu VELICESCU
- Prof. dr. eng. Mircea NEMEŞ
- Lect. dr. eng. Gheorghe VUC
- Eng. Oana POP

RESEARCH OFFERS
Power systems transients - modeling and simulation
Power systems reliability studies
transformer iron core, non-linear analyses methods

FIELD DESCRIPTION
It’s a very large category of electrical systems, which includes all type of switching devices (from Low to High Voltage), all the equipment existing in power stations, protection systems (surge arresters, current protections), automatic equipment (relays, contactors), power electronic devices and digital command equipment (such as PLC’s)

ACTIVITIES AND RESULTS
Design of new electrical switching devices, equipment and installations
PCL’s implementation for different applications
Software for digital command equipment
On-line systems for monitoring and diagnosis of electrical equipment

RESEARCH BENEFICIARIES
Ministry of Education and Research, S.C.
ELECTRICA S.A. (S.D. Timișoara and Sibiu), S.C.
TRANSELECTRICA S.A. (S.T. SIBIU), ELECTROPUTERE S.A. Craiova

RESEARCH TEAM
- Prof. dr. eng. Alexandru VASILIEVICI
- Prof. dr. eng. Lucian MOLDOVAN
- Prof. dr. eng. Iuliu DELESEGA
- Prof. dr. eng. Petru ANDEA
- Assoc. prof. dr. eng. Doru VĂTĂU
- Assist. eng. Flaviu FRIGURĂ
- Assist. eng. Eva ZENG
- Assist. eng. Cristian POPA

FIELD DESCRIPTION
Analysis of harmonics, unsymmetrical operations and measurement of equivalent parameters for harmonic frequencies, evaluation of static reactive power compensation, control of passive power filter in electrical distribution systems.

ACTIVITIES AND RESULTS
Measurements were made in substations for Romanian National Electricity Company. A complex digital data acquisition system was used for the statistical estimation of harmonic distortion and unsymmetrical operation. New solutions were developed for the improvement of power quality in distribution systems.

RESEARCH BENEFICIARIES
National Agency of Scientific Research.
Electrical Power Distribution Company – ELECTRICA.
National Power Transmission Company – TRANSELECTRICA.

RESEARCH TEAM
- Prof. dr. eng. Adrian BUTA
- Assoc. prof. dr. eng. Adrian PANĂ
- Assist. eng. Ilona BUCATARIU
- Assist. eng. Gabriel LIMBEAN

RESEARCH OFFERS
Measurement and characterization of harmonic distortion for large industrial loads, location of harmonics in power systems, estimation effects for harmonics and unbalanced load on power system’s equipment, analysis of power quality

FIELD DESCRIPTION
The analyzing of the energy consumption and of the power need for end consumers, in viewing of forecasting, of short-term forecasting algorithm and programs elaboration for energy and load curves on maximum interval by one week

ACTIVITIES AND RESULTS
Data acquisition in the substations of Romanian electrical power system
The data files processing and creating about the energy consumption and required power
The implementation and drawing up some programs as PRENPS

RESEARCH TEAM
- Prof. dr. eng. Adrian BUTA
- Prof. dr. eng. Bucur LUŞTREA
- Assoc. prof. dr. eng. Adrian PANĂ
- Assist. dr. eng. Ilona BUCATARIU
- Eng. Silviu COLBAN (SISE Banat)
- Eng. Gabriel LIMBEAN

RESEARCH OFFERS
Short-term energy and load curve forecasting. Expert systems for the checking of used database at forecasting.

FIELD DESCRIPTION
The unprecedented word - wide restructuring of the power industry move away from the traditional monopolies and toward greater competition, in the
form a increased members of independent power producers and an unbundling of the main services that were until now provided by the utilities, has been building up for over a decade.

**ACTIVITIES AND RESULTS**
Managing risk on new market power and price stability
Pricing of network access

**RESEARCH TEAM**
- Prof. dr. eng. Mircea NEMEŞ
- Lect. dr. eng. Gheorghe VUC
- Assist. eng. Ioan BORLEA
- Assoc. prof. dr. mat. Doru PĂUNESCU (Department of Mathematics)
- Eng. Oana POP

**RESEARCH OFFERS**
Digital model of power system.

### Researches in **POWER SYSTEM TRANSIENT STABILITY AND VOLTAGE STABILITY**

**FIELD DESCRIPTION**
Computer aided analysis and improvement of the stability of the electric power system (transient stability, dynamic stability and voltage stability). New control technique for stability improvement. Developing of the master studies in this fields.

