BRNO
UNIVERSITY
OF TECHNOLOGY

FACULTY
OF ELECTRICAL
ENGINEERING
AND COMMUNICATION

ANNUAL REPORT 2002

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FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION
BRNO UNIVERSITY OF TECHNOLOGY

I. INTRODUCTION

Brno University of Technology (BUT) is the second largest and the second oldest technical university in the Czech Republic. It was founded in **1849** for technical, agricultural and commercial specializations. The languages of instruction were Czech and German. As a consequence of political and national disputes, Czech ceased to be used as language of tuition, and in **1899 the Czech Technical High School** was founded in Brno. After World War I and foundation of Czechoslovakia this school merged with the German Technical High School (originally bilingual) to form the High Technical School in Brno, which later carried the name of Dr. Edvard Beneš, the second president of Czechoslovakia. In the period between World War I and World War II this school was among the best technical universities in Europe. During World War II the school was, as all other high schools were, closed. The premises were used by German military institutions, and most equipment was destroyed. Immediately after the end of World War II the activities of the school were resumed. In 1951, at the beginning of Cold War, the Technical High School was closed and the departments became parts of the newly established Military Technical Academy. Tuition for civilians continued at the former faculty of civil engineering only. However, it soon became evident that the technical university should be re-established. Since 1956 the school gradually started its activities in various fields.

Electrotechnical disciplines were first taught at our Faculty in 1905. Since **1959**, when the independent Faculty of Power Engineering was founded and subsequently transformed into **Electrotechnical Faculty**, over 22 000 students have graduated from our Faculty. When in **1993** the structure of the FEECS was changed, it received a new name – **Faculty of Electrical Engineering and Computer Science (FEECS).** The Faculty of Electrical Engineering and Computer Science was the third largest among the seven universities of BUT, after, at the beginning of 2000 **the Faculty of Technology** and **the Faculty of Management** joined to establish **Tomáš Baťa University in Zlín.**

A number of historical decisions were taken at FEECS in 2001 in connection with the intended foundation of a new **Faculty of Information Technology (FIT)** and transformation of **the Faculty of Electrical Engineering and Computer Science (FEECS)** into **the Faculty of Electrical Engineering and Communication (FEEC)**. Organizational and economic activities concerned with the foundation of FIT and transformation of FEECS into FEEC were crowned by the decision of the Rector of BUT to appoint **Professor Radimír Vrba** Acting Dean of FEEC and **Professor Tomáš Hruška** Acting Dean of FIT to 1 January 2002.

In 2002 Professor Jan Vrbka **was Rector of BUT.** Professor Jiří Kazelle **from the Department of Electrotechnology at FEECS was Vice-Rector for External Relations.**

Professor Radimír Vrba was the Acting Dean of FEEC in 2002, and together with four vice-deans he was in the management of the Faculty. At the end of 2002 there was academic staff of **184** and **2 705** students in all state-supported study programmes. Moreover, interfaculty instruction was provided for **380** students of FIT and **14** students of FSI. The numbers of students totalled **3 048**, with academic staff of **184**, which compared with 2001 (212 academic staff and 3,004 students) means that the load of one teacher went up from 14,7 s/t to 16,57 s/t, which means that the load increased by 16,9 %.

In the first year of the existence the Faculty of Electrical Engineering and Communication the Faculty management included:

Prof. Ing. Radimír Vrba, CSc.	Dean
Doc. Ing. Pavel Jura, CSc.	Acting Dean
	Vice-Dean, First-Level Study
Prof. Ing. Václav Říčný, CSc.	Vice-Dean, Second-Level Study
Doc. Dr. Ing. Zbyněk Raida	Vice-Dean, Research, Postgraduate Study (since 15 April)
Doc. Ing. František Zezulka, CSc.	Vice-Dean, International Relations
Ing. Miloslav Morda	Faculty Secretary

The chairman of Academic Senate was **RNDr. Vlasta Krupková.** The first Vice-Chairman and President of Student Union was **Jana Božáková**. The student advisor to the Dean was **Jan Mertl**. **RNDr. Naděžda Uhdeová** was advisor for equal opportunities. Trade Unions were represented by **Doc. Ing. Vítězslav Hájek, CSc.**

There were 12 departments at the Faculty:

> Department of Mathematics
> Department of Physics
> Department of Languages
> Department of Theoretical and Experimental Electrical Engineering
> Department of Biomedical Engineering
> Department of Control, Measurement and Instrumentation
> Department of Electrical Power Engineering
> Department of Electrotechnology
> Department of Microelectronics
> Department of RadioElectronics
> Department of Telecommunications
> Department of Power Electrical and Electronic Engineering

In the academic year 2001/2002, the running out study programmes **Electrical Engineering and Computer Science (EECS)** were offered at FEECS. New study programmes **Electrical, Electronic, Communication and Control Technology (EECCT),** accredited in 2001, were commenced in the academic year 2002/03. Thus, in accordance with the Bologna Declaration, a new structured system of tuition was started, fully compatible with the European Union.

In 2002, **47** students graduated from FEEC with a Bc. Degree, **291** graduated with an Ing. Degree, and **23** postgraduate students were awarded a PhD. Degree. A total of **830** new students were matriculated and **76** graduates entered the doctoral programme, **65** of them in full-time and **11** in combined study. Tuition in English was provided for **32** foreign students paying their tuition fees. **Two academics** habilitated**.**

The most significant events and activities at the Faculty in 2002 were:

- meeting of the former deans of the Faculty on the occasion of 97th birthday of Professor Jiří Brauner, one of the earliest deans
- traditional faculty ball held in the newly constructed BUT Centre
- re-structuring of the Faculty after the academic staff and students of FIT have left
- **meeting of representatives of electrotechnical and related faculties** in Slovakia
- introduction of the EECCT Bachelor´s programme implementing the intention of the dynamic development of BUT
- the GAUDEAMUS 2002 fair with presentation of the new study programmes at FEEC
- final state examinations in all specializations
- active and successful **participation in the INVEX fair**
- final state examinations in EI specializations
- activities of Vice-Dean for first-level study **Doc. Ing. Pavel Jura, CSc.** concerned with tuition in the new structured system, with the support of the Development and Transformation Project of the Ministry of Education
- activities of Vice-Dean for Research **Doc. Dr. Ing. Zbyněk Raida** focused on adjustment of the criteria and methodology of evaluating academic staff and doctoral students
- in cooperation with FIT, organization of **STUDENT EEICT 2002 competition and conference** with **3** Bachelor´s, **82** Master's and **106** Doctoral papers
- activities of Vice-Dean for External Relations **Doc. Ing. František Zezulka, CSc.** aimed at the programmes SOCRATES/ERASMUS and other European programme
- activities of Faculty Secretary **Ing. Miloslav Morda,** related to dislocation and investment issues, and reconstruction of the integrated object Pod Palackého vrchem intended for the Department of Microelectronics, Department of Electrotechnology and Department of Control, Measurement and Instrumentation
- opening of an **Internet Study Room** with 40 efficient computers nearly continuously available to FEEC students
- positive evaluation of all four research intentions at FEECS led by **Prof. Ing. Jiří Svačina, CSc., Prof. Ing. Jiří Kazelle, CSc., Prof. Ing. Petr Vavřín, DrSc. and Prof. Ing. Radimír Vrba, CSc.**

- successful work on Development and Transformation Programmes led by **Doc. Ing. Pavel Jura, CSc.**
- activities of **Faculty Secretary Ing. Miloslav Morda,** concerned with maintaining and increasing the economic parameters of the faculty budget in order to maintain the payroll level
- activities of members of the Academic Senate of FEEC, mainly **RNDr. Vlasta Krupková, CSc.** and **Doc. Ing. Vladimír Podroužek, CSc.** focused on faculty organization, development, and economic issues
- activities of the advisor for equal opportunities **RNDr. Naděžda Uhdeová,** aimed at identification of the causes of the low number of female students at FEEC and at consultancy for female students
- activities of the member of the Committee for International Relations **Prof. Ing. Jiří Skalický, CSc.,** and mainly **Prof. Ing. Jaromír Brzobohatý, CSc.** and **PhDr. Jarmila Jurášová** concerned with enlisting and care of foreign students paying their tuition fees. Work with these students is a good training for participation in SOCRATES/ERASMUS projects, and also a good source of income for qualified teachers
- at the end of 2002 **Doc. Ing. Pavel Jura, CSc. and Prof. Ing. Radimír Vrba, CSc. were proposed for elections of candidates for the Dean**
- on 26 November 2002 the **Academic Senate of FEEC elected Prof. Ing. Radimír Vrba, CSc. candidate for the Dean and recommended the Rector of BUT to appoint him the Dean** for the period from 1 February 2003 to 31 January 2006.

The year 2002 was a difficult one. The Faculty in its previous form ceased to exist to 31 December 2001. Though the succeeding Faculty of Electrical Engineering and Communication was established with full support of Brno University of Technology, there were only reduced subsidies from the Ministry of Education to cover the operation costs. Moreover, extensive inter-faculty tuition for FIT, ruled by Rector's decision, represented an extremely high load for the academic staff of FEEC which was not appropriately economically evaluated.

In 2002, the Faculty achieved very good economic results despite the substantial change in the number of students, staff, and finance. Achievements in material supply and payroll system can be considered satisfactory. All those who have been successful in work on grants, mainly within the projects of the Grant Agency of the Czech Republic and of the University Development Fund, and those involved in the three faculty and one inter-faculty research intentions contributed to the improvement of the economic situation of the departments. An important contribution in terms of the quality of tuition and payroll was the Development and Transformation Programme of the Ministry of Education for distance education. It helped to finance 121 titles of electronic teaching notes and instruction aid (a total of 12,800 A4 pages) for the EECCT Bachelor´s study programme with the aim of preparing accreditation materials for distance study at the FEEC to be submitted to the accreditation Board of the Ministry of Education in 2004.

The increased number of students admitted in the EECCT Bachelor´s study programme at the Faculty of Electrical Engineering and Communication greatly contributed to the in the Long-Term Intention of BUT declared dynamic development of Brno University of Technology. I would like to express my gratitude to the academic staff and postgraduate students.

Prof. Ing. Radimír Vrba, CSc.
Dean

II. ACTIVITIES AT THE FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION, BRNO UNIVERSITY OF TECHNOLOGY IN 2002

II.1 Study Programmes – First-Level Study and the EECCT Bachelor´s Programme

Most significant for faculty life and for all forms and levels of study was the transformation of FEECS into the Faculty of Electrical Engineering and Communication (FEEC), and foundation of the Faculty of Information Technology (FIT) of Brno University of Technology to 1 January 2002.

This change was best reflected in the admission procedure. It took place from 11 to 14 June 2002. As in the past, there were only written examinations in mathematics and physics. The maximum possible number of points was 50. Applicants who had received 27 and more points were admitted. Of the total number of applicants, 847 applicants were admitted. Another 303 applicants who did not win a place at the FIT but met the requirements of FEEC (27 points) were offered a place at the FEEC. Then the admitted students totalled 1150. Enrolled in the first year of the new EECCT Bachelor´s study programme Electrical, Electronic, Control and Communication Technology were 846 students.

The new Bachelor´s programme covers five areas

- Automation Technology (AMT)
- Electronics and Communications (EST)
- Microelectronics (MET)
- Power Electrical and Electronic Engineering (SEE)
- Teleinformatics (TLI)

Students´ interests have been monitored since the enrolment. During the first semester, from 4 to 6 December 2002, the first year students were invited to presentations and meetings with representatives of departments. Students´ interests are illustrated in the following table.

Table 1. Interest in areas of the study programme Electrical, Electronic, Control and Communication Technology

Year		AMT	EST	MET	SEE	TLI	not responded	total
2002/03	at registration	91	332	43	49	331	0	846
	after 1. semester	76	250	38	51	295	76	786

The table shows the continuing interest in Electronics and Communications, and great interest in the new area teleinformatics.

Admission statistics have been done for many years. The chart below shows the numbers of applicants, admitted and registered students during the past years.
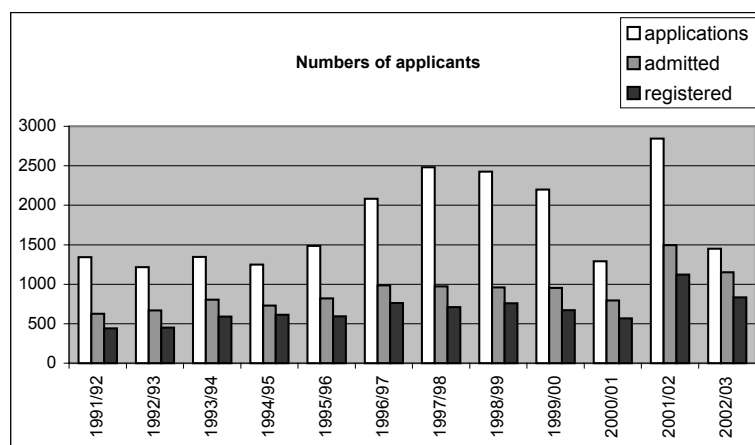
Apparent form the chart are three remarkable excesses in the past three years. The first one, in the academic year 2000/2001 was due to the fact that the number of school-leavers was reduced in consequence of introduction of the ninth grade. Then, the admission procedure for the academic year 2001/2002 was influenced by the transformation of FEECS and foundation of FIT. Out of the total number of 1123 there were 280 applicants for FIT. In the academic year 2002/2003, admission statistics reflect the high interest in areas containing the word ´informatics´ in their title, see Table1.

The quality of incoming students has been monitored for a number of years. An indicator of this aspect is the percentage of admitted students who have taken the school-leaving examination in mathematics or physics, see the graph.
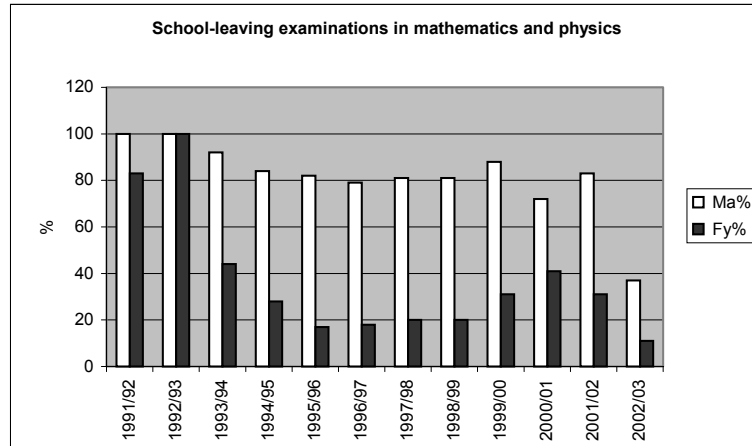
It is obvious from the graph that the current academic year 2002/2003 is unfavourable. In comparison with the previous year the number of students taking the school-leaving examinations in mathematics or physics went down by more than 50 %.

Another long-term indicator is the percentage of applicants coming from certain types of secondary schools - gymnazium´ type secondary schools (G), technical secondary schools (SPŠ) and apprentice schools (SOU), see the graph below:
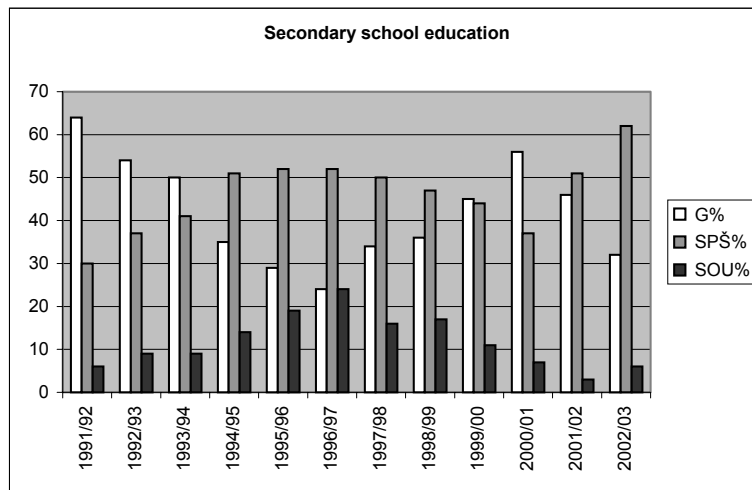
As first-level study, and particularly the first semester, is a transition period between secondary and university education, study results for this period are currently collected and analysed. These analyses are aimed at a better adaptation of incoming secondary-school leavers to university studies. Department of Mathematics and Department of Physics launched preparatory courses in mathematics and physics to assist applicants preparing for

entrance examinations. Preparatory courses in mathematics were attended by 131 applicants, and courses in physics by 67 applicants.

Academic year 2001/2002 was the last year when first-year students of the former study programme Electrical Engineering and Computer Science could choose areas offered by this study programme. These statistics are shown in the table below (the numbers before slash represent the interest in an area, the numbers after slash are the real numbers of students admitted in the area). The last row gives the numbers of students last admitted in the areas. VTI students were transferred to the newly established Faculty of Information Technology. (Bc. is the former three-year Bachelor´s study programme).

Table 2. Interest of students in areas covered by the study programme Electrical Engineering and Computer   Science

Academic Year	Study areas						Total
	VTI	EST	KAM	SEE	EVM	Bc	
1996/97	229/120	163/140	101/90	96/70	42/40	16/120	647/580
1997/98	251/130	191/150	67/90	80/80	41/60	7/100	637/610
1998/99	245/140	249/160	108/100	75/98	32/60	5/120	714/678
1999/00	212/120	244/140	67/90	48/117	35/99	0	606/566
2000/01	200/129	167/124	42/62	22/52	36/75	0	467/442
2001/02	468/280	290/268	133/130	76/172	57/142	0	1024/992

Attention has been paid to activities launched to motivate the students and to provide more information about areas offered in the EECCT Bachelor´s study programme.

Other activities related to first-level study were focused on regular activities, and on activities aimed at promoting the Faculty, and increasing the interest of secondary-school students in studies at our Faculty. We organized visiting days (15 January 2002 and 19 December 2002), teachers and students visited secondary schools. The Faculty participated in the GAUDEAMUS fair held from 30 October to 2 November 2002.

Doc. Ing. Pavel Jura, CSc.
Vice-Dean, First-Level Study and Bachelor´s Programme

II.2 Study Programmes – Second-Level Study and Publishing Activities

On the basis of the decision of the Academic Senate of BUT of 12 June 2001 the Faculty of Electrical Engineering and Computer Science was transformed into the Faculty of Electrical Engineering and Communication (FEEC) to 1 January 2002. In the academic year 2002/2003, students were admitted in the newly accredited three-year Bachelor's programme **Electrical, Electronic, Control and Communication Technology (EECCT)** with five areas: Automation and Measurement Techniques, Electronics and Communications, Microelectronics and Technology, Power Electrical and Electronic Engineering, Teleinformatics. There is also a newly accredited two-year continuing Master's programme with eight areas:

- Cybernetics
- Control and Measurements
- Microelectronics
- Electrical Manufacturing and Management
- Biomedical and Ecological Engineering
- Power Electrical and Electronic Engineering
- Power Electrical Engineering
- Communications and Informatics
- Electronics and Wireless Communications

At the same time tuition is going on in the running-out five-year (three-and-a half-year Bachelor´s, respectively) study programme **Electrical Engineering and Computer Science (EECS)** extended until the year 2007. These changes required a lot of work in 2002. The principal study regulations (Study and Examination Regulations, Scholarship Regulations, the Disciplinary Code, etc.) had to be re-worked, as well as the guides containing detailed study plans based on the newly accredited study programmes.

Tab. 3: EI Master's and Bachelor´s programme graduates in 2002 compared with 2001 graduates, according to specializations (without VTI)

Master's programme	2001	2002
EVM	37 (1 woman)	53 (2 women)
KAM	64	61
EST	108	105 (1 woman)
SEE	48 (2 women)	72 (1 woman)
Total Ing.	**257 (3 women)**	**291 (3 women)**

Bachelor´s programme	2001	2002
ESS (three-year)	77	37
SEE (three-year)	31 (1 woman)	9
EST (three-and –a half –year)		1
Total Bc.	**108 (1 woman)**	**47**

Master's programme for students paying their fees	2001	2002
EST	4	5
EVM	0	0
KAM	0	0
ESS	2	0
SEE	2	1
Total Mgr./Bc.	**8**	**6**

On the basis of the amendment to the University Act No 111/98 Coll. FEEC joined the lifelong education system. Besides a number of specialized courses for professionals from technical fields, those interested in study at FEEC are offered paid courses in the EECCT programme. Having completed these courses and earned the required number of credits, they will be admitted in the regular study without having to take entrance examinations, and the earned credits will be recognized. The academic staff of FEEC have been involved in tuition at the Third Age University opened at BUT in 2000. Tuition in English in the EI study programmes is offered to foreign students paying their fees.

A survey mapping the interest in combined study in the EECCT Bachelor´s programme started in 2002. This programme has been accredited, and, if there is a sufficient number of applicants, it can be offered as substitution for the former part-time studies.

A great attention was paid to the accreditation of the **distance** type of study in the EECCT Bachelor´s programme, which the Faculty would like to obtain in 2005. A grant from the Ministry of Education was obtained for this purpose. Within the framework of these activities, 91 titles of electronic texts with 12,800 pages were written.

The regular annual evaluation of the quality of tuition by students, was organized by Student Union, and the results were displayed on faculty websites.

Student mobility, receiving financial and legal support from the Faculty, has been successfully developing.

There was extensive publishing activity. Besides the above mentioned electronic texts, 32 titles of printed lecture notes were published with the support of the Dean's Fund, another 2 titles of lecture notes, 1 monography, and 4 habilitation theses were published in VUTIUM, and 23 PhD theses (5 of them issued in VUTIUM), and 8 proceedings from conferences organized by Faculty departments were issued.

The Study Department, in cooperation with Systems Integrator, started work on the transfer of organizational and administrative work of the departments, students and teachers into the administration system STUDENT (automatic registration and enrolment in courses, registration for examinations, electronic evaluation reports, admission procedure via Internet). Gradual transfer to this system is planned for the year 2003.

New websites offer complete information on the Faculty and the study programmes.

Prof. Ing. Václav Říčný, CSc.
Vice-Dean, Second-Level Study

II.3 Research and Postgraduate Study

The publications and research results of the academic staff and postgraduate students can be found on faculty websites. Most academics have done rather extensive work. Now we should concentrate on the quality of our work instead of quantity (publications in prestigious journals and presentations at renowned international conferences). For this purpose, the rules for research work and postgraduate study at FEEC were modified during 2002.

Research work is subject to point evaluation at the end of each academic year, and the results of such evaluation have an impact on each person's professional position, habilitation or appointment to professorship.

These rules are given in *The Dean's Guideline for the Point Evaluation of the Academic Staff and Research Workers of FEEC, amending The Rector's Guideline N.20/2002 for Habilitation Proceedings and Proceedings to the Appointment to Professorship (criteria of FEEC for habilitation and appointment to professorship)*[1]. They are based on the evaluation criteria of BUT for habilitation and appointment to professorship.
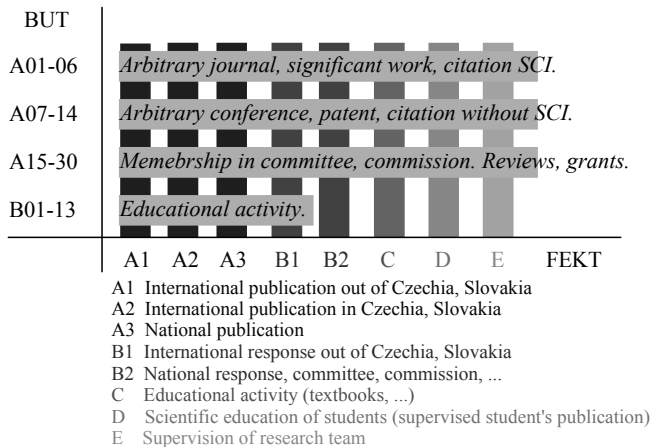

BUT

A01-06 *Arbitrary journal, significant work, citation SCI.*

A07-14 *Arbitrary conference, patent, citation without SCI.*

A15-30 *Memebrship in committee, commission. Reviews, grants.*

B01-13 *Educational activity.*

A1 A2 A3 B1 B2 C D E FEKT

A1 International publication out of Czechia, Slovakia
A2 International publication in Czechia, Slovakia
A3 National publication
B1 International response out of Czechia, Slovakia
B2 National response, committee, commission, ...
C   Educational activity (textbooks, ...)
D   Scientific education of students (supervised student's publication)
E   Supervision of research team

Fig. 1: *Criteria of FEEC for habilitation and professorship and their relation to the criteria of BUT*

Emphasis in the evaluation criteria of BUT is laid on balance in outputs of all categories - contributions to scientific journals (category A07 to A14), appreciation by the scientific community (category A15 to A30) and pedagogical work (category B01 to B13). However, the criteria do not specify the quality of each contribution. Therefore the criteria of FEEC consider another, *horizontal* dimension (see Fig.1) in addition to the *vertical* structure of criteria.

For the sake of motivation, the horizontal structure prefers substantially an article in an international journal (60 points) over an article in an international journal published in the Czech Republic or in Slovakia (20 points) Measured by the point evaluation, *one prestigious article* is equal to *three articles in a national journal of international character.* The philosophy is the same in the case of conference papers, monographies, etc.

The described changes in the evaluation criteria of FEEC naturally affected the evaluation criteria for the postgraduate students at FEEC. New criteria were worked out, strictly separating their study in the doctoral programme (subjects, study stays, etc.), their pedagogical training (instruction in the Bachelor´s and the Master's study programme, supervision of year projects and diploma theses, etc.) and their own research work (grant projects, articles, conference papers). The evaluation criteria for postgraduate students are given in *The Dean's Guideline amending the Study and Examination Regulations of FEEC,* articles 31 to 37 (www.feec.vutbr.cz).

Both guidelines will come in effect in 2003. It is therefore difficult to anticipate to what degree they will help to increase the quality of research.

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[1] The guideline can be found on faculty websites http:/www.feec.vutbr.cz. In the main vertical menu click on *Research,* in the local horizontal menu on *Habilitations, appointments.*

II.3.1 Habilitations

Two habilitation proceedings were successfully completed in 2002:

Ing. Ivo Provazník, Ph.D.

Department of Biomedical and Ecological Engineering
Electronics and Communications

Wavelet Analysis for Signal Detection – Applications to Experimental Cardiology Research

Habilitated on 5 March 2002

Doc. Ing. Čestmír Ondrůšek, CSc.

Department of Power Electrical and Electronic Engineering
Power Electrical and Electronic Engineering

Nestandardní metody optimalizace návrhu elektrických strojů
(Non-conventional methods of electric machines design optimisation)

Appointed on 10 September 2002

There were no new professors appointed in 2002.

II.3.2 Grant Projects

The funding of research work at FEEC comes from three major sources: research projects and the research centre, projects of the University Development Fund (FRVŠ) and grants from the Grant Agency of the Czech Republic (GAČR), FRVŠ with focus on education, GAČR with focus on research.

There were 74 FRVŠ projects in 2002, 42 (57%) in category G, covering projects of postgraduate students. Though this category does not represent a big financial contribution and requires extra administration, it is beneficial for the postgraduate students who get experience in preparing the application, following the budget, and defending the outcomes.

The lowest numbers of projects were in the categories where the numbers of applications were strictly limited. The project *Combined Computer Laboratory for Electronics and Communications* was funded in category A. The projects *Introduction of the Bachelor´ programme in the newly offered specialization Teleinformatics* and *Training of Bachelor´s students* were funded in category C. The projects *Interactive specialized library centre* and *Information and Consultancy centre on www* were in category E. The project *Laboratory of modern automation methods* came in category H. Moreover, FEEC participated in two projects in category H, submitted by the Rector's Office of BUT - *Laboratory of new generation network technologies* and *Enlargement of the joint laboratory of optical communications at BUT*.

For innovation of instruction, the FRVŠ projects are of utmost importance. Research is supported by the GAČR projects. Although the share of GAČR projects is roughly half the share of FRVŠ projects (38/74), the financial support received from GAČR exceeds that of FRVŠ (18.8 mil. CZK/16.7 mil. CZK)

More detailed information on the GAČR projects is given in chapters on respective departments.

Fig. 2:   *Number of projects of Czech ministry of education solved at the departments of FEEC in 2002*

Fig. 3: *Financial amount in thousands of CZK for solving projects of Czech ministry of education earned by departments of FEEC in 2002*
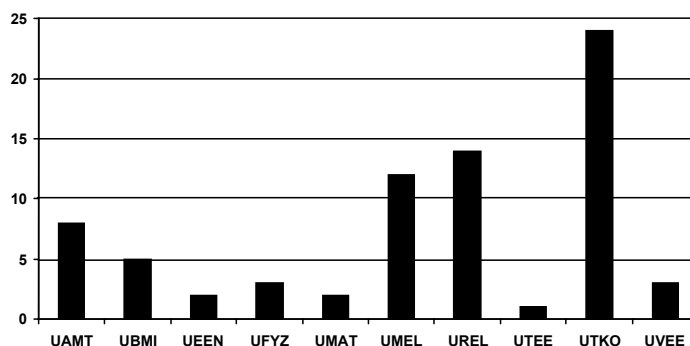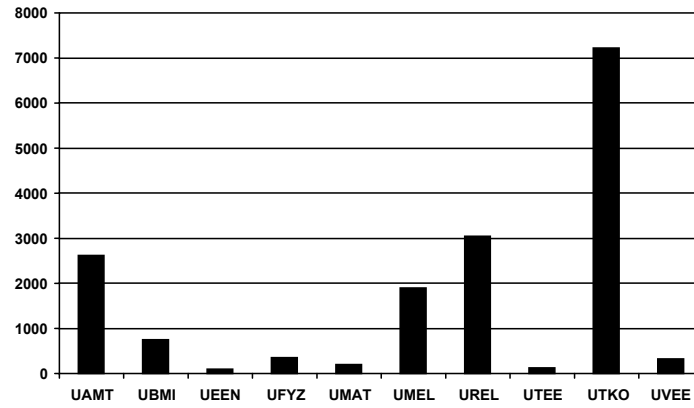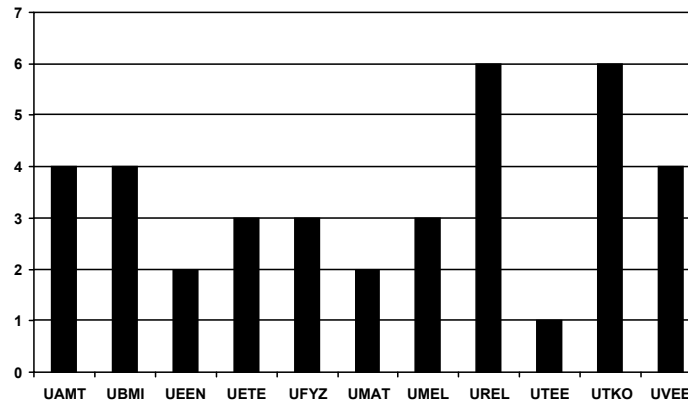

Fig. 4: *Number of projects of Czech grant agency solved at the departments of FEEC in 2002*
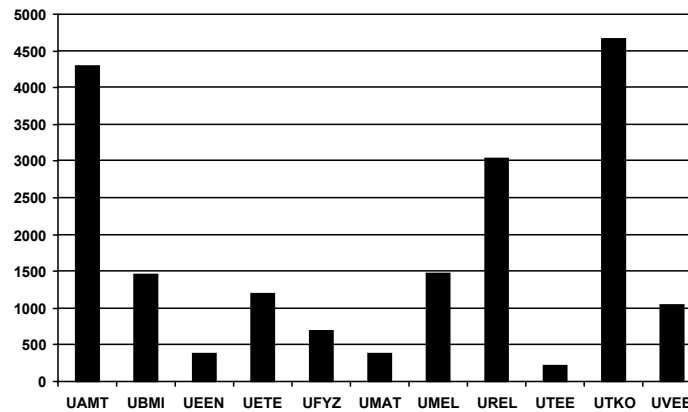

Fig. 5: *Financial amount in thousands of CZK for solving projects of Czech grant agency earned by the departments of FEEC in 2002*

II.3.3 Research intentions and the research centre of FEEC in 2002

Research at FEEC is supported by the research intentions underway and by the research centre. In 2002, the Faculty had four *own* research intentions (items 1 to 4 in Table 1), participated in the research intention of the Faculty of Information Technology (item 5 in Table 1), and together with the Faculty of Electrical Engineering of the Czech Technical University in Prague took part in work of their research centre (item 6 in Table 1).

Tab. 4: Research intentions and the research centre

Leader	Number of intention	Title
Prof. Ing. Jiří Kazelle, CSc.	MSM262200010	Resources, Accumulation and Optimisation of Electric Power Exploitation in Environmental Applications
Prof. Ing. Jiří Svačina, CSc.	MSM262200011	Electronic Communication Systems and Technologies
Prof. Ing. Petr Vavřín, DrSc.	MSM262200013	Automation of Industrial Processes and Technologies
Prof. Ing. Radimír Vrba, CSc.	MSM262200022	Microelectronic Systems and Technologies
Doc. Ing. František Šolc, CSc.	MSM262200012	Information and Control Systems
Prof. Ing. Petr Vavřín, DrSc.	LN00B096	Research Centre of Applied Cybernetics

The financial support for research was over 30 mil. CZK.
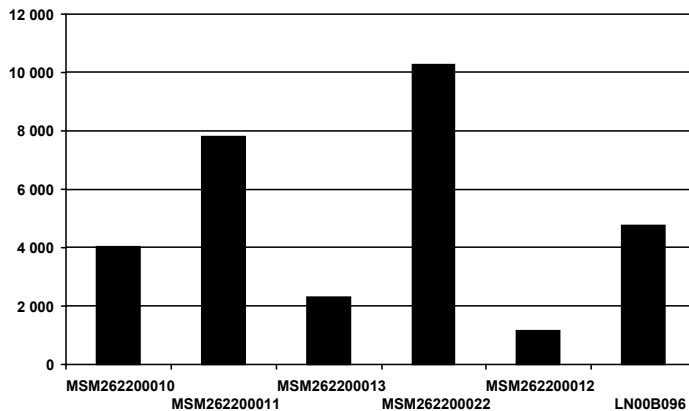
Fig. 6:   *Financial amount in thousands of CZK for solving research programs and research center of FEEC in 2002*

Short information on research results achieved in 2002 is given below.

II.3.3.1 Resources, Accumulation and Optimisation of Electric Power Exploitation in Environmental Applications

Results achieved in 2002

The impact of the composition of gel electrolytes on electric conductivity was studied with focus on their optimisation. A new binding agent for electrodes of fuel cells bound with plastic was tested. Pyrolitic preparation of thin oxide layers for electrochromic elements was completed. Long-term testing of Ni-Cd batteries from the French company SAFT in electric vehicles BETA and PROTOEL. Production of one-track and three-track versions of the folded scooter ROTOBIC in the firm ROTOKOV was launched. The use of electric power in charging electric vehicles, and in operating thermal pumps in small hydro-electric plants on the installation site using the fast-charging methods. Operation parameters of lead accumulators were enhanced. The distribution of current along the surface of electrodes of lead accumulators. The processes in the oxygen cycle in valve-controlled lead accumulators VRLA) were elucidated. The use of transport and noise characteristics for diagnosing monocrystallic, silicon, photovoltaic cells was studied. The design of synchronous generator was optimised using genetic algorithm, and the design of a new rotor groove of an asynchronous motor and the shape of the magnetic

connection claw. The drive of the electric scooter was optimised. The mathematical model and a functional sample of levitation electromagnet were constructed, the functional model of controlled magnetic bearing, the functional model of a microcomputer-controlled starter generator was optimised. The impact of real operation conditions on the efficiency of using photovoltaic transducers and sun radiation collectors was evaluated. A method based on the Chapman-Enskog kinetic theory of multi-component gaseous mixtures was studied, and a program was developed for computing electric conductivity in a wide temperature interval. A method of partial characteristics of plasma was developed, and the data on SF_6 plasma with admixture of Cu vapours were entered into the existing database.

Research in 2003

Systematic study of the characteristics of gel electrolytes for condensers, batteries and electrochromic elements. Verification and optimisation of systems of electrodes mounted on an ionex membrane. Development of electrochemical sensors of SF_6 decay in electric discharges. Continuation of long-term operation tests of Ni-Cd batteries from the French firm SAFT in electric vehicles BETA and ROTOEL. Participation in starting commercial production of the electric utility vehicle BRTA by KnapCar-International. Fast charging of Ni-metalhydride batteries for the electric folded scooter ROTOBIC. Computer modelling of inequalities in the distribution of current along the surface of electrodes in charging leaded accumulator. Optimisation of factors participating in the resulting efficiency of the oxygen cycle with achieving the maximum lifetime of the leaded accumulator.

Optimisation of all aspects (electromagnetic, thermal and fan cooling conditioning) of the design of an electric machine. Artificial intelligence in magnetic deposit control. Ultracapacitors in optimisation of an independent electric drive. Noise and vibration analysis of electric machines. Computation of the radiation of a water-stabilized arc. Optimisation of photovoltaic transducers operation. Optimisation of the design of plasma generators based on interaction of electric arc and magnetic field. Mathematical models of the arc and the design proper. Specification of the methods for computing conductivity of lines from massive conductors. Optimisation of operation of small sources using the HDO signal.

II.3.3.2 Electronic Communication Systems and Technology

Results achieved in 2002

1. Up-to-date electronic circuits of communication systems: Design of low-sensitivity filters based on optimised PWL systems. Definition of the category of non-linear imaging generating first-order digital maps. Methods of modelling and analysis of active circuits in graphs of signal flows. Numerical statements of Laplace transformation for linear systems. Effective symbolic analysis respecting changes of circuit parameters. Monography of filters. Generator of the testing signal sin220T and the signal-noise ratio meter. Current conveyor application.

2. Digital methods for analysis and processing of signals and images

New methods and algorithms for analysis, classification and reconstruction of speech and some medical signals and images. A new speech classifier working in noisy environment, a method for suppression of specles in ultrasound images, algorithms for the processing of electrocardiogram based on wavelet transformation, and for analysis of movement using optical flow methods.

Research continued in the **Laboratory for digital signal processing**, which was developed in the previous years at the Department of RadioElectronics with support from the MŠMT project VS 97060. In 2002 the research was focused on digital radio electronic methods and on general methods of digital processing of communication signals.

3. Technology of processing multimedia signals: Analysis of new signal processors with the VLIW architecture, development and optimisation of algorithms. A new method of spectrogram mapping for separating speech from noise by means of wavelet transformation. An optimised computer model of the ADSL line with DMT modulation for simulation of multitones NEXT and FEXT. Measurement of the impact of pulse interference on data transmission by means of the ADSL modems. Methods of identification of human images by means of digital processing of images and neural networks.

4. Communication networks of integrated services: Development of neural network for control of switching in active network elements. Development of a multimedia multi-point communication system supporting distribution of textual audio and video messages. Optimisation of the Fire code with adaptable control. Design of a system for transmission of biological signals with focus on transmission of EKG signals in GSM communication networks. Optimisation of safe communication through the Internet.

5. High-frequency, microwave and optical structures of communication systems: Cooperation with the international organization AMSAT: Telemetry and commanding of the Phase3D satellite, work on the

Phase3E and Phase5A projects. Design of a current controller for a semiconductor laser with noise shielding. Development of a photon counter with avalanche photodiode for detecting optical signals from the satellite. Development of new neural models for wide-band modelling of planar antennas on the basis of Elman network. Analytical modelling of high-frequency planar transmission structures.

Research in 2003

1. Up-to-date electronic circuits of communication systems: Research on the impact of digitisation on chaotic behaviour of electronic systems. Synthesis of circuits with universal multigate functional blocks. Optimisation of mixed non-linear electronic systems. Development of a programmable current conveyor. Minimization of spurious effects in high-frequency filters.

2. Digital methods for analysis and processing of signals and images: Development of a robust classifier of word categories in speech signals for direct control of medical instruments. Analysis of cardiovascular system signals. New methods of image processing, static and dynamic identification of the position and orientation of objects. Digital processing of radio signals.

II.3.3.3 Automation of industrial processes and technologies

Results achieved in 2002

A. Development of a new generation of omnidirectional chassis based on IcLA drives, development of a control robot for the CAN bus on the basis of the PIC16F258 processor, remote control on the basis of DECT modems. Design of an integrated system of UT control for panel houses. Optimisation of the parameters of controllers, and identification of systems using parallel genetic algorithms.

B. Solution of mathematical problems in continuous and discrete systems. Mathematical support for other research teams.

C. Research on application of fuzzy arithmetics and decisions in conditions of indeterminacy. Non-conventional control elements for robotics. Artificial neural networks for location of the source of acoustic emission signal.

D. Laboratory for measurement of flow and pressure. New laboratories for measurement of acoustic emission, and contactless temperature measurement are being completed.

E. Four workplaces for PC-programmable automatic BaR for modelling, implementation and verification of heterogeneous control algorithms have started operation.

Research in 2003

All teams will continue work on their tasks. Significant results can be expected in teams A (application of genetic algorithms) and C (non-conventional action elements in robots).

II.3.3.4 Microelectronic Systems and Technologies

Results achieved in 2002

1. Design of integrated circuits. new topology of current conveyor working with current feedback was designed. Also designed was a universal current conveyor UCC for integration into large VLSI systems. New possibilities were examined of electron control of high-order filters with the view of simple circuit integration. An integrated circuit was designed and implemented with circuits of a microsystem for conductivity sensors and the current conveyor CCII. Models in the VHDL language were designed, and instruction of the VHDL language prepared. The possibilities of using SoC and ´reusable blocks´ were examined. Research and design of first- and second-order reference voltage source (bandgap) was started.

2. Diagnostics and testing of IO systems. Testing of CMOS circuits with low input voltage and power. Testing of active optical microstructures. Tolerance analysis of circuit parameters. Generating of testing signals. Recording and processing of responses. Testing methods for implementation of microstructures.

3. Modelling and simulation of integrated circuits and semiconductor structures. Digital simulation of microwave circuits and integrated structures: wave propagation in non-linear microwave line with non-linear condensers. Analytical model of transmission parameters of a micro-band line of limited width and a line with double vertical screening. Digital models of microwave structures in time domain, and original neural models for wide bandwidth modelling. Simple heterostructural potential barrier modulated with low THz signal, generation of first and second harmonics.

4. Mounting technology for up-to-date concepts of electronic systems. Mounting microelectronic technology focused on construction of 3D cases, study and design of interconnecting different types of substrates for MCM and MSM construction, study and computations of temperatures using the ANSYS

program, experimental verification of unleaded solders, seeking an optimum temperature profile for soldering by remelting. Optimisation and innovation of sensors by using new construction principles and new polymer materials for construction of sensor electrodes, coating by silk-screen printing on corundum substrate. With a 380 mesh, resolution reliability of 97 um was achieved, for possible non-conventional applications The quality of electronic production, using SPC in surface mounting technology. Modelling of technological processes and operations aimed at quality, focus on small-series production, statistics, and other tools. Design of microsystems with focus on the environment, definition and handling of hazardous and prohibited materials (lead, halogens, etc.).

5. Microsystems Remarkable results have been achieved in modelling, production, identification of the properties and testing of the thick-layer planar sensor. Another notable achievement was the development of a gas sensor on the basis of SnO_2 and WO_2, and testing of its properties on six important technical gases. Good results have also been achieved in small microphone-membrane-based acoustic converters. Successful was the direct connection of smart sensors to the Internet, as well as application of the Bluetooth wireless technology in data collection from sensors, and for superior control. Another step was made in the design of the IEEE 1451 sensor built-in systems.

6. Modern principles of IO design. New methods of modelling and analysis of active circuits in graphs of signal flows. Design of low-sensitivity filters using optimised PWL systems. Numerical inversion Laplace transformation for linear systems. Models of elements for work in current-mode, and their application in the design of all-pass cells with current conveyers. A new principle of the circuit of a universal current conveyer, including topology design, and implementation on chip.

