Research Teams

Team of Industrial Electrical Engineering

Department of Theoretical and Industrial Electrical Engineering,
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Team members

prof. Ing. Dobroslav Kováč, CSc. – expert in the field of electrical engineering, electronics, sensors, microcomputer technics, automation and computer simulation of electrical circuits and electromagnetic fields

prof. Ing. Irena Kováčová, CSc. – expert in the field of electrical engineering, control and power electronics, electromagnetic compatibility and electrical measurement

doc. Ing. Iveta Tomčíková, CSc. – expert in the field of theoretical electrical engineering, computer simulation, modeling and numerical methods applied for parameter analysis of electrical circuits

Ing. Milan Guzan, PhD. – expert in the field of theoretical electrical engineering, computer simulation and modeling, metrology and measurement techniques, also as chaos theory field

Ing. Tibor Vince, PhD. – expert in the field of electrical engineering, automation, microcomputer technics, visualization, programming and applied information technologies

Ing. Ján Molnár, PhD. – expert in the field of electrical engineering, automation, measurement techniques, microcomputer technics, programming, applied information technologies, computer modeling and sensor technics

Ing. Radoslav Bučko, PhD. – expert in the field of electrical engineering, measurement and microcomputer technics, automation, CAD and CAM systems, also as embedded systems

Ing. Jozef Dziak – expert in the field of theoretical electrical engineering, electro power engineering, computer analysis and simulation of electric circuits functionality, also as project management field

Ing. Matej Bereš – expert in the field of applied analogue and digital electronics, microcomputer technics, controlling of industrial systems, visualization, automation and industrial electrical engineering

Research Direction

Research team activities are focused on following areas:

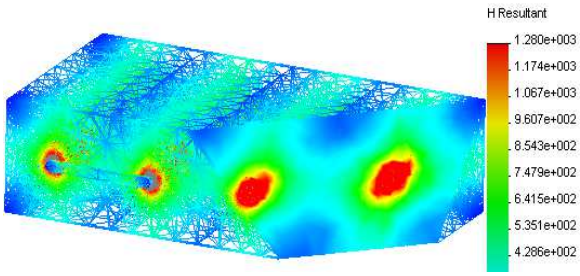
- modeling, measuring and optimization parameters of electric circuits and systems from the EMC point of view,
- development of elastomagnetic force sensors and relevant measurement apparatus,
- virtual, intelligent and automated modern measurement systems,
- modeling and measuring of electromagnetic fields and its influence on biological systems,
- analysis, computer simulation and measurement of functional problems of electrical circuits in the field of electrical engineering, electronics and automotive technics,
- expert and telemetric measurements,
- modern and effective diagnostic methods for electrical and electronic systems.

The Importance and Benefits of Research

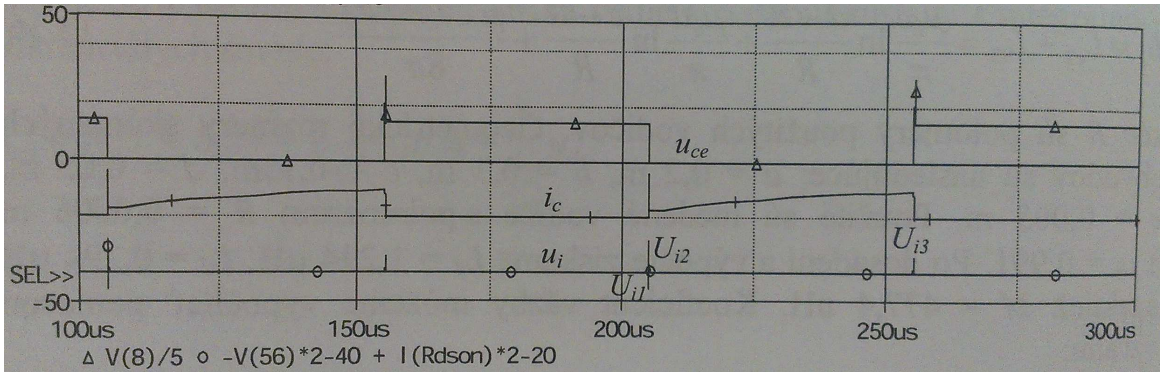
The importance and benefits of mentioned research team is focused to the field of design, development and application of new types of semiconductor converters and electronic circuits, computer simulation and application of modern semiconductor parts, computer simulation and practical verification of electric or magnetic fields, solving the EMC electrical engineering products, sensor and smart sensor development and application, virtual, distributed, measurement and diagnostic systems development and its applications, various physical units measurement and applications, high-emitting LED diode applications. Based on the research results the team prepares approximately one till two patent applications yearly.