**ACTIVITIES AND RESULTS**
Advanced software for stability analysis
New control techniques for the improvement of the dynamic behavior of synchronous generators
PHARE postgraduate and PhD program

**RESEARCH BENEFICIARIES**
Ministry of Education and Research
Electrical Power Distribution Company – ELECTRICA
National Power. Transmission Company – TRANSELECTRICA

**RESEARCH TEAM**
- Prof. dr. eng. Ştefan PREITL
- Prof. dr. eng. Mircea NEMEŞ
- Prof. dr. eng. Mihai MOGA
- Prof. dr. eng. Radu Emil PRECUP
- Assist. eng. Ioan BORLEA
- Eng. Gabriel LIMBEAN
- Eng. Filip LUPEA
- Eng. Marius GROZA

**RESEARCH OFFERS**
Software for stability analysis and improvement
Studies concerning dynamic behavior of power systems
Advanced control techniques for transient and voltage stability improvement

**Researches in **APPLIED NON-LINEAR MODELING OF FERROMAGNETIC MATERIALS**

**FIELD DESCRIPTION**
Non linear transformer iron core modelling taking into account the hysteresis loop. Methods of model establishment and validation. Estimation of the transformer behavior under symmetrical (sinusoidal and non-sinusoidal) and asymmetrical supply conditions. Analyses of the main quantities. Iron core losses harmonic analyses.

**ACTIVITIES AND RESULTS**
Measurements were performed in the ‘National Research Center for Welding and Material Trials-ISIM’ and the ‘Power Energy Department’ laboratories. A complex digital system was used for data acquisition and harmonics analyze of the transformer currents and tension for different supply conditions. The proposed transformer model was implemented into a welding machine and validated (comparison between the simulated and the measured results showed a very good agreement). Simulations were performed over in order to estimate the welding performances over a wide range of condition defined through: different firing pulse angle, materials, forms and thickness of welding pieces.

**RESEARCH BENEFICIARIES**
National Research Center for Welding and Material Trials-ISIM, Timisoara
Power Energy Department of the “Politehnica” University of Timisoara
ICPE Bucharest - manufacturer of the welding transformer under test

**RESEARCH TEAM**
- Assoc. prof. dr. eng. Doru VĂTĂU
- Assist. Eng. dr. Flaviu FRIGURĂ

**RESEARCH OFFER**
Modeling single-phase transformers and apparatuses with ferromagnetic core
Estimation of electromagnetic quantities: time variation shape, r.m.s., peak values, harmonic analyse over a wide range of conditions
Time and frequency analysis of electromagnetic quantities
Behavioural analysis of a complex system containing a transformer or an apparatus
Iron core power losses detailed analysis

### PUBLICATIONS

#### BOOKS


**PUBLISHED PAPERS**


6. Chiosa, N., Buta, A., Dușa, V., Gheju, P., Pană, A., Titihăzen, V., Trecerea alimentarii serviciilor proprii ale stațiilor RET la tertiarul AF în condițiile liberalizării pieii de e.e. în România, Energetica, An 52, Nr.4, ISSN 1453-2360, pp. 178-184

7. Buta, A., Pană, A., Jude, A., Aplatizarea curbelor de sarcina, mijloc de eficientizare a sistemelor de energie, Energetica, An 52, Nr.4, ISSN 1453-2360, pp. 520-524


13. Ticula, E., Buta, A., Pană, A., Metoda de identificare a regimurilor de rezonanta armonică ale rețelelor electrice de distribuție poluate armonic, Energetica, An 52, Nr.2, ISSN 1453-2360, pp. 62-67

14. Delesega, I., Toroidal Contact Model Computational Results, Electric Power Components and Systems, 32, 8, pp. 801-812


**RESEARCH PROJECTS / CONTRACTS**


**PhD THESIS DEFENDED**

Ilona Bucatari, Contribuţii la studiul compensării serie a reţelelor de distribuţie, PhD advisor: prof. dr. eng. Viorel Negru
### CONTACT

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Tel/Fax</th>
<th>Email</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. dr. eng. Flavius Dan ŞURIANU</td>
<td>300223, Timișoara, Romania</td>
<td>+40-256-403411</td>
<td><a href="mailto:catee@et.utt.ro">catee@et.utt.ro</a></td>
<td><a href="http://www.et.utt.ro">http://www.et.utt.ro</a></td>
</tr>
<tr>
<td>Head of Department</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, Vasile Pârvan Blv.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>