7. Diagnostics of materials and components. A method for characterizing semi-conductor structures based on noise, non-linear and capacity spectroscopy. Samples of 2D structures as quantum dots were produced on the base of GaA1A in cooperation with the MEISEI University Tokyo. An apparatus was designed for measuring spectral noise densities, and implemented in cooperation with VS Technology Brno, including software and control via PC. On the basis of optical local probe in adjacent field the interaction of atoms on the surfaces of photodiode samples was analysed.

8. Optoelectronic systems. A laser head with the VCSEL laser diode was developed, containing an adjustable, battery-powered source with precise temperature stabilization. A telecentric optical system with adjustable enlargement for precise and deterministic imaging of measured objects using a CCD camera was designed. A measuring chain for long-term monitoring of the parameters of optical cable-less connections.

Research in 2003

1. Design of IO circuits. Research on new structures for implementation of high-order synthetic elements, universal, five-gate voltage conveyor, development of new circuit structures with electronic adjustment of low-pass for measurement, research of function blocks in current mode, mainly current amplifier, circuits working on low supply voltages with focus on the processing of signals from sensors, development of an integrated system for wireless communication between the sensor and the control unit, measurement and testing of the chip developed in 2002.

2. Diagnostics and testing of integrated circuits and systems. Statistics of the production of IO and microstructures. Defects of IO and microstructures. Testing methods and procedures for the design of microstructures. Development and analysis of formal models and specifications of the testing systems. Design of internal and external diagnostic modules.

3. Modelling and simulation of integrated circuits and semiconductor structures. Further development of analytical models of special integrated structures. Development of hybrid digital models of selected microwave structures in time domain. Nanoelectronic structures with dc bias and a small signal in the THz band, and their characteristics. Study of the localization of defects in the conductive disc using electric impedance tomography.

4. Mounting technology for modern concepts of electronic systems. Integrated mounting and casing of microsystems, electrical model and design, verification of various types of joints in construction of multi-substrate 3D structures. Experimental verification of unleaded solders and optimisation of the soldering process with focus on using nitrogen as a protective atmosphere, using the ANSYS program for modelling the stress in joints, reliability analysis and destruction of soldered joints. The importance of cleaning. And design of a cleaning module device. Application of results in instruction of microelectronic technologies, including casing. Design and implementation of new polymer materials for sensors, verification of their stability and reproducibility of the technological process, focus on gas polymers and on detection of heavy metals, measurement of sensors, using the ANSYS for modelling the properties of sensors. Research on silk-screen printing with focus on reproducible resolution of very thin structures. A system of quality control for small

companies based on modelling production operations. Impact of electronic production on the environment, lifetime of products and their destruction, compliance with European and world standards and regulations.

5. Microsystems. Development in all areas and topics which were the subject of research in the first year of the project will be continued. In planar sensors experience with the thick-layer technology will be used in the development of a suitable planar sensor using the thin-layer technology. Development of the first SMART conductivity sensor. Another research plan of the team will be testing of other materials for gas sensors with focus on TiO_2 and combinations of WO_3, TiO_2 and SnO_2. Anticipated in this case is the design of a new concept on the basis of a platinum layer on an active layer of the sensor. In electrochemical sensors the impact of changed rotation will be eliminated, and further the development of a new sensor, and its optimisation for heavy metals detection. An acoustic converter will be developed on the holographic and the acoustic principle. Attention will be paid to the final design of a pressure sensor with direct connection to the Internet, and on using this experience in the development of other sensors to be connected to the Internet. Problems of transmission by way of deciphering will be studied. Application of the Bluetooth technology for data collection from sensors, and control through the Internet will be studied. Properties of the models of sensor-oriented built-in systems will be tested.

6. Modern principles of IO design. Expansion and generalization of the theory of transformation blocks, synthesis of circuits with universal multi-gate functional blocks. Development of mathematical algorithms for computer analysis of circuits with random active elements, implementation into analytical programs. Design and implementation of a universal programmable current conveyor. Research on new structures for implementation of high-order synthetic elements and other blocks in current mode, mainly the current amplifier.

7. Diagnostics of materials and components. The diagnostics of defects will be studied using the methods of noise and capacity spectroscopy. Analyses will be done on crystals on the basis of CdTe prepared in the Institute of Physics of Charles University in Prague. The motion of carriers will be controlled on the basis on noise spectroscopy, experiments will be carried out for monitoring of noise 1/f in dependence on sample illumination, and identification of microscopic processes resulting in degradation of characteristics. Characteristics of local photoflows on the Schottky barrier and their correlations with contact noise will be studied in order to work out reliability prognoses.

8. Optoelectronic systems. Design and construction of an absolute laser interferometer with the VCSEL laser diode. Design and construction of an atmospheric transmitter with focus on high reliability, long lifetime and protection from the impact of the environment.

II.3.3.5 Information and control systems

Results achieved in 2002

Computer graphics and multimedia in information and control systems, computer vision. Fundamental experiments with programmable ´surface´ cameras with high resolution and line sensor. Construction of an experimental interface with DSP from Texas Instruments series C6x and FPGA for processing images, their compression and transmission. Operation algorithms for image processing in industry and transport.

Computer-aided control. Research of fuzzy arithmetics of L-R fuzzy numbers. Model and design of helium cryostat control. Modelling methods based of binding graphs in robotic and mechatronic systems. Study on loss of energy in switching circuits for measurement and diagnostics of mechatronic systems – mechanic relays.

Industrial computer networks and systems of industrial automation. Development of an interface for A200 for the Ethernet bus. Development of a modular web server for data collection in process, and simple off-line control. Development of wireless communication between data collectors. Based on the Bluetooth technology.

Sensors, digital processing and computer analysis of signals. Development of power supply quality measurement in cooperation with EGÚ Brno. Completion of installation of the measuring system in the laboratory for measurement of flow, and start of measurements and analysis of mechanical vibrations in thin pulse piping. Measuring equipment for measurement of gearbox parameters, development of measurement methods.

Research in 2003

Computer graphics and multimedia in information and control systems, computer vision. Verification of applications of high-resolution cameras, and line cameras. Application of the newly developed platform with signal processor TMS320C6211/6711. Methodology of monitoring parts of human body on images.

Computer-aided control. Research on fuzzy arithmetics. Fuzzy decisions and control in conditions of indeterminacy. Modelling of mechatronic systems using binding graphs. Equipment for monitoring the development of static discontinuity in switching of mechanical relays.

Industrial computer networks and systems of industrial automation. Research and development of wireless communication of control systems and processing instrumentation. Experiments with the simple Bluetooth technology. Development of an experimental mobile platform for implementation of a wireless communication variant.

Sensors, digital processing and computer analysis of signals. Equipment for measuring the parameters of gearbox, including the development and experimental verification of measuring methods. Preparation of a new specialized laboratory for contactless temperature measurements in cooperation with the firm Raytek (TSI System).

Tab. 5: Researchers participating in research intentions

	MSM 262200010	MSM 262200011	MSM 262200013	MSM 262200022	MSM 262200012
Professors	5	13	3	14	0
Associate professors	13	19	9	16	6
Assistant professors	11	23	18	22	11
Postgraduate students	15	69	28	46	11
Technical staff	22	14	---	10	4

Tab. 6: Leading publications resulting from research intentions

	MSM 262200010	MSM 262200011	MSM 262200013	MSM 262200022	MSM 262200012
Books	2	6	---	8	0
Articles in international journals	10	35	---	38	0
Articles in national journals	38	191	---	227	6
Papers at international conferences, seminars and workshops	7	46	---	27	4
Papers at national conferences and seminars	41	93	17	70	10
Engineering products and software	1	11	---	0	2
Dissertations and habilitations	4	4	4	3	1

Tab.7 Responses to publications issued within the framework of research intentions

	MSM 262200010	MSM 262200011	MSM 262200013	MSM 262200022	MSM 262200012
Citations in foreign books, journals, proceedings of conferences, research reports and lecture notes	2	7	---	4	---
Citations in national books, journals, proceedings of conferences, research reports and lecture notes	0	35	---	14	---
Provable written responses and inquiries from abroad	0	3	---	2	---
Provable written responses and inquiries from the Czech Republic	0	9	---	6	---

II.3.3.6 Research centre of applied cybernetics

Results achieved in 2002

A. The team has been working on control algorithms using redesigners. In 2002, the algorithms were successfully applied in sensorless control of motors. The results were applied in the company Motorola-Rožnov. As a

result, the workplace (UAMT FEEC) received financial support from Motorola Foundation in the amount of 20,000 USD, which will be used for building the ´Motion Control´ laboratory.

B. The team has been developing telepresence robotic systems. In 2002, they were successful at the European Championships in Robotic Football in Vienna. The Robotic team of CAK ROBOBOHEMIA became the European champions in the category ´Small League´ (three-member teams) and the in ´Middle League´ (five-member teams), Details can be found at www.robobohemia.cz.

C. This team has focused on processing images (Computer Vision). Their results have been applied in road transport (control and identification of transport offences), and in the production process (visual control of products).

I.3.4 Funding of research in 2002

The Faculty received 94 mil. CZK from external sources for funding research work of the academic staff, research workers and postgraduate students.

The sources are shown in Fig.7. As it has been said, the greatest share from the received funds comes to research intentions and the research centre (32.4%), to grants of the Grant Agency of the Czech Republic and projects of the University Development Fund (20.1% and 17.1% respectively).

■ Industrial projects: 5,0 %
□ Inform. systems R&D: 2,2 %
□ EUREKA - ECOTRANS: 1,5 %
■ INGO: 0,1 %
■ KONTAKT: 1,2 %
■ Programs for bachelor study: 15,6 %
■ Czech ministry of education - other: 1,8 %

■ Long-life education: 0,3 %
■ Grants Cz. acad. of science: 0,2 %
■ 5. FP + other: 1,9 %
■ Research plans: 27,3 %
■ Research center: 5,1 %
□ Czech grant agency: 20,1 %
□ Czech ministry of educat.: 17,7 %
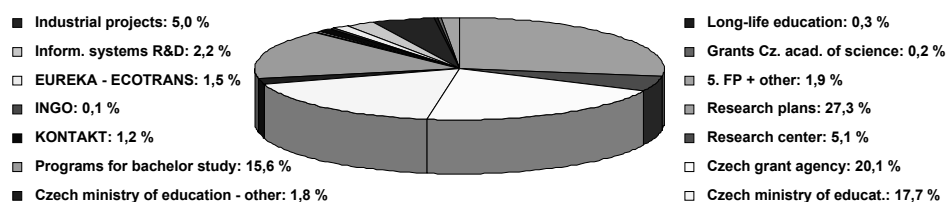
Fig. 7: *External sources of financing creative activities of FEEC in 2002*

The funds received in 2002 are compared in Fig.8 with the amounts received in the previous years. Obviously, the share of external sources is having an increasing tendency, owing to the outstanding activities of all those involved in research.
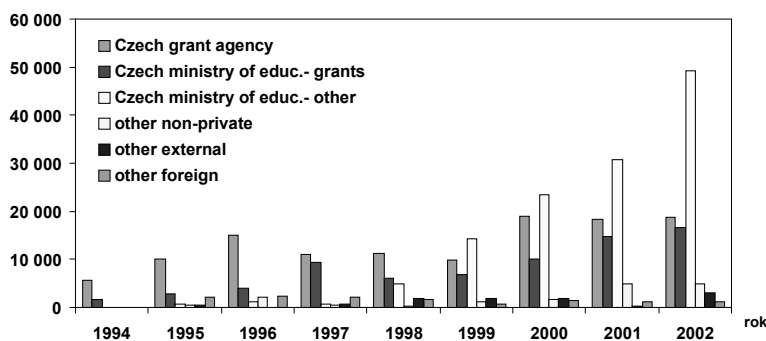
Fig. 8:   *Financial amnount earned by FEEC (till 2001 by FEI) in thousands of CZK for research and development from 1994 to 2002*

II.3.5 Postgraduate Study

There were two important changes in the doctoral study programme during the year 2002. Firstly, point evaluation was introduced (mentioned at the beginning of this chapter), secondly, the Scholarship Regulations were modified.

According to the modified Scholarship Regulations, responsibility for scholarships is transferred to the departments. Heads of departments together with the supervisors can regulate the scholarships according to the performance of the doctoral students. The funds that have not been used remain at the department and can be given to the students in reward for outstanding performances.

An important task is increasing the efficiency of the postgraduate study (increasing the ratio of those who successfully completed the doctoral programme[2] to the total number of students who entered the programme in the respective year). Therefore, in accordance with the new Study Regulations, the progress in work of full-time students on their theses will be evaluated by the supervisors with 0 to 4 points by the end of the winter semester of their third year of study. If a student does not receive at least one point, he/she will no longer receive a scholarship, and will be transferred to combined study.

Tab.2 gives numbers of students who have received the Ph.D. degree in the period 1999-2002. The percentage of successful students at individual departments is given in Fig.9. It is approximately the ratio of the total number of doctoral study graduates in the period 1999-2002 to the total number of doctoral students in the third year of study to 31 October of the respective year. It is assumed that those who have completed the third year of study to 31 October should defend their theses in the following calendar year.

It should be emphasized that the standard of the defended theses is more important than their number. This criterion, however, is difficult to illustrate in a table.

Tab. 5: Numbers of doctoral study graduates at the departments of FEEC

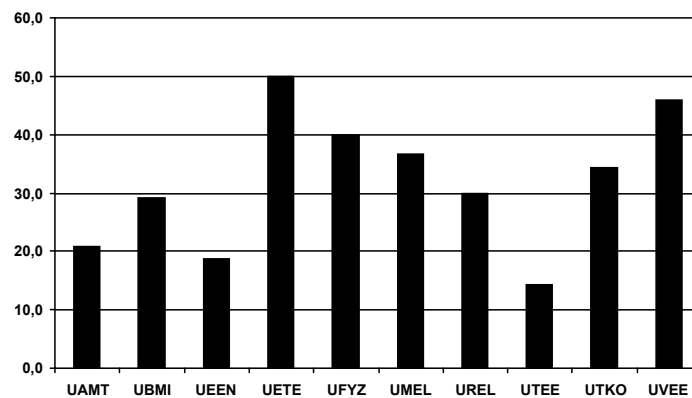|	1999	2000	2001	2002	total
UAMT	2	0	5	2	9
UBMI	2	2	2	1	7
UEEN	1	1	0	1	3
UETE	0	1	3	3	7
UFYZ	0	0	0	2	2
UMEL	1	2	4	4	11
UREL	3	1	4	1	9
UTEE	1	0	0	0	1
UTKO	1	3	6	1	11
UVEE	4	2	3	8	17
Total	15	12	27	23	

Fig. 9: *Estimated percentage of successful education of Ph.D. students at the departments of FEEC*

Tab.6 shows the numbers of doctoral students in the period 1999-2002 (to 31 October of the respective year). A majority of doctoral students in the first, second and third year are full-time students. Starting from the fourth year up to the sevSenth year they are in the combined form of study.

Tab.6 Numbers of doctoral students in the past four calendar years

year	1999	2000	2001	2002
1.	57	50	64	76
2.	56	56	45	59
3.	43	34	44	44
4.	40	40	35	41
5.	19	29	38	25
6.	37	20	22	33
7.	21	41	40	33
total	273	270	288	311

The following theses were defended in 2002 (according to specializations):

Cybernetics, automation and measurement

ŽALUD, L.   Proximity laser scanner cross-correlation based method for cooperative self-localization and map building

JUŘÍK, D.   Sběr technologických dat pomocí sítí Ethernet

(Technological data collection by means of Ethernet networks)

Biomedical electronics and biocybernetics

KOLÁŘ, R.   Metody předzpracování medicínských ultrazvukových tomogramů

(Pre-processing methods for medical ultrasound tomograms)

Electronics and communications

TOBEŠ, Z.   Analog neural networks for the control of adaptive antennas

Microelectronics and technology

ZDRAŽIL, M.   Zobrazování nevodivých preparátů metodou nenabíjecí elektronové mikroskopie

(Imaging of non-conductive preparations by the method of non-charging electron microscopy)

NOVÁK, V.   Výzkum pokročilých elektrodových materiálů

(Research on advanced electrode materials)

STRAKA, B.   Methods of IDDQ measurements for testing of CMOS integrated circuits

TKOČ, D.   A contribution to design and production of DSL modems

KÁŇOVÁ, J.   Rastrovací mikroskopie při kritické energii elektronů

(Raster microscopy in critical energy of electrons)

KOKTAVÝ, P.   Šum mikroplazmy v luminiscenčních GaAsP diodách

(Microplasma noise in luminescence GaAsP diodes)

PAVELKA, J.   Transportní a šumové charakteristiky tenkých amorfních vrstev TA205 a návrh indikátorů spolehlivosti

(Transport and noise characteristics in thin amorphous layers TA205 and design of reliability indicators

MICHÁLEK, M. Detekce signálových elektronů v nízkovakuové rastrovací elektronové mikroskopii

(Detection of signal electrons in low-vacuum raster electron microscopy)

SVOBODA, V.   The influence of fast charging on the performance of VRLA batteries

Power electrical and electronic engineering

CHALUPA, L.	Sensorless control techniques for burshless DC motor especially oriented to low-cost drives
VIŠINKA, R.	On-fly phase resistance estimation of switched reluctance motor for sensorless based control techniques
KRÁL, P.	Analýza dynamických vlastností elektromechanických soustav
	(Analysis of the dynamic characteristics of electromechanical systems)
KUNÁT, J.	Automatizované měřící systémy pro elektrické stroje
	(Automatic measuring systems for electric machines
BRADÍK, J.	Vyjadřování nejistot v elektromagnetické nedestruktivní diagnostice jakosti
	(Uncertainties in electromagnetic non-destructive diagnostics of quality)
GILAR, M.	Vybrané aplikace holografické skvrnkové metody
	(Selected applications of holographic speckle method)
TOMAN, P.	Lokalizace místa zemního spojení v sítích VN
	(Location of ground connections in VN networks)
KLÍMA, B.	Vektorově orientované řízení synchronního motoru s permanentními magnety
	(Vector-oriented synchronous motor control with permanent magnets)
HUDEC, J.	Zajištění kvality elektrické energie třístupňovou přepěťovou ochranou pro elektrické napájecí sítě do 1000 V
	(Electric power quality ensurance by means of three-stage overvoltage protection for supply mains up to 1000 V

II.3.6 STUDENT EEICT 2002 Conference and Competition

On Thursday 25 April 2002, the STUDENT EEICT Conference and Competition took place at the BUT campus Pod Palackého vrchem. The abbreviation EEICT conceals the English words Electrical Engineering, Information and Communication Technology covering the areas of the research and education carried out at the Faculty of Electrical Engineering and Communication (FEEC) and the Faculty of Information Technology (FIT). The 8th year of the student conference and competition was jointly organized by both faculties.

The opening event was the FLEXTRONICS UNIVERSITY DAY. The company FLEXTRONICS presented its activities, offered information to the students on job opportunities, and presented valuable awards to drawn participants. The company sponsored the event.

The competition was opened by Professor Radimír Vrba, Dean of FEEC, Professor Tomáš Hruška, Dean of FIT, and Associate Professor Eva Münsterová, Vice-Chairman of the Board of Universities and chairman of its committee for student research work. Presentations of companies which sponsored the event followed. The company NATIONAL SEMICONDUCTOR was the diamond sponsor in 2002.

After the opening, some time was devoted to the posters displayed by postgraduate students. Representatives of the firms and of the academic community could give votes to the most interesting works. Those which had gathered most votes were awarded at the end of the competition.

Then the competition of the Bachelor´s and Master's students started. Their works were presented in eight sections – Electronics and Communications, Microelectronics and Technology, Biomedical Engineering, Power Electrical and Electronic Engineering + Mathematics + Physics + Theoretical Electrical Engineering, Cybernetics, Control and Measurement, Information Systems, Modelling, Graphics, Equipment, Theoretical Informatics.

In each section the students defended their works before a committee of academics and representatives of companies and students. After the presentations the best works received financial awards.

The results were announced at the presence of Professor Jan Vrbka, Rector of BUT, Professor Jiří Kazelle, Vice-Rector for External Relations, Professor Jan Vobecký, Chairman of the Czech-Slovak section of the international organization IEEE, Associate Professor Eva Münsterová and Professor Radimír Vrba. The winners were presented with cheques and with gifts from sponsors.

The STUDENT EEICT 2002 competition and conference was a successful event. The nearly 200 registered student works attracted attention of the teachers as well as the representatives of companies with which both faculties closely cooperate.

All student works participating in the STUDENT EEICT 2002 competition have been published in Proceedings. The printed version can be obtained at the Research Department of FEEC, Dean's Office, Údolní 53, 602 00 Brno. The electronic version is available on a CD and on http://www.feec.vutbr.cz/EEICT/. On the websites you can find detailed results and more information.

Doc. Dr. Ing. Zbyněk Raida
Vice-Dean for Research and Postgraduate Study

II.4 International Relations

International activities are aimed at increasing the prestige of the Faculty by presenting results of research projects at international conferences, by participation in international research and education projects, by making it possible for our students to study at partner universities abroad, and by offering tuition in English to foreign students. On the basis of agreements on cooperation in research projects, research teams of faculty departments cooperated with a number of foreign partners. Such cooperation can result in participation in the 6th framework programme of the European Union, mainly in Networks of Excellence, Integrated Projects, and other projects. An important activity is student and teacher mobility among cooperating European universities. FEEC is among the most active faculties of Brno University of Technology. There has been very good cooperation with the BUT Department of International Relations which is responsible, in terms of organization and economic support, for the SOCRATES programme. As a result, 41 students could study abroad in the extent of 201 student/months, and 13 teachers were on lecture stays at the length of 13 weeks. The student and teacher mobility is not without problems. For various reasons the mobility plan was not realized in full extent. In the following years the plan will have to be more realistic. Efforts will have to be made to motivate the students and teachers. We share this experience with our partner universities from the European Union countries. The reasons may be poor knowledge of languages, lack of financial motivation, and the high working load of teachers. The management of FEEC and the Academic Senate provide financial support to both students and teachers travelling abroad within the framework of the SOCRATES programme, as international mobility is among the priorities of the long-term intentions of both FEEC and BUT.

Within the framework of another European student mobility programme – Leonardo da Vinci, the Department of Microelectronics was able to send several students for stays abroad, despite organizational and financial difficulties. The Faculty was invited by Université de Joseph Fourier in Grenoble, coordinator of a Leonardo da Vinci student mobility project, to send several students for practical training in France.

While last year the students showed the lowest interest in history in the Socrates programme, foreign students, mainly from Université de Joseph Fourier in Grenoble are greatly interested in study stays at FEEC, and in the cooperating industrial companies. Nevertheless, the number of applicants for placements abroad in the academic year 2003/2004 increased also among our students.

In cooperation with the BUT Department of International Relations a number of new bilateral agreements were concluded, and the validity of inter-faculty agreements (except two) was extended. In addition, again in cooperation with the Department of International Relations, contacts were established with several universities in Russia, mainly the Technical University in Izhevsk, which was visited by the representatives of BUT in February 2002. Exchange of students in the extent of two student/months was supported from a project of the Ministry of Education, and from the Rector's International Fund.

The cooperation, mainly in creating joint study plans, was strengthened during the visit of the representatives of the Technical University in Izhevsk in October 2002.

Cooperation was started within the framework of the network of Czech faculties of electrical engineering and ISTG, which was initiated by our traditional partner ISTG-Université de Joseph Fourier in Grenoble. The first step was the above mentioned professional training of French students in companies and institutions in the Czech Republic.

II.5 External Relations

Emphasis was laid on giving up-to-date and detailed information to the general public about the Faculty, the study programmes and study areas, education and research activities of individual departments, about the projects and grants underway as well as the projects within the framework programmes of the European Union. Attention was therefore paid to Faculty presentation, mainly on Internet. At the end of 2002, faculty websites were issued, and their simplified English version is being prepared.

The Faculty has cultivated cooperation with a number of faculties of other universities. Among the closest partners are all faculties of electrical engineering in the Czech Republic, mainly the Faculty of Electrical Engineering of the Czech Technical University in Prague and of the University of Mining and Metallurgy in Ostrava, and the Faculty of Electrical Engineering of the Slovak Technical University in Bratislava. The partners exchange members of scientific boards. Similar cooperation is going on with the Faculty of Information Technology of Masaryk University in Brno.

In 2002, FEEC took part in the annual meeting of the Czech and Slovak faculties of electrical engineering. The meeting dealt with transformation of the study programmes of the Czech universities based on the Bologna

Declaration, and with accreditation of new study programmes. In the focus of attention were the projects of the 6th Framework Programme, involvement of faculties and coordination.

The Faculty has been involved in the forming of the non-university sector, and in cooperation with the European Polytechnic Institute in Kunovice near Uherské Hradiště.

The Faculty has maintained close contacts with industrial companies in the Brno region and in other places in the Czech Republic. These contacts are mainly based on cooperation with faculty departments, in particular in research projects, expert reports and consultancy. The major partners are the companies ABB-EJG, JULI Motorenwerke, Škoda Volkswagen Mladá Boleslav, Telecom, Motorola, JME, Alcatel, Schneider Group, Rockwell/Allen Bradley, Siemens A.G., and others.

Close cooperation of many years has been maintained with the Institute of Instrumentation of the Czech Academy of Sciences in Brno. Researchers of both institutions cooperate in research projects of joint interest. Some members of the Institute's staff are external teachers in the Master's and PhD study programmes at FEEC. On the basis of an agreement between FEEC and Academy of Sciences, PhD. students can pursue their studies in the institutes of the Academy.

Members of the academic staff, mainly from the Department of Mathematics and the Department of Physics, have for many years been cooperating with secondary schools in Brno and in the Brno region in preparing their students for studies at FEEC. The Faculty also aims at establishing good contacts with the city of Brno and its boroughs. In May 2002, the Faculty co-organized and took part in the first year of the ELEKTRA fair in Brno – Královo Pole.

II.6 Lifelong Education in 2002

As in the past, some departments offered medium- and mainly short-term technical courses for the public.. Department of Control, Measurement and Instrumentation

- Course 'Voltage Quality Measurement', Assoc. Prof. Ludvík Bejček, Prof. Vladislav Matyáš, Ing. Karel Hoder, Ing. Miloslav Čejka, CSc. for EGÚ Brno, a.s., 23 October 2001-13 February 2002, 6 lecture and 6 exercise blocks:
    - Theory of Measurement and Fundamentals of EMC
    - EMC in Measuring Devices
    - Theory of Measurement Methods in Power Engineering
    - Flicker- Measurement Methods
    - Digital Processing of Signals
    - Detection, Measurement and Recording of Time Curves
    - Voltage, Power and Current Sensors
    - Measurement of Voltage Quality Parameters, Power Current Distortion
    - Impedance of High Frequency Power Networks
    - Optical Sensors in Power Engineering
    - Communication and Computer-Aided Measurement of Over Voltage Using Monitors
    - Statistical Methods of Measured Characteristics Evaluation
    Measurement Standards in Power Engineering
- **Department of RadioElectronics**
    - 6 March 2002, Avalanche Photodiode as a Counter of Photons (J. Šíp, FEEC BUT)
    - 13 March 2002, Verification of Chips: General Introduction (P. Malena, ALCATEL Czech Brno)
    - 20 March 2002, LabView – Applications (B. Růžička, FEEC)
    - 27 March 2002, Smart Home Networks (P. Lajšner, MOTOROLA Rožnov)
    - 3 April 2002, Alternative Optimisation Procedures in Design of EM Structures (V. Otevřel, FEEC BUT)
    - 10 April 2002, Antenna Measurements in Attenuation Chamber (V. Krčmář, ERA a.s. Pardubice)
    - 17 April 2002, Planar Microwave Filters and Microwave Measurements (T. Urbanec, FEEC BUT) Devices and Tools for Work with Modern Components (P. Dýmal, FEEC BUT)
    - 24 April 2002, Plastic Optical Fibre and the MOST Bus: Optical Communication in Automotive Applications (F. Mohr, University of Applied Sciences, Pforzheim, Germany)
    - 30 April 2002, Practical Analysis of Feedback Systems Stability (I. Koudar, ALCATEL Czech Brno)
    - 7 May 2002, Time Analysis of EM Structures: An Introduction to FD-TD (V. Otevřel, FEEC BUT)
    - 8 October 2002, Programming CPLD Using VHDL, and My Stay in Belgium (L. Závodný, FEEC BUT)

- 15 October 2002 Active Filters with the AD844 Circuit (V. Axman, FEEC BUT)
- 30 October 2002, Conform Image and Its Application in Analysis of Microwave Transmission Structures (V. Šádek, FEEC BUT)
- 13 November 2002, Carrier Digital Synchronization (J. Prokopec, FEEC BUT)
- 20 November 2002, The Impact of Atmosphere on Optical Connections and Their Reliability (P. Hovořák, FEEC BUT)
- 27 November 2002, Time Analysis of EM Structures: An Introduction to TD-FEM (M. Motl, FEEC BUT)
- 4 December 2002, Time Analysis of EM Structures: FDTD Method Implementation (O. Franek, FEEC BUT)
- 11 December 2002, Active Tuneable Filters for Laboratory Instruction (V. Axman, FEEC BUT)
- Department of Telecommunications Courses:
  - New Technology in Telecommunications III for ČTÚ
  - Voice Transmission in Multimedia Networks
  - Call Centre - for Aliatel
  - Mobile Communications Services
  - Multimedia Services - for Wirtschaftuniversität Wien
- Preparatory courses in mathematics
- A Preparatory Course in Physics - for applicants for admission at FEEC and other technical universities
- Laboratory Exercises in Physics for Secondary Schools

The academic staff of FEEC were involved in the lecturing, and other events at the Third Age University.

Doc. Ing. František Zezulka, CSc.
Vice-Dean for International Relations

II.7 Campus Development

The premises at Božetěchova 2 were taken over by the new Faculty of Information Technology. Reconstruction of the other buildings continued so as the generally accepted European standard would be achieved. The most extensive repairs were carried out at Technická and Údolní. In spring 2002, construction was started of the Integrated object Pod Palackého vrchem. Upgrading of the technical equipment of large-capacity lecture rooms, and of the computer and information network continued.

Reconstructions at Údolní 53

Reconstructions were carried out in some objects, namely of roofs in buildings U3 and U15, and stairs in building U1. At the end of the year, emergency repairs had to be started in building U4. When the Faculty of Civil Engineering left building U2, a contract of hire was concluded with Masaryk University. Subsequently, Masaryk University started extensive repairs. In 2003, the possibilities of re-opening a snack bar at Údolní will be considered.

Modernization of large-capacity lecture rooms at Technická 8

The gradual upgrading of audiovisual equipment in the three large-capacity lecture rooms, and the setting up of a computer room for instruction in mathematics and physics in the Bachelor´s programme continued in the period 2000-2001. During the year 2002, three lecture rooms, each of them accommodating over 50 students, were set up and equipped.

The entrance door system was renovated.

The roof was painted, and some other repairs, mainly of the toilets on the first floor, were completed, and planned for 2003 (further repairs of the roof and toilets on the higher floors, heating of large-capacity rooms, technical equipment of some rooms).

Reconstructions at Technická 2

As a result of the negotiations with the Faculty of Mechanical Engineering at the beginning of 2002, the Faculty could set up an Internet room for FEEC students in building A4. The Internet room for 40 students, with all-day attendance, received substantial financial support from the Academic Senate of BUT and from the Academic Senate of FEEC, and was opened in October 2002.

Purkyňova 118

Within the framework of the Programme of equipment upgrading, a large-capacity room M66 was set up. All corridors and staircases were painted.

Planned Construction Activities at FEEC

A major task in 2002 was to decide about location of the Department of Microelectronics and the Department of Electrotechnology into the Integrated object, and to decide about the placement of the Dean's Office and the Department of Languages. Construction of the Integrated object started in spring 2002 and is to be completed in the middle of 2004.

Brno University of Technology may decide about building a new object where the remaining parts of FEEC would be located.

Work will continue at Údolní 53 where some emergency repairs must be done even though the building will be left in 2004 .

Substantial financial means will be necessary for maintenance at Purkyňova 118 following expiry of some guarantee periods.

Computer and Information Networks

- upgrading of servers in areas Brno-centre and Brno-north
- strengthening the Gb technology network
- network backup
- network development at Údolní 53
- setting up Department of information systems administration
- administration of faculty network

- faculty websites
- faculty information system
- compatibility of orientation systems at Technická 8, Technická 2, and Údolní 53

Information Systems and Services

Owing to the activities of systems operators, the contents and graphics of the websites of the Faculty and of individual departments improved. New automated information was displayed for students, the faculty staff and the public.

The Department of information systems administration was established at the Dean's Office on recommendation of the Board for the FEEC Information System.

The Faculty has participated in setting up the new information system of BUT within the framework of which the information system of FEEC is being built on the principle of Internet and Intranet, using the XML/XSLT technology, over the central data store of BUT with the Oracle technology. Since 2001 a module for research data processing incorporated in the information system can be used. The information system was also used for admission data processing. The analysis of the study administration system was completed and the system was put into operation.

Ing. Miloslav Morda
Faculty Secretary

II.8 Equal opportunities at the FEEC

Advisor for equal opportunities RNDr. Naděžda Uhdeová continued with her activities when the Faculty of Electrical Engineering and Communication was established to 1 January 2002. Consultancy for female students continued in both professional and general terms in 2002, and moreover an information campaign was launched in cooperation with the Student Union, aimed at removing the barriers to interest in technical professions among secondary school female students.

Equal opportunities for men and women (the so called gender equality) are among the priorities of the European Union, which we are going to join in a few years. Besides legislative changes, mechanisms that would help to bring this principle to life will have to be ensured. Apart from other areas, equal opportunities in economic activities are involved, as the traditional attitude to employment in our society sees professions as female or male areas, with jobs in feminised fields generally less paid. An increased number of women in technical professions (namely in the area of information and communication technology) are among the targets of the Ministry of Education of the Czech Republic.

In 2002, FEEC applied for a grant for a ´Consultancy and Information Gender Studies Centre´. The proposed project should institutionalise consultancy in mathematics and physics for female students at the FEEC, increase the number of engineering female students by launching campaigns at secondary schools, and cultivate the awareness of parents, teachers and students of equal opportunities generally, and of the position of women and their opportunities in technical professions in particular.

II.9 Libraries and Study Rooms

There are several libraries at the Faculty: the library at Purkyňova (shared with the Chemical Faculty), five department libraries at Purkyňova, the library at Technická (Department of Mathematics and Department of Physics), and three libraries at Údolní)

Library Resources

There are 62,513 volumes in the above libraries.

Journal Resources

There are 178 titles, 79 of them from abroad.

Technical Equipment

The up-to-date equipment of the study room includes two Windows NT servers, a Novell server, 41 workstations, two printers, three copiers, a scanner, a combined data and video projector, and a scanner was installed in 2002.

Services

The libraries provide presence and absence book-loans, inter-library book loans, international inter-library book loans, researches from electronic databases, reference and information services, and copying. First-year students are instructed by the library staff in the library Purkyňova.

The library provided first-class services. During the summer holidays a detailed inventory of library resources was done. The services were fully automated, and acquisition of new items continued.

Tab 7. Statistics

		Presence	Not registered	
Book-loans		Absence	13,757	mainly for students and staff
		Inter-library	1,362	mainly for students and staff
Researches			690*	researches from information databases

To 31 December 2002
Daily average of visitors: 370
Books: 62,513
Journals: 178 (79 foreign)
New entries: 2,889 (1264 in branch libraries)

II.10 The Academic Senate of FEEC

At the beginning of 2002 when the Faculty of Electrical Engineering and Computer Science was transformed into the Faculty of Electrical Engineering and Communication several new members of the Academic Senate of the new faculty were elected. Until the end of the election period the members of the Academic Senate were:

Chairwoman
RNDr. Vlasta Krupková, CSc.
Academic Staff
Doc. Ing. Ivan Rampl, CSc. - chairman
Prof. Ing. Petr Pivoňka, CSc.   UAMT
Ing. Jiří Kozumplík, CSc.   UBMI
Ing. Jan Gregor, CSc.   UEEN
Ing. Svatopluk Havlíček, CSc.   UETE
RNDr. Naděžda Uhdeová   UFYZ
PhDr. Ludmila Neuwirthová   UJAZ
RNDr. Vlasta Krupková, CSc.   UMAT
Ing. Vladimír Kolařík, Ph.D.   UMEL
Doc. Ing. Vladimír Podroužek, CSc.   UREL
Ing. Jarmila Dědková, CSc.   UTEE
Doc. Ing. Ivan Rampl, CSc.   UTKO
Ing. Vladimír Kutnohorský, CSc.   UVEE
Student Part
Jan Mertl – chairman
Jana Božáková
František Drtil
Miroslav Kuruc
Jan Mertl
Petra Filipová
Representative of Ph.D. students
Ing. Martin Zlomek

There were three committees:

Economic Committee:
Doc. Ing. Svatopluk Havlíček, CSc. – chairman
Ing. Jan Gregor, CSc.
Prof. Ing. Petr Pivoňka, CSc.
Doc. Ing. Vladimír Podroužek, CSc.
Legislative Committee:
Ing. Jarmila Dědková, CSc. - chairwoman
Ing. Jiří Kozumplík, CSc.
Ing. Vladimír Kolařík, Ph.D.
Doc. Ing. Ivan Rampl, CSc.
Jana Božáková
Jan Mertl
Ing. Martin Zlomek
Pedagogical Committee:
Ing. Vladimír Kutnohorský - chairman
PhDr. Ludmila Neuwirthová
RNDr. Naděžda Uhdeová
František Drtil
Petra Filipová

Until elections in October 2002 the Academic Senate held eight regular and two irregular meetings. The average attendance was 85%.

The Academic Senate discussed and approved proposals for internal regulations of FEEC - the Statute, the Election Procedure, Rules of Procedure and the Disciplinary Code based on the regulations of FEECS, the predecessor of FEEC. The Legislative Committee collected comments and proposals for discussions and approval by the Academic Senate.

The Economic Committee and the Academic Senate discussed and approved the Financial Report for 2001, the proposal of rules for the distribution of financial means for 2002, based on a new methodology of the distribution of financial means based on pedagogical activities.

The Academic Senate approved the rules of admission to study in all study programmes offered at the Faculty.

In May 2002 the Academic Senate discussed and approved the Long-Term Intention of FEEC BUT for the period 2002 – 2005.

In October 2002 the following members of Academic Senate were elected for the period 2002 – 2005:

Chairwoman
RNDr. Vlasta Krupková, CSc.
Academic Staff
Ing. Vladimír Kolařík, Ph.D. - chairman
Prof. Ing. Petr Pivoňka, CSc.   UAMT
Ing. Jiří Kozumplík, CSc.   UBMI
Ing. Petr Toman, Ph.D.   UEEN
Ing. Helena Polsterová, CSc.   UETE
RNDr. Naděžda Uhdeová   UFYZ
PhDr. Ludmila Neuwirthová   UJAZ
RNDr. Vlasta Krupková, CSc.   UMAT
Ing. Vladimír Kolařík, Ph.D.   UMEL
Ing. Ivana Jakubová   UREL
Ing. Jarmila Dědková, CSc.   UTEE
Doc. Ing. Ivan Rampl, CSc.   UTKO
Ing. Josef Bradík   UVEE
Student Part
Jana Božáková - chairwoman
Jana Božáková
František Drtil
Petra Filipová
Kristýna Kubíčková
Miroslav Kuruc
Jan Mertl
Representative of Ph.D. students
Ing. Miroslav Zachariáš

The following committees were established:

Economic Committee:
Ing. Jiří Kozumplík, CSc - chairman
RNDr. Vlasta Krupková, CSc
Jan Mertl
Miroslav Kuruc
Legislative Committee:
Ing. Jarmila Dědková, CSc. - chairwoman
Ing. Vladimír Kolařík, Ph.D.
Doc. Ing. Ivan Rampl, CSc.
Ing. Petr Toman
Jana Božáková
František Drtil
Pedagogical Committee
RNDr. Naděžda Uhdeová - chairwoman
PhDr. Ludmila Neuwirthová
Ing. Helena Polsterová, CSc.
Ing. Ivana Jakubová
Ing. Josef Bradík
Petra Filipová
Kristýna Kubíčková

The first task of the newly elected Academic Senate was election of the candidate for the Dean of FEEC for the period 2003 – 2005, which took place on 29 October 2002. Professor Radimír Vrba who was appointed to take on the Dean's responsibilities for the period from 1 January 2002 to 31 January 2003 was elected.

At the end of 2002 the Academic Senate discussed and approved the Dean's guideline for point evaluation of creative activities of the academic staff of FEEC and the supplementary Rector's guideline for habilitations and appointment to professorship.

Discussions in the Academic Senate were always constructive as the proposals were submitted for comments to the members of Academic Senate and to the departments in order to avoid revocations of decisions.

RNDr. Vlasta Krupková, CSc.
Chairman of Academic Senate

II.11 Student Union at the Faculty of Electrical Engineering and Communication
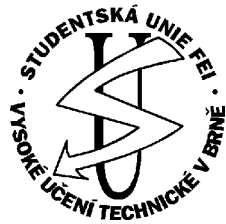
Student Union (SU) is an organization whose aim is to safeguard the interests of students at the Faculty. Each student can use the rights of a member of the Student Union. Student Parliament is a body of elected representatives of individual lecture groups and of members who, besides their deputies, wish to take active part in student activities. Student Parliament is elected for a period of one year. In 2002 the chairman of the Student Parliament was Stanislav Munster. Some members of the Parliament are also members of the Student Part of Academic Senate. The representative of students in the Academic Senate of BUT was also a member of the Student Parliament.

Activities of the Student Parliament cover several areas. The members cooperate with the faculty management and present to them students´ opinions and ideas, and reversely inform the students about the activities and events at the Faculty. Furthermore, the Student Parliament organizes and co-organizes cultural events and presentations. The Parliament also offers help in dealing with specific problems of the students.

Cooperation

In 2002 cooperation was going on with student organizations (Pardubice, Plzeň, Brno, Praha, Ostrava, Liberec, Bratislava, Izhevsk, Kyjev, Hagen). In September 2002 representatives of students from Izhevsk University visited our Faculty and met some members of the Student Parliament. (The event was not organized by the Student Parliament). We also cooperated with companies involved in electrical engineering and computer science (Celestica Ráječko etc.). Members of the Student Parliament take part in conventions of BUT students, student conferences, or meetings of the Board of Universities. We continued cooperation with GTS International in selling ISIC identification cards to the students in our office.

Cooperation at FEEC and BUT

Members of the Student Union co-organized the ball of FIT and FEEC, the Student EEICT 2002 competition, and the Gaudeamus fair. In cooperation with the Working Group for Leisure Activities they prepared the Majales festivities. Our deputies helped to organize the first all-university registration for sports in the summer semester, and helped to organize the sports event Sportsparty.

The Student Union took part in organization and evaluation of the competition for the best photography illustrating life at the Faculty.

The Student Parliament bought gifts in order to support the activity Vánoční strom – Christmas Tree sponsored by the radio station Kiss Rádio Brno.

Very successful were the ´campaigns´ i.e. visits to selected secondary schools of all types and presentations of the study programmes offered at the Faculty. At the beginning of the winter semester, the Student Union organized a presentation for the first-year students aimed at giving them information on the structure of the University, Faculty and other issues that they might find helpful.

Activities of the Student Union

Since the year 2001 the Student Union organizes evaluation of the quality of instruction at the Faculty by distributing questionnaires to the students. The results are displayed on SU websites. The Student Union cooperates in allocation of the so called preference minutes for accommodation in university dormitories, recommends to the Student Part of Academic Senate what priority criteria to use, and provides software for sending applications via Internet.

The Student Union organized a new sports event – Disorientation Race.

In 2002 the Student Union prepared presentations of several companies (On Semiconductor & TESLA SEZAM, Celestica, IBM Delivery Centre, Navigator), and an excursion to Celestica.

Student Union and Sports

Besides representing the Student Union at various conferences, we were successful in sports events organized by the Centre for Sports (AquaViva, ´Strojařské schody´ - an up-the-stairs running race). At the latter event our team came first.