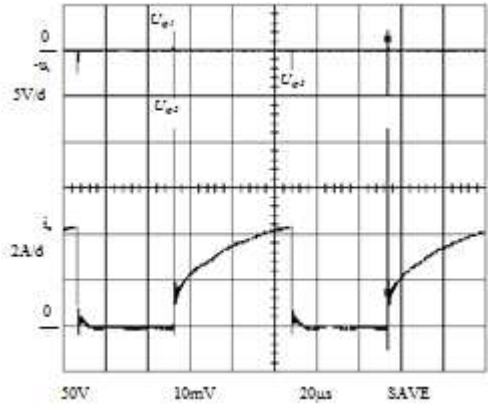
Solving Current problems

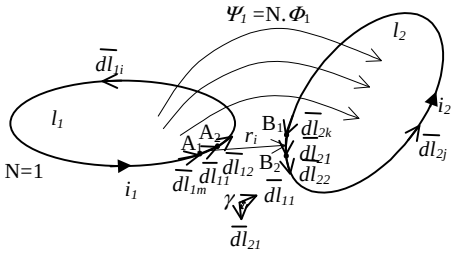
- Development and simulation of elastomagnetic sensor of pressure force 20kN.



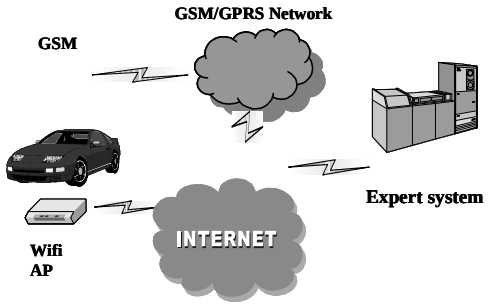
- Measuring of specific resistivity of cuprum.
- Solving of EMC problem in cold rolling mill.



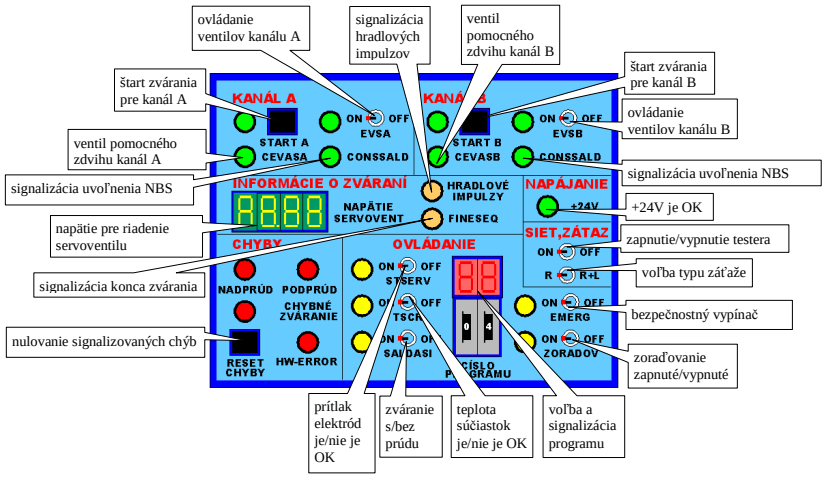




- Measuring and analysing of battery power management.