II.12 An Outline of the Development of the Faculty of Electrical Engineering and Communication in 2003

The Faculty of Electrical Engineering and Communication takes up the tradition of Czech university education in the field of electrical and electronic technology in Moravia. Our target for the following years is transformation into a modern faculty which has been maintaining a continuity of more than 40 years, but at the same reflects the current trends in education and research. The Faculty is convinced that it will be able to make up for the loss of students and academic staff accompanied with reduced potential and funding by expanding its activities in prospective programmes.

New Faculty Management since 1 February 2003

- Prof. Ing. Radimír Vrba, CSc. – Dean
- Doc. Ing. Pavel Jura, CSc. – Acting Dean, Vice-Dean for Master's Programme
- Doc. Ing. Jarmila Dědková, CSc.– Vice-Dean for Bachelor's Programme
- Doc. Ing. Ivo Provazník, Ph.D. – Vice-Dean for External and International Relations
- Doc. Dr. Ing. Zbyněk Raida – Vice-Dean for Research and Postgraduate Study
- Ing. Miloslav Morda – Faculty Secretary

Emphasis is currently laid on attracting an increased number of gifted students with serious interest in the study areas covered by the study programmes offered at the Faculty. In the academic year 2003/2004, the Faculty plans to admit over 920 students in the Bachelor´s programme Electrical, Electronic, Control and Communication Technology (EECCT). During the following two or three years, the Faculty would like to reach the number of students that there was before the establishment of the Faculty of Information Technology (FIT). Information on faculty life, education and research will be offered on visiting days at the departments, on visits to secondary schools, in promotion materials, and on well-designed and regularly updated websites. All these activities will be focused on target groups of students in order to get them acquainted with the study programmes, forms of instruction, laboratory equipment, and the possible future careers of our graduates. The potential students should be made aware that the Faculty can arrange for their students a large variety of study stays abroad. In 2003, new placements will be offered in the European Union countries as well as in Eastern Europe. In the following years we would like to obtain the largest possible number of projects from the Ministry of Education, aimed at innovation of instruction and at instruction through the Internet and Intranet. The present education development programme provides funding for a large number of electronic study materials and virtual laboratories, and the currently prepared projects will move instruction closer to Internet and Intranet based instruction up to Internet experiments with physical models in real laboratories. Increased attention will be paid to projects for the programmes of the University Development Fund, with particular attention to setting up new computer laboratories. For the year 2003 the academic staff and postgraduate students have won 88 projects from the University Development Fund, which is more than in 2002, and it reflects the efforts of all departments.

The twelve faculty departments have established good contacts with Czech and foreign companies, and have expanded cooperation with strategic partners. At the same time they are ready to cooperate with small and medium firms, which is supported by the programmes of the Ministry of Trade and Industry, and by the recently launched 6th framework programme of the European Union. The management of the Faculty will assist the departments in the preparatory stages, and will support them in their work on the projects. We will focus our attention on setting up inter-university research networks Networks of Excellence, and on participation in big integrated projects IP, but also the smaller projects STREP and CRAFT.

The building of the integrated object Pod Palackého vrchem will be accelerated so that the Department of Microelectronics, the Department of Electrotechnology and the Department of Control, Measurement and Instrumentation could be moved there in 2004.

In the difficult year 2002, when the Department of Computer Science left , the academic staff and the students of the Faculty clearly showed their willingness to work for a dynamic development of the transformed faculty. Now, at the start of the year 2003, we are optimistic in our expectations that during two or three years of hard work the number of in-coming students will increase, and the high standard of education and research will be maintained in an active and friendly atmosphere.

Prof. Ing. Radimír Vrba, CSc.
Dean

DEPARTMENT OF CONTROL AND INSTRUMENTATION

Head of Department: Prof. Ing. Petr Vavřín, DrSc.

Phone +420 541 141 155
Fax +420 541 141 123
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I. STAFF

Professors:

Prof. Ing. Petr Pivoňka, CSc., Prof. Ing. Petr Vavřín, DrSc.

Associate Professors:

Doc. Ing. Ludvík Bejček, CSc., Doc. Ing. Jozef Honec, CSc., Doc. Ing. Pavel Jura, CSc.,
Doc. Ing. Zdeněk Malec, CSc., Doc. Ing. František Šolc, CSc., Doc. Ing. František Zezulka, CSc.

Lecturers:

Ing. Petr Beneš, Ph. D., Ing. Zdeněk Bradáč, Ing. Miloslav Čejka, Csc., Ing. Marie Havlíková,
Ing. Karel Hoder, Ing. Radovan Holek, CSc., Ing. Václav Jirsík, CSc., Ing. Tomáš Macho,
Ing. Miloslav Richter, Ing. Petr Vaňous, Ing. Michal Polanský, Ing. Pavel Valenta

Technical Staff:

Jan Vodička, Miloš Zbořil

Postgraduate Students:

Ing. Petr Cach, Ing. Miloš Čábel, Ing. Pavel Fojtík, Ing. Petr Gratz, Ing. Bohumil Hnilička,
Ing. Petr Hráček, Ing. Petr Krupanský, Ing. Pavel Kučera, Ing. Soňa Orlíková, Ing. Petr Honzík,
Ing. Jakub Hrabec, Ing. Marek Lisztwan, Ing. Jaromír Brambor, Ing. Kamil Švancara

Administrative Staff:

Ing. Luděk Anděra, Lenka Petrová

Research Staff

Ing. Petr Blaha, Ph. D., Ing. Bohumil Honzík, Ph. D., Ing. Petr Honec, Ing. Lukáš Kopečný,
Ing. Tomáš Neužil, Ing. Petr Petyovský, Ing. Pavel Václavek, Ph. D., Ing. Soběslav Valach,
Ing. Luděk Žalud

II. FACILITIES

II.1 Teaching and Research Laboratories

- Laboratory of Measurement and Sensors of Nonelectrical Quantities
- Laboratory of Ultrasonic Emission
- Laboratory of Optoelectronics
- Laboratory of Computer vision
- Laboratory of PC-Subsystems
- Laboratory of Microprocessors and CAD systems
- Laboratory of Control Systems, Data Processing and Data Analysis
- Laboratory of Artificial Intelligence, Automatic Control and Servomechanisms
- Laboratory of Telemetry, Data Transmission and Construction of Instruments
- Laboratory of Logic Control Circuits and Systems
- Laboratory of Robotics
- Laboratory of Electronic Measurement and Instrumentation
- Laboratory of Measurement Automation
- Laboratory of Digital Control Engineering and Intelligent Controllers
- Laboratory of Programmable Logic Controllers and Process Control Systems
- Laboratory of Programming of Allan-Bradley Systems
- Laboratory of Pressure and Flow Measurements
- Laboratory of Telepresence and Robotics
- Laboratory of Mobile Co-operating Robots
- Laboratory of Modern Control Methods in Automation Control

II.2 Special Instrumentation and Computers

- Intelligent (Smart) sensors of pressure and differential pressure inclusive data transmission accessories from Fisher-Rosemount, FoxBoro, Endress & Hauser, and FoxBoro Eckardt
- Sensors and measuring channels for measurement of basic physical quantities, primarily of temperature, vibration, force ionizating radiation, rotation etc.
- A/D and D/A Converters
- Electronic measuring instruments: multimeters, oscilloscopes, universal counters, LCR meters, vector signal analyser, signal generators, power supplies etc. from Hewlett-Packard, Tektronix, Newtronics, LeCroy, Hung Chang, Tesla, Metra etc.
- Spectral analyser HP 89410A, Vector analyser
- Frame digitisers with signal processors Texas Instruments, scanners, optical accessories
- Programmable CCD cameras, FlashBus Frame Grabber, Panasonic Colour Camera
- Traffic real time monitoring system
- Evaluation kits for isp LSI LATTICE, SYNARIO
- Optoelectronic devices, modules EMOS-OPTEL made by E&L Instruments in UK, semiconductor lasers, optical measuring system OMS 3.1
- EPROM simulator SIME, SICE, programmers for EPROM, ATMEL ATC50, universal programmer LabProg+.
- DSP kit TMS320C50, Development kit for DSP MSP430, Texas Instruments.
- Development kit for microcontroller Motorola HC05, HC11, HC12.
- Personal computers, notebooks.
- Interface cards: GPIB, National Instruments LPM16, PC2/2A, PCL812PG
- Printers, Schlumberger A1 plotter, HP DesignJet 500PS plotter, CD ROM readers, scanners
- Software: Matlab-Simulink + Toolboxes, LabWINDOWS, LabVIEW5.0, Systems for PLC programming and simulation: Magic, Paradigm PULSE, Delta V, Witness.
- Physical models: inverted pendulum, set of water reservoirs, helicopter model, magnetic levitation, thermal processes, torsional rod etc.
- PLCs: Telemecanique, Omron, NS905, AEG Modicon, Allen-Bradley, SIMANTIC S7-200, S5-95U, S7-300, B&R, Schneider TSX 37, Allen-Bradley SLC500 and PLC5 interconnected by DeviceNet, DH, DH+ and RIO.
- Industrial monitors Panel View.
- Fieldbus development kits: LonWorks, AS-i, CAN, Profibus
- Allen-Bradley systems: PLC5, SLC 500, Remote I/O, DeviceNet, ControlNet, I/O bus, Profibus DP, DH, DH+. Set of sixty workplaces using these systems complemented by visualisation means.
- Apparatus for measurements on electromagnetic relays and on stepping motors.
- 2 robots ASEA IRb6
- Workplace for developing of control systems with signal processors Analog Devices
- Emerson Delta V workplace
- Multianalyser B&K Pulse 3560C for measurement of vibrations
- Mobile Universal Telepresence and Autonomous Robot (U.T.A.R.)
- Multianalyser Bröel & Kjaer PULSE 2560-C
- Distributed control systems Schneider Electric Modicon Moentum equipped by Ethernet interface
- Workplaces equipped by Industrial computers for SoftPLC and SoftControl
- Workplaces equipped by industrial control systems based on I51 microcontrollers
- Model of technology equipped by Profibus DP and Profibus PA compliance components

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Bachelor Thesis	Y 3, summer	0/4	Jirsík
Computer Control	Y 3, winter	3/2	Pivoňka
Computer Science in Automation	Y 1, summer	0/2	Pivoňka
Control Theory 1	Y 2, summer	3/2	Vavřín
Control Theory 2	Y 3, winter	3/2	Vavřín
Database Systems	Y 3, summer	2/3	Holek

Electronic Measurement Systems	Y 3, summer	2/2	Čejka
Fibre Optics in Automatization	Y 3, winter	3/2	Bejček
Fundamentals of Robotics	Y 3,summer	3/2	Šolc
Industrial Automation	Y 3, winter	2/3	Zezulka
Measurement in Electroengineering	Y 2, winter	2/3	Bejček
Measurement of Physical Quantities	Y 2, summer	2/3	Bejček
Microprocessors	Y 2, summer	2/3	Holek
Modelling and Simulation	Y 2, summer	2/2	Šolc
Modern Means in Automation	Y 3, summer	2/3	Jirsík
PC in Instrumentation	Y 3, winter	2/3	Čejka
PC Systems	Y 3, summer	2/3	Honec
Practical Programming in C++	Y 2, winter	2/2	Honec
Practical Project	Y 3, winter	0/3	Jirsík
Professional Practice	Y 3, summer	4 weeks	Jirsík
Programmable Logics Controllers	Y 3, summer	2/3	Zezulka
Signals and Systems	Y 2, winter	2/3	Jura

III.2 Master's Programme (Ing) -First Level

Signals, Processes, Systems	Y 2, L 1, summer	2/2	Jura
Technical Informatics	Y 1, L 1, summer	0/2	Jirsík

III.3 Master's Programme (Ing) – Second Level

Artificial Intelligence	Y 2, L 2, winter	3/2	Jirsík
Automation in Measurement	Y 2, L 2, summer	3/2	Čejka
Binary Control Systems	Y 1, L 2, summer	3/3	Malec
Components of Control Systems	Y 1, L 2, summer	3/2	Holek
Computer Aided Design	Y 1, L 2, summer	1/4	Honec
Computer Graphics	Y 2, L 2, summer	2/3	Honec
Computer Integrated Manufacturing	Y 1, L 2, winter	3/2	Šolc
Construction of Measuring Instruments	Y 3, L 2, summer	2/3	Beneš
Data Analysis and Processing	Y 1, L 2, summer	3/2	Čejka
Database Systems	Y 1, L 2, winter	2/3	Holek
Design of Control Systems	Y 3, L 2, summer	2/2	Zezulka
Digital Control Engineering	Y 1, L 2, summer	3/2	Pivoňka
Diploma Project	Y 3, L 2, summer	0/9	Jirsík
Electronic Measuring Instruments	Y 1, L 2, summer	3/3	Čejka
Electronic Measuring Systems	Y 3, L 2, winter	3/3	Hoder
Electronics for Control and Measurem.	Y 2, L 2, summer	3/2	Hoder
Expert Systems	Y 3, L 2, summer	2/3	Jirsík
Fuzzy Logic in Control	Y 2, L 2, winter	2/2	Jura
Knowledge Based Systems in Control	Y 2, L 2, summer	2/2	Vavřín
Laboratory Instruments	Y 3, L 2, summer	3/2	Bejček
Linear Automatic Control	Y 1, L 2, winter	3/3	Vavřín
Devices for Automation	Y 3, L 2, winter	2/2	Zezulka
Measuring of Nonelectrical Quantities	Y 2, L 2, summer	2/2	Bejček
Microprocessors	Y 2, L 2, winter	3/3	Jura
Modelling and Identification	Y 1, L 2, winter	2/3	Šolc
Multivariable Signal Processing	Y 3, L 2, winter	2/3	Honec
Nonlinear Automatic Control	Y 1, L 2, summer	3/3	Šolc
Robotic	Y 2, L 2, winter	3/2	Šolc
Optoelectronics in Control	Y 2, L 2, winter	3/2	Bejček
PC in Instrumentation	Y 3, L 2, winter	2/3	Čejka
Practical Project I	Y 2, L 2, summer	0/4	Jirsík
Practical Project II	Y 3, L 2, summer	0/4	Jirsík
Programmable Logic Controllers	Y 1, L 2, winter	2/2	Zezulka
Programming in C	Y 1, L 2, winter	2/3	Richter
Reliability and Diagnostics	Y 3, L 2, summer	3/2	Malec
Robotic	Y 2, L 2, winter	3/2	Šolc
Semicond. and Smart Sensors	Y 3, L 2, summer	3/2	Beneš
Sensors of Nonelectrical Quantities	Y 2, L 2, winter	3/3	Bejček

Servomechanisms	Y 3, L 2, winter	3/2	Malec
Signal Processors in Autom. and Meas.	Y 3, L 2, summer	3/2	Honec
Subsystems of PC	Y 2, L 2, winter	2/2	Honec
System Analysis	Y 2, L 2, summer	3/3	Pivoňka
Theory of Measurement and Experim.	Y 2, L 2, winter	3/2	Čejka

III.3 Doctoral Programme (PhD)

Modern Control Theory	winter	42 hrs.	Vavřín
Computer Vision	winter	42 hrs.	Honec
Industrial Robotics	summer	42 hrs.	Šolc
Intelligent Controllers	winter	42 hrs.	Pivoňka
Large Scale Systems Control	winter	42 hrs.	Zezulka
Optimal Control and Identification	winter	42 hrs.	Honec
Reliability and Diagnostics	winter	42 hrs.	Malec
Selected Chapters from Optoelectronics	summer	42 hrs.	Bejček

III.4 Study in English Language (International students)

Binary Control Systems	Y 1, L 2, winter	3/3	Malec
Digital and Optimal Control	Y 1 , L 2, summer	3/3	Zezulka
Digital Control Engineering	Y 1, L 2, winter	3/2	Pivoňka
Electric Drives	Y 2, L 2, summer	3/2	Malec
Electronic and Instrumentation	Y 2, L 2, winter	1/2	Hoder
Fuzzy Control	Y 2, L 2, winter	2/2	Jura
Industrial Control	Y 3, L 2, summer	3/2	Zezulka
Nonlinear Automatic Control	Y 3, L 2, winter	3/2	Šolc
Year Project	Y 2, L 2, summer	0/4	

IV. RESEARCH PROJECTS

Automation in production processes
Research programme No. MSM262200013, principal investigator: Petr Vavřín, participants: Petr Pivoňka, František Šolc, Ludvík Bejček, Zdeněk Malec

Research in information and control systems
Research programme No. MSM262200012, principal investigator: Jan M. Honzík, FIT, participants: František Šolc, Jozef Honec, Pavel Jura, František Zezulka

Research in microelectronics systems and technologies
Research programme No. MSM262200022, principal investigator: Radimír Vrba, DMEL, participants: František Zezulka, Ludvík Bejček, Pavel Jura

Research in control of smart robotics actuators
Grant project GAČR No. 102/02/0782, principal investigator: František Šolc

Analysis of minorite ampholytes from biological mixtures
Grant project GAČR No. 203/00/0251, principal investigator: Ing. Jan Pospíchal, CSc., Mendel University Brno, participant: Ludvík Bejček

Pressure Analyser
Grant project GAČR No. 102/00/0938, principal investigator: Radimír Vrba, DMEL, participant: Petr Beneš

Development of Methods for Measuring of Precise Gearboxes
Grant project GAČR No. 102/01/1044, principal investigator: Zdeněk Malec

Research centre of applied cybernetics
Grant project No. LN00B096, principal investigator: Prof. Ing. Vladimír Kučera, DrSc., Czech Technical University Praha, participants: Petr Vavřín, František Šolc, Jozef Honec

Centre of aeronautic and cosmic research
Grant project No. LN00B051, principal investigator: Prof. Ing. Antonín Pištěk, CSc., FCE BUT, participant: Ludvík Bejček

Phyto-sanitary administration for future external borders – Integrated IT system for plant protection, Poland
Grant project No. PHARE PL9906.01, participant: Radovan Holek

Experimental methods of modal analysis
Grant project FRVŠ No. 1798/2002, principal investigator: Petr Grätz

Control of pneumatic muscles
    Grant project FRVŠ No. 1965/2002, principal investigator: Petr Vaňous
Autonomous and telepresence controlled robots
    Grant project FRVŠ No. 1936/2002, principal investigator: Luděk Žalud
Laboratory universal control system
    Grant project FRVŠ No. 1969/2002, principal investigator: Zdeněk Bradáč
Test and control station for industrial automation
    Grant project FRVŠ No. 1961/2002, principal investigator: Zdeněk Bradáč
Fault-tolerant process control
    Grant project FRVŠ No. 1955/2002, principal investigator: Bohumil Hnilička
Real-time Linux
    Grant project FRVŠ No. 1967/2002, principal investigator: Radovan Holek
Laboratory of modern control methods in automation control
    Grant project FRVŠ No. 1936/2002, principal investigator: František Zezulka.

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- CAMEA Ltd., Camera systems and computer processing of videosignals, Jozef Honec
- MZLU Brno, Research of mechanical properties of agricultural products, Ludvík Bejček
- Secunet Praha, Utilization of digital signatures in automation, Petr Vaňous
- EGU Co. Brno, Training on Measurement of power quality, Ludvík Bejček, Vladislav Matyáš, Miloslav Čejka, Karel Hoder
- ČD-TÚDC Bohumín, Measurement of parameters of trolley lines, Miloslav Čejka
- Fisher-Rosemount Brno, Ltd., Intelligent Sensors and System Delta V, Ludvík Bejček
- Siemens Brno, Ltd, Intelligent pressure transducers, Ludvík Bejček
- Brüel & Kjaer Praha, Ltd., Measuring of dynamic parameters of transducers, measuring system PULSE, Ludvík Bejček
- Mikrokom Praha and Optovit Jihlava, Optic fibre sensors, measuring system OMS 3.1, Ludvík Bejček
- AMTEK Brno Ltd., Analog Devices, Smart Sensors an signal processors , Ludvík Bejček
- SPT Telecom Co., Praha, subsidiary Brno, Automated measurements of broadcast line parameters, Miloslav Čejka
- EGU Co., Brno, The correction of phase-errors at QV - Miloslav Čejka
- EGÚ Co.. Brno, Simulation software for interharmonics analysis in Power quality monitor class A, Miloslav Čejka,
- EGÚ Co. Brno, Power quality monitor QN20 firmware, Miloslav Čejka.
- EGÚ Co. Brno, Optimalization for data transfer in power quality monitor QN20, Miloslav Čejka
- EGÚ Co. Brno, Monitor QN20 simulation software, Miloslav Čejka.
- MEgA Co Blansko, Calibration stand for voltmeters MEg 10, Miloslav Čejka.
- State Phytosanitary Administration Brno, An information system for national filing of import and export, Radovan Holek, Vaclav Jirsík
- State Phytosanitary Administration Brno (State filing of import and export of commodities - Radovan Holek, Václav Jirsík)
- Police Headquarters, Czech Rep., Praha, Monitoring of traffic, Jozef Honec
- AVX Group, Czech Rep., Lanškroun, Measurement and inspection of components defects, Jozef Honec
- NATE Co., Chotěboř, Inspection of defects of bottles in grocery and glass industry, Jozef Honec
- SIEMENS Co., Trutnov, Output check of SMD relays, Jozef Honec
- Schneider Group, Praha, PLC Programming with IEC 1131 standard ,František Zezulka
- Compas Ltd., Žďár nad Sázavou, Process control and process control systems, František Zezulka
- Autec Ltd., Brno, Design of the logical control level of technological processes, František Zezulka
- BCS Engineering Ltd., Brno, Modelling and control of thermal and biochemical processes, Allen-Bradley PLC systems, František Zezulka
- IFM electronics Ltd., Průhonice, Consulting and supervision in the area of AS-interface for sensors and actuators, František Zezulka

- Rockwell Automation Prague / Brno (Training and consulting in the laboratory of Rockwell control systems, František Zezulka
- WAGO Elektro Ltd. Brno, Training and consulting in distributed intelligent I/O systems, František Zezulka
- Moravian instruments ALCOR Brno, Utilization and lectures in PC-oriented DCS Control WEB, František Zezulka)
- DASFOS Ltd. Ostrava, Modelling and control of special devices for metal and fuel analysis, František Zezulka
- SIEMENS Brno, Ltd., Testing of producer's control systems, František Zezulka
- ÚPT AV Brno, Fuzzy control of helium evaporation for the low loss helium cryostat, Pavel Jura
- koPek Ltd., Advanced design of instruments for disabled, František Šolc
- BD Sensors, participation in a grant Konsorcia, František Zezulka

V.2 International Cooperation

- Elsinco - Elektronische Geräte Vetriebsgesellschaft GmbH Vienna, Austria, Software for the instrument AUDIO PRECISION SYSTEM ONE PLUS, Miloslav Čejka)
- Central check and test institute of agriculture Bratislava, Slovakia, Information system for national filing of vineyards, Radovan Holek, Václav Jirsík
- SIEMENS Co., Berlin , Germany, Output check of SMD relays, Jozef Honec
- AVX Group, Miracle Beach, USA, Measurement and inspection of components defects, Jozef Honec
- Lapperanta University of Technology, Lappeenranta, Finland, Monitoring of traffic, Jozef Honec
- Stoeber Antriebe Pforzheim, BRD, Measurements on precise gearboxes, Zdeněk Malec, Petr Beneš
- Gossen-Metrawatt, Nuernberg, Germany, Development of serial interfaces for electronic measuring instruments, František Zezulka
- FTZ at HTWK, Leipzig, Germany, Industrial communication buses and protocols, František Zezulka
- Brüel & Kjaer A/S, Naerum, Denmark, Acoustic and vibration measurements, analyses and instrumentation, Petr Gratz

V.2.1 Visitors to the Department

- Prof. Dr. Dr. W. Hallang, Fern Universität Hagen, 3.9.-5.9.2002, Socrates
- Assoc. Prof. Ivan Gančev, Technical University Plovdiv, June 2002, CEEPUS Project CZ 103-02/03
- Prof. Istvan Dalmi, Technical University of Miscolc, June 2002, CEEPUS Project CZ 103-02/03
- Prof. János Czekkel, Technical University of Miscolc, June 2002, CEEPUS Project CZ 103-02/03
- Daniel Georgiev, Technical University Plovdiv, June 2002, CEEPUS Project CZ 103-02/03
- Dalibor Tadič, University of Maribor, June 2002, CEEPUS Project CZ 103-02/03
- Prof. Demakov, Technical University of Izhevsk, September 2002
- Assoc. Prof. Abilov, Technical University of Izhevsk, September 2002
- Prof. Dr.-Ing. D.P.F. Möller, Universität Hamburg, April 2002

V.2.2 Visits of Staff Members to Foreign Institutions

- Zdeněk Bradáč, Tampere University of Technology, Finland, August 2002, Socrates
- Petr Grätz, Danish Technical University, 1.7.2001-30.3. 2003, Marie Currie Fellowship
- František Šolc, University of Salford, GB, 12.5.-22.5. 2002, Socrates
- František Šolc, University of Huddersfield, GB, 12.5.-22.5. 2002, Socrates
- František Šolc, University of Split, Croatia, 16.6.-30.6. 2002, CEEPUS
- František Šolc, University of Roma La Sapienza, Italy, 8.10.-13.10. 2002, Socrates
- František Zezulka, France, ESIEE Amiens, June 2002, Socrates
- František Zezulka, France, ESIEE Paris Noisy – le – Grand, June 2002, Socrates
- František Zezulka, France, INSA Lyon, June 2002, Socrates
- František Zezulka, France, ISTG Grenoble, October 2002, Socrates
- František Zezulka, Tampere University of Technology, December 2002, Socrates
- Petr Gratz, June 2002, CEEPUS Project CZ 103-02/03
- Soňa Orlíková, June 2002, CEEPUS Project CZ 103-02/03

- Petr Cach, June 2002, CEEPUS Project CZ 103-02/03
- Pavel Kučera, November 2002, CEEPUS Project CZ 103-02/03
- Petr Honzík, November 2002, CEEPUS Project CZ 103-02/03
- František Zezulka, November 2002, CEEPUS Project CZ 103-02/03
- Pavel Kučera, 5 month study stay in the Research Centre IFA Magdeburg, 2002
- Lukáš Kopečný, 5 month study stay on University of Salford, GB, Socrates

V.3 Contracts

- Laboratory of signal processors AD. AMTEK Ltd. Brno (Analog Devices), Ludvík Bejček
- Laboratory for measurement of pressure and flow. VAVRA Ltd., Ludvík Bejček
- Monitoring of traffic situation. Police CR, Jozef Honec
- Laboratoř bezdotykového měření teploty. Raytek (TSI Systém s.r.o.), Ludvík Bejček
- Spolupráce s VŠZ Brno – akustické testování plodů, Ludvík Bejček

V.4 Membership in International Organizations and Societies

- Ludvík Bejček, member of National Committee IMEKO, TC 2
- Ludvík Bejček, member, Photonica, Prague, CZ
- Ludvík Bejček, member European Optical Society, Paris, France
- Pavel Jura, member IEEE.
- Zdeněk Malec, member of Supervisory council of Czech Nat. Committee IMEKO, Praha
- František Šolc, member IEEE
- František Šolc, member IFAC TC Robotics
- Prof. Petr Vavřín, member National committee IFAC
- František Zezulka, member LonWorks Vendor Association, USA
- František Zezulka, member AS-i Verein, Odenthal, Germany
- František Zezulka, member DeviceNet Vendor Organization
- František Zezulka, member of P-Net Organisation, Denmark

VI. PUBLICATIONS

VI.1 Journals, Parts of Books

- BEJČEK, L., PREČAN, J. Poznatky z dynamických měření snímačů tlaku (What have we learnt from dynamic measurement of pressure sensors). *Automa*, ISSN 1210-9592, 2002, Vol. 2002, n. 11, p. 26 - 30.
- FIEDLER, P., CACH, P., BRADÁČ, Z., ZEZULKA, F., HONZÍK, P. Využití technologie Ethernet pro řízení, měření a sběr dat (Utilization of Ethernet interface for control, measurement and data acquisition). *Automa*, ISSN 1210-9592, 2002, Vol. 8, n. 5, p. 8 - 9.
- HONZÍK, B., HRABEC, J. Polidští fotbal roboty (Humanization of soccer robots). *VTM*, ISSN 1210-0897, 2002, Vol. 44, n. 3/2002, p. 26 - 27.
- HONZÍK, P., HRABEC, J., SEMRÁD, B., LÁBROVÁ, R., HONZÍKOVÁ, N. Fuzzy hodnocení rizikových faktorů zpřesňuje predikci rizika srdeční smrti (A new fuzzy method improves a cardiac death prediction). *Cor at Vasa*, ISSN 0010-8650, 2002, Vol. , n. ,
- HONZÍKOVÁ, N., FIŠER, B., SEMRÁD, B., LÁBROVÁ, R., HONZÍK, P., HRABEC, J. Nonlinear analysis of inter-beat data in patients after myocardial infarction. *Acta Physiologica Hungarica*, ISSN 0231-424X, 2002, Vol. 89, n. 1-3,
- KHEILOVÁ, M., ŠTRUNC, M., ŠOLC, F. Kolmogorov-Sinai Entropy and Lyapunov Exponents Related to Information and Transport Processes. *International Journal of Computing Anticipatory Systems*, ISSN 1373-5411, 2002, Vol. 11, n. 11, p. 306 - 319.
- MACHO, T. Vestavné systémy (Embedded systems). *Automa*, ISSN 1210-9592, 2002, Vol. 2002, n. 12, p. 2 - 4.
- VAVŘÍN, P. Česká věda a realita (Czech science and present reality). *Lidové noviny*, 2002, Vol. 2002, n. 10.7., p. 8 - 8.
- VAVŘÍN, P. Myšlenky na zlomu tisíciletí. Chapter: *Ohlédnutí s varováním (Look back and warning)*. VUT Brno: VUTIUM, 2002. p. 189 - 196. ISBN 80-214-1872-9

- VAVŘÍN, P. Věda, financování a kouzla statistik (Science, financial support and statistics). *Hospodářské noviny*, 2002, Vol. 2002, n. 1.11, p. 4 - 4.
- VYCHODIL, H., PIVOŇKA, P., KRUPANSKÝ, P. Recent Advances in Circuits, Systems and Signal Processing. Chapter: *The Choice of Patterns in Training Set for Neural On-line Identification*. http://www.worldses.org: Published by WSES Press, http://www.worldses.org, 2002. p. 250 - 253. ISBN 960-8052-64-5
- ZEZULKA, F., BRADÁČ, Z., FIEDLER, P., CACH, P., KUČERA, P., FOJTÍK, P. Laboratoř pro výuku průmyslových komunikačních sběrnic (Laboratory of industrial communication buses for educational purposes). *Automa*, ISSN 1210-9592, 2002, Vol. 8, n. 5, p. 34 - 35.

VI.2 Conferences

- BEJČEK, L., GRATZ, P., GOLIÁŠ, J., KLUSÁČEK, S. *Mechanical Resonance Method for Evaluation of Firmness of Peach Fruit In Modern Analytical Methods for Food and Beverage Authentication*. Modern Analytical Methods for Food and Beverage Authentication. Lednice: MZLU Brno, Lednice, 2002,
- BEJČEK, L., GRATZ, P., KLUSÁČEK, S. *Measuring mechanical properties of fruit by frequency response* In Eurosensors XVI. Eurosensors XVI, The 16th European Conference on Solid-State Transducers.. Praha: CVUT Praha, 2002, p. 113 - 114, ISBN 80-01-02576-4
- BENEŠ, P. *Particle Velocity Flowmeters* In Eurosensors XVI. Eurosensors XVI, The 16th European Conference on Solid-State Transducers.. Praha: Czech Technical University, 2002, p. 673 - 676, ISBN 80-01-02576-4-
- BRADÁČ, Z., BRADÁČ, F. *Packet routing problem – LP problem* In International Conference Cybernetics and Informatics. Cybernetics and Informatics. Trebisov: STU Bratislava, 2002, p. 95 - 96, ISBN 80-227-1749-5
- BRADÁČ, Z., BRADÁČ, F. *Zvyšování rozlišení snímacích optických zařízení (Spatial resolution improving of optical sensors)* In International Conference Cybernetics and Informatics. Cybernetics and Informatics. Trebisov: STU Bratislava, 2002, p. 97 - 98, ISBN 80-227-1749-5
- BRADÁČ, Z., FIEDLER, P. *Soft control, současný stav a perspektivy využití (Soft control, present state of the art and future)* In Teorie a praxe automatizace 2002. Teorie a praxe automatizace 2002. Brno: VUT FEKT UAMT v Brně, 2002, p. 11 - 14,
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VI.3 PhD Theses

- ŽALUD, L: Proximity Laser Scanner Cross-Correlation Based Methods for Cooperative Self-Localization and Map Building

VI.4 Research and Technical Reports

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- VRBA, R., ZEZULKA, F. Snímač tlaku nové generace (Pressure Sensor of New Generation). 2002.
- VRBA, R., ZEZULKA, F., CACH, P., FIEDLER, P., BRADÁČ, Z., HONZÍK, P. SENSVISION – Internet access to processes. 2002.

VII. OTHER ACTIVITIES

- RoBohemia autonomous robot soccer team was exhibited during GAUDEAMUS exhibition, Brno, Oct. 2002
- RoBohemia autonomous robot soccer team won FIRA, European championship in MIROSOT category in two leagues (small and middle league). Vienna 18.-21.Apr.,2002
- Organization of 2nd open seminary on Theory and Praxis of Automation for lecturers and experts, Brno, 8th November 2002
- Lecture of Prof. Dr. Dr. W. Hallang, Fern Universität Hagen, Topic: HW protection of IT systems versus virus etc., 4th September 2002

- Lecture of Prof. Dr. Dr. W. Hallang, Fern Universität Hagen, Topic: Real time programming in PEARL-90, 5th September 2002
- Prof. Dr.-Ing. Dietmar Paul Franz Möller, Universität Hamburg, Topic: IT today and choice for future, 28th April 2002
- Acqusition of Motorola grant for Motion control laboratory establish, 20,000 USD
- Lecture of Measurement of mains power quality, Ludvík Bejček, Vladislav Matyáš, Karel Hoder, Miloslav Čejka, Organised for EGÚ Brno, a.s., 23th October 2001-13th February 2002, 6 lectures and 6 laboratories seminars in following topics:
  - Measurement Theory and Introduction to EMC
  - EMC of Measurement Devices
  - Introduction to Measurement Methods in Power Engineering
  - Flikr – Measurement Methods
  - Digital Processing of Signals in Power Networks
  - Methods of Detection, Measurement and Collection of Signal Time Evolution
  - Voltage, Current and Power Sensors
  - Measurement of Voltage Quality Parameters, Power Current Distortion
  - Impedance of Power Networks on Higher Frequencies
  - Optical Sensors in Power Engineering
  - Communication and Computer Aided Measurement of Over voltage by Monitors
  - Statistical Methods
  - Measurement Standards in Power Engineering
- Organization of 2nd open seminary on Theory and Praxis of Automation for lecturers and experts, Brno, 8th November 2002, František Zezulka, Petr Vavřín, Petr Pivoňka, František Šolc, Ludvík Bejček, Petr Beneš, Tomáš Macho, Zdeněk Bradáč, Petr Fiedler, Petr Honzík, Luděk Černý, Radek Štohl, 8 Nov.2002, 12 lectures on the following topics:
  - Robotics
  - Communication technologies in automation
  - PLC
  - Soft control, present state of the art and future
  - Sensor techniques news
  - Standard IEEE1451 „Plug and Play" sensors
  - Methods for automation project choosing
  - Direct implementation of highly sophisticated algorithms
  - Embedded systems
  - Reliability and safety of devices
  - Internet technologies
  - Diagnostics and maintenance of automation systems

DEPARTMENT OF BIOMEDICAL ENGINEERING

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Lecturers:

Ing. Karel Jehlička, CSc., Ing. Jiří Kozumplík, CSc., Ing. Zoltán Szabó, Ph.D.

Assistant Lecturers:

Ing. Petr Fedra

Technical Staff:

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II FACILITIES

II.1 Teaching and Research Laboratories

- teaching computer laboratory of medical informatics
- teaching computer laboratory of signal and image processing
- teaching laboratory of medical electronic equipment
- teaching laboratory of medical diagnostic systems
- teaching laboratory of bionics
- research laboratory for image data processing
- design and construction laboratory

Stays on clinics and medical laboratories at the Faculty Hospital Brno - Bohunice and at the Medical Faculty of Masaryk University are an important part of the study curriculum.

II.2 Special Instrumentation and Computers

II.2.1 Instrumentation

- set of technical and software equipment for digitisation, recording and digital processing of black-and-white and colour images and image sequences, including digital cameras Panasonic NVDX1000EG, Olympus C800, Olympus 4030, Nikon CP950, Nikon CP 4500, Nikon 5000, SONY TRV828 and DV-videorecorder SONY DHR1000;
- IR-cameras FLIR 595 and AGA 780 with accessories;

- image digitising system OLYMPUS for on-line medical information system applications (for microscopic images)
- analogue video-cameras for different applications, camcorders, video-recorders and equipment for editing of teaching video-clips
- set of medical diagnostic instrumentation: electroencephalograph SAN-EI EEG1A98, electrocardiograph Chirastar 32, electrocardiograph Schiller AT-1 with accessories, system Medicard (virtual, 12-lead digital electrocardiograph with automatic evaluation of ECG), cardio-monitor LKM200, portable one-channel electrocardiograph Unicard, digital blood pressure meter Omron 4-1, electroglottograph, instrument for electro-acupuncture, EEG alpha-monitor for bio-feedback, photo-stimulator for evoked-potential analysis, ECG-generator for equipment testing, spirometer Schiller- Spirovit SP1/20 with accessories, psycho-galvanometr, bicycle ergometer Schiller ERG 500 with adjustable load, 2-lead and 4-lead rheographs for blood-flow impedance measurement;
- IMEXLAB 9000 by IMEX (USA) - diagnostic system for Doppler blood-flow measurements, plethysmography and blood-pressure measurements for diagnostics of peripheral vessel ischemic disease
- digital thermometer YSI 4600 (USA)
- set of dosimetric equipment for radiation control
- ecological measuring equipment: noise-level meter Brüel-Kjaer, humidity and temperature meter BEHA93420, electrosmogmeter BEHA UNITEST9013, electromagnetic field meter Lutron EMF 823, luxmeter Chauvin Arnoux CA810
- dual channel digital oscilloscopes Tektronix TDS210 and Tektronix TDS1004

II.2.2 Computers

- local network of 75 PC-type computers (Pentium, Celeron, Pentium II, Pentium III, Pentium 4) including Internet connection (4 x 24 port switch 100 Mbps);
- work-station SUN Sparc IPC;

II.2.3 Special software

- professional multistation hospital information system SMS,
- technical software including complete MATLAB v.6.3 and LabVIEW 6 environment;
- development systems Motorola for microcontrollers and signal processors.

III TEACHING

III.1 Master´s Programme (Ing)

The Department provides several basic generic courses for the study areas Electronics and Communication (EST) and Cybernetics, Automation and Measurement (KAM) at FEEC BUT (in 2002 last year also for FIT BUT). It also offers specialised courses from the fields of biomedical engineering and medical informatics for students of the mentioned areas who want to specialise in the biomedical interdisciplinary area. In the ac academic year 2002/03 a new study programme Electrical, Electronic, Control and Communication Technology has been launched – course Computers and Programming I.

Advanced Signal Processing Algorithms	Y3, L2, summer	3/2	Kozumplík
Biological Signal Analysis	Y3, L2, summer	3/2	Jehlička
Biological System Modelling	Y3, L2, winter	3/2	Holčík
Biology of Man	Y1, L2, summer	3/1	Honzíková
Bionics	Y1, L2, winter (EST)	3/2	Holčík
	Y2, L2, winter (FIT, KAM)		
Biophysics	Y1, L2, winter	3/1	Šimurda
Clinical Physiology	Y2, L2, winter	2/2	Chaloupka
Design of Medical Systems	Y3, L2, summer	3/2	Jehlička
Digital Image Processing and Analysis	Y1, L2, summer	3/3	Jan
Digital Signal Processing and Analysis	Y1, L2, winter	3/3	Jan
Ecological Engineering	Recommended course	3/2	Rozman
Environmental diagnostics	Y1, L2, winter (EST)	3/2	Rozman
	Y2, L2, winter (KAM)		
Expert Systems and Computers aided	Y3, L2, summer (EST, KAM)	3/2	Provazník

Diagnostics	Y2, L2, summer (FIT)		
Imaging Systems	Y2, L2, winter	3/2	Drastich
Laboratory Medical Instrumentation	Y3, L2, winter	3/2	Chmelař
Marketing in Health Care	recommended course	2/1	Holčík
Medical Care	Y2, L2, summer	2/2	Vomela
Medical Diagnostic Instrumentation	Y2, L2, summer	3/2	Chmelař
Medical Imaging Systems	Y2, L2, summer	3/2	Drastich
Medical Information Systems	Y3, L2, winter (EST, KAM) Y2, L2, winter (FIT)	3/2	Provazník, Jehlička
Computers and Programming 1	Y1, L1, winter	2/2	Provazník
Programming and Computer Applications 2	Y1, L1, summer	3/2	Provazník
Systems, Processes, and Signals	Y2, L1, summer (FIT)	3/2	Jan, Kozumplík
Therapeutical Instrumentation	Y2, L2, winter (EST) Y3, L2, winter (KAM)	3/2	Rozman

III.3 Doctoral Programme (PhD)

Genetic Algorithms and their Applications	summer	42 hrs.	Holčík
Methods and Systems for Ultrasound Diagnostics	summer	42 hrs.	Rozman
Neural Networks, Adaptive and Optimum Filtering	winter	42 hrs.	Jan
Spectral Analysis of Digital Signals	winter	42 hrs.	Holčík
Advanced Methods of Digital Image Processing	summer	42 hrs.	Jan

III.4 Study in English Language (International Students)

Within the framework of the programme for international students, the Department participates in teaching in the study areas Electronics and Communication and Informatics and Computer Science by providing some generic basic courses. Besides that, it organises the study of a group of students oriented towards the interdisciplinary area of biomedical engineering and offers the respective specialised courses. The Department also offers doctoral study in English.

Biological Signal Processing	individual study plan	3/2	Holčík
Biology of Man	individual study plan	3/1	Honzíková
Bionics	individual study plan	3/2	Holčík
Biophysics	individual study plan	3/1	Šimurda
Clinical Physiology	individual study plan	3/1	Vomela
Computer Aided Medical Diagnostics	individual study plan	3/2	Provazník
Diagnostic Electronic Devices.	individual study plan	3/2	Chmelař
Digital Image Processing and Analysis	individual study plan	3/3	Jan
Digital Signal Processing and Analysis	individual study plan	3/3	Jan
Imaging Systems	individual study plan	3/2	Drastich
Informatics in Health Care	individual study plan	3/2	Szabó
Laboratory Medical Instrumentation	individual study plan	3/2	Chmelař
Medical Imaging Systems	individual study plan	3/2	Drastich
Modelling Biological Systems	individual study plan	3/2	Holčík
Therapeutical Instrumentation	individual study plan	3/2	Rozman
Genetic Algorithms and Their Applications	PhD L, summer	42 hrs.	Holčík
Neural Networks, Adaptive and Optimum Filtering	PhD L, winter	42 hrs.	Jan
Spectral Analysis of Digital Signals	PhD L, winter	42 hrs.	Holčík
Advanced Methods of Digital Image Processing	PhD L, summer	42 hrs.	Jan

IV RESEARCH PROJECTS

Research in Electronic Communication Systems and Technologies

Research programme No. MSM 262200011, principal investigator: Jiří Svačina, research coordinator at the DBME: Jiří Jan, team leader for the expert area "Digital methods of signal and image analysis": Jiří Holčík, participants: Ivo Provazník, Jiří Kozumplík, Zoltán Szabó, Petr Fedra, Jiří Rozman, Milan Chmelař

Research in Microelectronic Systems and Technologies

Research programme No. MSM 262200022, principal investigator: Radimír Vrba, participant: Ivo Provazník

Computer Processing of Ophtalmological Image Data

Joint grant project with the Friedrich-Alexander University, Erlangen, Germany, KONTAKT CZE 01/031, principal investigator: Jiří Jan

Analysis of medical image data aimed at 3D imaging in cardiology

Grant project GAČR No. 102/02/0890, principal investigator: Jiří Jan.

Model Study of Ultrasound Probe Radiation

Grant project GAČR No. 102/00/0936, principal investigator: Jiří Rozman.

Research and Applications of Optoelectronic Methods in Measuring, Communications, Medical Diagnostics, and Environmental Engineering

Grant project GAČR No. 102/00/0936, principal investigator: Václav Říčný (Dept. of Radioelectronics), participants: Aleš Drastich, Jiří Rozman.

Multiresolution Methods of Visualisation of Medical Images

Grant project GAČR No. 102/00/P079, principal investigator: Ivo Provazník., supervisor: Jiří.Jan

Optical Recording of Action Potential and Its Use in Experimental Cardiology

Grant project GAČR No. 102/01/194, principal investigator: Ivo Provazník

3D Imaging and Segmentation of Medical Image Data

Grant project FRVŠ No. 1939/2002, principal investigator: Zbyněk Veselý, supervisor: Ivo Provazník

Long-time Monitoring of EEG and Other Biological Signals During Sleep

Grant project FRVŠ No. 1717/2002, principal investigator: Petr Sadovský, supervisor: Jiří Rozman

Diagnostic of Inflammation by Thermogram Analysis

Grant project FRVŠ No. 1935/2002, principal investigator: Petr Dub, supervisor: Aleš Drastich

Compilation and Segmentation of 3D Image Data Set from 2D Scans

Grant project FRVŠ No. 1804/2002, principal investigator: Jaroslav Rohel, supervisor: Jiří.Jan

Innovation of Biomedical Engineering Curriculum at the BUT

Grant project FRVŠ No. 1592/2002, principal investigator: Ivo Provazník.

Comment: The teachers providing the biomedical courses have their own research programs at their main employing institutions, partly in co-operation with the Department of Biomedical Engineering.

V COOPERATIONS

V.1 Cooperations in the Czech Republic

- Association of Manufacturers and Suppliers of Medical Devices
- AudioScan, Ltd., Prague
- GE Medical Systems S.A., Prague
- Brno Congress Center
- Brno Trade Fairs and Exhibitions, Co.Ltd., Brno
- Czech State Institute for Metrology, Brno
- Czech State Institute for Normalisation, Prague
- Dept. of Physiology, Medical Faculty of Masaryk University, Brno
- Equine Clinic, University of Veterinary Sciences and Pharmacy, Brno
- Faculty Children Hospital, Brno, Clinic of Radiology
- Faculty Hospital Brno-Bohunice, Centre for Functional Diagnostics
- Faculty Hospital Brno-Bohunice, Clinic of Nuclear Medicine
- Faculty Hospital Brno-Bohunice, Clinic of Ophtalmology
- Faculty Hospital Brno-Bohunice, Clinic of Psychiatry
- Faculty Hospital Brno-Bohunice, Clinic of Radiology
- Faculty Hospital Brno-Bohunice, Clinic of Surgery
- Faculty Hospital Brno-Bohunice, Clinic of Urology

- Faculty Maternity Hospital Brno
- Faculty St.Anne Hospital, Brno, Clinic of Imaging Methods
- Faculty St.Anne Hospital, Brno, Clinic of Neurosurgery
- GEOFYZIKA Brno
- Hospital at Homolka, Dept. of Leksell Gama Knife, Prague
- Hospital of Traumatology, Brno
- Institute of Scientific Instruments, Czech Academy of. Science, Brno
- Institute of Radioelectronics, Czech Academy of Science, Prague
- Institute of Material Science, Faculty of Mechanical Engineering, Brno University of Technology
- Masaryk Institute of Cancer Diseases, Brno
- Ministry of Industry and Trade of the Czech Republic
- SMS, Ltd., Brno
- State Institute for Testing in Machine Industry, Brno
- Weather-Station, Faculty of Civil Engineering, Brno University of Technology

V.2 International Cooperation

- Catholic University Leuven - ESAT, Leuven, Belgium
- Fachhochschule Wiesbaden, Germany
- Free University Brussels - ETRO, Brussels, Belgium
- Friedrich-Alexander-University, Erlangen, Germany
- IMEC v.z.w., Institute for Microelectronics, Leuven, Belgium
- Politechnika Slaska, Instytut elektroniki, Gliwice, Poland
- Toshiba Medical Systems Europe BV Zoetermeer, The Netherlands
- University of Leicester, United Kingdom
- University of Zaragozza, Spain
- University of Bergen, Norway
- University of Tampere, Finland

V.2.1 Visitors to the Department

- Prof. Peter Grant, EURASIP President, University of Edinburgh, United Kingdom, 3 days
- Prof. Thomas Penzel, University of Marburg, Germany, 5 days
- Prof. Ewaryst Tkacz, Instytut elektroniki, Politechnika Śląska, Gliwice, Poland, 3 days
- Dr. Stanislaw Pietraszek, Instytut elektroniki, Politechnika Śląska, Gliwice, Poland, 3 days
- Dr. Marian Kotas, Instytut elektroniki, Politechnika Śląska, Gliwice, Poland, 2 days
- Dr. Pawel Kostka, Instytut elektroniki, Politechnika Śląska, Gliwice, Poland, 2 days

V.2.2 Visits of Staff Members to Foreign Institutions

- Jiří Holčík, Instytut elektroniki, Politechnika Śląska, Gliwice, Poland, 1 week
- Jiří Jan, University of Zaragozza, Spain, 1 week
- Ivo Provazník, Zagazeeg University, Ain Sham University, Tanta University, El Mansoura University, University of Cairo, Egypt, 12 days
- Ivo Provazník, Fachhochschule Wiesbaden, Germany, 7 days

V.3 Membership in International Organizations and Societies

V.3.1 Committee members

- Jiří Jan, EURASIP - European Association for Signal Processing (Switzerland) - Central European Liaison of AdCom
- Jiří JAN, Editorial Board member – EURASIP Journal of Applied Signal Processing
- Jiří Jan, IEEE - Institute of Electrical and Electronics Engineers (USA), Signal Processing Society, Engineering in Medicine and Biology Society - Associate Editor of IEEE Transactions on Biomedical Engineering
- Invited editors - Special Issue on Modality oriented medical image processing of the EURASIP Journal of Applied Signal Processing: Jiří Jan and Ivo Provazník

V.3.2 Membership

- Nataša Honzíková, Societe des Physiologistes Francaises
- Jiří Holčík, IEEE - Institute of Electrical and Electronics Engineers (USA), Engineering in Medicine and Biology Society
- Jiří Rozman, IEEE - Institute of Electrical and Electronics Engineers (USA), Engineering in Medicine and Biology Society
- Ivo Provazník, IEEE - Institute of Electrical and Electronics Engineers (USA), Engineering in Medicine and Biology Society, Computer Society
- Ivo Provazník, EURASIP - European Association for Signal Processing (Switzerland)

VI Publications

VI.1 Books

- JAN, J.: Číslicová filtrace, analýza a restaurace signálů, druhé rozšířené vydání (Digital Signal Processing, Analysis and Restoration, 2nd extended issue). Brno 2002, VUTIUM Press, VUT v Brně, 427 str., ISBN 80-214-1558-4
- JAN, J., KOZUMPLÍK, J., PROVAZNÍK,I (Eds.): Analysis of Biomedical Signals and Images (16-th international EURASIP conference BIOSIGNAL 2002 proceedings). VUTIUM Press, VUT v Brně, 489 str., ISBN 80-214-2120-7

VI.2 Journal Papers and Parts of Books

- BAHNÍKOVÁ, M., MATĚJOVIČ, P., PÁSEK, M., ŠIMURDOVÁ, M., ŠIMURDA, J. The effect of ajmaline on ionic currents of rat ventricular myocytes. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51(4), n. , p. 1 - 1.
- HOLČÍK, J. Česko-slovenská vědecká konference "Inteligentní systémy ve zdravotní péči" (Czech and Slovak Scientific Conference on "Intelligent Systems in Health Care"). *Lékař a technika*, ISSN 0301-5491, 2002, Vol. 33, n. 6, p. 194 - 195.
- HOLČÍK, J., MOUDR, J., HLAVÁČ, M. Modelování vlivu založení arteriovenózní spojky v paži na hemodynamické poměry v kardiovaskulární soustavě (Modelling of Hemodynamic Response to Creation of Arteriovenous Fistula in Vascular Bed of Arm). *Acta Mechanica Slovaca*, ISSN 1335-2393, 2002, Vol. 6, n. 2, p. 63 - 73.
- HOLČÍK, J., MUSIL, J. O ortogonalitě elektrokardiografických svodových systémů (On Orthogonality of Electrocardiographic Lead Systems). *Vnitřní lékařství*, ISSN 0042-773X, 2002, Vol. 48, n. Supplemention
- HONZÍKOVÁ, N., FIŠER, B., SEMRÁD, B., LÁBROVÁ, R., HONZÍK, P., HRABEC, J. Nonlinear analysis of inter-beat data in patients after myocardial infarction. *Acta Physiologica Hungarica*, ISSN 0231-424X, 2002, Vol. 89, n. 1-3,
- HONZÍKOVÁ, N., HRSTKOVÁ, H., ZÁVODNÁ, E., NOVÁKOVÁ, Z. Baroreflex sensitivity in children with bronchial asthma. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51, n. 4, p. 13
- HONZÍKOVÁ, N., HRSTKOVÁ, H., ZÁVODNÁ, E., NOVÁKOVÁ, Z. Relationship between 0.1 Hz variability and pulse intervals in hypertensive children. *Journal of Hypertension*, ISSN 0263-6352, 2002, Vol. 20, n. 4, p. 128
- HONZÍKOVÁ, N., KRTIČKA, A., NOVÁKOVÁ, Z., ZÁVODNÁ, E. Exercise and 0.1 Hz variability in blood pressure and pulse intervals with respect to baroreflex sensitivity. *Journal of Hypertension*, ISSN 0263-6352, 2002, Vol. 20, n. 4, p. 130
- HONZÍKOVÁ, N., KRTIČKA, A., NOVÁKOVÁ, Z., ZÁVODNÁ, E. Variabilita v krevním oběhu při frekvenci 0.1 Hz v klidu a při zátěži. *Cor at Vasa*, ISSN 0010-8650, 2002, Vol. 44, n. 4, p. 38
- HONZÍKOVÁ, N., SEMRÁD, B., FIŠER, B. Non-linear structure analysis of inter-beat interval data and the risk of mortality in patients after myocradial infarction. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 2, p. 105 - 109.
- JAN, J., JANOVÁ, D. Complex approach to surface reconstruction of microscopic samples from bimodal image stereo data. *Machine Graphics and Vision*, ISSN 1230-0535, 2002, Vol. 10, n. 3, p. 261 - 288.
- JAN, J., MÍŠEK, A. Deriving attenuation profiles from raw digital ultrasonographic data. *Journal of Electrical Engineering*, ISSN 0013-578X, 2002, Vol. 2002, n. 3-4, p. 70 - 75.

- KREMLÁČEK, J., HOLČÍK, J. Model of Visually Evoked Cortical Potentials. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51, n. 1, p. 65 - 71.
- NOVÁKOVÁ, Z., FIŠER, B., HONZÍKOVÁ, N., ZÁVODNÁ, E., HRSTKOVÁ, H. Autonomic control of the heart in relation to anthropomethric characteristics in children and adolescents. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 5, p. 217 - 221.
- NOVÁKOVÁ, Z., ZÁVODNÁ, E., NOVOTNÝ, J., HONZÍKOVÁ, N. Baroreflex sensitivity in trained swimmers. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51, n. 4, p. 51
- NOVÁKOVÁ, Z., ZÁVODNÁ, E., NOVOTNÝ, J., HONZÍKOVÁ, N., AL-KUBATI, M. Variabilita oběhových parametrů ve vytahu k citlivosti baroreflexu u aktivně sportujících dětí. *Cor at Vasa*, ISSN 0010-8650, 2002, Vol. 44, n. 4, p. 84
- PÁSEK, M., CHRISTÉ, G., ŠIMURDA, J. Arrhythmogenic effect of extracellular K+- depletion is prevented by the transverse-axial tubular system in a ventricular cardiac cell model. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 4, p. 179 - 186.
- PROVAZNÍK, I., BARDOŇOVÁ, J., NOVÁKOVÁ, M., NOVÁKOVÁ, Z., KOZUMPLÍK, J. High Resolution Methods For Detection Of Electrophysiological Changes In The Ischaemic Heart. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 5, p. 223 - 230.
- ŠIMURDA, J. Ajmaline-induced block of sodium current in ventricular myocytes. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 4, p. 169 - 178.
- ŠIMURDA, J. Modelling of calcium movements in mammalian cardiac cells. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51, n., p. 41 - 41.
- ZÁVODNÁ, E., HRSTKOVÁ, H., HONZÍKOVÁ, N., NOVÁKOVÁ, Z. Autonomous regulation of circulation in children after anthracycline therapy. *Scripta medica*, ISSN 1211-3395, 2002, Vol. 75, n. 4, p. 195 - 201.
- ZÁVODNÁ, E., NOVÁKOVÁ, Z., HONZÍKOVÁ, N. Influence of blood pressure variability on the relationship between baroreflex sensitivity and pulse interval variability. *Journal of Hypertension*, ISSN 0263-6352, 2002, Vol. 20, n. 4, p. 129
- ZÁVODNÁ, E., NOVÁKOVÁ, Z., HONZÍKOVÁ, N. The relationship between baroreflex sensitivity and the variability in blood pressure and pulse intervals. *Physiological Research*, ISSN 0862-8408, 2002, Vol. 51, n. 4, p. 53

VI.3 Conference Papers

- BAHNÍKOVÁ, M., MATĚJOVIČ, P., PÁSEK, M., ŠIMURDOVÁ, M., ŠIMURDA, J. *Voltage clamp analysis of ajmaline-induced block of potassium currents in rat ventricular myocytes* In Analysis of Biomedical Signals and Images. 16-th Biennial International Eurasip Conference Biosignal 2002. Brno: Vutium Press, 2002, s. 217 - 219, ISBN 80-214-2120-7
- BARDOŇOVÁ, J., PROVAZNÍK, I., NOVÁKOVÁ, M., NOVÁKOVÁ, Z. *Application Of Dynamic Time Warping In ECG Description For Recognition Of Myocardial Ischemia* In Analysis of Biological Signals and Images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: VUTIUM Press, 2002, s. 236 - 239, ISBN 80-214-2120-7
- BURHAN, R., HOLČÍK, J. *New Software Tool for Modelling Biological Systems* In Analysis of Biomedical Signals and Images. Proc. 16th biennial International EURASIP Conf. BIOSIGNAL 2002. 16th International EURASIP Conference BIOSIGNAL 2002. Brno Univ. of Technology: VUTIUM Press 2002, s. 480 - 482, ISBN 80-214-2120-7
- BURHAN, R., HOLČÍK, J. *Prediction Based on HMM Theory In Analysis of Biomedical Signals and Images* In Analysis of Biomedical Signals and Images. Proc. 16th biennial International EURASIP Conf. BIOSIGNAL 2002. 16th International EURASIP Conference BIOSIGNAL 2002. Brno Univ. of Technology: VUTIUM Press 2002, s. 223 - 225, ISBN 80-214-2120-7
- DIBLÍK, J., SADOVSKÝ, P. *Využití přírůstku argumentu pro hledání kořene polynomu* In Sborník, 1.mezinárodní matematický whorkshop. Brno: VUT v Brně, 2002, ISBN 80-86433-16-1
- DUB, P., DRASTICH, A., NOVÁK, Z., ŘÍHA, I. *Infrared Imaging In Nerve Roots Diseases* In Proceeding of 16th international EURASIP conference BIOSIGNAL 2002. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Vysoké učení technické v Brně, 2002, s. 307 - 309, ISBN 80-214-2120-7
- FEDRA, P., PROVAZNÍK, I. *Complex-Valued Wavelets for Edge Enhancement in Medical Images* In IFMBE Proceedings - 2nd European Medical and Biological Engineering Conference EMBEC'02. 2nd European Medical and Biological Engineering Conference EMBEC'02. Vienna, Austria: Verlag der Technischen Universitat Graz, Austria, 2002, s. 950 - 951, ISBN 3-901351-62-0

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- HLAVÁČ, M., HOLČÍK, J., MOUDR, J. *Model of short and long-term control of cardiovascular system* In Analysis of biomedical signals and images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Brno University of Technology VUTIUM Press, 2002, s. 427 - 429, ISBN 80-214-2120-7

- HOLČÍK, J., HÉDL, R. *Linear Feedback Analysis of the Cardiovascular Control* In IFMBE Proc. 2nd European Medical & Biological Engineering Conference EMBEC '02. 2nd European Medical and Biological Engineering Conference EMBEC'02. Vienna, 2002, s. 632 - 633, ISBN 3-901351-62-0

- HONZÍK, P., HRABEC, J., LÁBROVÁ, R., SEMRÁD, B., HONZÍKOVÁ, N. *Risk Stratification Of Patients After Myocardial Infarction By The Fuzzy And Weighted Methods* In Analysis of Biomdedical Signals and Images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno, Czech Republic: Brno University of Technology, VUTIUM Press Brno, 2002, s. 463 - 465, ISBN 80-214-2120-7

- HONZÍKOVÁ, N. *The development of the relationship between baroreflex sensitivity and tonic control of circulation in children and adolescents* In Hypertonia és Nephrologia: Blood Pressure and Heart Rate Variability New Technologies - Abstracts of Hungarian Satellite Symposium HYPERTENSION PRAGUE 2002. Praha, 2002, s. 12

- JAN, J. Methods of *Ultrasonographic Image Data Processing (invited lecture)* In Analysis of Biomedical Signals and Images 16th EURASIP Conference BIOSIGNAL Proceedings. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: VUTIUM Press Brno, 2002, s. 277 - 279, ISBN 80-214-2120-7

- JAN, J. *New graduate biomedical & ecological engineering curriculum at the University of Technology Brno* In Analysis of Biomedical Signals and Images 16th EURASIP intern. conf. BIOSIGNAL proceedings. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: VUTIUM Press Brno, 2002, s. 483 - 485, ISBN 80-214-2120-7

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- KOLÁŘ, R., KOZUMPLÍK, J. *Speckle suppression and contrast enhancement in ultrasound images* In Analysis of biomedical signals and images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: VUTIUM Press, 2002, s. 353 - 355, ISBN 80-214-2120-7

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- KOZUMPLÍK, J., KOLÁŘ, R. *Wavelet Denoising of Electrocardiograms* In Analysis of Biomedical Signals and Images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Vutium Press, 2002, s. 220 - 222, ISBN 80-214-2120-7

- KRTIČKA, A., HONZÍKOVÁ, N., NOVÁKOVÁ, Z., ZÁVODNÁ, E. *Baroreflex sensitivity determined by two spectral methods: cross-spectral and continuous alpha index* In IFMBE Proceedings Part 2, 2nd European medical and Biological Engineering Conference 2002. Vídeň, Rakousko: , 2002, s. 1274 - 1 275, ISBN 3-901351-62-0

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- KUREČKA, R., KOZUMPLÍK, J. *Segmentation Of Ultrasound Images Using Active Contour Method* In Analysis of Biomedical Signals and Images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Brno University of Technology VUTIUM Press, 2002, s. 356 - 358, ISBN 80-214-2120-7
- MAHDAL, V., KUREČKA, R. *Multiscale Thresholding Method With Quincunx Transform For Ultrasound Speckle Suppression* In Analysis of biomedical signals and images. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Brno University of Technology, 2002, s. 359 - 360, ISBN 80-214-2120-7
- MATĚJOVIČ, P., BAHNÍKOVÁ, M., PÁSEK, M., ŠIMURDOVÁ, M., ŠIMURDA, J. *Voltage and frequency dependent block of sodium current in cardiac cells: comparison of the effect of antiarrhythmic drugs* In Analysis of Biomedical Signals and Images. 16-th Biennial International Eurasip Conference Biosignal 2002. Brno: Vutiumm Press, 2002, s. 214 - 216, ISBN 80-214-2120-7
- NOVÁKOVÁ, M., PROVAZNÍK, I. *Time- And Time-Frequency Analysis Of Contractility And Desensitization In Multicellular Heart Preparations* In IFMBE Proceedings of EMBEC'02. 2nd European Medical and Biological Engineering Conference EMBEC'02. Vienna, Austria: Verlag der Technischen Universitat Graz, 2002, s. 554 - 556, ISBN 3-901351-62-0
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- PÁSEK, M., CHRISTÉ, G., ŠIMURDA, J. *The role of transverse-axial tubular system in ventricular cardiac cell arrhythmogenesis* In International Conference Biomechanics of Man. Čejkovice: , 2002, s. 42 - 44, ISBN 80-86317-23-4
- SEMRÁD, B., HONZÍKOVÁ, N., FIŠER, B. *Ejection fraction and baroreflex sensitivity in patients after myocardial infarction* In Proceedings, Symposium The importance of chronobiology in diagnosing and therapy of internal diseases, eds. Halberg F., Kenner T., Fišer B., Brno, 2002. Brno: Masaryk University, 2002, s. 159 - 162, ISBN 80-7013-352-X
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- SKOKAN, M., SKOUPÝ, A., JAN, J. *Registration of Multimodal Images of Retina* In Proceedings of the 24th Annual Inernational Conference of EMB Society of IEEE. New Jersey USA: IEEE USA, 2002, s. 1094 - 1 096, ISBN 0-7803-7612-9
- ŠIMURDA, J., CHRISTÉ, G. *Effect of series resistance, seal resistance and leak resistance on membrane current-voltage relations measured in whole cell patch clamp arrangement* In Analysis of Biomedical Signals and Images. 16-th Biennial International Eurasip Conference Biosignal 2002. Brno: Vutium Press, 2002, s. 389 - 391, ISBN 80-214-2120-7
- ZÁVIŠEK, M., HOLOUBKOVÁ, Z., DRASTICH, A., DUB, P. *Breast Cancer Diagnostics Using Infracamera* In Proceeding of 16th international EURASIP conference BIOSIGNAL 2002. 16th International EURASIP Conference BIOSIGNAL 2002. Brno: Vysoké učení technické v Brně, 2002, s. 310 - 312, ISBN 80-214-2120-7
- ZÁVODNÁ, E., HONZÍKOVÁ, N., NOVÁKOVÁ, Z., HRSTKOVÁ, H. *Relationship between variability in blood pressure and pulse intervals in borderline hypertensive children* In 11. Tagung mitteleuropaeischer Laender "Paediatrische Forschung". Budapest 2002, s. 19

VI.4 Textbooks, Lecture Notes

- KUZUMPLÍK, J., KOLÁŘ, R., JAN, J.: *Číslicové zpracování signálů v Matlabu (Digital Signal Processing in Matlab)*. Second edition, Brno Univ. of Technology 2002, ISBN 80-214-1964-4
- HONZÍKOVÁ, N.: *Biologie člověka (Biology of Man)*. Electronic Textbook for the Bc Study, Brno Univ. of Technology 2002.

- PROVAZNÍK, I.: *Počítače a programování 1 (Computers and Programming 1)*. Electronic Textbook for Bc Study, Brno Univ. of Technology 2002.
- ROZMAN, J., CHMELAŘ, M., JEHLIČKA, K.: *Terapeutická a protetická technika (Therapeutic and Prosthetic Technology*. Electronic Textbook for Bc Study, Brno Univ. of Technology 2002.

VI.5 PhD and Habilitation Theses

- PROVAZNÍK I.: Wavelet Analysis for Signal Detection - Applications to Experimental Cardiology Research. Habilitation thesis, Brno TU, 2002.
- KOLÁŘ R.: Methods for Ultrasound Preprocessing of Ultrasound Tomograms. FEEC BUT, PhD Thesis, 29 October 2002, (academic advisor: Jiří KOZUMPLÍK)

VI.6 Research and Technical Reports

- DUB, P., DRASTICH, A. Diagnostika zánětlivých procesů analýzou povrchového teplotního reliéfu (Inflammation diagnostics using thermal pattern analysis). 2002.
- HOLČÍK, J., HANÁK, J., VÁCLAVÍK, V., HRUBÝ, R., SEDLINSKÁ, M., JAHN, P. Ortogonalizace elektrokardiogramu velkých zvířat (Orthogonal Transforms of ECG Signals in Large Animals). 2002.
- SVAČINA, J., HANUS, S., VRBA, K., JAN, J. Research of Electronic Communication Systems and Technologies. 2002. Výzkumná zpráva výzkumného záměru MŠMT v Praze č. MSM 262200011.

VII OTHER ACTIVITIES

- organisation of a regular biennial international conference BIOSIGNAL devoted to problems of acquisition, processing and analysis of biomedical signals and images and to problems of medical informatics. The conference that has become a recognised forum in the field and regularly attended by about 130 - 150 international participants is sponsored by international scientific organizations EURASIP and IEEE EMBS. Besides the basec scientific program, a session is held on Biomedical and Ecological Engineering tuition schemes. Members of organizing committee: Ivo Provazník (chairman), Jiří Jan (conference chairman), Jiří Kozumplík, Zoltán Szabó, Petr Fedra.
- Participation on organisation of a regular circulating international conference SYMBIOSIS, arranged by co-operating biomedical engineering institutions alternately in St. Petersburg in Russia, Gliwice in Poland and in Brno. Member of organizing committee: Jiří Holčík.
- Co-organisation together with the Faculty of Pharmacy of the University of Veterinary Sciences and Pharmacy and the Medical Faculty of the Masaryk University in Brno symposium MEDIFORUM adjoining the Congress MEFA. Members of organizing committee: Milan Chmelař (chairman), Ivo Provazník.
- Participation in activities of the Consortium for Biomedical Engineering of the BUT, Jiří Holčík (chairman), Jiří Jan, Jiří Rozman (members).
- Providing a shelter for the inter-departmental Institute for Signal and Image Processing, the purpose of which is to provide information channels among colleagues working in this area in different departments of the Faculty. Also, it declares the interest of the Faculty in this field to the outside world and participates at the international scientific activities concerning signal and image processing.
- Membership in editorial boards of journals (IEEE - Transaction on Biomedical Engineering, Journal of Applied Signal Processing - EURASIP, Radioengineering, Czech Biomedical Engineering - Lékař a technika).
- Elected membership in the Engineering Academy of the Czech Republic
- Memberships in scientific boards of the Faculty of Electrical Engineering, Faculty of Medicine, Masaryk University Brno, and of the Institute of Scientific Instruments of the Czech Academy of Sciences,
- Memberships in the international boards of recognised conferences
  - BIOSIGNAL 2002, Jiří Jan (chairman), Ivo Provazník
  - EMBEC '02, Jiří Holčík
  - MEDINFORM '03, Ivo Provazník
- Memberships in the steering committee of the Society for Biomedical Engineering and Medical Informatics of the Association of Medical Societies J.E.Purkyně, Jiří Jan, Jiří Holčík, Milan Chmelař.
- Memberships in international scientific societies (IFMBE, EURASIP, IEC TC18 WG14).
- The Department also covers the courses on environmental engineering offered by the Faculty.

DEPARTMENT OF ELECTRICAL POWER ENGINEERING

Head of Department: Doc. Ing. Antonín Matoušek, CSc.

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I. STAFF

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Doc. Ing. Evžen Haluzík, CSc., Doc. Ing. Jiří Plch, CSc., Doc. Ing. Jiří Raček, CSc.

Lecturers:

Ing. Petr Baxant, Ph.D., Ing. Vladimír Blažek, CSc., Ing. Michal Chmela, Ing. Milan Ondrášek, CSc., Ing. Jaroslava Orságová, Ing. Petr Toman, Ph.D. (since 1.10.2002)

Research Staff:

Doc. RNDr. Oldřich Coufal, CSc., Ing. Jan Gregor, CSc., Ing. Josef Šenk, CSc.

Technical Staff:

Ing. Ilona Lázničková, Ing. Miroslav Velísek, CSc., Ing. Petr Toman (to 30.9.2002), František Matoušek

Postgraduate Students:

Ing. Michal Bernard, Ing. Ivo Běhunek, Ing. Petr Čambala, Ing. Marek Daniel, Ing. Jiří Drápela, Ing. Eva Kadlecová, Ing. Rostislav Kaleta, Ing. Petr Mastný, Ing. Tomáš Mendl, Ing. Petr Skala, Ing. Jan Uher, Ing. Libor Weidinger

Administrative Staff:

Helena Karásková

II. FACILITIES

II.1 Teaching and Research Laboratories

- Power Plant Laboratory
- Light Laboratory
- Heating and Regulation Laboratory
- Protective Devices Laboratory
- Transmission and Distribution of Electric Power Laboratory
- Plasma Technology Research Laboratory with arc heater, controlled semiconductor rectifier (100 kW) , gas accessories and data acquisition system
- Laboratory of Solar Energy Utilization and Unconventional Energy Conversion
- Spectroscopy Laboratory

II.2 Special Instrumentation and Computers

- Harmonic analysis of electrical networks: BK 550 (power harmonics analyzer), PC Pentium 90, digital oscilloscope HungChang 3850
- METREL MI 2092 Power Harmonics Analyzer: economical tool designed for the power to find and resolve quality and energy management, current probes Chavin Arnoux D38N 9 kApk. max. 30-100 kHz and E3N 100 Arms 0-100 kHz
- Protections box ABB: REM 543 A 212 AAA (motor), REJ 525 (over-current), workstation 2*PIII
- Chroma-meter: measurement of colour coordinates and chromatic temperature
- Hagner meter: measurement of brightness and illumination
- Data projector UP 800
- Digital Oscilloscope Gould - 4 channels, 20 MHz
- Digital Oscilloscope Gould - 2 channels, 100 MHz
- Spectrograph ISP-51 three-prisms, glass, with UF –89 photo camera
- Spectrograph Q24 Zeiss Jena, Micro-photometer Zeiss Jena
- Tester of Protective Devices TZ03

III. TEACHING

III.2 Master's Programme (Ing)

Mechanics	Y1 L2, winter	4/2	Raček
Transmission and Distribution of Electrical Power I	Y1 L2, winter	3/2	Blažek
High Voltage Technology	Y1 L2, winter	3/2	Blažek
Linear Circuit Application	Y1 L2, winter	2/2	Haluzík
Transmission and Distribution of Electrical Power II	Y1 L2, summer	3/2	Haluzík
Mechanical Equipment of Power Plants	Y1 L2, summer	3/2	Raček
Interference in Power Engineering	Y1 L2, summer	2/3	Holoubek
Power Plants I	Y2 L2, winter	3/2	Matoušek
Electrical Heat and Light	Y2 L2, winter	3/2	Plch
Designing in Power Engineering I	Y2 L2, winter	2/2	Baxant
Non-conventional Conversions of Energy	Y2 L2, winter	3/2	Matoušek
Project I	Y2 L2, summer	0/5	
Power Plants II	Y2 L2, summer	3/3	Ondrášek
Lighting Technology	Y2 L2, summer	3/2	Plch
Nuclear Power Plants	Y2 L2, summer	3/2	Raček
Protections and Automatics	Y2 L2, summer	3/2	Haluzík
Project II	Y3 L2, winter	0/5	
Illuminating Systems	Y3 L2, winter	3/2	Plch
Network Operational Control	Y3 L2, winter	3/3	Haluzík
Power Networks	Y3 L2, winter	3/3	Orságová
Power Plant Automation	Y3 L2, winter	3/3	Ondrášek
Diploma Project	Y3 L2, summer	0/0	
Power Engineering in Environment	Y3 L2, summer	3/2	Matoušek
Economy of Power Engineering	Y3 L2, summer	2/3	Chmela
Nuclear Power Plants Control	Y3 L2, summer	3/2	Ondrášek
Designing in Power Engineering II	Y3 L2, summer	3/2	Holoubek

III.3 Doctoral Programme (PhD)

Ecology in Power Engineering	winter	42/0	Raček
Computer Modelling of Power Systems	winter	42/0	Haluzík
State Estimation of Power System Security	winter	38/0	Haluzík
Light and Lighting Application	winter	42/0	Plch
Low-temperature Plasma in Electrotechnics	winter	42/0	Coufal, Šenk, Gregor
Electrodynamics of High-temperature Processes	winter	42/0	Šenk
Specific Problems of Power Plants	summer	42/0	Matoušek
Power Plants Control	summer	42/0	Matoušek
Game Theory Application in Power Engineering	summer	42/0	Blažek
Methods of Experimental Investigation of Electrodynamics Processes in Plasma Devices	summer	18/24	Gregor
Exploitation of Solar Energy	summer	42/0	Gregor
Thermodynamics of the Electric Arc Plasma	summer	33/9	Coufal

III.4 Studies in English Language (International students)

Electrical Power Transmission and Distribution I	Y1 L2, winter	3/0	Chmela
Applied Computers I	Y1 L2, winter	3/0	Chmela
Electrical Power Plants I	Y1 L2, winter	3/0	Chmela
High Voltage Technology	Y1 L2, winter	3/0	Javora

Applied Computers II	Y1 L2, summer		Chmela
Electrical Power Transmission and Distribution II	Y1 L2, summer	3/0	Chmela
Electrical Heat and Light	Y1 L2, summer	3/0	Baxant
Electrical Power Plants II	Y1 L2, summer	3/0	Chmela
Transient Phenomena in Power Engineering	Y1 L2, summer	3/0	Haluzík
Protections and Automatics	Y2 L2, summer	3/0	Haluzík
Economy of Power Engineering I	Y3 L2, winter	3/0	Chmela
Network Operational Control	Y3 L2, winter	3/0	Haluzík
Economy of Power Engineering II	Y3 L2, summer	3/0	Chmela
Unconventional Energy Conversion	Y3 L2, summer	3/0	Šenk

IV. RESEARCH PROJECTS

Equilibrium and Kinetics in the Switching Arc. (Grant Agency of the Czech Republic)
  Grant project GAČR No. 102/02/1414, principal investigator: Oldřich Coufal
Digital Photography in a New Valuation of Lighting Systems (Grant Agency of the Czech Republic)
  Grant project GAČR 102/01/D005, principal investigator: Petr Baxant
Participation in the Faculty Research Intentions
  Research programme No. MSM 262200010, principal investigator: Jiří Kazelle, participants: Oldřich Coufal, Jan
  Gregor, I. Jakubová, Ilona Lázničková, Antonín Matoušek, František Matoušek, Josef Šenk
New principles of Earth Faults Location in MV Electrical Networks (Grant Agency of the Academy of Science of the Czech Republic)
  Grant project GAAV No. B28 133 04, principal investigator: Petr Toman
Operation Practice of Bc Level Students
  Grant project FRVŠ No. 161/2002, principal investigator: Jiří Raček
Utilization Stirling's thermodynamic cycle in heat accumulation systems
  Grant project FRVŠ No. 1850/2002, principal investigator: Petr Mastný

V. COOPERATIONS

V.1 Cooperation in the Czech Republic

- ABB, s.r.o., Brno
- Beghelli - Elplast a. s., Brno
- ČEPS, a. s., PsPS Morava-Jih
- Czech Committee CIRED, Praha
- DEOS, s. r. o. Zlín
- DL – Systém, Buchlovice
- DNA Central Europe s. r. o., Nehvizdy
- EGU Energetický Ústav Brno, a. s.
- Elektro Engineering EZO, s. r. o., Brno
- Elektroprof s. r. o., Tábor
- EPI, s. r. o. Rožnov
- GE – Lighting ČR
- Institute of Electrical Engineering of the Academy of Sciences of the Czech Republic, Prague
- Institute of Plasma Physics of the Academy of Sciences of the Czech Republic, Prague
- Jihomoravská energetika, a. s., Brno
- MSE - Moravský svaz elektrotechniků, Brno
- National Committee CIE, Praha
- OLLI– Elektro, s. r. o. Brno
- Schneider-Electric cz
- Solartech s.r.o., Rožnov pod Radhoštěm
- SRVO - Praha
- Teplárny Brno a. s., Brno

V.2 International Cooperation

- TU Košice - FEECS, Slovak Republic
- Politechnika Warszawska, Instytut wielkich mocy i vysokich napiec, ul. Koszykowa, Warszawa, Poland
- Politechnika Poznańska, Instytut elektroenergetiky, Poznań., Poland
- Politechnika Lódzka, Instytut aparatov elektrycznych, ul. Stefanowskiego 18/22, Lódź, Poland
- NICTIV, High Energy Density Research Center, Izhorskaya 13/19 , Moscow, Russia
- Institute of Molecular and Atomic Physics, AS of Belarus, pr. F. Skariny 70, Minsk, Belarus
- Universitet Tarasa Ševčenko, fakultet radiofyzičeskij, Volodymyrska 64, Kiev-33,01033 Ukraine

V.2.1 Visits of Staff Members to Foreign Institutions

- Michal Chmela, TU Košice, Slovak Republic, 5 days

V.3 Contracts

- Jiří Plch, Measurement of Luminary - Technical Parameters, Beghelli-Elplast Brno
- Josef Šenk, Prof Jozef Lorenc IEPP contract between IE PP Poznaň and the Faculty of Electrical Engineering and Computer Science of the Brno University of Technology (research of thermal plasma generators and switching arc), Poznaň, Poland
- Josef Šenk, Dr. V. Molotko, CSc. NICTIV-HEDRC Electro-physical and Thermo-physical Processes in Low-temperature Plasma, Moscow, Russia

V.4 Membership in International Organizations and Societies

- Antonín Matoušek, member of Czech Committee CIGRE - ČK CIRED
- Jiří Plch, member of International Commission on Illumination NK CIE
- Ing. Michal Chmela, member of IEEE Power Engineering Society
- Petr Skala, student member of IEEE Pwer Engineering Society
- Eva Kadlecová, student member of IEEE Power Electronic Society
- Michal Bernard, student member of IEEE Electromagnetic Compatibility Society

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- BARTLOVÁ, M., COUFAL, O. Comparison of some models of reaction kinetics in HV circuit breakers with SF6 after current zero. *Journal of Physics D*: Applied Physics, ISSN 0021-8980, 2002, Vol. 35, n. 11, p. 3065 - 3 075.
- GREGOR, J., JAKUBOVÁ, I., MENDL, T., ŠENK, J., KOPECKÝ, V. Method of Correction of Measured Temperature and Velocity Field in Free Hot Gas Jet. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. suppl. D, p. 601 - 606.
- GREGOR, J., JAKUBOVÁ, I., MENDL, T., ŠENK, J., KOPECKÝ, V. Thermocouple Based Method of Temperature and Velocity Field Mapping. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. suppl. D, p. 596 - 600.
- GREGOR, J., JAKUBOVÁ, I., ŠENK, J., HRABOVSKÝ, M., KOLMAN, B., KONRÁD, M., KOPECKÝ, V., VORLÍČEK, V., POKORNÝ, J. Deposition of Diamond Films in Arc Plasma Jet at Atmospheric Pressure. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. suppl. D, p. 878 – 885.
- HEINZ, J., ŠENK, J., HRABOVSKÝ, M. Processes of Energy Exchange between Blasted Electric Arc and Surrounding Gas in Arc Heater Channel. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. suppl. D, p. 583 - 588.
- LÁZNIČKOVÁ, I. The temperature dependence of the electrical conductivity of the gas system. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. 6, p. 632 - 636.