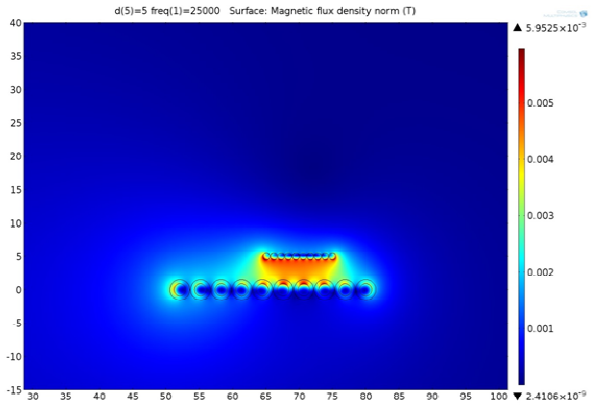


- Designed and developed electronic tester for FASE control.



- Designed and developed degaussing equipment for SAAB Company.

- Designed and developed current measurement transformer.
- Charger for electro mobiles based upon the principle of directed energy transfer by air.



Current Projects

- Project supported from EU foundation „Centre of Excellence of the Integrated Research & Exploitation the Advanced Materials and Technologies in the Automotive Electronics.“ ITMS 26220120055, activity 2.5 - Laboratory for modeling and measuring (MODMER)
- Project supported by Volkswagen Slovakia foundation in the frame of grant program: To develop by technics „Quick charger for electro mobiles based on wireless energy transfer by air“
- Project of Grant Agency of Czech Republic GA15-22712S titled as „Chaotic tangles in subsystems of radiofrequency channel“
- Project VEGA No. 2/0069/15 „Investigation of postnatal neurogenesis in relation to neurodegeneration“.

Cooperation with Academic Institutions and Industry

Cooperation with Academic Institutions:

- Institute of Electromechanics, energy saving, and automatic control systems, Kremenchuk Mykhailo Ostrohradskyi National University, Ukraine
- University of West Bohemia, Pilsen, Czech Republic
- University of Valencia, Spain
- Czech Technical University in Prague, Czech Republic
- Silesian University of Technology, Gliwice, Poland
- Institute of Physics, A. Mickiewicz University, Poznan, Poland
- University, Budapest, Hungary
- The Czech Academy of Science, Prague, Czech Republic
- Stefan cel Mare University, Suceava, Romania

- University of Applied Sciences, Harz, Germany
- University, Miskolc, Hungary
- Politechnika Czestochowska, Poland
- University of Florence, Italy
- Dresden University, Germany
- Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland

Cooperation with Industry:

- Magna Steyr, Graz, Austria
- Volkswagen, Slovakia
- LVD II Slovakia - Unicorn Tornaľa
- Molex Slovakia, a.s.
- SPP, a.s.
- US Steel, Košice

Selected Publication

- Kováč, D. - Kováčová, I. - Kaňuch, J.: „EMC from the theory and praxis point of view“. In: 1.st edition, Prgue: BEN-technical literature, 2006, 208 pages, ISBN 80-7300-202-7.
- Kováč, D. - Vince, T. - Molnár, J. - Kováčová, I.: „Modern internet based production technology“. In: New Trends in Technologies: devices, computer, communication and industrial systems, Rijeka, Sciyo, 2010, p. 145-164, ISBN 978-953-307-212-8.
- Patent 288241 „Connection for automated and variable interconnection of electrical parts and equipment into electrical circuits“, 2015
- Patent 288331 „Control impulse generator for multiphase step up DC/DC converter“, 2015
- Patent 288279 „Analogue impulse generator for multiphase step up DC/DC converter“, 2015

Photos

Laboratory for development of microcomputer and internet control systems

Laboratory for application of industrial control systems

Laboratory for development of electronic circuits