VI.2 Conferences

- BARTLOVÁ, M., COUFAL, O. *An Improved Model of Chemical Kinetics in SF6-Arc Plasma* In Proceedings of the XIV International Conference on Gas Discharges and their Applications. XIV International Conference on Gas Discharges and their Applications. Liverpool: University of Liverpool, 2002, p. 51 - 54, ISBN 0-9539105-1-2

- BAXANT, P. *Vlastnosti digitální fotografie využitelné ve fotometrii (Digital photography properties exploitable in photometry)* In 5. mezinárodní konference SVĚTLO 2002. Brno: Česká společnost pro osvětlování, 2002, p. 14 - 19, ISBN 80-238-8928-1
- BERNARD, M., PLCH, J. *Influences of the illumination on the man* In Proceedings of 8th conference STUDENT EEICT 2002 Volume 2. Student EEICT 2002. Ondráčkova 105, Brno: VUT FEKT, FIT Brno, 2002, p. 142 - 145, ISBN 80-214-2115-0
- ČAMBALA, P. *Optimal working conditions of photovoltaic generators* In Student EEICT 2002. Brno: VUT Brno, 2002, p. 146 - 150, ISBN 80-214-2115-0
- GREGOR, J., JAKUBOVÁ, I., KOPECKÝ, V., MENDL, T., ŠENK, J. *Investigation of the Temperature Field in the Free Jet of Hot Gas Mixture* In E-MRS IUMRS ICEM2002 Book of Abstracts. E-MRS Spring Meeting - TPP 7 Thermal Plasma Processes. Strasbourg, France: European Materials Research Society, 2002, p. G21 - 0, G/P1308
- HEINZ, J., ŠENK, J., HRABOVSKÝ, M. *Method of Calculation of Temperature and Velocity Field and Energy Flows in Blasted Electric Arc and Surroundings Medium* In E-MRS Spring Meeting 2002: Symposium G: TPP7 Thermal Plasma Processes. E-MRS Spring Meeting - TPP 7 Thermal Plasma Processes. Strasbourg, France: European Materials Research Society, 2002, p. G21 - 0
- HRABOVSKÝ, M., KONRÁD, M., KOPECKÝ, V., SEMBER, V., KAVKA, T., GREGOR, J. *Investigation of Thermal Plasma Jet Generated in Hybrid Water-Argon Torch* In EMRS Spring Meeting - TPP7 Thermal Plasma Processes. E-MRS Spring Meeting - TPP 7 Thermal Plasma Processes. Strasbourg, France: European Materials Research Society, 2002, p. G21 - 0
- KADLECOVÁ, E., PLCH, J. *Optimizing distribution flow of light from aspect of hold on the man* In Proceedings of 8th Conference STUDENT EEICT 2002 Volume 2. Student EEICT 2002. Brno: VUT FEKT Brno, 2002, p. 151 - 155, ISBN 80-214-2115-0
- KALETA, R., GREGOR, J., ČAMBALA, P., MASTNÝ, P. *Možnosti Stirlingova solárního motoru (Potential of the Stirling solar's motor)* In Mezinárodní vědecké konference Elektroenergetika 2002. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: VŠB Ostrava, 2002, p. 46 - 51, ISBN 80-248-0060-2
- LÁZNIČKOVÁ, I. *The Calculation of the Electrical Conductivity of a Gas System* In Proceedings of 8th Conference STUDENT EEICT 2002. Student EEICT 2002. Brno: VUT FEKT Brno, 2002, p. 156 - 159, ISBN 80-214-2115-0
- LÁZNIČKOVÁ, I. *Výpočet konduktivity plynného systému (Calculation of conductivity of gas system)* In Mezinárodní vědecká konference ELEKTROENERGETIKA 2002. Sborník konference.. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: VŠB-TU Ostrava, 2002, p. 317 - 320, ISBN 80-248-0060-2
- MASTNÝ, P., GREGOR, J., KALETA, R., ČAMBALA, P. *Možnosti využití solárních systémů s tepelnými čerpadly (Potential utilize solar systems with heat pumps)* In Mezinárodní vědecká konference Elektroenergetika 2002. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: VŠB Ostrava, 2002, p. 63 - 67, ISBN 80-248-0060-2
- MASTNÝ, P., KALETA, R. *Utilize of lowpotencial heat by means of the Stirling heat pump* In Proceedings of 8th Conference STUDENT EEICT 2002. ELECTRICAL ENGINEERING, INFORMATION AND COMMUNICATION TECHNOLOGIES 2002. VUT FEKT Brno: FEKT VUT Brno, 2002, p. 160 - 164, ISBN 80-214-2115-0
- MENDL, T., ŠENK, J., JAKUBOVÁ, I. *Možnosti zpřesnění korekce teplotních profilů měřených termočlánkem (Possibilities of More Precise Correction of Temperature Profiles Measured by Thermocouple)* In Mezinárodní vědecká konference Elektroenergetika 2002. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: Katedra elektroenergetiky, fakulta elektrotechniky a informatiky, VŠB - TU Ostrava, 2002, p. 68 - 72, ISBN 80-248-0060-2
- ORSÁGOVÁ, J., HALUZÍK, E. *Ochrana při ztrátě buzení synchronního generátoru (Protection for exitation loosing of synchronous generator)* In Mezinárodní vědecká konference Elektroenergetika 2002. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: VŠB - TU Ostrava, 2002, p. 173 - 177, ISBN 80-248-0060-2
- RAČEK, J. *Termoemisní přeměna energie (Conversion by means of thermoemissions)* In Mezinárodní vědecká konference Elektroenergetika 2002. Mezinárodní vědecká konference Elektroenergetika 2002. Ostrava: VŠB TU Ostrava, 2002, p. 178 - 183, ISBN 80-248-0060-2
- TOMAN, P., HALUZÍK, E. *Lokalizace zemního spojení ve zkruhované síti vn (Location of Earth Fault in Circle Network)* In Mezinárodní vědecká konference ELEKTROENERGETIKA 2002. Mezinárodní vědecká konference ELEKTROENERGETIKA 2002. Ostrava: VŠB-Technická univerzita Ostrava, 2002, p. 110 - 114, ISBN 80-248-0060-2

Faculty of Electrical Engineering and Communication, BUT

DEPARTMENT OF ELECTROTECHNOLOGY

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Lecturers:

Ing. Petr Bača, Ph.D., Ing. Svatopluk Havlíček, CSc., Ing. Petr Křivák, Ph.D., Ing. Mgr. Jiří Maxa,
Ing. Tamara Mazlová, Ing. Helena Polsterová, CSc., Ing. Zdenka Rozsívalová,
Ing. Marie Sedlaříková, CSc., Ing. Jiří Špinka

Technical Staff:

Jarmila Bartošková, Ing. Zdeněk Buřival, CSc., Jaroslava Hlavsová, Ing. Petr Kahle, František Kořínek,
Rudolf Krásenský, Ing. Vítězslav Novák, Ph.D., Ing. Jiří Starý, Ing. Jiří Vaněk

Postgraduate Students:

Ing. Roman Černý, Ing. Radek Drnovský, Ing. Martin Frk, Ing. Miroslav Haman, Ing. Vítězslav Hekerle,
Ing. Petr Hrnčiřík, Ing. Karel Hruška, Ing. Roman Kameník, Ing. Pavel Nečesal, Ing. Vilém Neděla,
Ing. Vladimír Přichystal, Ing. Jan Rychnovský, Ing. Luděk Schneider, Ing. Jaroslav Skřivánek,
Ing. Karel Smékal, Ing. Petr Wandrol

Administrative Staff:

Dagmar Prosová

II. FACILITIES

II.1 Teaching and Research Laboratories

- CAD Laboratories (2)
- Computer Systems Laboratory
- Joint Workplace of Surface Mounting Technology (with UMEL)
- Laboratories of Dielectric Materials (2)
- Laboratory of Electron Microscopy
- Laboratory of Chemical Power Sources
- Laboratory of Materials for Electrical Engineering
- Laboratory for the Measurement of Dielectric Properties under Highly Stabilized Conditions
- Laboratory for Research of Photovoltaic Cell - Battery Systems
- Laboratory for Research of Properties of Batteries for Electric Vehicles
- Laboratory of Semiconductor Materials
- Laboratory of System Design and Surface Mounting Technology

II.2 Special Instrumentation and Computers

- Computer Controlled Drilling and Routing Machine Bungard CCD SW
- Coulometric Apparatus for Measuring of Water Volume in Waterless Electrolytes
- Data Acquitision Switch Unit S3448B with Accessories and VEE Pro 6.0 Windows
- Data and Video Projector Philips Hopper XG20 Impact
- Electric Vehicle for the Research of Batteries for Electric Vehicles (3)
- Electrometers Keithley 610 C, 640 and 617 (Currents down to 30 fA)
- Chromatograph Chrom 5
- Picoampermeter Keithley 485 (3)

- Polystat O1 (Electrostatic Properties of Insulators)
- Potentiostat (2) μAUTOLAB and PGSTAT 12
- Precision LRC Meter HP 4284A with Accessories
- Programmed Charger CONDATA – PNC Including SW
- RLCG-meter and Q-meter Hewlett Packard (Complex Permittivity in the Frequency Range 20 Hz – 300 MHz)
- Scanning Electron Microscope Arranged for Operation under Environmental Conditions
- Schering Bridge Tettex 2801 and 2821 with Additional Equipment (Capacitance and Loss Angles at HV, at Currents up to 20 A and at Temperatures up to 150 °C)
- Vacuum Evaporating Unit Jeol

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Climatotechnology	Y3 summer	3/2	Karel Liedermann
Electronic Measuring Technique	Y3 summer	3/2	Svatopluk Havlíček
Electrotechnical Technology	Y2 summer	3/2	Jiří Kazelle
Materials and Technical Documentation	Y1 winter	2/3	Josef Jirák
Nonconventional Sources of Electrical Energy	Y3 summer	3/2	Milan Calábek
Technological Design	Y3 summer	3/2	Jiří Špinka

III.2 Master´s Programme (Ing)

Advanced Modelling	summer	0/3	Jiří Maxa
Basic 3D Modelling	winter	0/3	Jiří Maxa
CAD 1	winter	0/3	Pavel Procházka
CAD 1	summer	0/3	Tamara Mazlová
CAD 2	summer	0/3	Jiří Maxa
CADDS5 – Manufacturing	winter	0/3	Jiří Maxa
Climatotechnology	Y3 L2 summer	3/2	Karel Liedermann
Computer Aided Scheme Systems	summer	0/2	Vítězslav Novák
Design of Production Systems and Logistic	Y3 L2 winter	2/2	Jiří Špinka
Design View	winter	0/3	Jana Doňarová
Diagnostics and Testing in Electrical Engineering	Y3 L2 winter	2/3	Josef Jirák
Ecology in Manufacturing	Y3 L2 winter	4/1	Miroslav Cenek
Electrotechnical Materials	Y1 L2 winter	3/2	Karel Liedermann
Fundamentals of Reliability in Electrical Engineering	Y2 L2 winter	3/2	Helena Polsterová
Graphic Systems 1	summer	0/2	Tamara Mazlová
Graphic Systems 2	summer	1/2	Pavel Procházka
Manufacturing of Electronic Systems	Y2 L2 summer	3/3	Svatopluk Havlíček
Manufacturing of Power Devices	Y2 L2 winter	3/2	František Veselka, UVEE
Materials in Electrical Engineering	Y2 L1 summer	2/2	Karel Liedermann
Printed Circuits and Surface Mount Technology	Y2 L2 summer	2/3	Jiří Starý
Production Processes	Y1 L2 summer	4/3	Jiří Kazelle
Reliability of Power Devices and Systems	Y2 L2 summer	3/2	Helena Polsterová
Special Materials	Y1 L2 summer	3/1	Karel Liedermann
Technical Documentation and CAD	Y1 L1 winter	2/3	Pavel Procházka

III.3 Doctoral Programme (PhD)

Accumulators and Protection of Environment	summer	36/30	Miroslav Cenek
Diagnostics of Semiconductor Materials and Structures	winter	42/8	Josef Jirák
Electron Spectroscopy	winter	30/11	Luděk Frank, ext.
Electrochemical Power Sources in Electrotechnical Practice	winter	42/24	Milan Calábek

| Methods of Measuring in Electrochemical Power Sources | winter | 40/30 | Jiří Vondrák, ext. |
| Optoelectronics - Materials and Technology | summer | 42/8 | Rudolf Autrata |

III.4 Study in English Language (International students)

Materials in Electrical Engineering	Y2 L1 summer	2/2	Josef Jirák
Technical Documentation and CAD	Y1 L1 winter	2/3	Tamara Mazlová
Materials and Technical Documentation	Y1 winter	2/3	Josef Jirák Tamara Mazlová

IV. RESEARCH PROJECTS

A Fundamental Study of the Effects of the Compression on the Performance of Active Mass in AGM Batteries

Grant project ILZRO/ALABC No. B-001.1, Research Triangle Park, NC, USA, principal investigator: Milan Calábek

Direct Charging of Electric Vehicles from Hydro-Electric Power Plants Using Fast Charging Equipment

International Austrian – Czech grant project ECOTRANS E!2521 solved in Framework of the EU Program EUREKA. Project Leader in the Czech Republic: Miroslav Cenek

Research of Bus and its Components for City Transport

Grant project MPO No. FD-K/111, principal investigator: Ing. J. Novák, ČAS-SERVICE Znojmo, co-investigator: Miroslav Cenek

Consortium for Research, Development and Production of High Current and Low Voltage Modular Sources with Possibility of Series and Parallel Connection

Grant project MPO No. FD-K/063, principal investigator: Ing. B. Kotek, Eprona, Rokytnice nad Jizerou, Project Co-Leader: Jiří Kazelle

Research of Electric Power Sources, of Energy Accumulation and of Optimisation of Energy Consumption in Ecological Applications

Research programme No. MSM262200010, principal investigator: Jiří Kazelle

Study of Active Materials and Contact Layers in Electrodes of Lead-Acid Batteries in situ

Grant project GAČR No. 102/02/0794, principal investigator: Milan Calábek

Study of Detection Methods in Boundary Conditions of Environmental Scanning Electron Microscopy

Grant project GAČR No. 102/01/1271, principal investigator: Rudolf Autrata, co-investigator: Josef Jirák

Transport, Solvatation, Sorption of Ions of Gel Polymer Electrolytes

Grant project GAČR No. 104/02/0731/A, principal investigator: Doc. Ing. J. Vondrák, DrSc. (UACH, Czech Academy of Science, Řež by Prague), co-investigator: Marie Sedlaříková

Preparation and Properties of Aprotic Gel Polymer Electrolytes

Grant project GA AV ČR No. A4032002/171/00, principal investigator: Doc. Ing. J. Vondrák, DrSc. (UACH, Czech Academy of Science, Řež by Prague), co-investigator: Marie Sedlaříková

Scanning Electron Microscopy for Research of Wet Material Structures

Grant project GA AV ČR No. S 2065107 – Program of Goal-Directed Research and Development Assistance, principal investigator: Rudolf Autrata

Optimised Traction System of Electric Vehicle

Grant project of State Foundation of Environment solved in Framework of the Contract No. 03419623, principal investigator: Miroslav Cenek

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- ABB - EJF Co. Brno
- Administration of Czech Centres of Czech Ministry of Foreign Affairs
- AIR Products Děčín
- AKUMA Battery (Fiam) Co. Mladá Boleslav
- Association for Innovation Business, Czech Republic
- Astris Ltd. Benešov
- AUDY Ltd. Brno

- AutoDESK Ltd. Prague
- Automotive Industry Association, Praha
- AŽD Ltd. Praha, Manufactory Brno
- BELCANTO Prague
- BIC Ltd. Brno
- Bochemie Ltd. Bohumín
- Brno Communications Co. Brno
- Buse - Special Purpose Electronics Ltd. Blansko
- BVV Co. Brno
- Cink Co. Karlovy Vary
- Condata Ltd. Olomouc
- Crytur Ltd. Turnov
- Czech Association for Renewable Energy, Brno
- Czech Center for Cleaner Manufacturing, Prague
- Czech Energy Agency
- ČAS-Service Co. Znojmo
- ČEMEBO Ltd. Blansko
- Department of Environmental Issues, FS ČVUT Prague
- EDF Prague
- EKOSOLARIS, Kroměříž
- ELIS Ltd. Plzeň
- EPCOS Šumperk
- Eprona Co. Rokytnice nad Jizerou
- Faculty of Mechanical Engineering BUT Brno (Institue of Design)
- FEI Ltd. Brno
- HONORIS, Prague
- Institute of Basics of Chemical Processes AV ČR Prague
- Institute for the Transport Vehicles Research / TŰV Bayern Ltd. Prague
- Institute for the Additional Education in Health Service Workers Brno
- Inter Informatics Ltd. Prague
- KnapCar Ltd. Olomouc
- LF MU Brno
- Magnety Ltd. Světlá Hora
- MEGA Co. Stráž pod Ralskem
- Military Academy, Brno
- Military Protection Institute, Brno
- MTX RS Ltd. Prague
- OLLI Electro Ltd. Brno
- Omnis Expo Ltd. Olomouc
- Polymer Institute Ltd. Brno
- Preciosa Co. Jablonec nad Nisou
- REDI Ltd. Karlovy Vary
- ROTOKOV Ltd. Křídlůvky by Znojmo
- Saft - Ferak Co. Raškovice
- SCANIA Czech Republic Ltd. Rudná u Prahy
- SOKOLOVSKÁ UHELNÁ Co. Sokolov
- Solartec Ltd. Rožnov pod Radhoštěm
- SOLIDVISION Ltd. Brno
- State Environmental Fund of Czech Republic
- Škoda Co. Plzeň
- TAAWIN Ltd. Brno
- TECHNODAT, informační systémy Co. Brno
- Technological Centre AV ČR

- Technoplast Co. Chropyně
- TES Co.Třebíč
- Tescan Ltd. Brno
- TG Numic Co. Brno
- Town Council of Karlovy Vary
- TU of Liberec
- TYCO ELECTRONICS CZECH Kuřim
- UACH AV ČR Řež by Prague
- UFCH AV ČR J. Heyrovského Prague
- UMCH AV ČR Prague
- UPT AV ČR Brno
- VADO plus Co. Sokolov
- VARTA Co. Česká Lípa
- VUES Co. Brno
- ŽS Co. Brno (Railway Buildings)

V.2 International Cooperation

- AMER-SIL, Luxemburg
- ASTRIS ENERGY, Mississauga, Ontario, Canada
- Central Laboratory of Electrochemical Power Sources BAV Sofia, Bulgaria
- CSIRO Energy Technology, Clayton, South Victoria, Australia
- Daramic Inc. Nordersted, Germany
- Dept. of Cell Biology and Neuroanatomy, University of Minnesota, Minneapolis, USA
- ECO CHEMIE, Utrecht, Netherlands
- Griesműhle Kleinkraftwerk GmbH, Ottensheim, Austria
- Chemical Institute, Technical University, Ljubljana, Slovenia
- Institut für Energieverfahrenstechnik, Forschungszentrum Jülich, Germany
- Institut für chemische Technologie anorganischer Stoffe, TU Graz, Austria
- Industrial Systems Engineering School, La Rochelle, France
- Institut Technologii Elektronowej, Politechnika Wroclaw, Poland
- Laboratory for EMI, Institute of Cell Biology, ETH Zentrum, Zürich, Switzerland
- Lead Zinc Research Organisation - THE ALABC, Triangle Park, NC, USA
- Lund University, Lund, Sweden
- Nagoya University, Faculty of Engineering, Dept. of Electronics, Furo-cho, Chikusa-ku, Nagoya, Japan
- NANOLYTICS, Bad Műhllacken , Feldkirchen, Austria
- Norvik Technologies Inc., Mississauga, Ontario, Canada
- Santa Barbara Electric Transportation Institute, Santa Barbara, California, USA
- Slovak Technical University, Bratislava, Slovak Republic
- SUNRIDE Engineering, Lund, Sweden
- Technical University of Košice, Faculty of Manufacturing Technologies of Prešov, Slovak Republic
- Universität Greifswald, Germany
- VARTA Forschungs - und Entwicklungszentrum, Kelkheim, Germany
- ZSW, Ulm, Germany

V.2.1 Visitors to the Department

- Harry Döring, ZSW, Ulm, Germany, 3 days
- Jűrgen Garche, ZSW, Ulm, Germany, 3 days
- A. Azens, Angstrom Laboratory, University of Uppsala, Sweden, 1 day
- Boris Orel, Institute of Chemistry, University of Ljubljana, Slovenia, 1 day
- K. C. Möller, Institute for Technology of Inorganic Materials, Graz University of Technology, Austria, 1 day

V.2.2 Visitors of Staff Members to Foreign Institutions

- Milan Calábek, ZSW, Ulm, Germany, 3 days
- Jiří Kazelle, Institut für Energieverfahrenstechnik, Forschungszentrum Jülich, Germany, 1 day
- Jiří Kazelle, Polytechnical Institute of Iževsk, Iževsk, Russia, 4 days
- Jiří Kazelle, Fachhochschule Darmstadt, Darmstadt, Germany, 1 day
- Jiří Kazelle, Fachhochschule Wiesbaden, Wiesbaden, Germany, 2 days
- Jiří Kazelle, ESIEE Amiens, Amiens, France, 2 days
- Jiří Kazelle, ESIEE Noisy le Grande, Paris, France, 2 days
- Jiří Kazelle, University of Joseph Fouriere, Grenoble, France, 4 days
- Jiří Kazelle, INSA Lyon, Lyon, France, 1 day
- Marie Sedlaříková, National Renewable Energy Laboratory, Denwer, Colorado, USA, 1 day

V.3 Contracts

- Rudolf Autrata: Study of Biological and Soft Tissues by Means of Environmental Scanning Electron Microscopy, Institute of Histology and Embryology, Faculty of Medicine MU Brno
- Milan Calábek: Characteristic of Resistance - Changes in Plates of Lead - Acid Batteries. ALABC, Research Triangle Park, NC, USA
- Marie Sedlaříková, J. Vondrák: Development of Electrochromic Components. Cooperation - Contract between UACH Czech Academy of Science Řež by Prague, FEEC BUT Brno and BUSE, Ltd. Blansko
- Marie Sedlaříková, J. Vondrák: Cooperation - Contract between FEEC BUT Brno and MEGA, Co. Stráž pod Ralskem
- Marie Sedlaříková, J. Vondrák: Cooperation - Contract between FEEC BUT Brno and UACH Czech Academy of Science Řež by Prague
- Marie Sedlaříková, J. Vondrák: Cooperation - Contract between FEEC BUT Brno, UACH Czech Academy of Science Řež by Prague and Orgrez, Co. Prague
- Marie Sedlaříková, J. Vondrák: Cooperation - Contract between UACH Czech Academy of Science Řež by Prague, FEEC BUT Brno and EPCOS AG, KO Division Heidenheim Germany

V.4 Membership in International Organizations and Societies

- Rudolf Autrata, MSA (Microscopy Society of America)
- Rudolf Autrata, SGEM (Švýcarská společnost elektronové mikroskopie)
- Miroslav Cenek, ISE
- Josef Jirák, IEEE
- Jiří Starý, IMAPS (International Microelectronics and Packaging Society), Czech and Slovak Chapter

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- AUTRATA, R., JIRÁK, J. Metody analýzy povrchů. Iontové, sondové a speciální metody (Methods of Surface Analysis. Ion, Test and Special Methods). Chapter: *Environmentální rastrovací elektronová mikroskopie (Environmental Scanning Electron Microscopy)*. 1st ed. Praha, Academia, 2002, p. 459 – 484, ISBN 80-200-0594-3
- CENEK, M. Využití elektrické energie z malých vodních elektráren k provozu elektrických vozidel a tepelných čerpadel (Utilization of Electric Energy from Small Hydro-electric Power Plants for Operation of Electric Vehicles and Heat Pumps). *EKO-Ekologie a společnost*, 2002, Vol. XII, n. 1, p. 11, ISSN 1210-4728
- CENEK, M. Tři etapy rozvoje elektrických vozidel v České republice (Three Phases of Electric Vehicles Development in Czech Republic). *Technický týdeník*, 2002, Vol. 50, n. 44, p. 1, ISSN 0040-1064
- CENEK, M., ROZSÍVALOVÁ, Z. Prodloužení životnosti akumulátorových baterií cesta ke snížení zátěže životního prostředí (Prolongation of Accumulator Batteries Service Life is a Way to Decreasing Environmental Load). *Inovační podnikání a transfer technologií*, 2002, Vol. 2002, n. 3, p. 21, ISSN 12104612
- KRÁL, P., KŘIVÁK, P., BAČA, P., CALÁBEK, M., MICKA, K. Current Distribution over the Electrode Surface in a Lead-acid Cell During Discharge. *Journal of Power Sources*, 2002, Vol. 105, n. 2002, p. 35 – 44, ISSN 0378-7753

- VONDRÁK, J., SEDLAŘÍKOVÁ, M., VELICKÁ, J., NOVÁK, V. Elektrochemické kondenzátory v praxi (Electrochemical Capacitors in Praxis). *Sdělovací technika*, 2002, roč.49, č. 12, ISSN 0036-9942

VI.2 Conferences

- AUTRATA, R., JIRÁK, J. *X-Ray Microanalysis in ESEM and LV SEM.* In Proceedings of Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Czech Republic, Brno, Institute of Scientific Instruments Academy of Sciences of the Czech Republic, Czechoslovak Microscopy Society, 2002, p. 49 - 50, ISBN 80-238-8986-9

- AUTRATA, R., JIRÁK, J., ROMANOVSKÝ, V. *Influence of Electrode System Geometry on Signal in ESEM Ionisation Detector* In Proceedings of 15th International Congress on Electron Microscopy. 15th International Congress on Electron Microscopy 2002. Durban, South Africa, 2002, p. 231 - 232, ISBN 0-620-29294-6

- AUTRATA, R., JIRÁK, J., ROMANOVSKÝ, V. *Combined Detector for BSE, SE and BSE+SE Detection in a Low Voltage SEM* In Proceedings of Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Czech Republic, Brno, Institute of Scientific Instruments Academy of Sciences of the Czech Republic, Czechoslovak Microscopy Society, 2002, p. 49 - 50, ISBN 80-238-8986-9

- BAČA, P., KŘIVÁK, P. *A Fundamental Study of the VRLA Cells* In Proceedings of Advanced Batteries and Accumulators - 3rd International Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 12-1 – 12-4, ISBN 80-214-2082-0

- BAČA, P., MAXA, J. *Experience with the Establishment of Teaching EPD* In Proceedings of STO-8 Modern Directions in the Teaching of Electrical Engineering and Electronics. STO-8 Colloquium of a Circuit Theory. Brno, Department of Electrical Engineering and Electronics MA Brno. Institute of Theoretical and Experimental Electrical Engineering FEEC BUT Brno, 2002, p. 25 - 28, ISBN 80-214-2190-8

- BUŘIVAL, Z., BARTUŠEK, K., ROZSÍVALOVÁ, Z. *The Need of Bioclimatic Design* In Proceedings of 9th Electronic Devices and Systems Conference 2002 and Experimental Methods in Acoustic and Electromagnetic Emission. EDS 2002 Electronic Devices and Systems Conference. Brno, 2002, p. 411 - 414, ISBN 80-214-2180-0

- CALÁBEK, M., MICKA, K., BAČA, P., KŘIVÁK, P. *A Fundamental Study of the Effects of Compression on the Performance of Active Mass in AGM Batteries* In Proceedings of 7th ALABC Members & Contractors´ Conference. 7th ALABC Members & Contractors´ Conference. Marina Del Ray, California, USA, 2002

- CENEK, M., KAZELLE, J., ROZSÍVALOVÁ, Z. *Results of Long Term User's Operation of Accumulator Batteries* In Proceedings of Advanced Batteries and Accumulators - 3rd International Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 46-1 – 46-3, ISBN 80-214-2082-0

- CENEK, M., KAZELLE, J., ROZSÍVALOVÁ, Z. *Fast Charging of Accumulator Batteries of Electric Vehicles* In Proceedings of Electrochemistry in Molecular and Microscopic Dimensions. Electrochemistry in Molecular and Microscopic Dimensions. Düsseldorf, Germany, 2002, p. 285 - 285

- ČERNÝ, R. *Catalyses for Membrane Fuel Cells* In Proceedings of 8th Conference STUDENT EEICT 2002. 8th Conference STUDENT EEICT 2002. FEEC BUT Brno. Brno, 2002, p. 106 - 110, ISBN 80-214-2115-0

- DOČKAL, M., SEDLAŘÍKOVÁ, M., VONDRÁK, J. *Electrodeposition of Metal from Polymer Electrolytes* In Proceedings of the Advanced Batteries and Accumulators - 3rd International Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 13-1 – 13-2, ISBN 80-214-2082-0

- FRK, M., KAMENÍK, R. *Dielektrická relaxační spektroskopie periklasové keramiky (Dielectric Relaxation Spectroscopy of Periclas Ceramic)* In Proceedings of Electrical Engineering and Information Science 2002. Electrical Engineering and Information Science 2002. University of West Bohemia Pilsen Faculty of Electrical Engineering. Plzeň, 2002, p. 71 - 74, ISBN 80-7082-904-4

- HAVLÍČEK, S. *Sledování vlivů elektrodových systémů a prostředí při měření dielektrických vlastností elektroizolantů (Monitoring of Influences of Electrode Systems and Environment in Measurement of Dielectric Characteristics of Electroinsulants)* In Proceedings of DISEE 02 - Dielectric and Insulating Systems in Electrical Engineering. DISEE 02 - Dielectric and Insulating Systems in Electrical Engineering. Častá-Píla, 2002, p. 182 - 184, ISBN 80-227-1758-1

- HRNČIŘÍK, P. *Computer Controlled SEM Tesla BS 350 with a Schottky Cathode for Detection of Slow and Auger Electrons* In Microscopy 2002 - Proceedings of the 2nd Annual Meeting of the Czechoslovak

Microscopy Society. 2nd Annual Meeting of the Czechoslovak Microscopy Society. Brno, 2002, p. 71 - 72, ISBN 80-238-8749-1

- HRUŠKA, K. *Kontrola a sledování jakosti v procesu výroby DPS (SMT Quality and Process Control)* In Proceedings of 8th Conference STUDENT EEICT 2002. 8th Conference STUDENT EEICT 2002. FEEC BUT Brno, 2002, ISBN 80-214-2114-2

- JIRÁK, J., AUTRATA, R., ŠPINKA, J. *Detection of Signal Electrons at Higher Pressure in the Specimen Chamber* In Proceedings of Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Brno, Institute of Scientific Instruments Academy of Sciences of the Czech Republic Czechoslovak Microscopy Society, 2002, p. 55 - 56, ISBN 80-238-8986-9

- KAZELLE, J., ROZSÍVALOVÁ, Z., SEDLAŘÍKOVÁ, M. *Materiálové inženýrství v magisterském studiu na Fakultě elektrotechniky a komunikačních technologií (Engineering of Materials in the Graduate Study – MSc Level in the FEEC BUT in Brno)* In 11th Seminar of Departments and Institutes of Material Engineering of Universities in the Czech and Slovak Republics - Proceedings. 11th Seminar of Departments and Institutes of Material Engineering of Universities in the Czech and Slovak Republics. Brno, 2002, p. 39 - 42

- KŘIVÁK, P., BAČA, P. *Current Distribution over the Electrode Surface in a Lead-acid Cell During Discharge* In Proceedings of Advanced Batteries and Accumulators - 3rd International Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 11-1 – 11-5, ISBN 80-214-2082-0

- NEČESAL, P. *Lithium – Ion Batteries* In Proceedings of 8th Conference STUDENT EEICT 2002. 8th Conference STUDENT EEICT 2002. FEEC BUT Brno, 2002, p. 120 - 124, ISBN 80-214-2115-0

- NEDĚLA, V., AUTRATA, R., ROMANOVSKÝ, V. *Influence of the Gas USED on Amplification of Signals in Environmental SEM* In Proceedings of Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Czech Republic, Brno, Institute of Scientific Instruments Academy of Sciences of the Czech Republic, Czechoslovak Microscopy Society, 2002, p. 63 - 64, ISBN 80-238-8986-9

- NOVÁČEK, T., SEDLAŘÍKOVÁ, M., VONDRÁK, J. *Gel Polymer Electrolytes* In Proceedings of Advanced Batteries and Accumulators - 3rd International Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 42-1 – 42-2, ISBN 80-214-2082-0

- NOVÁK, V. *Bifunkční elektroda pro palivové články (Bifunctional Electrode for Fuel Cells)* In 24th Chemical Sources of Electric Energy - Proceedings. 24th Chemical Sources of Electric Energy. Brno, 2002, p. 18 - 21, ISBN 80-214-2181-9

- POLSTEROVÁ, H. *Sledování stárnutí izolantů pomocí ESEM (Monitoring of Insulants Ageing by Means of ESEM)* In Proceedings of DISEE 02 - Dielectric Insulating Systems and Electrical Engineering. DISEE 02 - Dielectric and Insulating Systems in Electrical Engineering. Častá-Píla, 2002, p. 123 - 126, ISBN 80-227-1758-4

- SCHNEIDER, L. *Signal Detection in Conditions of Environmental SEM* In Proceedings of The Fifth Scientific Conference on Electrical Engineering and Information Technology for Ph.D. Students. The Fifth Scientific Conference on Electrical Engineering and Information Technology. 2002, p. 74 - 76, ISBN 80-227-1760-6

- SCHNEIDER, L., JIRÁK, J. *Influence of Size of Ionisation Detector Electrode System on Signal Detection in ESEM* In Proceedings of Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Recent Trends in Charged Particle Optics and Surface Physics Instrumentation. Czech Republic, Brno, Institute of Scientific Instruments Academy of Sciences of the Czech Republic, Czechoslovak Microscopy Society, 2002, p. 57 - 60, ISBN 80-238-8986-9

- SMÉKAL, K. *Vliv SF_6 a jeho rozkladných produktů na rezistivitu polymerů (The Influence of SF_6 and its Decomposition Products on Resistivity of Polymers)* In Proceedings of Electrical Engineering and Information Science 2002. University of West Bohemia Pilsen Faculty of Electrical Engineering. Plzeň, ISBN 80-7082-904-4

- STARÝ, J. *Material Compatibility and Process Optimisation in Lead Free Soldering* In Socrates Workshop 2002 - Proceedings. Intensive Training Programme in Electronic System Design. Socrates Workshop. Intensive Training Programme in Electronic System Design. Brno, 2002, p. 200 - 204, ISBN 80-214-2217-3

- VANĚK, J., CHOBOLA, Z. *Influence of Illumination of Silicon Solar Cells* In Proceedings of 9th Electronic Devices and Systems Conference 2002 and Experimental Methods in Acoustic and Electromagnetic Emission. EDS 2002 Electronic Devices and Systems Conference Brno. Brno, 2002

- VANĚK, J., KAZELLE, J., CHOBOLA, Z. *Comparing Contact Technologies by 1/f Noise in Photovoltaic Cells* In Proceedings of Advanced Batteries and Accumulators - 3rd International

Conference. Advanced Batteries and Accumulators, ABA - 3. Brno, 2002, p. 34-1 – 34-4, ISBN 80-214-2082-0

- VONDRÁK, J., REITER, J., SEDLAŘÍKOVÁ, M., ČERNÝ, R. *PMMA Based Aprotic Gel Electrolytes* In Proceedings of 5th International Meeting on Electrochromism. 5th International Meeting on Electrochromism. Denver, Colorado: National Renewable Energy Laboratory Golden, USA, 2002

VI.3 Textbooks, Lecture Notes

- JIRÁK, J., LIEDERMANN, K., SEDLAŘÍKOVÁ, M., AUTRATA, R., ROZSÍVALOVÁ, Z. *Materiály v elektrotechnice (Materials in the Electrical Engineering - Electronic Text)*. Brno, 2002
- NOVÁK, V., JIRÁK, J., ROZSÍVALOVÁ, Z. *Teplotní závislost vybraných parametrů polovodičových materiálů (Temperature Dependence of Selected Parameters of Semiconductive Materials). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K. *Absorpční charakteristika izolantů (Absorption Characteristic of Insulants). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K. *Magnetické vlastnosti látek (Magnetic Properties of Materials). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K., ROZSÍVALOVÁ, Z. *Graficko-numerická analýza tepelného průrazu (Graphic-numeric Analysis of Thermal Breakdown). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K., ROZSÍVALOVÁ, Z. *Teplota a supravodivý stav látek (Temperature and Superconductive Status of Materials). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K., ROZSÍVALOVÁ, Z. *Teplotní závislost rezistivity elektrotechnických materiálů (Temperature Dependence of Electrotechnical Materials Resistivity). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., LIEDERMANN, K., ROZSÍVALOVÁ, Z. *Ztráty v dielektriku (Losses in Dielectric Materials). (Virtual Laboratory, software)*. Brno, 2002
- NOVÁK, V., ROZSÍVALOVÁ, Z. *Komplexní permitivita dielektrik (Complex Permitivity of Dielectrics). (Virtual Laboratory, software)*. Brno, 2002
- PROCHÁZKA, P., ROZSÍVALOVÁ, Z. *Technická dokumentace (Technical Documentation – Electronic Text)*. Brno, 2002

VI.4 Research and Technical Reports

- CENEK, M. Zvýšení využití elektrické energie při nabíjení elektrických vozidel z malých vodních elektráren (Increasing Utilization of Electric Energy by Direct Charging of Electric Vehicles from Hydro-electric Power Plants). Research Report, Brno, 2002.
- CENEK, M. Dlouhodobé provozní zkoušky elektrických vozidel BETA, I. část (Long-term Operational Tests of Electric Vehicles BETA - First part). Research Report EUREKA EU E! 2521 ECOTRANS, 2002
- CENEK, M. Monitorování zdroje (Monitoring of the Source). Research Report, Brno, 2002.
- STARÝ, J. Expert Opinion: IEC 61192-4 Ed.1: Workmanship Requirements for Soldered Electronic Assemblies - Part 4: Terminal Assemblies. 2002.
- STARÝ, J. Expert Opinion: IEC 61188-5-6 Ed.1: Printed Boards and Printed Boards Assemblies - Design and Use. 2002.
- STARÝ, J. Expert Opinion: IEC 60068-2-58 Ed.3: Environmental Testing - Test Td - Test Method for Solder Ability, Resistance to Dissolution of Metallization and to Soldering Heat of Surface Mounting Devices. 2002.

VI.5 PhD and Habilitation Theses

- NOVÁK, V. Výzkum pokročilých elektrodových materiálů (Study of advanced electrode materials). FEEC BUT Brno, PhD Thesis, 2002 (Supervisor Vondrák J.)

VII. Other Activities

- Department of Electrotechnology Acted as an Organiser of the International Conference 3rd ABA (Advanced Batteries and Accumulators), International Conference 2002, Brno 16th – 20th June 2002 (M. Sedlaříková)

- Department of Electrotechnology and Czech Electrotechnical Society in Prague Acted as Organisers of the Conference 24th Chemical Sources of Electric Energy, Brno 3rd – 5th September 2002 (M. Calábek)

- CALÁBEK, M., MICKA, K., BAČA P., KŘIVÁK P. A Fundamental Study of the Effects of Compression on the Performance of Active Mass in AGM Batteries, ALABC Project No. B-001.1 (Annual Report No. 4), Brno 2002

- CENEK, M. Programme of Activities of the Czech Association for Renewable Energies, Conference „Renewable Sources of Electrical Energy in Praxis". Constructional and Technical Trade Fair STAVOTECH 2002, Hodonín 8th February 2002, Mladá Boleslav 28th March 2002, Hradec Králové 9th May 2002, Olomouc 25th October 2002; PRAGOTERM, Prague 27th March 2002; 8th Exhibition of Environments FOR ECO a 9th Exhibition of Accommodation and Realities FOR HABITAT, Prague24th May 2002

- CENEK, M. Using of Electric Energy of Small Hydroelectric Power Plants in the Place of their Installation for Charging of Electric Vehicles and for an Operation of Heat Pumps, Conference „Renewable Sources of Electrical Energy in Praxis". Constructional and Technical Trade Fair STAVOTECH 2002, Hodonín8th February 2002, Mladá Boleslav 28th March 2002, Hradec Králové 9th May 2002, Olomouc 25th October 2002; PRAGOTERM, Prague 27th March 2002; 8th Exhibition of Environments FOR ECO a 9th Exhibition of Accommodation and Realities FOR HABITAT, Prague 24th May 2002

- CENEK, M. Renewable Energies, INOVACE 2002, Week of Research, Development and Innovation in the Czech Republic, Section Technologies of Environment (4th December 2002), 4 p., Prague 3rd – 5th December 2002

- CENEK, M. Direct Charging of Electric Vehicles from Hydro-electric Power Plants Using Fast Charging Equipment, International Austrian-Czech Project ECOTRANS E!2521, solved in the EU Programme EUREKA, INOVACE 2002, Week of Research, Development and Innovation in the Czech Republic, Section CEERDA EUREKA, (5th December 2002), 2 p., Prague 3rd – 6th December 2002

- CENEK, M. Ecological Accommodation by Means of Renewable Energies, Ecological Transport with Electric Vehicles – Life Style of the 3rd Millennium, Slovak-Czech Meeting in the Course of International Scientific and Technical Cooperation KONTAKT, Bratislava 19th November 2002, Slovak Republic

- CENEK, M., HAMAN, M. Elektrický skládací skútr ROTOBIC (Electric Folding Scooter ROTOBIC). Presentation in Exposition FEEC BUT Brno, First Year of South-Moravian Exhibition of the Industrial Electrical and Power Engineering, Brno, 21st – 23rd May2002

DEPARTMENT OF PHYSICS

Head of Department: Doc. Ing. Lubomír Grmela, CSc.

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I. STAFF

Professors:

Prof. RNDr. Ing. Josef Šikula, DrSc., Prof. RNDr. Pavel Tománek, CSc.

Associate Professors:

Doc. Ing. Lubomír Grmela, CSc., Doc. RNDr. Pavel Hruška, CSc., Doc. RNDr. Milena Kheilová, CSc., Doc. Ing. Karel Liedermann, CSc., Doc. RNDr. Marian Štrunc, CSc.

Lecturers:

RNDr. Milada Bartlová, Ph.D., Ing. Jitka Brüstlová, CSc., RNDr. Pavel Dobis, CSc., RNDr. Eva Hradilová, Ing. Pavel Koktavý, CSc., Ph.D., RNDr. Naděžda Uhdeová, RNDr. Oldřich Veverka, RNDr. Vladimír Zdražil, Ph.D.

Technical Staff:

Miroslav Sadovský

Postgraduate Students:

Mgr. Dana Košťálová, Ing. Jiří Majzner, Ing. Vlasta Sedláková, Ing. Petr Létal

Administrative Staff:

Eva Biskupová, Lenka Horká

II. FACILITIES

II.1 Teaching and Research Laboratories

- Students laboratories
- Laboratory of Nanometrology
- Laboratory of Dielectric Relaxation Spectroscopy
- Czech Noise Research Laboratory
- Computer Laboratory

II.2 Special Instrumentation and Computers

- Student's laboratories. The student's laboratories are equipped with 18 PC and HW and SW systems allowing not only data processing but also the experiment control and automation. Physics experiments by PHYWE are used in the laboratories, such as Michelson's experiment, velocity of light determination, ultra-sound studies, application of lasers and X-rays.
- Laboratory of Nanometrology. Scanning Tunneling Microscope with Scanning Near Field Optical Sensor Head, Video Microscope, Acoustooptical Modulator, Antivibration Working Station, N_2 laser, Dye laser.
- Laboratory of Dielectric Relaxation Spectroscopy. Impedance analyzer HP4285A for the range 75 kHz – 30 MHz, Impedance analyzer HP 4284A for the range 20 Hz – 1 MHz, Electrometer Keithley 617, measurements down to 30 fA, measuring capacitor system HP 16541B.

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Physics	Y1, winter	3/2	Dobis
Seminar of Physics	Y1, winter	0/2	Hradilová
Physics (FIT)	Y1, winter	2/3	Hruška

III.2 Master´s Programme (Ing)

Physics 1	Y1, winter	2/3	Dobis
Physics 2 (Electrical Engineering)	Y1, summer	3/3	Kheilová
Physics 2 (Informatics)	Y1, summer	3/3	Hruška
Physics 3 (Electrical Engineering)	Y2, winter	3/3	Kheilová
Physics 3 (Informatics)	Y2, winter	2/2	Hruška
Maple in Technical Physics	Y2, summer	0/2	Hruška
Fundaments of Optoelectronics	Y2, summer	2/2	Tománek
Fundamental of Quantum Mechanics	2nd Level	3/2	Kheilová

III.3 Doctoral Programme (PhD)

Modern Aspects of Optics	winter	42 hrs.	Tománek
Physics of semiconductor interfaces and structures	summer	42 hrs.	Hruška
Stochastic processes in solid state	summer	42 hrs.	Šikula
Selforganization and evolution processes in nonequilibrium, non-linear systems	summer	42 hrs.	Štrunc

III.4 Study in English Language (International students)

Physics 1	Y1, winter	3/2	Liedermann
Physics 2	Y1, summer	4/1	Hruška/Grmela
Physics 3	Y2, winter	3/1	Hruška/Grmela
Physics (Informatics)	Y1, winter	2/2	Hruška

IV. RESEARCH PROJECTS

Study of processes influencing radial transport of energy in an arc discharge with liquid stabilization
Grant project GAČR No. 202/02/1027, principal investigator: Milada Bartlová

Cracks detection in solids by means of electromagnetic emission
Grant project GAČR No. 102/02/D073, principal investigator: Pavel Koktavý

Electromagnetic and acoustic emission in solids
Grant project GAČR No. 103/01/1058, principal investigator: Josef Šikula

The impact of pathological changes in the middle and inner ear upon the acoustic waves transmission through bones
Grant project MZD No. NK/5871, principal investigator: Josef Šikula

Noise of HEMT structures for global communication
Grant project MŠMT KONTAKT No. ME/605, principal investigator: Josef Šikula

Noise and Non-linearity of Thick-Films Resistor
Grant project MŠMT KONTAKT No. ME/244, principal investigator: Josef Šikula

Committee work in European Optical Society
Grant project MŠMT INGO No. LA/031, principal investigator: Pavel Tománek

Nanostructures: Optical and electrical characteristics
Grant project MŠMT COST No. OC/523.40, principal investigator: Pavel Tománek

Semiconductors: Local optical and electrical characteristics
Grant project MŠMT KONTAKT No. ME/544, principal investigator: Pavel Tománek

Physical, mathematical and electrotechnical seminar in bachelor study
Grant project FRVŠ No. 1941/2002, principal investigator: Eva Hradilová

Scanning near-field optical microscopy
Grant project FRVŠ No. 1757/2002, principal investigator: Dana Košťálová

Support of the self-work of students in Physics
Grant project FRVŠ No. 1941/2002, principal investigator: Naděžda Uhdeová

Teaching labs innovation
Grant project VUT /4125, principal investigator: Pavel Dobis

Complex project of study support for handicap students
Grant project MŠMT – Development Program No. BC/2002, principal investigator: Naděžda Uhdeová

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- FEL ČVUT Prague, Dept. of Electrotechnology
- Mikrokom, s. r. o. Prague
- Optokon s. r. o. Antonínův Důl
- Institute of Scientific Instruments Academy of Science, Brno
- Center for Higher Education Studies, Prague
- ČVUT Prague, Department of Pedagogy and Development
- Institute of Plasma Physics Academy of Science, Prague
- Teaching Hospital of St. Anna, Brno
- Faculty of Medicine MU Brno
- Faculty of Science MU Brno

V.2 International Cooperation

- Rheinische Westphalische Technische Hochschule (RWTH), Aachen, Germany, Milada Bartlová
- Inter-Universities Micro Electronic Centre (IMEC), Leuven, Belgium, Pavel Hruška
- Laboratoire de Physique des Composants a Semiconducteurs (LPCS), Ecole Nationale Supérieure d'Electronique et Radioélectricité Grenoble, France, Pavel Hruška
- Meisey University Tokyo, Japan, Josef Šikula
- Yamanashi University Koffu, Japan, Josef Šikula
- Polytechnic Gdansk, Poland, Josef Šikula
- Maritime Academy Gdynia, Poland, Josef Šikula
- Ferdinand Braun-Institut Berlin, Germany, Josef Šikula
- Josef Stefan Institute, Ljubljana, Slovenia, Josef Šikula
- University of Florida, Gainsville, USA, Josef Šikula
- DuPont Bristol, UK, Josef Šikula
- Centre d'Electronique et de Micro-Optoélectronique (CEM II), Université Montpellier II, Francie, Pavel Tománek
- Université de Franche-Comté, Faculté des Sciences, 16, route de Gray, La Bouloie, F-25030 Besançon, France, Pavel Tománek
- Institute of Optics, Russian Academy of Science, Birzhevaya linia 12, St. Petersburg, Russia, Pavel Tománek
- Osaka University, Japan, Pavel Tománek
- Slovak university of Technology in Bratislava, Department of Engineering Pedagogy and Psychology, Naděžda Uhdeová
- Technische Fachhochschule (TFH) Berlin, Germany, Naděžda Uhdeová

V.2.1 Visitors to the Department

- Prof. S. Kawata, Osaka University, Japan, 1 week
- Dr. Elena Azizova, Navoi Mining and Metallurgical Combinat, Uzbekistan 2 weeks
- Prof. Olga Nedzvetskaya, Izhevsk States Technical University, Russian Federation, 2 weeks
- Prof. Munecazu Tacano, Meisei University, Tokyo, Japan, 1 week
- Prof. Yasuka Mori, Nihon University, Tokio, Japan, 1 week

V.2.2 Visits of Staff Members to Foreign Institutions

- Milada Bartlová, Rheinische Westphalische Technische Hochschule, Aachen, Germany, 1week
- Josef Šikula, Pavel Koktavý, Vlasta Sedláková, Josef Stefan Institute, Ljubljana, Slovenia, 1 week
- Josef Šikula, Lubomír Grmela, Physical Acoustic Corporation, Princetown, New Jersey; University of Florida, Gainesville, Florida; National Institute of Health, Bethesda-Washington. 1 week
- Josef Šikula, University of Technology Krakow, Poland, 1 week

V.3 Membership in International Organizations and Societies

- Milada Bartlová, member of the SEFI (Societé Européene pour la Formation des Ingénieurs), member of the IPCS (International Plasma Chemistry Society)
- Jitka Brüstlová, member of the SEFI
- Pavel Dobis, member of the SEFI
- Lubomír Grmela, member of IMAPS CZ & SK (International microelectronics and Packaging society), NDT (Non destructive testing) – member of permanent comiteee
- Pavel Hruška, member of the SEFI
- Pavel Koktavý, member of IMAPS CZ & SK, member of NDT
- Karel Liedermann, member of the American Physical Society, member of IEE (Institution of Electrical Engineers)
- Josef Šikula, member of the ICNF International Advisory Committee, USA, Program Committee CARTS Europe, prezident IMAPS CZ & SK, chair of the South Moravia regional group NDT (Non destructive testing)
- Pavel Tománek, member of the European Optical Society – Board of Directors and Advisory Committee, member of the SPIE, CSSF – Execom, member of the OSA (Optical Society of America)
- Naděžda Uhdeová, member of the IGIP (Internationale Gesellschaft für Ingenieurpädagogik), member of the SEFI

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- AUBRECHT, V., BARTLOVÁ, M. Net Emission Coefficients in Argon Arc Plasmas. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. 6, p. 522 - 527.
- BARTLOVÁ, M. Electron Attachment in Kinetic Modeling of SF6 Arc Plasma. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. 6, p. D392 - 4.
- BARTLOVÁ, M., COUFAL, O. Comparison of some models of reaction kinetics in HV circuit breakers with SF6 after current zero. *Journal of Physics D*: Applied Physics, ISSN 0021-8980, 2002, Vol. 35, n. 11, p. 3065 - 3 075.
- DOBISOVÁ, M., DOBIS, P., TOMÁNEK, P., UHDEOVÁ, N. Local measurement of optically induced photocurrent in semiconductor structures. *Proceedings of SPIE*, ISSN 0277-786X, 2002, Vol. 4096, n. , p. 630 - 634.
- KHEILOVÁ, M., ŠTRUNC, M., ŠOLC, F. Kolmogorov-Sinai Entropy and Lyapunov Exponents Related to Information and Transport Processes. *International Journal of Computing Anticipatory Systems*, ISSN 1373-5411, 2002, Vol. 11, n. 11, p. 306 - 319.
- KOKTAVÝ, P., ŠIKULA, J. Reverse Biased P-N Junction Noise in GaAsP Diodes with Avalanche Breakdown Induced Microplasmas. *Fluctuation and Noise Letters*, ISSN 0219-4775, 2002, roč. 2, č. 2, s. 65 - 70.
- PAVELKA, J., ŠIKULA, J., GRMELA, L., TACANO, M., HASHIGUCHI, S. Noise and Self-Healing of Tantalum Capacitors. *Capacitor and Resistor Technology*, ISSN 0887-7491, 2002, Vol. 2002, n. 4/2002, p. 181 - 185.
- ŠIKULA, J., KOKTAVÝ, P., KOŘENSKÁ, M., PAVELKA, J., SEDLÁKOVÁ, V., LOKAJÍČEK, T. Kinetics of the Cracks Creation in Granite Under Ramp loading. *NDT Welding Bulletin*, ISSN 1213-3825, 2002, Vol. 2002, n. 12, p. 4 - 6.
- ŠTRUNC, M. Thoughts for the New Millenium. Chapter: *The World of Non-linear Effects*. Brno: VUTIUM, 2002. p. 220 - 223. ISBN 80-214-1872-9
- ŠTRUNC, M. Thoughts for the New Millenium. Chapter: *Amazing Self-Organization*. Brno: VUTIUM, 2002. p. 225 - 253. ISBN 80-214-1872-9
- TOMÁNEK, P. Konference "Nové trendy ve fyzice" (Conference "New trends in Physics"). *Jemná mechanika a optika*, ISSN 0447-6411, 2002, Vol. 47, n. 1, p. 27 - 28.
- TOMÁNEK, P., DOBISOVÁ, M., KOŠŤÁLOVÁ, D., LÉTAL, P. Local optical characteristics of semiconductor surfaces. *Proceedings of SPIE*, ISSN 0277-786X, 2002, Vol. 4607, n, p. 168 - 177. zvaná přednáška na 5. mezinárodní konferenci Korelační optiky
- UHDEOVÁ, N. Steuerung der Selbständigen Arbeit der Studenten in Physik an der Hochschulen. (Control of the self-work of university students in Physics). *Ingenieurpädagogik*, ISSN 0724-8873, 2002, Vol. 48, n. 9, p. 329 - 333.

VI.2 Conferences

- BARTLOVÁ, M., COUFAL, O. *An Improved Model of Chemical Kinetics in SF6-Arc Plasma* In Proceedings of the XIV International Conference on Gas Discharges and their Applications. XIV International Conference on Gas Discharges and their Applications. Liverpool: University of Liverpool, 2002, s. 51 - 54, ISBN 0-9539105-1-2

- DOBIS, P., BRÜSTLOVÁ, J. *Electronic Noise and Detectivity of CdHgTe Detector*s In Noise and Non-linearity testing of Modern Electronic Componenets- NNT2001 Proceedings. Noise and Non-Linearity Testing of Modern Electronics Components. Brno: CNRL Brno, 2002, s. 104 - 107, ISBN 80-238-9094-8

- GRMELA, L., BRÜSTLOVÁ, J., KOŠŤÁLOVÁ, D., TOMÁNEK, P., DOBISOVÁ, M. *Local photoluminescence scanning measurement on A3-B5 quantum dots* In Optics in computing - St. Petersburg. Optics in computing. St. Petersburg, Russia: St. Petersburg Institute of fine Mechanics and Optics, 2002, s. 25 – 26

- HRADILOVÁ, E. *Computer Simulation of Electromagnetic Waves with Program CUPS* In PTEE 2002. Physics Teaching in Engineering Education PTEE 2002. Belgie: , 2002, ISBN 90-5682-359-0

- KOKTAVÝ, P., ŠIKULA, J. Non-destructive Testing of Luminescent Diodes by Noise In 8-th ECNDT. 8-th ECNDT. Madrid: European Federation for Non-Destructive Testing, 2002, s. 247 - 247, ISBN 84-699-8573-6

- LIEDERMANN, K. *Effect of annealing on dielectric spectra of oligobutadiene* In Dielectric and insulating systems in electrical engineering - Proceedings. 14th International Conference Dielectric and insulating systems in electrical engineering - DISEE 2002. Bratislava: FEI STU, 2002, s. 147 - 150, ISBN 80-227-1758-4

- MAJZNER, J., PAVELKA, J., ŠTRUNC, M., ŠIKULA, J. *Noise to signal ratio for piezoceramic sensors* In Electronic devices and systems 02 - Proceedings. EDS 2002 Electronic Devices and Systems Conference. Brno: Zdeněk Novotný, 2002, s. 107 - 113, ISBN 80-214-2180-0

- PAVELKA, J.,MAJZNER, J. *Crack's Wall Vibration Kinetics Determined by Electromagnetic Emission* In Proceedings of 8th ECNDT. 8-th ECNDT. Leganes, Madrid: Spanish Society for NDT AEND, 2002, s. 234 - 236, ISBN 84-699-8573-6

- SEDLÁKOVÁ, V. *NDT of thick film resistors by noise spectroscopy* In Proceedings of 8th ECNDT. 8-th ECNDT. Leganes, Madrid: Spanish Society for NDT AEND, 2002, s. 215 - 220, ISBN 84-699-8573-6

- ŠIKULA, J., PAVELKA, J., DOBIS, P., ZEDNÍČEK, T. *Charge carrier transport and noise of niobium capacitors* In Proceeding of CARTS 2002 - 16th European Passive Components Conference. CARTS - EUROPE 2002. SWINDON, England: Electronic Components Institute Internationale, Ltd., 2002, s. 32 - 36,

- ŠIKULA, J., ŠTRUNC, M., MAJZNER, J., KOKTAVÝ, P., PAVELKA, J., HÁJEK, K. *Electrical Noise of Piezoceramic Sensors* In EWGAE 2002 - 25th European Conference on Acoustic Emission Testing. 25th European Conference on Acoustic Emission Testing - EWGAE 2002. Prague: Brno University of Technology, 2002, s. 171 - 176, ISBN 80-214-2174-6

- TOMÁNEK, P., DOBIS, P., DOBISOVÁ, M., KOŠŤÁLOVÁ, D. *Nanometric applications of the Scanning Near-field Optical Microscopy* In NANO´02. Brno: Akademické nakladatelství, CERM, 2002, s. 53 - 53, ISBN 80-7204-258-0

- TOMÁNEK, P., DOBISOVÁ, M., DOBIS, P., KOŠŤÁLOVÁ, D., GRMELA, L. *Spectral measurements of semiconductor structures using optical near-field approach* In Joint COST-Action workgroup meeting on individual and assembled nanoparticles and quantum dots. IANQ. Leuven, Belgie: KU Leuven, COST 523, 2002, s. P55 - 0,

- UHDEOVÁ, N. *ICT integration into the education* In CO-MAT-TECH 2002. CO-MAT-TECH 2002. Bratislava: Slovenská technická univerzita v Bratislave, 2002, s. 641 - 645, ISBN 80-227-1768-1

- UHDEOVÁ, N., GRMELA, L., TOMÁNEK, P.: *Support of the self-work of Students in Physics* In: Proc. of Conference Physics teaching in engineering education PTEE 2002, 5-7 June 2002, Leuven, Belgium, paper P2: 4 pages (CD ROM) (ISBN 90-5682-359-0)

VI.3 Textbooks, Lecture Notes

- HRADILOVÁ, E., UHDEOVÁ, N.: *Physics – entrance examination* (in Czech), 9. Ed. Brno, BUT Brno 2002, ISBN 80-214-1922-9

- UHDEOVÁ, N. et al.: *Physics Labs* (in Czech), 7. Ed. Brno, BUT Brno 2002, ISBN 80-214-2051-0 (Authors: Brüstlová, Dobis, Grmela, Uhdeová, Veverka)

- DOBIS, P., BRüSTLOVÁ, J., UHDEOVÁ, N., BARTLOVÁ, M.: *Physics I – study guide*, electronic textbook
- GRMELA, L., MAJZNER, J.: *Laboratory 1*, electronic textbook
- HRADILOVÁ, E., UHDEOVÁ, N.: *Seminar of Physics*, electronic textbook
- HRUŠKA, P., GRMELA, L.: *Physics* (for FIT), electronic textbook
- KHEILOVÁ, M., LIEDERMANN, K., TOMÁNEK, P., ZDRAŽIL, V.: Physics 2, electronic textbook

VI.4 Research and Technical Reports

- HRADILOVÁ, E. Physical, mathematical and electrotechnical seminar in bachelor study, 2002 (in Czech)
- TOMÁNEK, P., GRMELA, L. Semiconductors: local optical and electrical characteristics, 2002 (in Czech)
- TOMÁNEK, P., GRMELA, L. Nanostructures: Optical and electrical properties, 2002 (in Czech)
- UHDEOVÁ, N. Support of the self-work of students in Physics, 2002 (in Czech)
- UHDEOVÁ, N., HRADILOVÁ, E., Brüstlová, J. Complex project of study support for handicap students, 2002 (in Czech)

VI.5 PhD Theses, Habilitations

- GRMELA, L.: Experimental methods of non-destructive testing of electronic devices and materials, Habilitations thesis, BUT Brno 2002, 35 pp., ISBN 80-214-2133-9
- Koktavý P.: Microplasma noise of luminescent GaAsP diodes, Ph.D. thesis, September 2002 (in Czech)
- PAVELKA, J.: Noise and self-Healing of Tantalum Capacitors, Ph.D. thesis, September 2002 (in Czech)

VII. OTHER ACTIVITIES

- Organization of the "9th conference Electronic Devices and Systems EDS ´02" and "International Workshop Experimental methods in acoustic and electromagnetics emission (9.-10. 9. 2002)
- Organization Preparatory courses of Physics for the entrance examination at the technical Universities
- Organization courses Physics Labs for the Gymnasiums.

DEPARTMENT OF LANGUAGES

Head of Department: PhDr. Milena Krhutová

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I. STAFF

Lecturers:

Mgr. Ladislav Baumgartner, PaedDr. Alena Baumgartnerová, PhDr. Marcela Borecká, Mgr. Dorota Egerlová, Kenneth A. Froehling, M.A., Mgr. Jana Hofmanová, PhDr. Dagmar Malíková, Mgr. Jana Matoušková, PhDr. Ludmila Neuwirthová, Mgr. Danuše Zavřelová

Administrative Staff:

Hana Vondráčková

II. FACILITIES

II.1 Teaching and Research Laboratories

- Self-Access Centre: self-learning and language training; computer-assisted language learning

II.2 Special Instrumentation and Computers

- Computers with language packages, videos, tape-recorders, radio

III. TEACHING

III.1 Bachelor´s Programme (Bc)

English: Pre-Intermediate	Y2,3, win./sum.	0/2	Malíková
English: Intermediate	Y2,3, win./sum.	0/2	Neuwirthová
English: Upper-Intermediate	Y2,3, win./sum.	0/2	Froehling
English: Preparatory Course for CFC	Y3, win./sum.	2/2	Matoušková
English: Reading Skills	Y3, win./sum.	1/1	Borecká
English: Everyday Conversation	Y3, win./sum.	1/1	Krhutová
English: Business English	Y3, win./sum.	1/1	Malíková
English: Listening	Y3, win./sum.	1/1	Hofmanová
English: Professional English	Y3, win./sum.	1/1	Neuwirthová
German: Grundkurs	Y2,3, win./sum.	0/2	Baumgartner
German: Mittelstufe	Y2,3, win./sum.	0/2	Baumgartner
German: Fortgeschrittene	Y2,3, win./sum.	0/2	Baumgartner
German: Aufbaukurs	Y3, win./sum.	1/1	Baumgartner
Russian for Beginners	Y3, win./sum.	0/2	Baumgartnerová
Russian for Pre-Intermediate	Y3, win./sum.	0/2	Baumgartnerová
Spanish for Beginners	Y3, win./sum.	0/2	Borecká
Spanish for Pre-Intermediate	Y3, win./sum.	0/2	Borecká

III.2 Master´s Programme (Ing)

English: Pre-Intermediate	Y2,3,4 win/sum.	0/2	Malíková
English: Intermediate	Y2,3,4 win/sum.	0/2	Neuwirthová
English: Upper-Intermediate	Y2,3,4 win./sum.	0/2	Froehling
English: Preparatory Course for CFC	Y3,4, win./sum.	2/2	Matoušková
English: Reading Skills	Y3,4, win./sum.	1/1	Borecká
English: Everyday Conversation	Y3,4, win./sum.	1/1	Krhutová
English: Business English	Y3,4, win./sum.	1/1	Malíková
English: Listening	Y3,4, win./sum.	1/1	Hofmanová
English: Professional English	Y3,4, win./sum.	1/1	Neuwirthová
German: Grundkurs	Y2,3,4 win/sum.	0/2	Baumgartner
German: Mittelstufe	Y2,3,4 win/sum.	0/2	Baumgartner
German: Fortgeschrittene	Y2,3,4 win/sum.	0/2	Baumgartner
German: Aufbaukurs	Y3,4, win./sum.	1/1	Baumgartner

German: State Exam Course	Y3,4,5 win./sum.	2/2	Zavřelová
Russian for Beginners	Y3,4, win./sum.	0/2	Baumgartnerová
Russian for Pre-Intermediate	Y3,4, win./sum.	0/2	Baumgartnerová
Spanish for Beginners	Y3,4, win./sum.	0/2	Borecká
Spanish for Pre-Intermediate	Y3,4,5 win./sum.	0/2	Borecká

III.3 Doctoral Programme (PhD)

English for Postgraduate Students	Y1,2 win./sum.	1/1	Malíková

IV. RESEARCH PROJECTS

Writing Professional English

Grant project Leonardo da Vinci No. CZ/02/B/F/LA-134043, principal investigator: PhDr. Zuzana Svobodová, FME BUT Brno, co-investigator Dagmar Malíková

Interactive and Unified E-Based Education and Training in Electrical Engineering

Grant project Leonardo da Vinci No. CZ/02/B/F/PP-134009, principal investigator Vítězslav Hájek, Dpt of Power Electrical and Electronic Engineering, co-investigator Ludmila Neuwirthová

TRANSkELT – Transition Skills for English Language Teaching

The British Council grant project accredited by the Ministry of Education of the Czech Republic under the file number 22380/2001-25-111. 22.10.2001-30.04.2002, principal investigator: Ludmila Neuwirthová

Technical Support of Language Learning

BUT grant project for Education Support, 2002, principal investigator: Milena Krhutová

IV.1 Participation in the Faculty Research Intentions

Research of Information and Control Systems

Research programme No. MSM 262200012, principal investigator: Prof. Dr. Jan M. Honzík, FIT Brno, participant: Marcela Borecká

Microelectronic Systems and Technology Research

Research programme No. MSM 262200022 (principal investigator: Prof. Ing. Radimír Vrba, CSc., Dpt of Microelectronics), participants: Milena Krhutová, Dagmar Malíková, Ludmila Neuwirthová

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- The British Council, Opletalova 6, Brno
- The British Council, Národní 10, Prague
- Goethe-Institute, Masarykovo nábřeží, Prague
- SGUN, Heroldovy Sady 1, Prague
- MZK-Austrian Library, Solniční 12, Brno
- MZK-German Library, Solniční 12, Brno
- Ambassy of Federal Republic of Germany, Prague
- Department of English and American Studies, Faculty of Arts, Masaryk University, Brno
- English Department of the Faculty of Education , Masaryk University, Brno
- Language Centre, Faculty of Philosophy and Arts, Charles University, Prague
- Department of Pedagogy of the Faculty of Education, Masaryk University, Brno
- Department of Foreign Languages, Faculty of Sciences, Masaryk University, Brno
- Department of Foreign Languages, Faculty of Law, Charles University, Prague
- Department of Languages, Faculty of Electrical Engineering, Czech Technical University, Prague
- Department of Languages, Faculty of Mechanical Engineering, Czech Technical University, Prague
- Department of Languages, Faculty of Civil Engineering, Czech Technical University, Prague
- Department of Applied Linguistics, Faculty of Humanities, University of West Bohemia, Plzeň
- Department of Applied Languages, Faculty of Informatics nad Management, University of Hradec Králové
- Department of Languages, Faculty of Management and Economics, Tomas Bata University, Zlín
- Department of Languages, Faculty of Economics, Technical University of Ostrava
- Department of Languages, Faculty of Law, Palacky University, Olomouc

- Language Institute, Military Academy, Brno
- State Language School, Brno
- Association of Spanish Teachers, School of Economics, Department of Roman Languages, Prague
- Language advisor for education with the Ministry of Education of the Czech Rebublic and Spanish Ambassy, Prague
- Resource Center, Ambassy of Spain, Pevnostní 9, Prague
- Technology Center, Academy of Sciences of the Czech Republic, Rozvojová 135, Prague
- National Educational Fund, Václavské náměstí 43, Prague
- Ministry of Education of the Czech Republic, Karmelitská 7, Prague

V.2 International Cooperation

- Department of English and American Studies, The University of Vienna, Austria
- Department of Languages, Faculty of Electrical Engineering, Slovak Technical University, Bratislava, Slovakia
- Goethe-Institut, Helene-Weber-Alle 1, D-80604 Munich, Germany
- Friedrich-Ebert Foundation, Hiroshimastrasse 17, Berlin, Federal Republic of Germany
- Bruecke/Most – Stiftung zur Foerderung der deutsch-tschechischen Verstaendigung und Zusammenarbeit, Reinhold-Becker-Stra3e 5, 01277 Dresden-Blasewitz, Federal Republic of Germany
- Ost-West-Kolleg, Willy-Brandt-Stra3e 1, 50321 Bruehl, Federal Republic of Germany
- Max Hueber-Verlag, Max-Hueber-Stra3e 4, 85737 Ismaning, Federal Republic of Germany

V.2.1 Visits of Staff Members to Foreign Institutions

- Milena Krhutová, Jana Matoušková, Department of English and American Studies, The University of Vienna, Austria, 4.11 – 7.11.2002
- Ladislav Baumgartner, Bruecke/Most-Stiftung zur Foerderung der deutsch-tschechischen Verstaendigung und Zusammenarbeit, seminar: „Die deutsch-tschechischen Bezihungen als Thema der politischen Bildung", Bruehl, Federal Republic of Germany, 21.5.-24.5.2002

V.3 Membership in International Organizations and Societies

- Milena Krhutová, IATEFL (The International Association of Teachers of English as a Foreign Language), 3 Kingsdown Chambers, Whitstable, Kent, CT5 2DJ England
- Milena Krhutová, ELTeCS (The English Language Teaching Contacts Scheme), London, England
- Milena Krhutová, IGIP (The International Society for Engineering Education)
- Marcela Borecká: Asociación de profesores de espanol, Prague
- Ludmila Neuwirthová, IATEFL (The International Association of Teachers of English as a Foreign Language), 3 Kingsdown Chambers, Whitstable, Kent, CT5 2DJ England
- Ludmila Neuwirthová, ELTeCS (The English Language Teaching Contacts Scheme), London, England
- Ludmila Neuwirthová, Association of Teachers of English Language- ATECR, Czech Republic
- Ludmila Neuwirthová, CercleS (European Confederation of Language Centres in Higher Education) – CASAJC (Czech and Slovak Association of University Language Teachers), Strasbourg, Prague, Bratislava

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- KRHUTOVÁ, M.: 26 September – European Day of Languages. *BUT NEWS*, vol. XII, no.8, 2002, p. 21. ISSN 1211-4421.
- NEUWIRTHOVÁ, L.: European Framework of Reference for Foreign Language Teaching. *BUT NEWS*, vol. XII, no. 9, 2002, pp. 19,26. ISSN 1211-4421

VI.2 Conferences

- KRHUTOVÁ, M.: *Lexical Cohesion in English Scientific Electrotechnical Texts* In Proceedings of the 7th Conference of English, American and Canadian Studies, Brno, 10–12 September, 2002 (in press)

- FROEHLING, K.: *Canadian Media Commentary on Resurgent Anti-Semitism and Israel in the 21st Century* In Proceedings of the 7th Conference of English, American, and Canadian Studies, Brno, 10-12 September, 2002 (in press)
- BAUMGARTNEROVÁ, A.: *A Questionnaire as a Supportive Evaluation in ESP at University of Technology*. SPECTRUM 2000; November 2002, pp. 15-16. ISBN 80-238-9358-0

VII. OTHER ACTIVITIES

- Creating electronic texts and textbooks with the purpose of of making them available to the students of the Department at the department's regular web pages: Mgr. L. Baumgartner, PaeDr. A. Baumgartnerová, PhDr. M. Borecká, Mgr. J. Hofmanová, PhDr. D. Malíková, PhDr. L. Neuwirthová
- Preparation and Conducting State Exam in German Language: Mgr. D. Zavřelová, Mgr. L. Baumgartner, PhDr. M. Krhutová
- Successful preparation to the most widely known international exam "First Certificate in English": Mgr. J. Matoušková, K. Froehling, M.A.
- Krhutová, M.: the fourth year of PhD studies at the Department of English and American Studies, Faculty of Arts, MU Brno. "The Language of Electrotechnical Engineering and Computer Science as a Special Province".
- Matoušková, J.: the third year of PhD studies at the Department of English and American Studies, Faculty of Arts, MU Brno. "Lexical and Stylistic Features of Czech and English Texts".
- Neuwirthová, L.: the second year of PhD studies at the Department of Pedagogy, Pedagogical Faculty, MU Brno. "The Attainment Targets in Foreign Language Teaching at Technically Orientated Universities".
- Malíková, D.: participation in the seminar First Certificate exams and Business English „Preparing for Exams and for Real Life", Cambridge University Press, 6.6.2002, Brno
- Neuwirthová, L.: participation in the seminar „The University Modern Languages Certificate UNIcert", Faculty of Arts, Charles University, Prague, 8.11.2002
- Borecká, M.: language support for the Industrial Automation Group, FEEC BUT, Brno
- Borecká M.: supervisor at the International Cambridge Examinations, University of Cambridge Local Examinations Syndicate, English as a Foreign Language, at the centre level in Brno
- Borecká, M: supervisor at the State Exam, State Language School, Brno
- Malíková, D.: supervisor at the State Exam, State Language School, Brno
- Malíková, D.: language support for the Dean's Office and Rector's Ofiice
- Neuwirthová, L.: member of the Language Institute Scientific Board , Military Academy, Brno
- Neuwirthová, L.: expert opinion on the internal scientific project no. UJPv05-44p04: Comparison of English and Spanish Languages. Language Institute of Military Academy Brno, 14.2.2002

DEPARTMENT OF MATHEMATICS

Head of Department: Prof. Ing. Jan Chvalina, DrSc.

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I. STAFF

Professors:

Prof. RNDr. Josef Diblík, DrSc., Prof. RNDr. Václav Havel, DrSc., Prof. RNDr. Jan Chvalina, DrSc., Prof. RNDr. František Melkes, Csc., Prof. RNDr. František Neuman, DrSc.

Associate Professors:

Doc. RNDr. Jaromír Baštinec, CSc., Doc. RNDr. Jaroslav Bayer, CSc.,
Doc. RNDr. Zdeněk Šmarda, CSc., Doc. RNDr. Josef Zapletal, CSc.

Lecturers:

RNDr. Lubomír Bajgar, Mgr. Helena Durnová, Ph.D., RNDr. Břetislav Fajmon, Ph.D., RNDr. Petr Fuchs, Ph.D., RNDr. Anežka Haluzíková, CSc., RNDr. Milena Hanzálková, RNDr. Marta Chrastinová, RNDr. Ilona Knéslová, RNDr. Martin Kovár, Ph.D., RNDr. Vlasta Krupková, CSc., RNDr. Svatopluk Švarc, CSc., Mgr. Marie Tomšová, RNDr. Otto Tyc, CSc.

Technical Staff:

Jiří Novák, Tomáš Harwot

Assistant Lecturers:

Mgr. Jan Koláček, Mgr. Michal Novák, Mgr. Martin Řezáč, RNDr. Edita Kolářová, Mgr. Irena Růžičková

Administrative Staff:

Marie Krejčířová

II. FACILITIES

- Three computer laboratories serving to the courses M1B, M2B, M3B – especially Pascal, MATLAB and MAPLE programming environment. Each of these laboratories is equipped with 10 computers for students and one for the teacher.

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Linear Algebra and Geometry	Y2 L1, winter	2/2	Haluzíková
Mathematical Analysis 1	Y2 L1, winter	3/4	Bayer
Mathematics 1 – Bachelor's Study	Y1, winter	4/2	Chvalina
Mathematical Seminar – Bachelor's Stu.	Y1, winter	0/2	Fuchs
Linear Algebra – FIT	Y1, winter	2/1	Kovár
Discrete Mathematics – FIT	Y1, winter	2/2	Kovár
Algebra and Discrete Mathematics	Y1 L1, summer	2/2	Haluzíková
Algebras and Graphs (VTI)	Y1 L1, summer	2/2	Kovár
Mathematical Analysis 2	Y1 L1, summer	3/4	Diblík
Mathematical Analysis 2 (VTI)	Y1 L1, summer	3/4	Krupková
Programming and Computers 2	Y1 L1, summer	3/2	Bajgar
Mathematical Seminar 2	Y1 L1, summer	0/2	Zapletal
Multidimensional Integral and Differential Equations	Y2 L1, winter	3/3	Šmarda
Chosen Parts of Mathematics (VTI)	Y2 L1, winter	3/3	Švarc
Probability and Mathematical Statistics	Y2 L1, summer	2/2	Baštinec
Numerical Mathematics and Probability (VTI)	Y2 L1, summer	3/3	Zapletal
Integral Transforms	L2, winter	3/3	Melkes
Orthogonal Systems of Special	L2, winter	2/2	Švarc

Functions			
Mathematical Statistics and Econometrics	L2, winter	3/2	Zapletal
Statistical Methods	L2, winter	2/2	Zapletal
Differential Equations in Electrical Engineering	L2, summer	2/2	Diblík
Matrix Calculus	L2, summer	2/2	Hrůza
Modern Numerical Methods	L2, summer	2/3	Melkes
Operational Research	L2, summer	2/2	Zapletal

III.2 Doctoral Programme (PhD)

Discrete Processes in Electrical Engineering	Winter	39 hrs.	Diblík
Algebra, Combinatorics, Graphs	Winter	39 hrs.	Havel
Numerical Solutions of Fields	Winter	39 hrs.	Melkes
Impulse Function, Application in Electrotechnical Engineering	Winter	39 hrs.	Šmarda
Statistical Methods of Data Processing	Winter	39 hrs.	Zapletal
Elements of Tensor Calculus	Summer	39 hrs.	Bayer
Complex Variable in Electrical Engineering	Summer	39 hrs.	Diblík
Logic	Summer	39 hrs.	Havel
Differential Equations in Electrical Engineering	Summer	39 hrs.	Melkes
Variational Calculus in Electrical Engineering	Summer	39 hrs.	Šmarda
Operations Research	Summer	39 hrs.	Zapletal

III.3 Study in English Language (International Students)

Mathematics I – Bachelor's Study	Y1, winter	4/2	Diblík
Linear Algebra – Bachelor's Study FIT	Y1, winter	2/2	Kovár
Discrete Mathematics – BS FIT	Y1, winter	3/2	Kovár
Mathematics II	Y1 L1, summer	3/4	Diblík
Discrete Mathematics	Y1 L1, summer	2/2	Havel
Mathematics III	Y2 L1, winter	3/3	Diblík
Mathematics IV	Y2 L1, summer	2/2	Zapletal
Statistical Methods	L2, winter	2/2	Zapletal

IV. RESEARCH PROJECTS

Information and Control Systems
  Research programme No. MSM 262200012, participants: František Melkes, Martin Kovár

Technologies and Operation Processes Automization
  Research programme No. MSM 262200013, participants: Josef Diblík, Zdeněk Šmarda, Jaromír Baštinec

Continuous and Set Theoretical Methods in Topological and Algebraic Structures
  Grant project GAČR No. 201/00/1466, principal investigator: Martin Kovár

Qualitative Properties of Functional Differential Equation Solutions and Their Application
  Czech – Slovak cooperation grant project No. 25 (022), participants: Josef Diblík, Jaromír Baštinec

Qualitative Theory of Difference Equations Solving
  Grant project GAČR No. 201/01/0079, principal investigator: Josef Diblík, participant: Jaromír Baštinec

Oscillation Theory for Functional Differential Equations
  Czech – Chinese cooperation grant project, ME 423, principal investigator: Josef Diblík, participant: Jaromír Baštinec

Heterogeneous Systems Development, Modelling and Application Environment
  Grant project GAČR No. 102/01/1485, principal investigator: František Melkes.

Algorithms By Playing – at School or at Home
  Grant project FRVŠ No. 1726/2002, principal investigator: Milena Hanzálková.

Mathematics and Physics at the Faculty of Information Technology
  Grant project FRVŠ No. 1714/2002, principal investigator: Vlasta Krupková

Nonuniqueness Theory for Ordinary Differential Equations
  Czech – Austrian cooperation grant project No. ME 412001, principal investigator: Josef Diblík
Symbolical, Semisymbolical and Numerical Methods of Analysis, Electrical Circuits Design and Optimization
  Grant project GAČR No. 101/01/0432, principal investigator: Josef Diblík
Microelectronic systems and technologies (MICROSYT)
  Research programme No. MSM 262200022, participant: František Melkes

<u>**V. Cooperations**</u>

V.1 Cooperations in the Czech Republic
- Dept of Mathematics, Faculty of Civil Engineering, Czech Technical University, Prague
- Dept of Mathematics, University of Chemical Technologies, Prague
- Dept of Mathematical Analysis, Faculty of Mathematics and Physics, the Charles University, Prague
- Dept of Mathematical Analysis, Faculty of Science, the Masaryk University, Brno
- Dept of Mathematics, Faculty of Science, the Masaryk University, Brno
- Dept of Algebra and Geometry, Faculty of Science, the Masaryk University, Brno
- Dept of Mathematics, Faculty of Education, the Masaryk University, Brno
- Dept of Mathematics, Faculty of Science, Ostrava
- Dept of Mathematical Analysis and Applied Mathematics, Faculty of Science, The Palacký University, Olomouc
- Dept of Algebra and Geometry, Faculty of Science, The Palacký University, Olomouc
- Mathematical Institute, Academy of Science, Prague
- Mathematical Institute, Academy of Science, Brno
- Dept of Mathematics, Faculty of Mechanical Engineering, Brno University of Technology
- Dept of Solid Mechanics, Faculty of Mechanical Engineering, Brno University of Technology
- Dept of Mathematics, Military Academy, Brno
- Dept of Mathematics and Computer Science, Faculty of Economical state defence, Military Academy, Vyškov
- Dept of mathematics, Faculty of Education, České Budějovice
- Tatra, a. s., Kopřivnice

V.2 International Cooperation
- Prof. Saeid Safari, Dept of Mathematics, Roskilde University, Copenhagen, Denmark
- Dept of Mathematics, University of Veszprém, Hungary
- Dept of Mathematical Analysis, Dresden University of Technology, Germany
- Dept of Mathematics, Klagenfurt University, Austria
- Dept of Mathematics, the University of Žilina, Slovak Republic
- Mathematical Institute, Technical University of Poznan, Poland
- Dept of Mathematics, Warszaw University - Bialystok, Poland
- Dept of Mathematics, Faculty of Cybernetics, Kiev State University, the Ukraine
- Dept of Mathematics, Plovdiv Technical University, Bulgaria
- Dept of Mathematics, Sophia Institute of Metallurgy, Bulgaria
- Courant Institute, New York University, USA
- Prof. Dr. Thomas Vougiouklis, Democritus University of Thrace, Department of Mathematics, Alexandroupolis, Greece
- Prof. Dr. Pierguilio Corsini, Udine University, Dept. Of Mathematics and Computer Science, Udine, Italy

V.2.1 Visitors to the Department
- Prof. F. Hartung, Dept of Mathematics, University of Veszprém, Hungary
- Prof. M. Pituk, Dept of Mathematics, University of Veszprém, Hungary
- Prof. D. Khusainov, Dept of Mathematics, Faculty of Cybernetics, Kiev State University, the Ukraine

- Dr. M. Růžičková, Dept of Mathematics, the University of Žilina, Slovak Republic
- Prof. A. Wyrwinska, Mathematical Institute, Technical University of Poznan, Poland
- Prof. Chr. Nowak, Klagenfurt University, Austria
- Prof. A. Boichuk, The Ukraine Academy of Science, Kiev

V.2.2 Visits of Staff Members to Foreign Institutions

- Josef Diblík, Dept of Mathematics, Klagenfurt University, Austria
- Josef Diblík, Dept of Mathematical Analysis, Dresden University of Technology, Dresden
- Josef Diblík, Dept of Mathematics, the University of Žilina, Slovak Republic

V.3 Membership in International Organizations and Societies

- Jaromír Baštinec, Union of Czech Mathematicians and Physicists
- Jaroslav Bayer, Union of Czech Mathematicians and Physicists
- Josef Diblík, American Mathematical Society
- Josef Diblík, Europen Mathematical Society
- Josef Diblík, Union of Czech Mathematicians and Physicists
- Václav Havel, American Mathematical Society
- Martin Kovár, New York Academy of Science
- Vlasta Krupková, Czech – Slovak Committee of Teaching Mathematics at Technical Universities (established by the Union of Czech Mathematicians and Physicists)
- Zdeněk Šmarda, Union of Czech Mathematicians and Physicists
- Jan Chvalina, Union of Czech Mathematicians and Physicists, the member of the Brno committee
- Jan Chvalina, ICMI (International Commission for Mathematical Instructions)

V.4. Membership in scientific, expert and editorial boards

- Jan Chvalina, membership in science councils at Ostrava University, Faculty of Science, Palacký University, Olomouc
- Jan Chvalina, membership in editorial board of Discussiones Mathematicae. General Algebra and Applications
- Jan Chvalina, membership in expert councils of doctor´s study programmes. Discrete mathematics, Faculty of Education, Olomouc, Algebra and geometry, Faculty of Science, Olomouc, Mathematical education, Faculty of Education, Prague, Education, Faculty of Education, Olomouc, Applied Algebra, Faculty of Science, Ostrava, Army and Population Protection, Military Aademy, Vyškov.
- Josef Diblík, membership in editorial board of Studies of University in Žilina, Mathematical – Physical series.

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- KOVÁR, M. On weak reflections in some superclasses of compact spaces I. *Topology Proceedings*, ISSN 0146-4124, 2002, Vol. 25, n. 1, p. 575 - 587.
- DIBLÍK, J., KHUSAINOV, D. Asymptotic estimation of the convergence of solutions of the equation x´(t)=b(t)x(t-T(t)). *ARCHIVUM MATHEMATICUM*, ISSN 0044-8753, 2002, Vol. 37(2001), n. , p. 279 - 287.
- DIBLÍK, J. Asymptotic convergence criteria of solutions of delayed functional differential equations. *Journal of Mathematical Analysis and Application*, ISSN 0022-247X, 2002, Vol. 274(2002), n. , p. 349 - 373.
- ŠMARDA, Z. On an initial value problem for singular integro-differential equations. *Demonstratio Mathematica*, 2002, Vol. XXXV, n. 4, p. 803 - 811.
- HORT, D., CHVALINA, J., MOUČKA, J. Characterizations of totally ordered sets by their various endomorphisms. *Czechoslovak Mathematical Journal*, ISSN 0011-4642, 2002, Vol. 52, n. 1, p. 23 - 32.
- KOLÁČEK, J. Problems of automatic data-driven bandwidth selectors for nonparametric regression. *Journal of Electrical Engineering*, ISSN 1335-3632, 2002, Vol. 53, n. 12, p. 48 - 51.
- DIBLÍK, J., SVOBODA, Z. An existence criterion of positive solutions of p-type retarded functional differential equations. *Equadiff 10, CD ROM, Papers*, 2002, Vol. 2002, n. , p. 139 - 141.

- DIBLÍK, J., KHUSAINOV, D., BENDITKIS, D. Bull. Kiev University, Series: Cybernetics. Chapter: *About stability of quadratics systems of differential equations with two conjugating pure imaginary eigenvalues*. 1 ed. Kiev, Ukrajina: Kiev State University, 2002. p. 25 - 31. ISBN 966-76-52-00-9.
- DIBLÍK, J., KHUSAINOV, D., MAMEDOVA, V. Bull.Kiev University, Series Physics and Mathematics. Chapter: *The convergence of the differential equations with pure delay*. 1 ed. Kiev, Ukrajina: Kiev State University, 2002. p. 201 - 210. ISBN 966-76-52-00-9.
- NEUMAN, F. Encyklopedia of Mathematics. Chapter: *d'Alembert equations for finite sum decompositions*. 1 ed. Dordrecht: Kluver Acad. Press, 2002. p. 116 - 116. ISBN 1-4020-0198-3.
- BENDITKIS, D., DIBLÍK, J., KHUSAINOV, D. Bull.Kiev University, Series:Physics and Mathematics. Chapter: *Systems with weak delay in the plane*. 1 ed. Kiev, Ukrajina: Kiev State University, 2002. p. 175 - 181. ISBN 966-76-52-00-9.

VI.2 Conferences

- KOVÁR, M. *Sequence of dualizations of topological spaces is finite* In Proceedings of The Prague Topological Symposium, ISSN 0-9730867-0-X, 2002, Vol. 9, n. 1, p. 181 - 188.
- BAŠTINEC, J., DIBLÍK, J. *Asymptotic behaviour of solutions of linear discrete equations* In Equadiff 10, CD ROM, Papers, 2002, Vol. 2002, n. , p. 21 - 23.
- KUNOVSKÝ, J., MELKES, F. *Analysis of the Taylor Series Terms* In Proceedings of the Conference Modelling and Simulation of Systems, Vol. I. Modelling and Simulation of Systems. Ostrava: , 2002, p. 33 - 38, ISBN 80-85988-71-2.
- DURNOVÁ, H. *Logický zkrat? (Logical Fallacy?)* In XX. mezinárodní kolokvium o řízení osvojovacího procesu. XX.mezinárodní kolokvium o řízení osvojovacího procesu. Vyškov na Moravě: Vysoká vojenská škola pozemního vojska ve Vyškově, 2002, p. 88 - 90, ISBN 80-7231-090-9.
- ŘEZÁČ, M. *Selecting The Bandwidth In Kernel Density Estimation* In Summer School DATASTAT'01 Proceedings. DATASTAT'01. Brno: FOLIA Facultatis Scientiarum Naruralium Universitatis Masarykianae Brunensis Mathematica 11, 2002, p. 207 - 218, ISBN 80-210-3028-3.
- NEUMAN, F. *Transformations and global properties of differential equations* In CDDE 2002. Colloquium on Differential and Difference Equations. Brno: Masaryk University Brno, 2002, p. 23 - 23.
- CHVALINA, J. *Algebraic join spaces of first order linear partial differential operators.* In International Mathematical Workshop. Brno: Brno University of Technology, 2002, p. 1 - 2, ISBN 80-86433-16-1.
- KOVÁR, M. *On iterated dualizations of topological structures* In Abstract of the International Conference on Topology and Its Applications - Topology in Matsue. International Conference On Topology and Its Applications Topology in Matsue. Matsue, Japonsko: Shimane University in Matsue Osaka university, 2002, p. 42 - 43.
- SEDLÁKOVÁ, V., MELKES, F., ŠIKULA, J., DOBIS, P., ROČAK, D., BELAVIČ, D. *Influence od Contact Electrode on Thick Film Resistors Noice and Nonlinerity* In Proc. of 38th International Conference on Microelectronics, Devices and Materials. 38th International Conference on Microelectronics, Devices and Materials. Lipica, Slonenia: , 2002, p. 245 - 251, ISBN 961-91023-0-4.
- BAŠTINEC, J., DIBLÍK, J. *Detection of initial data generating solutions of linear discrete equations with prescribed asymptotic behaviour* In Sixth Crimean International Workshop on the Method of Lyapunov Functions and their Applications, Crimea, Alushta, September 2002. Sixth Crimean International Workshop on the Method of Lyapunov Functions and their Applications. Simferopol, Ukraine: Ministery of Education Ukraine, 2002, p. 24 - 24.
- DIBLÍK, J. *Anti-Lyapunov method for systems of discrete equations* In International Conference on Differential, Difference Equations and their Applications, Patras 2002, Thesis of Conference Reports. Patras, Řecko: University of Patras, 2002, p. 47 - 48.
- KOLÁČEK, J. *Kernel estimation of the regression function - bandwidth selection* In Summer School DATASTAT'01 Proceedings FOLIA Facultatis Scientiarum Naruralium Universitatis Masarykianae Brunensis Mathematica 11. Brno: FOLIA Facultatis Scientiarum Naruralium Universitatis Masarykianae Brunensis, 2002, p. 129 - 266, ISBN 80-210-3028-3.
- ŠMARDA, Z. *Singular initial value problem for nonlinear integro-differential equations* In 1.Mezinárodní matematický workshop. Brno: TERRA computer systems, Olomoucká 81, Brno, 2002, p. 101 - 102, ISBN 80-864333-16-1.
- NOVÁK, M. *Analytická geometrie na pražské univerzitě v letech 1871 - 1903* (Analytic Geometry at Prague University between 1871 and 1903) In XX. International Colloqium on the directed learning process (Proceedings – part II) Vyškov: The Military Academy, Vyškov 2002, p. 274 - 277, ISBN 80-7231-090-9.

- DURNOVÁ, H. *Discrete Optimization: A Chronological Survey* In. VI. Symposium Mathematik - K?eine Insel? 2002.

VI.3 Research and Technical Reports

- Review for magazines. Prof. Dr. Jan Chvalina, D.Sc., Archivum Mathematicum, Czechoslovak Mathematical Journal, Discussiones Mathematicae.
- KOVÁR, M. Review of the article - Charatonik, Janusz J.; Illanes, Alejandro: Various kinds of local connectedness. (English) [J] Math. Pannonica 13, No.1, 103-116 (2002). [ISSN 0865-2090]. Zentralblatt MATH, ISSN 1436-3356, 2002, Vol. 1, No. 1, p. 0997.54028 - 997.

VI.4 Textbooks, Lecture Notes

- KOLÁŘOVÁ, E.: *Mathematical seminar*. Electronic text of The Department of Mathematics FEEC, 104 pages.
- DIBLÍK, J., BAŠTINEC, J., DURNOVÁ, H., ŘEZÁČ, M.: *Matematika 1*. Electronical text for the Bachelor's Study Programme. Dep. Of Mathematics FEEC, 194 pages.
- MELKES, F., ŘEZÁČ, M.: *Matematika 2*. Electronical text for the Bachelor's Study Programme. Dep. Of Mathematics FEEC, 108 pages.
- FAJMON. B., RŮŽIČKOVÁ. I.: *Matematika 3*. Electronical text for the Bachelor's Study Programme. Dep. Of Mathematics FEEC, 177 pages.
- ZAPLETAL, J., TOMÁŠ, J.: *Operační analýza*. Electronical text for the Doctor's Study Programme. Dep. Of Mathematics FEEC, 181 pages.
- ZAPLETAL, J., TOMÁŠ, J., DURNOVÁ, H.: *Introduction to the Theory of Probability and Statistics*. Electronical text in English for the Doctor's Study Programme. Dep. Of Mathematics FEEC, 76 pages.

VII. OTHER ACTIVITIES

- Organizing entrance examination in mathematics – FEEC, FIT.
- Preparatory course of Mathematics. We established a course for the secondary school students to prepare them for the entrance examination at technical colleges.
- Seminar on the differential equations, Faculty of Science, Masaryk University. Participation in and organization of the seminar.
- Seminar on the numerical methods, Faculty of Mechanical Engineering, Brno University of Technology. Participation in and organization of the seminar.
- Seminar on the history of mathematics, Faculty of Science, Masaryk University. Participation in and organization of the seminar.
- Seminar „Dialogues on Mathematics" held by the Department of Mathematics FEEC – organization of and taking part in the seminar.
- 8th Conference STUDENT FEEC 2002. Participation in the organization of the conference.

DEPARTMENT OF MICROELECTRONICS

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I. STAFF

Professors:

Prof. Ing. Jaromír Brzobohatý, CSc., Prof. Ing. Radimír Vrba, CSc., Prof. Ing. Vladislav Musil, CSc.

Associate Professors:

Doc. Ing. Arnošt Bajer, CSc., Doc. Ing. Pavel Legát, CSc., Doc. Ing. Ivan Szendiuch, CSc.,
Doc. Ing. František Urban, CSc.

Lecturers:

Ing. Jaroslav Boušek, CSc., Ing. Edita Hejátková, RNDr. Michal Horák, CSc., Ing. Vladimír Kolařík,
Ph.D., Ing. Milan Recman, CSc., Ing. Josef Šandera, Ing. Jana Trunkátová, CSc.

Technical Staff:

Ing. Daniel Bečvář, Ing. Jan Garčic, Ing. Petr Hub, Ing. Roman Prokop, Ing. Zuzana Grosmanová,
Ing. Jaromír Hubálek, Jan Žaloudek

Postgraduate Students:

Ing. Lukáš Daněk, Ing. Lukáš Fujcik, Ing. Jiří Háze, Ing. David Chvastek, Ing. Ahmad Khateb,
Ing. Vít Matoušek, Ing. Filip Mika, Ing. Ondřej Sajdl, Ing. Michal Skočdopole, Ing. Jindřich Bulva,
Ing. Feras Moalla, Ing. Radek Kuchta, Ing. Robert Pasz, Ing. Miroslav Zachariáš, Ing. Jaromír Bílek,
Ing. Miroslav Hora, Ing. Karel Malysz, Ing. Jan Prášek, Ing. Radovan Novotný, Ing. Jan Jaroš,
Ing. Michal Bazalka, Ing. Břetislav Mikel, Ing. Petr Tomiczek

Administrative Staff:

Jarmila Fučíková, Petra Jedličková, PhDr. Jarmila Jurášová

II. FACILITIES

II.1 Teaching and Research Laboratories

- Integrated Circuits Design Laboratory
- Electronic Devices Laboratory
- Practical Electronics Laboratory Flextronics
- Optoelectronics and Laser Laboratory
- Microelectronics Technologies Laboratory (thick film, surface mounting technology, packaging)
- Biosensors Laboratory
- Microprocessor Techniques Laboratory
- Electronic Instruments and Systems Design Laboratory
- Computer Classroom with PC Pentium (I)
- Computer Classroom with PC Pentium (II)
- Joint Electron-beam Lithography Laboratory: UMEL FEECS VUT, UPT AV ČR v Brno
- Joint Laboratory of Electronics Technologies: UMEL and UETE FEECS VUT, SMT plus Brno

II.2 Special Instrumentation and Computers

- Integrated circuits design: workstations HP 2600, HP 712/60, HP 715/80, HP 715/100, plotter A1/A2 HP 757, postscript printer HP LJ5RP.
- Electronic instruments and systems design: automatic measure workplace (PC 486, unit for data acquisition HP34970A with 20-channel multiplexer, oscilloscope HP 54600A, power source HPE3631A, generator HP33120A), oscilloscope HP54603 + current probe, Tektronix 2201, 76330, and HX720. Precise impedance analyzer HP4284A, logic analyzer Philips PM 365, digital multimetr Solartron 7065, waveform generator HP 8116 A, signal generator Tesla BM 492, multimeters Metex 3850 and 3860M

with equipment for power measurements, programmer ALL07 + erase unit UV, programmer of microcontroller MC68HC05 and MC68HC11, programmer ATMEL for AT89C2051 and AT89/90, programmer and developmental units with microcontroller Analog Devices AduC812, oven with regulated temperature KC 65, spectrum analyzer Advantest R3131, software Control Web (Moravské přístroje) for control of measuring and technological applications with subsequent process visualization.

- Electronic componets: ten workplaces equipped with analog oscilloscope 40/60MHz, functional generator HC8205, DC power supply sources, multimeter Metex 8200, system for data collection: four channel in multiplex mode, connected with each workplace, controlled by computer PC Pentium, 12bit card with sampling frequency 4x50 kHz or 3x10 MHz, converter DA 2x8 bit with FIFO memory, software Win for collection and data processing. For special purposes: capacity meter HP 4280A, digital oscilloscope Tektronics 210.
- Optoelectronic: lasers, holography, measurement of spectral properties of optoelectronic components characteristics, measurement of optical fibre parameters.
- Microelectronic technologies: SMT mounting equipment (Fritsch) with "hot plate" re-flow system for BGA, CSP and flip-chip – computer driven, bonding ultrasonic machines (Al leads), ovens for thick film HIC (up to 1200 °C), semiautomatic screen process printing machine UL 150, trimming machine COMCO TR 1800, surface mounting technology (re-flow soldering, wave soldering Hollis, hot air soldering Weller, Pace), packaging equipment, interference microscope, color CCD camera, design systems HYDE and HIOCAD.
- Electron lithography: electron beam lithograph BS 600, computers for exposition data preparation and exposition check.

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Optoelectronics	3 Y, summer	2/1	Musil
Integrated Circuit Design	3 Y, summer	3/0	Urban
Microprocessor Technology	3 Y, summer	0/3	Legát
Laser Technology	3 Y, summer	2/2	Urban
PC Technology	3 Y, summer	2/3	Kolařík
Design of Electronic Instruments	3 Y, summer	3/2	Vrba

III.2 Master´s Programme (Ing)

Analogue Circuits	1 Y, 2 L, winter	3/2	Brzobohatý
Computer in Manager Practice	1 Y, 2 L, winter	2/3	Trunkátová
Digital Circuits	1 Y, 2 L, summer	3/2	Vrba
Modelling and Simulation	1 Y, 2 L, summer	3/4	Kolařík
Vacuum and Ultravacuum Technology	1 Y, 2 L, summer	2/2	Šandera
Fabrication of Construction Elements	2 Y, 2 L, winter	3/2	Szendiuch
Design of Integrated Circuits	2 Y, 2 L, summer	3/3	Musil
Optoelectronics and Communications Networks	2 Y, 2 L, summer	3/3	Urban
Quality Control	3 Y, 2 L, winter	3/1	Fiedler
Diagnostics and Testing in Electronics	3 Y, 2 L, winter	3/2	Musil
PC Technology and Communication	3 Y, 2 L, winter	3/3	Hub
Minimum Business Practice	3 Y, 2 L, summer	2/2	Legát

III.3 Doctoral Programme (PhD)

Photonics	winter	42 hrs	Urban
Modern Managing Methods	summer	42 hrs	Fiedler
New Principles for IC Design	winter	35 hrs	Brzobohatý
Integration Method of HIC, ASIC, PM	winter	42 hrs	Szendiuch
Digital Integrated Circuits Simulation	winter	42 hrs	Musil
A/D and D/A Converters	summer	42 hrs	Vrba

III.4 Study in English Language (International Students)

Analogue Circuits	1 Y, 2 L, summer	3/2	Musil

Electronic Devices	1 Y, 2 L, winter	3/2	Horák
Sensors	3 Y, 2 L, winter	3/2	Szendiuch
Microelectronics	3 Y, 2 L, summer	3/2	Brzobohatý
Microwave Electronics	3 Y, 2 L, summer	3/2	Horák
Electronic Circuits I	2 Y, 2 L, winter	3/2	Brzobohatý
Electronic Circuits II	2 Y, 2 L, summer	3/2	Brzobohatý
Czech Language	all semesters	2/2	Jurášová
Diploma Seminar	3 Y, 2 L, summer	2/2	Horák

IV. RESEARCH PROJECTS

IV.1 Projects

INTIM – Inteligent integrated microsensors and microsystems

Grant project GAČR No. 102/00/939, principal investigator: Radimír Vrba

SENSVISION – Internet connection to a process

Project Konsorcia FD K/104 s BD Senzors s.r.o., principal investigator: Radimír Vrba

SmartFuel

Grant project EU 5th Framework EU, No. G4RD-CT-2002-00769, principal investigator: Radimír Vrba.

NEXUS

Grant project No. CP94-0793 Pan-European Network in Microsystems, principal investigators: Jaromír Brzobohatý, Radimír Vrba

Flemish project TSJ/003/01

Training Centre in Brno for Designers in Electronic Systems (BTIC), IMEC, Leuven/Heverlee, Belgium, co-investigator: Jaromír Brzobohatý

PHARE – InterPRISe

Grant project Interregional Co-operation for Promoting Regional Innovation Strategies in Europe, principal investigator: Vladislav Musil

Special sensors for research of ionised gasses

Grant project GAČR No. 42 1311, principal investigator: Vladislav Musil

New circuit principles and functional blocks for integrated circuit design

Grant project GAČR No. 42 1312, principal investigator: Jaromír Brzobohatý

Innovation of exercises from Digital circuits

Grant project FRVŠ No. 1760, principal investigator: Radimír Vrba

Realisation of modern functional blocks of integrated circuits

Grant project FRVŠ No. 1769, principal investigator: Daniel Bečvář

Introduction of modern trends into tuition of Analogue circuits

Grant project FRVŠ No. 1789, principal investigator: Jaromír Brzobohatý

Innovation of subject on Design and technology of electronic equipments

Grant project FRVŠ No. 1811, principal investigator: Vladislav Musil

Manufacturing of student chip as a part of diploma thesis

Grant project FRVŠ No. 1836, principal investigator: Jaromír Hubálek

Optimal method for sensing and evaluation of accumulated charge in traction battery

Grant project FRVŠ No. 1843, principal investigator: Jaroslav Boušek

Monitoring system for electric-powered vehicle

Grant project FRVŠ No. 1851, principal investigator: Radek Kuchta

Modernisation of the tuition process of electronic technologies

Grant project FRVŠ No. 1920, principal investigator: Ivan Szendiuch

Optimisation of methods for thick films deposition for sensors

Grant project FRVŠ No. 1931, principal investigator: Jan Prášek

Optical systems and networks

Grant project FRVŠ No. 1934, principal investigator: František Urban

Modernisation of tuition of sensor technology

Grant project FRVŠ No. 1940, principal investigator: Radimír Vrba

Methodology of optimisation of technological processes within practical applications

Grant project FRVŠ No. 1958, principal investigator: Radovan Novotný

IV.2 Participation

Relief submicron diffractive structures created by means of electron beam lithography
 GAAV S2065014, principal investigator: František Matějka, UPT AV ČR.

IV.3 Participation in the Faculty Research Intentions

MSM262200022 (principal investigator: Prof. Radimír Vrba, UMEL)
 participants: Radimír Vrba and 22 co-workers from UMEL

MSM 262200011 (principal investigator: Prof. Jiří Svačina, UREL)
 participants: Jaromír Brzobohatý, Radimír Vrba, Daniel Bečvář

MSM 262200010 (principal investigator: Prof. Jiří Kazelle, UETE)
 participants: Radimír Vrba, Jaromír Hubálek, Jaroslav Boušek.

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- ALCATEL Microelectronics, Vídeňská 125, 619 00 Brno
- ASICentrum, s. r. o., Novodvorská 994, 142 21 Praha 4
- AVX CR, s. r. o. Lanškroun, Dvořákova 328, 56301 Lanškroun
- BD Sensors, s. r. o., Sadová 1385, 686 05 Uherské Hradiště
- CEDO Brno, Vídeňská 127, 619 00 Brno
- CSRC, Štursova 71, 616 00 Brno
- Delong Instruments s. r. o., Brno
- EPRONA, a. s., 512 45 Rokytnice nad Jizerou
- Krejčí Engineering, Tišnov
- Motorola s. r. o., European Semiconductor Group, Klimentská 46, 11002 Praha 1
- On Semiconductor, SCG Czech Design Center s. r. o., B. Němcové 1720, 756 61 Rožnov pod Radhoštěm
- TEROSIL, a. s., 1. máje 1000, 756 61 Rožnov pod Radhoštěm
- Tesla Lanškroun, divize HIO a PM, Dvořákova 324, 56324 Lanškroun
- Tesla SEZAM, a. s., 1. máje 1000, 756 61 Rožnov pod Radhoštěm
- Institute of Scientific Instruments AVČR, 612 09 Brno, Královopolská 147
- VEMER ČESKÁ, s. r. o., Entrelec Vemer, s. r. o., Dusíkova 1, 63800 Brno

V.2 International Cooperation

- Bournemouth University, Dept of Electronics, Bournemouth, UK
- Fraunhofer–Institute fur Siliziumtechnologie, Berlin, Germany
- IMEC, Leuven, Belgium
- KHBO, Oostende, Belgium
- Leeds Metropolitan University, Faculty of Information and Engineering Systems, Leeds, Great Britain
- MEGATRON, Putzbrunn, München, Germany
- Philips, Eindhoven, Holland
- Universitat Rovira I Virgili, Tarragona, Spain
- VEMER Group, Brughezio Milano, Italy

V.2.1 Visitors to the Department

- Prof. Xavier Vilanova Salas, Eduatd Llobet-Valero, Xavier Correig-Blanchar, Universitat Rocira i Virgili, Spain, October, cooperation in the field of fluid sensors, September 7-10, 2002
- Dr. Lothar Abicht, isw Halle-Lipsko, Germany. Seminar: Foundation and activities of training centres for information technologies (Zakládání a provoz školících center pro pracovníky v oborech informačních technologií). In the frame of the InterpRISe Programme of the EU. November 21-24, 2002
- Dipl. Ing. Petr Hrassky, STMicroelectronics, European Automative Center, Grasbrunn-Munich, Germany. February 26-28, 2002. Lecture: New developments and trends in dedicated smart-power integrated circuits for automotive electronics.

- Dr. Istvan Cocron, Dr. Robin Shields, National Semiconductor, May 8-10, 2002, cooperation in the field of integrated circuit design
- Dr. Istvan Cocron, Dr. Paavo Takalo, National Semiconductor, September 24-25, 2002, cooperation in the field of integrated circuit design
- Prof. Jozef Vanneuville, KHBO Brugge/Ostende, Belgium. January 28-31, 2002, August 12-15, 2002, September 25-27, 2002. Research cooperation.
- Dr. Serge Sibony, Goodrich Actuation Systems, France, October 21-23, 2002, progress meeting of the SmartFuel Programme/WP2.
- Dipl. Ing. Hans-Dietrich Schnell, Autoflug GmbH, Hamburg - Rellingen, Germany, meeting with the research team for the SmartFuel Programme (5th frame of EU). September 26-27, 2002.
- Ing. Valerie Loosveld a Ing. Jeroen Lambert, IMEC-KHBO Oostende (Belgium), November 11-15, 2002, Short intensive course on VHDL: Designing with VHDL – introduction, applications and demonstrations. In the frame of the Flemish project TSJ/003/01.
- Prof. Juri Demakov – Dean of Faculty of Instrumentation of the TU Izhevsk, A. Abilov - Vice-Dean of Faculty of Instrumentation of the TU Izhevsk, O. Nedzvedskaja – of Faculty of Instrumentation of the TU Izhevsk, Russia, November 17-30 (November 25 at UMEL), 2002. Possible research cooperation.

V.2.2 Visits of Staff Members to Foreign Institutions

- Vladislav Musil, Great Britain, Leeds Metropolitan University. Workshop on Design of high-sped PCBs. June 7-11, 2002.
- Jaromír Brzobohatý, Italy. Visit of the LABEN, coordination meeting of the SmartFuel Programme and special measuring in plasma laboratory. June 7-9, 2002.
- Jaromír Brzobohatý, Prof. V. Musil. KHBO Brugge/Oostende: teaching and project-coordinating stay. May Socrates Programme. May 26 – June 1, 2002.
- Jan Prášek, Spain, Universitat Rovira i Virgili, research of chemosensors. 5 months, Socrates Programme
- Karel Malysz, Spain, Universitat Rovira i Virgili, research of fluid sensors. 5 months, Socrates Programme
- Jaromír Hubálek, Spain, Universitat Rovira i Virgili, research of chemosensors. 6 months, scholarship from the Spanish Ministry of Education

V.3 Contracts

- Jaromír Brzobohatý: Contract G4RD-CT-2002-00769 (5th frame of the EU – SmartFuel), signed 11.9. 2002. Duration of 3 years.
- Szendiuch, Joint workplace for research of biosensors, Krejčí Engineering Tišnov, CZ, signed 28 June 2003
- Vladislav Musil: Training centre for design and technology of modern electronic systems. Inter-regional programme PHARE. Agreement with the Brno Council.
- Ivan Szendiuch, Hybrid integrated circuits and surface mounting, Tesla Lanškroun, CZ
- Radimír Vrba: Remote Controlled High-Voltage Quadruple Power Supply. Krejčí Engineering Tišnov, CZ
- Radimír Vrba: Programme Analysis, Development and Design for Smart Sensor Communication with ARM 7 System via Internet using Ethernet. BD Sensors, s. r. o., Uherské Hradiště, CZ

V.4 Membership in International Organizations and Societies

- Jaromír Brzobohatý: senior member IEEE (USA),
- Jaromír Brzobohatý: member of the New York Academy of Sciences (USA),
- Jaromír Brzobohatý: member of AMSE (France)
- Jaromír Brzobohatý: member of IMEC Partnership Programme (Belgium)
- Radimír Vrba: vice-president of the international scientific association AMSE, address: 16, Av. Grange Blanche, F-69160 Tassin-la-Demi-Lune (France)
- Radimír Vrba: member of *Editorial Board* international scientific periodical AMSE, Lyon (France)
- Vladislav Musil: member of IEEE (USA)
- Vladislav Musil: member of the New York Academy of Sciences (USA)

- Ivan Szendiuch: president International Society for Microelectronics and Packaging, Czech and Slovak Chapter, member of TPC Europe
- Ivan Szendiuch: member of IMAPS (USA)
- Michal Horák: member of IEEE (USA)

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- NOVOTNÝ, R. Weibullovo rozdělení při analýzách bezporuchovosti (Weibull distribution in reliability analysis). *Elektrorevue - Internetový časopis (http://www.elektrorevue.cz)*, ISSN 1213-1539, 2002, Vol. 17/2002, n. 2, p. 0 - 5.
- SZENDIUCH, I. Trendy montážních technologií v mikroelektronice (Trends of SMT in Microelectronics). *Sdělovací technika*, ISSN 0036-9942, 2002, Vol. 2002, n. 8, p. 3 - 5.
- NOVOTNÝ, R. Six sigma (koncepce a metodologie) (Six sigma (Conception and Methodology)). *Moderní řízení*, ISSN 0026-8720, 2002, Vol. 7, n. 7, p. 27 - 30.
- NOVOTNÝ, R. Principy techniky kanban uplatňované ve výrobních i distribučních systémech (Principles of kanban technique in the production and distributive systems). *Logistika*, ISSN 1211-0957, 2002, Vol. 3/2002, n. 3, p. 26 - 26.
- HORÁK, M. Intrinsic Microwave Characteristics of a Heterostructure Barrier Diode. *Journal of Electrical Engineering*, ISSN 0013-578X, 2002, Vol. 2002, n. 11/12.
- MIKEL, B., RŮŽIČKA, B., ČÍP, O., LAZAR, J., JEDLIČKA, P. Stabilní polovodičové lasery v metrologii délek (Semiconductor lasers in metrology of lenght). *Jemná mechanika a optika*, ISSN 0447-6441, 2002, Vol. 2002, n. 11-12, p. 341 - 344.
- POSPÍŠIL, J., BRZOBOHATÝ, J., HANUS, S., MICHÁLEK, V., DOSTÁL, T. Advances in Systems Science: Measurement, Circuits and Control (Ed: N.E. Mastorakis). Kapitola: *RL Equivalent Circuits of the Simplest Op-Amp Structures*. 1 vyd. Greece: WSEAS Press, 2002. s. 107 - 110. ISBN 960-8052-64-5.
- POSPÍŠIL, J., KOLKA, Z., HANUS, S., MICHÁLEK, V., BRZOBOHATÝ, J. Advances in Systems Science: Measurement, Circuits and Control (Ed: N.E. Mastorakis). Kapitola: *General Form of Optimised State Model of the Second-Order Dynamical systems.*. Greece: WSEAS Press, 2002. s. 120 - 122. ISBN 960-8052-64-5.

VI.2 Conferences

- NOVOTNÝ, R. *Taguchiho přístup v optimalizaci technologického procesu* (Technological Process Optimization using Taguchi Approach) In Analýza dat a statistické metody pro praxi. Analýza dat a statistické metody v praxi. Pardubice: 2002, p. 163 - 167, ISBN 80-238-9281-9.
- KUČERA, P., ZEZULKA, F., ŠVÉDA, M., VRBA, R. *Executable specification for Process Automation and Microelectronics* In IEEE TC-ECBS and IFIP WG10.1 Joint Workshop on Formal Specifications of Computer-Based Systems. IEEE TC-ECBS and IFIP WG10.1 Joint Workshop on Formal Specifications of Computer-Based Systems. Lund: 2002, ISBN 1-85769-169-5.
- POSPÍŠIL, J., KOLKA, Z., BRZOBOHATÝ, J., HANUS, S., DOSTÁL, T. *Optimized Higher-Order Dynamical Systems* In Proc. of the IASTED International Conference Modelling, Identification and Control (MIC'2002). IASTED International Conference "Modelling, Identification, and Control". Innsbruck: 2002, s. 496 - 499, ISBN 0-88986-319-9.
- DANĚK, L., KOLAŘÍK, V. *A Tool for Elimination of the Proximity Effect in Multilevel Structures Prepared by Electron-Beam Lithography* In ELECTRONIC DEVICES AND SYSTEMS 02 - Proceedings. EDS 2002 Electronic Devices and Systems Conference. Brno: Vysoké učení technické v Brně, 2002, s. 204 - 206, ISBN 80-214-2180-0.
- LUDVÍK, J., VRBA, R. *Cellular Neural Network in Noise Removing* In ELECTRONIC DEVICES AND SYSTEMS 02 - PROCEEDINGS. EDS 2002 Electronic Devices and Systems Conference. Brno: Vysoké učení technické v Brně, 2002, s. 330 - 336, ISBN 80-214-2180-0.
- SZENDIUCH, I., BAZALKA, M. *Application of SPC and IPO in Small Electronic Production* In Proc. 2nd European Microelectronics Packaging and Interconnection Symposium "IMAPS Europe Cracow 2001. European Microelectronics Packaging and Interconnection Symposium "IMAPS Europe Cracow 2001". Cracow, Poland: IMAPS Europe, 2002, s. 334 - 338, ISBN 83-904462-7-8.
- MUSIL, V., PROKOP, R. *WinVLSI - The PC-based CAD tool for student's IC design at the Department of Microelectronics* In ELECTRONIC DEVICES AND SYSTEMS 02 - PROCEEDINGS. EDS 2002 Electronic Devices and Systems Conference. Brno: Vysoké učení technické v Brně`, 2002, s. 293 - 296, ISBN 80-214-2180-0.

- MUSIL, V., BAJER, A., PROKOP, R. *Signal and Power Integrity: A Problem for Design and CAD Engineers* In ELECTRONIC DEVICES AND SYSTEMS 02 - PROCEEDINGS. EDS 2002 Electronic Devices and Systems Conference. Brno: Vysoké učení technické v Brně, 2002, s. 267 - 279, ISBN 80-214-2180-0.

- VEČEŘA, I., VRBA, R., ŠVÉDA, M. *A/D Switched-Current Converter with Built-In Self Testing Features* In Proceedings of the 6th World Multiconference on Systemics, Cybernetics and Informatics SCI 2002. 6th World Multiconference on Systemics, Cybernetics and Informatics SCI 2002. Orlando: SCI, 2002, s. 250 – 253.

- ŠVÉDA, M., VRBA, R. *Embedded System Formal Specifications Reuse by a Case-Based Reasoning Approach* In Proceedings of the 6th World Multiconference on Systemics, Cybernetics and Informatics SCI 2002. 6th World Multiconference on Systemics, Cybernetics and Informatics SCI 2002. Orlando: SCI, 2002, s. 200 – 205.

- ŠVÉDA, M., VRBA, R. *An Integrated Framework for Sensor-Based Embedded Systems* In Proceedings of the Ninth IEEE International Conference and Workshop on the Engineering of Computer-Based Systems. Ninth IEEE International Conference and Workshop on the Engineering of Computer-Based Systems. Los Alamitos, CA: IEEE, 2002, s. 195 - 202, ISBN 0-7695-1549-5.

- VEČEŘA, I., VRBA, R., LUDVÍK, J. *Modified RSD Analog Digital Converter with BIST Technology* In 2002 WSEAS International Conference on System Science, Applied Mathematics & Computer Science, and Power Engineering Systems. 2002 WSEAS International Conference on System Science, Applied Mathematics & Computer Science, and Power Engineering Systems. Rio de Janeiro: WSEAS, 2002, s. 2211 - 2 213, ISBN 960-8052-74-9.

- LUDVÍK, J., VRBA, R. *Image Processing Noise Removal using a Cellular Neural Network* In 2002 WSEAS International Conference on System Science, Applied Mathematics & Computer Science, and Power Engineering Systems. 2002 WSEAS International Conference on System Science, Applied Mathematics & Computer Science, and Power Engineering Systems. Rio De Janeiro: WSEAS, 2002, s. 2631 - 2 634, ISBN 960-8052-74-9.

- MALYSZ, K., HUBÁLEK, J., PRÁŠEK, J. *Study of sensitivity of thick film SnO2 and WO3 semiconducting gas sensors* In EDS 2002 Electronic Devices and Systems Conference. EDS 2002 Electronic Devices and Systems Conference. Brno: Ing. Zdeněk Novotný, CSc., Brno, Ondráčkova 105, 2002, s. 349 - 354, ISBN 80-214-2180-0.

- RECMAN, M. *Transistor Models Paramter Extraction* In Socrates Workshop 2002 - Proceedings. Intensive Training Programme in Electronic System Design. Socrates Workshop. Intensive Training Programme in Electronic System Design. Brno: Ing. Z. Novotný, Brno 2002, 2002, s. 103 - 106, ISBN 80-214-2217-3.

- VRBA, R., KUCHTA, R. *Advancement of Laboratory Practice in Digital Circuits* In Seminář teorie obvodů STO-8, Moderní směry výuky elektrotechniky a elektroniky. STO-8 Seminář teorie obvodů. Brno: Vojenská akademie, 2002, ISBN 80-214-2190-8.

- VRBA, R., LUDVÍK, J. *Cellular Neural Network in Noise Removing* In. The 6th World Multi-Conference on SYSTEMICS, CYBERNETICS AND INFORMATICS. Proceedings of the 6th World Multi-Conference on SYSTEMICS, CYBERNETICS AND INFORMATICS: 2002, s. 253 - 511, ISBN 0-7456-1547-2.

- VRBA, R., ŠVÉDA, M. *An Integrated Framework for Internet-Based Applications of Smart Sensors* In Proceedings of IEEE Sensors 2002. IEEE Sensors 2002. Piscataway, New York: Piscataway, New York, US, ICSP, 2002, s. 1543 - 1 548, ISBN 0-7803-7454-1.

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VI.3 Research and Technical Reports

- VRBA, R., ZEZULKA, F., CACH, P., FIEDLER, P., BRADÁČ, Z., HONZÍK, P. SENSVISION - Internetový přístup do procesu (SENSVISION - Internet Access to Technology), 2002 (research report).

- MALYSZ, K. Tlustovrstvé plynové polovodičové senzory (Thick film semiconducting gas sensors), 2002 (research report).

- VRBA, R., BOUŠEK, J., HEJÁTKOVÁ, E., BEČVÁŘ, D., PRÁŠEK, J., MALYSZ, K., KREJČÍ, J., HUBÁLEK, J., ADÁMEK, M., FUJCIK, L., HÁZE, J., SKOČDOPOLE, M., GROSMANOVÁ, Z. Návrh senzorů (Design of Sensors), 2002 (research report**).**

- VRBA, R., KREJČÍ, J., HEJÁTKOVÁ, E., PRÁŠEK, J., MALYSZ, K., ZEMÁNEK, M., HUBÁLEK, J., ADÁMEK, M., FUJCIK, L., HÁZE, J., KUCHTA, R., SAJDL, O., SKOČDOPOLE, M., GROSMANOVÁ, Z. ANTOPE Výzkum nových metod přístrojové analýzy toxicity pro integrální měření toxicity v potravinářském průmyslu a jejich ověření na prototypu analyzátoru toxicity pesticidů (ANTOPE), 2002 (research report).

- SKOČDOPOLE, M., HÁZE, J., VRBA, R., KREJČÍ, J., ŠTEFFAN, P. Výzkum a vývoj elektronických obvodů analyzátoru (Research and Ddesign of Electronic Curcuits of Analyser), 2002 (research report).

- VRBA, R. Výzkum mikroelektronických systémů a technologií (Research of Microelectronic Systems and Technologies), 2002 (research report).

- VRBA, R., KUCHTA, R. Inovace výuky cvičení z předmětu Digitální obvody (Innovation of Educational Exercices of Digital Circuits Lectures), 2002 (research report).

- KUCHTA, R., VRBA, R. Monitorovací systém vozidla s elektrickým pohonem (Monitoring system for car with electric power), 2002 (research report).

- VRBA, R., ADÁMEK, M. Modernizace výuky senzorové techniky (Uprading of Sensor Techniques Education), 2002 (research report).

- VRBA, R., ZEZULKA, F. Snímač tlaku nové generace (Pressure Sensor of New Generation), 2002 (research report).

VII. OTHER ACTIVITIES

- Electronic Devices and Systems 2002. Experimental Methods in Acoustic and Electromagnetic Emission. September 9 – 10, 2002 at The University Center, Antonínská 1, Brno. International conference. Main topics: electronic devices, semiconductor structures, physics of semiconductor, integrated circuits design, integrated circuits technology, electronic circuit and systems, signals processing, microelectronic sensors, electromagnetic compatibility, CAD and CAE, software for teaching and learning.
- Socrates Workshop 2002. Intensive Training Programme in Electronic System Design. Chania, Crete (Greece). Organised with Technological Educational Institute of Crete, 2 - 9. 9. 2002. Supported by the Socrates Programme of the European Union.
- FPGA Solutions. The Seminar took place on November 5, 2002 at The University Center, Antonínská 1, Brno. Organised with ASICentrum Prague (Ing. Pleštil).

DEPARTMENT OF RADIOELECTRONICS

Head of Department: Prof. Ing. Jiří SVAČINA, CSc.

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I. STAFF

Professors:

Prof. Ing. Tomáš Dostál, DrSc., Prof. Ing. Jiří Pospíšil, DrSc., Prof. Ing. Václav Říčný, CSc., Prof. Ing. Vladimír Šebesta, CSc.

Associate Professors:

Doc. Ing. Stanislav Hanus, CSc., Doc. Ing. Miroslav Kasal, CSc., Doc. Ing. Jaromír Kolouch, CSc., Doc. Ing. Zdeněk Nováček, CSc., Doc. Ing. Vlastislav Novotný, CSc., Doc. Dr. Ing. Zbyněk Raida, Doc. Ing. Milan Sigmund, CSc., Doc. Ing. Otakar Wilfert, CSc.

Lecturers:

Ing. Viera Biolková, Ing. Jaromír Habán, CSc. (to 15. 9. 2002), Ing. Ivana Jakubová, Dr. Ing. Zdeněk Kolka, Ing. Jiřina Kovářová, Ing. Marta Krátká, Ing. Tomáš Kratochvíl, Ing. Václav Michálek, CSc., Ing. Aleš Prokeš, Ph.D., Ing. Jiří Šebesta

Technical and Administrative Staff:

Květuška Bílá, Věra Dostalová, František Horký, Anna Kalná, Jaroslav Novák, Petra Šípová

Postgraduate Students:

Ing. Vladimír Axman, Ing. Milan Boštík, Ing. Karel Čermák, Ing. Pavel Dýmal, Ing. Lukáš Džbánek, Ing. Ondřej Franek, Ing. Tomáš Frýza, Ing. Stanislav Goňa, Ing. David Hlaváč, Ing. Martin Horák, Ing. Pavel Hovořák, Ing. Rostislav Hučka, Ing. Tomáš Kratochvíl, Ing. Vítězslav Krčmář, Ing. Petr Kutín, Ing. Zbyněk Lukeš, Ing. Petr Macura, Ing. Roman Maršálek, Ing. Pavel Matějka, Ing. Milan Motl, Ing. Vlastimil Navrátil, Ing. Viktor Otevřel, Ing. Libor Poláček, Ing. Petr Poměnka, Ing. Jan Prokopec, Ing. Pavel Radkovský, Ing. Bohdan Růžička, Ing. Petr Stančík, Ing. Václav Šádek, Ing. Jan Šebesta, Ing. Josef Šíp, Ing. Vít Štencl, Ing. Dalibor Štverka, Ing. Martin Švirák, Ing. Roman Tkadlec, Ing. Tomáš Urbanec, Ing. Tomáš Vaculín, Ing. Michal Zamazal, Ing. Luděk Závodný

II. FACILITIES

II.1 Teaching and Research Laboratories

- Laboratory of Analog Circuits
- Laboratory of Digital and Microprocessor Techniques
- Laboratory of Audio Frequency Electronics
- Laboratory of TV and Video Techniques
- Laboratory of Mobile Communication and HF Techniques
- Laboratory of Microwave Techniques
- Laboratory of Signals and Data Transmission
- Laboratory of Antennas and EM Field
- Laboratory of Optoelectronics and Photonics
- Laboratory of Radio Relay and Satellite Communication
- Personal Computers Educational Laboratories - 3 rooms
- Optical Communication Research Laboratory
- Digital Signal Processing Research Laboratory
- Experimental Satellite Communication Research Laboratory
- Numerical Methods Research Laboratory
- EMC Pre-Compliance Test Laboratory

II.2 Special Instrumentation and Computers

- Digital storage oscilloscopes HP 54601, 54602, 54603, and 54621A with HP 54659 Interface/Storage Modules
- Digital storage oscilloscope AGILENT Infinium
- Read-out oscilloscopes HITACHI V-1150 and 3150 150 MHz
- Two- and four channels digital storage oscilloscopes TEKTRONIX Mega-Zoom HC TDS 3012, TDS 2012, TDS 2022, TDS 2024 (6 pcs)
- DOMINOPUTER - educational and research equipment for digital techniques
- Development system PLD Shell Plus vers. 3.1
- Multifunction synthesizer HP 8904 A DC - 600 kHz
- 15 MHz function/arb generators HP 33120 A   (6 pcs)
- Signal generators SMT 03, SMX ROHDE & SCHWARZ 100 kHz - 1000 MHz (3 pcs)
- Signal generator SMG-B2 ROHDE & SCHWARZ 10 kHz - 1000 MHz
- Vector signal generator SMIQ 02B ROHDE & SCHWARZ
- RF signal generator HP 8648 A 150 kHz - 1000 MHz
- RF signal generator HP 8648 C 9 kHz - 3200 MHz
- Power signal generator 80 kHz - 520 MHz MARCONI 2018 A
- Sweep oscillator HP 8350B with HP 83595A and HP 83592B RF plug-ins 100 MHz - 26,5 GHz
- Sweep synthesizer AGILENT 83752A 10 MHz – 20 GHz
- TV generator SECAM/NTSC/PAL GV 698/5 PROMAX
- Spectrum analyzer AE - 476 PROMAX 1 - 1000 MHz
- RF spectrum analyzer HP 8590 L 9 kHz - 1,8 GHz
- Spectrum analyzers R 3132 and R 4131C ADVANTEST 10 kHz - 3,5 GHz
- EMC spectrum analyzer HP 7404 A 9 kHz - 13,2 GHz
- Spectrum analyzer SONY – TEKTRONIXS 3086 DC – 3 GHz
- Spectrum/network analyzer HP 3589 A 10 Hz - 150 MHz
- PC controlled spectrum receiver SEAWARD 9 kHz - 1 GHz for EMI measurements
- EM immunity test equipment MACE and THOR SEAWARD
- Microwave network analyzer HP 8410C 110 MHz-18 GHz
- Dual channel dynamic signal analyzer HP 35655 A
- TV/FM level meters MC 160B and 477D/5 PROMAX
- Level meter PROLINK - 3C PROMAX
- VHF-UHF EM field intensity meter ROHDE & SCHWARZ 25-900 MHz
- Vector-voltmeter HP 8508 A 0,1-1000 MHz
- Searching receiver AR 3000 100 kHz - 2,036 GHz
- GPS receiver GPR 22 A DICOM
- RF transceivers YAESU FT-840 and VR-5000
- Digital radio testers CMD 53 and CTS 65 ROHDE & SCHWARZ
- Digital radio monitor ROHDE & SCHWARZ CMS 50
- Power meter HP 437 B with power sensors to 26,5 GHz
- Microwave counter and power meter HP 5342A opt. 002 10 Hz-18 GHz
- Microwave counter and power meter XL MICROWAVE 3260 1 Hz - 26 GHz
- Optical power meter ANRITSU ML 9002A
- Termovision camera ThermaCAM 575 FLIR Systems including software
- Waveguide and coaxial set for experiments in 3,95-26,5 GHz bands
- Satellite TV receiver systems (2 sets)
- Analog transmission channel of the satellite link INTERSPUTNIK
- Personal computers PC 486, PENTIUM I, II, III, and IV with 15", 19", and 21" monitors in LAN (165 pcs)
- Laser and/or ink printers HP LJ 4L, 5L, 5 MP, 1100A, Color LJ 2500, DJ 690, 850, and 1220 A3 (59 pcs)
- Scanners HP Scan Jet IIP, 4C, 1100A, Epson Perfection (16 pcs)

III. TEACHING

III.1 Master´s Programme (Ing)

Electronic Practice	Y1 L1, summer	0/2	Krátká
Signals and Systems I	Y2 L1, winter	2/2	Šebesta V.
Electronic Circuits Theory	Y1 L2, winter	3/5	Pospíšil, Dostál
Theory of Communication	Y1 L2, summer	3/1	Šebesta V.
Electromagnetic Waves and Lines	Y1 L2, summer	3/3	Nováček, Wilfert
Pulse and Digital Techniques	Y1 L2, summer	3/4	Kolouch
Technical Project 1	Y1 L2	0/2	Krátká
Quantum and Laser Electronics	Y1 L2, winter	3/2	Wilfert
CAD of Electronic Circuits	Y1 L2, winter	2/3	Kolka
Special Electronic Devices and their Applications	Y1 L2, winter	3/2	Svačina, Novotný
Electronic Circuits and Filters Design	Y1 L2, summer	3/3	Dostál
Electronic Instruments Feeding	Y1 L2, summer	3/3	Novotný
Object Oriented Programming in Pascal	Y1 L2, summer	0/5	Raida
Analog Circuits and Converters	Y1 L2, winter	3/3	Dostál
Electronics	Y1 L2, winter	3/2	Kolouch
HF and Microwave Techniques	Y2 L2, winter	4/3	Hanus, Svačina
Microprocessor Techniques	Y2 L2, summer	3/3	Michálek
Technical Project 2	Y2 L2	0/3	Krátká
Antennas and Radio Waves Propagation	Y2 L2, winter	2/4	Nováček
Audio Electronics	Y2 L2, winter	3/3	Novotný
Speech Signal Analysis and Synthesis	Y2 L2, winter	3/3	Sigmund
Programmable Logic Devices	Y2 L2, winter	3/2	Kolouch
Electromagnetic Compatibility	Y2 L2, summer	3/2	Svačina
Radio Links Design	Y2 L2, summer	2/3	Nováček
Optoelectronics	Y2 L2, summer	3/2	Wilfert
Wireless and Mobile Communications	Y2 L2, summer	3/1	Hanus
Videotechnics	Y2 L2, summer	3/3	Říčný
Professional Practice	6 weeks		Kovářová
Diploma Work and Seminar	Y3 L2, summer	0/5	Biolková
Radio Receivers and Transmitters	Y3 L2, winter	3/3	Hanousek
Radio Relay and Satellite Communication	Y3 L2, winter	3/3	Kasal
Microcomputers for Instrumental Applications	Y3 L2, winter	3/3	Michálek
CAD in HF and Microwave Techniques	Y3 L2, winter	2/3	Raida
TV Techniques	Y3 L2, winter	3/3	Hanus
Photonics and Optical Communications	Y3 L2, winter	3/2	Wilfert
Radars and Navigation	Y3 L2, summer	3/1	Hanousek ext.
Cable Television	Y3 L2, summer	3/2	Říčný

III.2 Doctoral Programme (PhD)

Neural Networks and Fuzzy Systems	winter	39/0	Mikula ext.
Numerical Methods in Electrical Engineering	winter	39/0	Raida
Speech Signal Processing for Speaker Recognition	winter	26/13	Sigmund
Photonics and Optical Communications	winter	39/0	Wilfert
Optimization in Electrical Engineering	winter	39/0	Raida
Selected Problems of TV Techniques	winter	39/0	Říčný
New Methods of Audio Signal Processing	winter	39/0	Novotný
PC Modelling and Analysis of Electronic Circuits	winter	13/26	Kolka
Selected Topics of Digital Techniques	winter	18/21	Kolouch
Electromagnetic Waves in Communication	winter	39/0	Nováček
Sel. Topics of Analog and Digit. Wireless Communicat.	summer	39/0	Prokeš
Selected Topics of Signal Theory	summer	39/0	Šebesta V.
Modern Analog Filters	summer	39/13	Dostál
Selected Themes of Mobile Communications	summer	39/0	Hanus
Signal Processing in Instrumental Techniques	summer	39/6	Kasal
Special Topics of HF and MW Techniques	summer	39/0	Svačina
Modelling of Chaos in Electronic Circuits	summer	13/26	Pospíšil

III.3 Study in English Language (International Students)

Electronic Circuits	Y1 L2, summer	2/2	Dostál
Telecommunication Circuit Theory	Y1 L2, winter	2/2	Dostál

IV. RESEARCH

Research at the Department has been predominantly supported by institutional research grants funded by the Ministry of Education, by the Grant Agency of the Czech Republic, and by diverse other companies inclusively international. The total annual fund for the 23 projects solved at the Department in the year 2002 was 6,520 mil. CZK.

In the year 2002, also the special research plan named *"Research of Electronic Communication Systems and Technologies"* is continued at the University. The research plan is supervised by Prof. Svačina from the Department and it is financial supported by the Ministry of Education of the Czech Republic in Prague. The annual fund for the research plan was 7, 824 mil. CZK. Also an other research plan named *"Research of Microelectronic Systems and Technologies"* was solved at the University in co-operation with the Department. In 2002 the funding for the Department was 1,183 mil. CZK.

Innovative Education of Microwave Communication
Grant project FRVŠ No. 1721/2002, principal investigator: Jiří Svačina

Semiconductor Laser Frequency Stabilization through Linear Absorption in Jodi
Grant project FRVŠ No. 1722/2002, principal investigator: B. Růžička

Educational Program for Speech Signal Processing
Grant project FRVŠ No. 1742/2002, principal investigator: P. Matějka

Using Possibilities of Modern ICs in Active Filters
Grant project FRVŠ No. 1751/2002, principal investigator: V. Axman

Combined Computer Lab for Electronics and Communication
Grant project FRVŠ No. 1908/2002, principal investigator: Z. Raida

Design of EM Systems in the Time Domain
Grant project FRVŠ No. 1921/2002, principal investigator: V. Otevřel

Innovative Education of Communication Theory
Grant project FRVŠ No. 1924/2002, principal investigator: A. Prokeš

Modern Lab for PLD and FPGA Circuit Applications
Grant project FRVŠ No. 1926/2002, principal investigator: J. Kolouch

Study Stay at the University of Applied Sciences Wiesbaden, Germany
Grant project FRVŠ No. 1927/2002, principal investigator: M. Sigmund

Discrete Realization of Electronically Tuneable Filters
Grant project FRVŠ No. 1928/2002, principal investigator: V. Axman

Experimental Verification of FMCW Radar Antennas
Grant project FRVŠ No. 1929/2002, principal investigator: S. Goňa

Digital Processing of Image Information
Grant project FRVŠ No. 1930/2002, principal investigator: T. Kratochvíl

Design and Realization of a Scalar Network Analyser
Grant project FRVŠ No. 1942/2002, principal investigator: T. Urbanec

Analysis, Design and Simulation of the G-TEM Cell for EMC Tests
Grant project FRVŠ No. 1953/2002, principal investigator: V. Navrátil

Electronic Circuits in Non-Conventional Modes and their Applications
Grant project GAČR No. 102/01/0228, principal investigator: T. Dostál

Research and Applications of Optoelectronic Methods in the Measuring Techniques, Communications, Medical Diagnostics and Ecological Engineering
Grant project GAČR No. 102/00/0043, principal investigator: V. Říčný

Design and Applications of New State-Models of Dynamical Systems
Grant project GAČR No. 102/01/0229, principal investigator: S. Hanus

Time Domain Modelling of Microwave Structures
Grant project GAČR No. 102/01/0571, principal investigator: Z. Raida

New Methods for Broad Band Vector Measurements
Grant project GAČR No. 102/01/0573, principal investigator: Z. Raida in co-operation with CTU in Praha

Support of Continuing Education
  Grant project No. CD 420090 of the Ministry of Education, principal investigator: Z. Raida
Telemetry and Command Station for Experimental Satellite Phase 3D
  R & D project of AMSAT-DL Marburg, Germany, supervised by M. Kasal
Realistic Model Design of Tantalus and Niobium Capacitors for the SPICE Program Simulation
  R & D project of AWX Czech Republic Ltd., Lanškroun, supervised by Z. Kolka
Multi Media Educational Rooms at the Department of Radio Electronics
  R & D project of the Brno University of Technology, supervised by V. Michálek
Research of Electronic Communication Systems and Technologies
  Research programme No. MSM 262200011 of the Ministry of Education in Prague, principal investigator: Jiří Svačina
Research of Microelectronic Systems and Technologies
  Research programme MSM 262200022 of the Ministry of Education in Prague, principal investigator: Radimír Vrba

V. COOPERATIONS

V.1 Cooperations in the Czech Republic
- WIRELESSCOM Ltd. Prague
- Czech Radio Communications Ltd. - South Moravia, Brno
- TESTCOM Prague
- KOMP Ltd. Kroměříž
- ATMOCOM Ltd. Brno
- ERA Ltd. Pardubice
- TR Instruments Ltd. Brno
- T & M DIRECT Ltd. Prague
- Departments of radio electronics, EM fields, and circuit theory at the CTU in Prague
- MICOS Prostějov
- Institute of Scientific Instruments, Czech Academy of Sciences Brno
- Institute of Atmospheric Physics, Czech Academy of Sciences Prague
- Institute of Radio Engineering and Electronics, Czech Academy of Sciences Prague
- ROHDE & SCHWARZ Ltd., Prague
- ELDIS Ltd., Pardubice
- Czech Standards Institute Prague
- Military Technical Institute of Land Forces Vyškov
- FLEXTRONICS International, Brno
- ALCATEL Microelectronics, Brno
- RADIOMOBIL Ltd., Prague
- BETA CONTROL Ltd., Brno
- Railway Traffic Automation Ltd., Prague
- MOTOROLA Czech Republic, Prague
- Czech TELECOM Ltd., Praque
- National Security Authority, Prague
- AVX Czech Republic Ltd. Lanškroun
- AVX Czech Republic Ltd. Uherské Hradiště
- TechniServ Net Ltd. Brno
- ADEMCO Microtech Ltd. Brno
- ALPS Electric Czech Ltd. Boskovice
- The Net Ltd. Brno

V.2 International Cooperation
- Fachhochschule Wiesbaden, Fachbereichs Elektrotechnik und Informatik, Germany
- Department de Signal, Ecole Supérieure d'Ingénieur en Electrotechnique et Electronique (ESIEE), Paris, France

- Université Catholique de Louvain, Laboratory of Hyperfrequencies, Louvain-la-Neuve, Belgium
- ROSETTA Laboratories Pty Ltd., St. Kilda, Australia
- Department of Theoretical Fundamentals of Radiotechniques, Kiev Polytechnic Institute, Ukraine
- AMSAT-DL, Germany
- Central Laboratory of Electronics, Philipps University of Marburg, Germany
- Katedra elektroniky a multimediálnych telekomunikácií, TU Košice, Slovakia
- Katedra rádioelektroniky, STU Bratislava, Slovakia
- Oregon Graduate Institute of Science & Technology, Portland, Oregon, USA
- Katholieke Hogeschool Brugge-Oostende, Belgium
- Inter-University Microelectronic Center (IMEC), Université Catholique de Louvain, Belgium
- Fachhochschule Darmstadt, Germany
- Fachhochschule Pforzheim, Germany
- The Net - Internet Services AG Bern, Switzerland
- RWTH Aachen, Germany
- INFINEON Technologies Mnichov, Germany
- SIEMENS Corporate Technology Erlangen, Germany
- Honeywell Control Systems Ltd., Motherwell, UK
- Izhevsk State Technical University, Faculty of Instrumentation, Izhevsk, Russia
- European Space Agency, Paris Cedex, Francie

V.2.1 Visitors to the Department

- Prof. Genevieve Baudoin, ESIEE Paris, France (April 2002, 3 days)
- James A. Romaguera, TheNet - Internet Services AG Bern, Switzerland (May 2002, 1 day)
- Geert Vanderstegen, Bart Vandijck (students), Katholieke Hogeschool Limburg, Diepenbeek, Belgium (March – June 2002, 4 months)
- Prof. José Luis Arce Diego, Universidad de Cantabria, Spain (May 2002, 1 day)
- Christian Seeman, AVX Czech Republic, Uherské Hradiště (March 2002, 1 day)
- Prof. Dr. Detlef Richter + 20 students, Fachbereich Elektrotechnik und Informatik, Fachhochschule Wiesbaden, Germany (May 2002, 4 days)
- Dr. Viktor Kudielka, AMSAT, IEEE, Vienna, Austria (March 2002, 2 days)
- Prof. Dr. Ing. Jiri Sobota, Fachbereich Elektrotechnik, Fachhochschule Wiesbaden, Germany (June 2002, 2 days)
- Rudi Roox, Katholieke Hogeschool Limburg, Diepenbeek, Belgium (June 2002, 4 days)
- Michael Fletcher, AMSAT, Anritsu Finland, Helsinki, Finland (August 2002, 2 days)
- Elisabeth Young, Dr. Frank Turnbull, Jaroslav Doležal, Honeywell Control Systems Ltd., Golden Valey, USA; Motherwell, Scotland; Honeywell Laboratories Prague (September 2002, 1 day)
- Jürgen Arold, Thomas Zeller, Honeywell AG, Schönaich, Germany (October 2002, 1 day)
- Zoltan Szalai, Sandor Blasko, Peter Bakki (Ph.D. students), Technical University of Budapest, Hungary (November 2002, 2 days)
- Prof. Dr. Friedemann Mohr, University of Applied Sciences, Pforzheim, Germany (April, November 2002, 5 days)
- Prof. Jurij Pavlovich Demakov, Dr. Albert Vinerovich Abilov, Izhevsk State Technical University, Izhevsk, Russia (November 2002, 2 weeks)
- Dr.-Ing. Arnolf Maurer, Dr.-Ing. Marco Leone, SIEMENS Corporate Technology Erlangen, Germany (November 2002, 3 days)

V.2.2 Visits of Staff Members to Foreign Institutions

- T. Dostál, Department of Radio Electronics, STU Bratislava, Slovakia; diploma state examinations (January 2002, 2 days)
- Z. Raida, Katholieke Hogeschool Limburg, Diepenbeek, Belgium; lecture stay (November 2002, 1 week)
- Z. Raida, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; lecture stay (November 2002, 1 week)

- L. Závodný, Associated Laboratory IMEC-KHBO; Oostende, Belgium; study stay (March – June 2002, 14 weeks)
- P. Matějka, Oregon Graduate Institute, Portland, Oregon, USA; study stay (October – December 2002)
- T. Urbanec, V. Šádek, K. Čermák, Z. Raida, M. Motl, 12th International Travelling Summer School of Microwaves and Lightwaves, Institute of Electronics of National Academy of Sciences of Belarus, Minsk, Belarus (July 2002, 7 days)
- R. Maršálek, ESIEE Noisy-le-Grand, France; Czech-French PhD study (January – February, September – December 2002)
- Z. Raida, O. Wilfert, University of Applied Sciences, Pforzheim, Germany; lecture stay (April, May 2002, 1 week)
- K. Čermák, University of Applied Sciences, Pforzheim, Germany; study stay (September – December 2002)
- V. Navrátil, SIEMENS Corporate Technologie, Erlangen, Germany; Czech-German PhD study (January – December 2002)
- M. Sigmund, FH Wiesbaden, Germany; visiting professorship (January – December 2002)
- M. Kasal, Philips Universität, Marburg, Germany; working stay in the AMSAT programme (October 2002, 3 days)

V.3. Contracts

- Z. Nováček, GSM antennas matching; HASAM Ltd. Zlín
- V. Michálek, Expert opinion on personal computers and monitors; Brno University of Technology
- M. Kasal, J. Šebesta, Telemetry and command station for Phase 3D experimental satellite; AMSAT-DL, Germany
- Z. Nováček, Calculation of electromagnetic fied and EM exposure review; Radiomobil Ltd. Brno
- Z. Nováček, Ingerference EM background measurement in 1800 MHz band; Radiomobil Ltd. Brno
- O. Wilfert, Z. Kolka, V. Biolková - Evaluation of Optical Wireless Link CBL Laser Link 300/155; CTU in Prague
- V. Šádek, EMS tests of railway traffic lights; AŽD Ltd. Pragua
- V. Šádek, Consulting and supervision of the EMI measurement on the railway unit series 471; ČKD Vagonka Ltd. Ostrava
- V. Šádek, EMI measurement and EMS tests of the control unit and sensors for cable thickness measurement; HAAL Elektro Ltd. Brno
- P. Dýmal, V. Šádek, T. Urbanec, Design, realization and measurement of antennas in the frequency band 2.4 GHz; The Net Ltd. Brno

V.4 Membership in International Organizations and Societies

- Members - IEEE, USA: Dostál *(CAS)*, Kasal *(BME)*, Nováček *(AP, COM)*, Říčný *(IA)*, Šebesta *(SP)*
- S. Hanus – Editorial board member of the *RADIOENGINEERING - Proceedings of Czech and Slovak Technical Universities and Czechoslovak URSI Committee* – Member of the Academy of the crystalline disc at the 12th International fair INVEX 2002
- I. Jakubová: Exetutive editor of the *RADIOENGINEERING - Proceedings of Czech and Slovak Technical Universities and Czechoslovak URSI Committee*
- J. Pospíšil: Senior Member of IEEE *(Soc. CAS)*
- Z. Raida: Chairman of the MTT/AP/ED Chapter of the Joint Czech-Slovak section of IEEE – Editor-in-Chief of *RADIOENGINEERING - Proceedings of Czech and Slovak Technical Universities and Czechoslovak URSI Committee* – Senior Member of IEEE *(Soc. MTT)*
- V. Říčný: Member of The American Biographical Institute Research Association (ABIRA), USA
- M. Sigmund: Council Member of the European Association for Education in Electrical and Information Engineering EAEEIE (France) – Member of the International Speech Communication Association ISCA, Germany
- J. Svačina: Fellow-IEE, United Kingdom – Chartered Engineer (CEng) of the Engineering Council, United Kingdom – Senior Member of IEEE *(Soc. MTT, EMC, EDU)* – Member of The American Biographical Institute Research Association (ABIRA), USA – Fellow of the International Biographical Association, England – Editorial Board Member of *IEEE Transactions on Microwave Theory and Techniques*, USA
- V. Šebesta: Council Member of the CAS/COM/SP Chapter of the Joint Czech-Slovak section of IEEE

- O. Wilfert: Chairman of section D „Electronics and Photonics", Czech Committee of URSI

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- BIOLEK, D., BIOLKOVÁ, V. Recent Advances in Circuits, Systems and Signal Processing. Chapter: *Flow Graphs for Analysis (not only) Current-Mode Analogue Blocks*. 1. ed. New York: WSES Press, 2002. p. 151 - 156. ISBN 960-8052-64-5

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- ČAJKA, J., DOSTÁL, T., VRBA, K. High-order lowpass filters using DVCC elements. *Radioengineering*, ISSN 1210-2512, 2002, Vol. 11, n. 2, p. 14 - 17.

- DOSTÁL, T., ČAJKA, J., VRBA, K. High-Order Lowpass Filters Using DVCC Elements.. *Radioengineering*, ISSN 1210-2512, 2002, Vol. 11, n. 2, p. 14 - 30.

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- GREGOR, J., JAKUBOVÁ, I., MENDL, T., ŠENK, J., KOPECKÝ, V. Thermocouple Based Method of Temperature and Velocity Field Mapping. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. suppl. D, p. 596 - 600.

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- KASAL, M. AMSAT OSCAR E (AMSAT OSCAR E). *Praktická elektronika a radio*, ISSN 1211-328X, 2002, Vol. VII/2002, n. 6, p. 45 - 45. rubrika OSCAR

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VI.2 Conferences

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- AXMAN, V., DOSTÁL, T. *Conveyor based eliptic function filters* In Elektrotechnika a informatika 2002. Elektrotechnika a informatika 2002. Plzeň: Západočeská univerzita v Plzni, Fakulta elektrotechnická, 2002, p. 10 - 13, ISBN 80-7082-904-4
- BĚLOHRAD, D., KASAL, M. *Optimalized Magnetic Field Homogenity for MR Coils* In. RADIOELEKTRONIKA 2002 12th International Czech-Slovak Scientific Conference. Bratislava: , 2002, p. 445 - 448, ISBN 80-227-1700-2

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- WILFERT, O., KOLKA, Z., NĚMEČEK, J., BIOLKOVÁ, V. Protokol č.2/02 o testování optických směrových spojů (Protocol No. 2/02 about Optical Wireless Links Testing). 2002. Testování a ověření deklarovaných parametrů a vlastností vybraných optických směrových spojů pro aplikaci v síti Telecom.

VII. OTHER ACTIVITIES

Conferences, Workshops, Courses and Seminars Organized by the Department

- **Electromagnetic Compatibility** (special study for FLEXTRONICS International Brno)
  February - March 2002; 24 hours, 8 participants
- **Microwave Integrated Techniques** (special study for FLEXTRONICS International Brno)
  April - May 2002; 24 hours, 6 participants
- **Microwave Links in Communication Techniques** (special study for TechniServ Net Ltd. Brno)
  May 2002; 24 hours, 5 participants
- **Digital Speech and Image Processing** (special seminary for students from University of Applied Sciences   Wiesbaden, Germany)
  May 2002; 20 hours, 20 participants
- **Digital Circuits Design and Introduction to the VHDL Language** (special seminary) In co-operation with Katholieke Hogeschool Brugge – Oostende (Belgium) and the Design Center CEDO in Brno.
  June 2002; 24 hours, 8 participants
- **Radio Electronic Seminars 2002** (special lectures on up-to-date themes)
  - 6 March 2002, Avalanche photodiode in Geiger mode (J. Šíp, FEKT VUT)
  - 13 March 2002, Chip verification: a general introduction (P. Malena, ALCATEL Czech Brno)
  - 20 March 2002, LabView – demonstration of applications (B. Růžička, FEKT VUT)
  - 27 March 2002, Smart Home Networks (P. Lajšner, MOTOROLA Czech Rožnov pod Radhoštěm)
  - 3 April 2002, Alternative optimisation approach to the design of EM structures (V. Otevřel, FEKT VUT)
  - 10 April 2002, Antenna measurements in an anechoic chamber (V. Krčmář, ERA a.s. Pardubice)
  - 17 April 2002, Design of planar microwave filters and microwave measurements (T. Urbanec, FEKT VUT) Instruments and Tools for Working with Modern Devices (P. Dýmal, FEKT VUT)
  - 24 April 2002, Plastic optical fibre and MOST bus: Optical communication in automotive applications (F. Mohr, University of Applied Sciences, Pforzheim, Germany)
  - 30 April 2002, Practical analysis of stability for feedback systems (I. Koudar, ALCATEL Czech Brno)
  - 7 May 2002, Time-domain analysis of EM structures: an introduction to FD-TD (V. Otevřel, FEKT VUT)
  - 8 October 2002, Programming of CPLD by using the VHDL Language (L. Závodný, BUT)
  - 15 October 2002, Active Filters with the AD844 Circuit (V. Axman, BUT)
  - 30 October 2002. Conformal Mapping and its using to Analysis of Microwave Transmission Structures (V. Šádek, BUT)
  - 13 November 2002, Carrier Digital Synchronization (J. Prokopec, BUT)
  - 20 November 2002, Atmosphere Influence and the Reliability of Optical Directional Links (P. Hovořák, BUT)
  - 27 November 2002, Time Analysis of EM Structures: Introduction to TD-FEM (M. Motl, BUT)
  - 4 December 2002, Time Analysis of EM Structures: Implementation of FDTD Method (O. Franek, BUT)
  - 11 December 2002, Tuned Active Filters for Laboratory Education (V. Axman, BUT)

DEPARTMENT OF TELECOMMUNICATIONS

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I. STAFF

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Prof. Ing. Kamil Vrba, CSc.

Associate Professors:

Doc. Ing. Miloslav Filka, CSc., Doc. Ing. Vladimír Kapoun, CSc., Doc. Ing. Karel Němec, CSc., Doc. Ing. Ivan Rampl, CSc.

Lecturers:

Ing. Radim Číž, Ing. Miroslav Balík, Ing. Ivo Herman, CSc., Ing. Ladislav Káňa, Ing. Jiří Mišurec, CSc.,
Ing. Karol Molnár, Ph.D., Ing. Zoltán Nagy, Ing. Petr Sysel, Ing. Jiří Schimmel,
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Administrative Staff:

Magda Lounková, Jitka Lukešová

II. FACILITIES

II.1 Teaching and Research Laboratories

- Laboratory for electroacoustics, studio and musci electronics
- Laboratory for analog techniques and converters
- Laboratory for transmission media and optoelectronics
- Laboratory for data communcations
- Motorola Development Centre, digital signal processors and digital filters
- Digital music studio
- Laboratory for network operating systems and subscriber terminals
- Laboratory for access and transport networks, high-rate communication systems
- Laboratory fo multimedia services, computers and programming
- Laboratory for the design of electronic devices, communication technologies

II.2 Special Instrumentation and Computers

- ATM System Lightstream and Catalyst Cisco System
- Alcatel 4400 Digital Private Branch Exchange and Business Phone 23 Ericsson Exchange, Lucent
  Technologies Exchange wirth ISDN Cards
- Workstation for Digital Speech Processing
- Workstation for Music Processing
- Workstation for Digital Video Processing, Editing Card for DV Raptor Digital Video
- NV-DS 77 Digital Videocamera, S-VHS Videorecorder BV-HS950, TX-W28D5F Display Unit 16:9

- VCON software for the realization of video-conferences
- GN Nettest Analyzer WinPharaoh LAN, WAN, ATM, Ethernet Module
- Soundproof room for EA transformer measuring
- Specialized workplace for the measurement of optical cables, TK-400 universal tester
- HP 3589A Spectrum / Network Analyzer and HP 35665A Spectrum Analyzer
- DIGISTANT 4422 Numerically Controlled Calibration Unit
- 36 pcs PC Pentiium
- 13 pcs Multimedia computers
- 2 pcs CISCO 170
- SUNLITE E1 Analyzer
- PDH ET&T Digital Transfer Systém
- Telecom/Data Analyzer PUM-4300E
- ADSL tester E2740, Alcatel ADSL modems, EMUTEL Maestro xDSL simulator, Telebyte 485 line model, ACUSCOM TA220ST ISDL modems, PUMA 3000 tester
- Agilent Oscillscope Infiniium 54820A
- MONA Direct Pro Q1C four-channel audiosignal analyzer, YAMAHA 01r digital mixing console, FOS TEXT D6 digital recorder, DIGITECH Studio 400 digital effect processor, EVENT ELECTRONICS Layla and Mona audio-interface modules, DIGIDESIGN 001, YAMAHA MU 90R digital synthesizer of music signals, SOUND ART Chameleon programmable 24-bit DSP audio-module. III. Teaching

III.1 Bachelor´s Programme (Bc)

Electronic Practice	Y1, L1, summer	0/2	Zeman
Systems, Processes and Signals	Y2, L1, summer	3/3	Smékal
Access and Transport Systems	Y1, L2, winter	3/3	Kapoun
Electroacoustics	Y1, L2, winter,	2/2	Káňa
Theory of Communication	Y1, L2, summer	3/2	Biolek
End-of-year Technical Project I	Y1, L2, winter, summer	0/6	Zeman
Communication Systems	Y1, L2, summer	3/2	Němec
Analog Technique	Y1, L2, summer	3/2	Vrba
Sensor Systems	Y1, L2, summer	3/2	Rampl
Telecommunications Lines	Y1, L2, summer	3/2	Filka
Data Communication	Y1, L2,winter	3/2	Němec
Mutual A/D Conversion of Signals	Y1, L2, winter	3/2	Vrba
Digital Transmission Systems	Y2, L2, winter	2/3	Škorpil
Parallel Processes in Operational Systems	Y2, L2, winter	3/3	Herman
Optical Telecommunication Networks	Y2, L2, winter	2/2	Filka
Telematic and multimedia services	Y2, L2, winter,	2/2	Vrba
Communication Networks and Techniques	Y2, L2, summer	2/3	Herman
End-of-year Technical Project II	Y2, L2, winter, summer	0/6	Zeman
Digital Exchanges	Y2, L2, summer	2/3	Kapoun
Digital Filters	Y2, L2, summer	3/3	Smékal
Digital Processing of Acoustic Signals	Y2, L2, summer	3/3	Mišurec
Sound Studio and Music Electronics	Y2, L2, summer	2/3	Káňa
Management and Marketing - a general education course	winter	3/2	Rampl

III.2 Master´s Programme (Ing)

Design of Electronic Circuits	Y3 L2, winter	3/2	Vrba
Microprocessor Technique in Telecommunications	Y3 L2, winter	2/3	Mišurec
ISDN Services	Y3 L2, winter	3/2	Škorpil
Integrated Networks	Y3 L2, winter	3/2	Novotný
Digital Signal Processors	Y3 L2, winter	3/2	Smékal
Coding Security Systems	Y3 L2, winter	3/2	Němec
Cryptography in informatics	Y3 L2, winter	2/3	Zeman

Diploma Work and Seminar	Y3 L2, winter, summer	0/10	Vrba
Subscriber Terminal Units	Y3 L2, summer	3/2	Novotný
High-Speed Telecommunication Devices	Y3 L2, summer	3/2	Škorpil
Maintenance of Telecommunication Devices	Y3 L2, summer	3/3	Chládek

III.3 Doctoral Programme (PhD)

Digital Signal Processors	Summer	42 hrs	Smékal
Integration of Telecommunication Networks and Services	Winter	42 hrs	Kapoun
Switched Circuits and their Application	Winter	42 hrs	Biolek
Sensor Information Systems	Winter	42 hrs	Rampl
Communication Media for Information Transmission	Summer	42 hrs	Filka
Mutual Conversion of Analog and Digital Signals	Summer	42 hrs	Vrba

III. 4 Study in English Language (International students)

Telecommunication Lines	Y1 L2, winter	3/3	Filka
Switching System Elements	Y1 L2, winter	3/3	Kapoun
Digital Filters	Y1 L2, winter	3/3	Smékal
Transmission System Elements	Y1 L2, summer	3/3	Škorpil
Optical Telecommunication Networks	Y1 L2, summer	3/3	Filka
Parallel Computing	Y2 L2, summer	3/2	Herman
Communication Networks and Techniques	Y2 L2, winter	3/3	Herman
Control and Simulation of Telecommunication Systems	Y2 L2, winter	3/3	Zeman
Digital Transmission Systems	Y2 L2, winter	3/2	Škorpil
Computer Practice	Y2 L2, winter	0/6	Svoboda
Integrated Networks	Y2 L2, summer	3/3	Kapoun, Škorpil
Digital Signal Processors	Y2 L2, summer	3/3	Smékal
Microprocessor Techniques in Telecommunications	Y3 L2, summer	3/3	Novotný
Terminal Equipment	Y3 L2, winter	3/3	Novotný
Switching Systems	Y3 L2, winter	4/3	Kapoun
Digital Processing of Acoustic Signals	Y3 L2, winter	3/3	Balík

IV. RESEARCH PROJECTS

IV.1 Active projects

Symbolic, semisymbolic and numerical methods for the analysis, design and optimisation of electrical circuits
   Grant project GAČR No. 102/01/0432, principal investigator: D. Biolek
New types of current conveyors and their application
   Grant project GAČR No. 102/00/1037, principal investigator: K. Vrba
RTD technology for separating sounds from speech masked in noise
   Grant project GAČR No. 102/00/1084, principal investigator: Z. Smékal
Code protection systems in systems transmitting messages over high-speed networks
   Grant project GAČR No. 102/0/1086, principal investigator: K. Němec
New filter structures using current conveyors and the switched-circuit technique
   Grant project GAČR No. 102/00/P067, principal investigator: V. Novotný
Synthetic elements with higher-order immittances
   Grant project GAČR No. 102/00/P130, principal investigator: I. Lattenberg
Introduction of the Bachelor programme in the new Teleinformatics field
   Grant project FRVŠ No. 1799, principal investigator: K. Vrba

Interactive library centre of scientific fields
  Grant project FRVŠ No. 1837, principal investigator: M. Studená
Information and counselling centre in www environment
  Grant project FRVŠ No. 1801, principal investigator: V. Škorpil
Introduction of instruction in problems of the structure of multimedia data processing systems
  Grant project FRVŠ No. 1818, principal investigator: L Káňa
Innovation and support of instruction in digital modulations
  Grant project FRVŠ No. 1816, principal investigator: D. Biolek
Innovation of the study programme in the subject "Data communication"
  Grant project FRVŠ No. 1827, principal investigator: V. Zeman
Modernization of the subject "Telematic and multimedia services"
  Grant project FRVŠ No. 1842, principal investigator: Z. Nagy
Innovation of instruction "Microprocessor technique in telecommunications"
  Grant project FRVŠ No. 1780, principal investigator: J. Mišurec
Innovation of the study programmes in optical transmission subjects
  Grant project FRVŠ No. 1814, principal investigator: M. Filka
Innovation of the study programme "Digital transmission systems"
  Grant project FRVŠ No. 1932, principal investigator: V. Škorpil, CSc.
New connections of frequency filters with UCC
  Grant project FRVŠ No. 1933, principal investigator: I. Rampl
Sensitivity classes and their application when comparing circuit properties
  Grant project FRVŠ No. 1825, principal investigator: L. Matějíček
Improving the quality and intelligibility of speech in mobile communications
  Grant project FRVŠ No. 1963, principal investigator: J. Poruba
Electronically controlled active frequency filters
  Grant project FRVŠ No. 1803, principal investigator: M. Olšák
Electronically controlled ARC oscillators
  Grant project FRVŠ No. 1790, principal investigator: T. Gubek
Statistical thresholding of wavelet spectrum when extracting a signal from noise
  Grant project FRVŠ No. 1823, principal investigator: P. Rajmic
Real-time parametric speech synthesis using cepstral models
  Grant project FRVŠ No. 1767, principal investigator: M. Vondra
Transmission of biological signals over GSM networks
  Grant project FRVŠ No. 1807, principal investigator: K. Polák
Neural network for the recognition of human face photographs
  Grant project FRVŠ No. 1793, principal investigator: M. Habr
Model of the transmission medium of access network
  Grant project FRVŠ No. 1828, principal investigator: V. Zeman
Wireless data transmission by the TCP/IP protocol
  Grant project FRVŠ No. 1797, principal investigator: M. Vajdík
IP telephony using Microsoft TAPI with linkage to the radio network
  Grant project FRVŠ No. 1802, principal investigator: D. Komosný
Laboratory for new-generation network technologies
  Grant project FRVŠ No. 1846, principal investigator: K. Molnár
Completion of the joint optical communications laboratory of Brno University of Technology and Masaryk University
  Grant project FRVŠ No. 1915, principal investigator: M. Filka
Creating a communication technology encyclopaedia and accessing on the Internet
  Grant project MŠMT No. LP 01060, principal investigator: K. Vrba
On-line journal Elektrorevue
  Grant project MŠMT No. LP 0088, principal investigator: V. Škorpil
Presentation of research results at the Invex fairs
  Grant project MŠMT No. LP 0052, principal investigator: V. Zeman
Interactive branch library
  Grant project MŠMT No. LI 002008, principal investigator: K. Vrba

Accessing on the Internet the results of international research and development of electronics technologies
   Grant project MŠMT No. LP 002004, principal investigator: I. Rampl
Application of digital speech separation in communication technologies
   Grant project MPO No. FD-K/125, principal investigator: K. Vrba
Applied research in the technologies of multimedia and hypermedia services
   Grant project MPO No. FD-K/040, principal investigator: K. Vrba
Research into new methods of image processing for precision measurements of dimensions in the building industry and their tests on the prototype of a 2D tester
   Grant project MPO No. FD-K/201, principal investigator: K. Vrba

IV.2 Participation in Faculty Research Projects

Research into Electronic Communication Systems and Technologies
   Research programme No. MŠMT 262200011, principal investigator: J. Svačina, UREL
Research into Microelectronic Systems and Technologies
   Research programme No. MŠMT 262200022, principal investigator: R. Vrba, ÚMEL

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- AMI Semiconductor, Brno
- ASICentrum, s. r. o., Prague
- TTC Marconi, s.r.o, Prague
- CZECH TELECOM, Brno
- EDUCATION CENTRE OF CZECH TELECOM PRAHA, Brno
- SOUTH-MORAVIAN POWER SUPPLY, Brno
- BRNO MUNICIPAL TRANSPORT, Brno
- OSTRAVA MUNICIPAL TRANSPORT, Ostrava
- BRNO TECHNICAL NETWORKS, Brno
- ŠKODA-TRANSPORT SYSTEMS, Plzeň
- ŠKODA OSTROV, s. r. o., Ostrov nad Ohří
- MILITARY ACADEMY, Brno
- MUSIC STUDIO DISK, Boskovice
- INSTITUTE OF SCIENTIFIC INSTRUMENTS OF CZECH ACADEMY, Brno
- INSTITUTE OF RADIOENGINEERING AND ELECTRONICS OF CZECH ACADEMY, Prague
- MOTOROLA, Prague
- MIROKOM Praha, Prague
- OPTOKON, Ltd., Jihlava
- TECHNISERV NET, Brno
- RADIOMOBIL, a. s., Prague
- SEV LITOVEL, a. s.
- ApS BRNO, s. r. o., Brno
- MOTOROLA CZECH SYSTEMS LABORATORIES MCSL, Rožnov p. Radhoštěm
- GiTy, a.s. Mariánské nám. 1, 617 00 Brno
- Military research institute of the army, Vyškov

V.2 International Cooperation

- Bournemouth University, Bournemouth, Poole, UK
- Oregon Graduate Institute of Science & Technology, 20000 N. W. Rd., Beaverton, Oregon 97006-1000, USA
- MOTOROLA European Semicondductors Group, Route de Ferney 207, P. O. Box 15, 1218 Le Grand-Saconnex, Geneva, Switzerland
- Department of Telecommunication ESIEE, Noisy, Paris, France
- Technische Universität Ilmenau, Germany
- Department of Microelectronics KHB, Oostende, Belgium

- Institute Supérieur d'Electronique de Paris, France
- European Cooperation in the Scientific and Technical Research, Luxembourg
- GEC Alsthom, Konstal, Poland
- Tishreen University in Lattakia, Syrian Arab Republic
- Interaction Design Centre, University of Limerick
- Acoustic Engineering Society, Netherlands

V.2.1 Visitors to the Department

- Cordonnier Charles Edouard, PhD., European Semiconductors Group, Route de Ferney 207, P. O. Box 15, 1218 Le Grand-Saconnex, Geneva, Switzerland, 2 days
- Dr. Hugo Tassignon, Katholieke Hogeschool Brugge, Oostende, Zeedijk 101, B-8400 Oostende, Belgieum, 5 days
- Prof. Hynek Hermansky, Department of Electrical Engineering and Applied Physics, Oregon Graduate Institute of Science & Technology, 20000 N. W. Walker Rd., Beaverton, Oregon 97006-1000, USA, 10 days

V.2.2 Visits of Staff Members to Foreign Institutions

- Pavel Šilhavý, Belgium, Katholieke Hogeschool Brugge-Oostende, 3 months
- Jiří Schimmel and Petr Sysel, the Netherlands, Acoustic Engineering Society, Amsterdam, 1 week
- Zdeněk Smékal, Katholieke Hogeschool Brugge-Oostende, 1 week

V. 3 Contracts

- Z. Smékal, Agreement on scientific cooperation with Tishreen University in Lattakia, Syrian Arab Republic
- Z. Smékal, Agreement within the Erasmus-Socrates project between UTKO and the Dept. of Microelectronics of KHBO (Ing. Tassignon, PhD.), Oostende, Belgium, on cooperation in the area of speech and image signal processing by wavelets (1997-2000)
- K. Vrba, Contract between UTKO and Czech Telecom in Brno on cooperation and educational support (2000)
- V. Škorpil, Contract between BUT and Czech Telecom Education Centre in Brno (2000)
- Z. Smékal, Contract between BUT and Motorola CZ (2000)
- K. Vrba, Contract between FEE BUT and RadioMobil, p. l. c. (2000)
- K. Vrba, Contract between FEEC BUT and the firm STROM Telecom (2002)
- K. Vrba, Contract between FEEC BUT and the firm GiTy (2002)

V. 4 Membership in International Organizations and Societies

- Dalibor Biolek: Correspondent of the Union Radio Scientifique Internationale
- M. Filka: Member of EAMEC, USA
- Z. Smékal: Member of IEEE, USA (Professional Communication Society & Signal Processing Society & Communications)
- Z. Smékal: Member of Audio Engineering Society, New York, USA
- Z. Smékal: Member of IASTED
- Z. Smékal: Member of the National Geographic Society
- K. Vrba: Member of EAMEC, USA
- K. Němec: Member of IEEE, USA
- M. Filka: Member of IEEE, USA
- K. Vrba: Member of IEEE, USA
- V. Škorpil: Member of IEEE, USA
- V. Zeman: Member of IEEE, USA
- I. Lattenberg: Member of IEEE, USA
- V. Kapoun: Member of the Editorial Board of the journal "Telecommunications and Business"

VI. PUBLICATIONS

VI.1 Journals, Books and Parts of Books

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- VRBA, K., SMÉKAL, Z., PORUBA, J., RAJMIC, P. Oponovaná výzkumná zpráva "Vývoj alternativních metod separace řeči", č. FD-K/125 (63 stran) (Development of alternative speech separation methods.).

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- KOMOSNÝ, D., HERMAN, I., VAJDÍK, M. Oponovaná závěrečná výzkumná zpráva projektu FRVŠ 1802/2002/G1 "IP telefonie pomocí Microsoft TAPI s návazností na rádiovou síť" (IP telephony by Microsoft TAPI with connection to radio network). 2002.

- POLÁK, K. Přenos biologických signálů v sítích GSM (Transferring biological signals in the GSM networks). 2002. Oponovaná výzkumná zpráva, 51 stran.

- VRBA, K. Tvorba algoritmů pro DSP (Algorithm implementation on DSP). 2002. Oponovaná výzkumná zpráva k projektu podporovaného MPO ČR v programu „KONSORCIA" ev. č. FD-K/125, 55 stran.

- ŠKORPIL, V. Oponovaná výzkumná zpráva (244 stran) pro SignalProjekt OK-BN-SZT-20 05 02 "Optické kabely" (Optical cables). 2002.

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- MOLNÁR, K., VRBA, K., NAGY, Z. Možnosti obousměrné multimediální komunikace - oponovaná výzkumná zpráva projektu MPO ČR č. FD-K/040, poč. stran. 67 (Possibilities of duplex multimedia communications). 2002.

- NAGY, Z., WILFERT, O., VRBA, K. Úvodní studie koherentního zobrazování (Introduction to coherent imaging). 2002. Oponovaná výzkumná zpráva o řešení projektu MPO ČR, FD-K2/01. 54 stran. VUT v Brně. Brno, 2002

- MATĚJÍČEK, L., VRBA, K., GUBEK, T. Nové kmitočtové filtry vyšších řádu s netradičními aktivními prvky, oponovaná výzkumná zpráva k projektu FRVŠ 1825/G1/2002 (52 stran) (Novel frequency filters of higher-order with modern active components). 2002.

- MATĚJÍČEK, L., VRBA, K. Definice citlivostních funkcí a příklady využití, oponovaná výzkumná zpráva k projektu FRVŠ 1825/G1/2002 (57 stran) (Definition of sensitivity function and examples of their using). 2002.

- MATĚJÍČEK, L. Druhy citlivostí a jejich využití při srovnávání vlastností obvodů - závěrečná zpráva k projektu FRVŠ č. 1825/G1/2002 (Different types of sensitivities a their using at the juxtaposition of the circuit characteristics). 2002.

- NAGY, Z., WILFERT, O., VRBA, K. Výzkum metod segmentace obrazu založených na hranových detektorech a objektových modelech (Research of image segmentation methods based on edge detectors and object models). 2002. Oponovaná výzkumná zpráva o řešení projektu MPO ČR, FD-K2/01. 60 stran. VUT v Brně. Brno, 2002
- NAGY, Z., WILFERT, O., VRBA, K. Výzkum optických soustav a příprava experimentu (Research of optical systems and preparation of experiment). 2002. Oponovaná výzkumná zpráva o řešení projektu MPO ČR, FD-K2/01. 59 stran. VUT v Brně. Brno, 2002
- BIOLEK, D., BIOLKOVÁ, V. Inovace a podpora výuky digitálních modulací (Innovation and Support of Teaching Digital Modulations). 2002. Závěrečná zpráva grantového projektu č. 1816/2002/F1 Fondu rozvoje vysokých škol. UTKO, FEKT VUT v Brně 2002
- ČÍŽ, R., SMÉKAL, Z., SYSEL, P., ŠILHAVÝ, P., RAJMIC, P. Samostatný rychlý modem (Oponovaná výzkumná zpráva k projektu GAČR "Kódové zabezpečovací systémy v sytémech pro přenos zpráv po vysokorychlostních sdělovacích sítích", reg.č. 102/00/1086) (Standalone fast modem (Research report of the GACR project No. 101/00/1086)). 2002. 62s.
- HÁJEK, K., BIOLEK, D., KRTIČKA, A., DOŇAR, B., ZAPLATÍLEK, K. Nekonvenční realizace kmitočtových filtrů, jejich návrh a optimalizace (Unconventional realization of frequency filters, their design and optimization). 2002. Závěrečná výzkumná zpráva grantového projektu č. 102/00/0907 Grantové agentury České republiky. VA Brno 2002

VII. OTHER ACTIVITIES

- New Technology in Telecommunications III. A course designed for workers of ČTU,
- Call Centre. A course prepared for the company Aliatel.
- Integrated Services of Digital Networks. A course prepared by the Department.
- Troubleshooting. A course prepared by the Department
- Mobile Communications Services.
- Presentation of results of research at the INVEX 2002 trade fair.
- The Department publishes the Internet journal www.Elektrorevue.cz (in Czech) and the international journal www.ElectronicsLetters (in English)
- The Department published the 1st volume of the Encyclopedia of communication technologies www.teleinform.cz
- Organizing the international conference 'Telecommunications and Signal Processing 2002'

DEPARTMENT OF THEORETICAL AND EXPERIMENTAL ELECTRICAL ENGINEERING

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Václav Hauer, Ing. Jaroslav Heinz

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Ing. Zdeněk Zapletal, Ing. Martin Zlomek

Administrative Staff:

Eva Cupáková, Eva Koubková

II FACILITIES

II.1 Teaching and Research Laboratories

- Laboratory for teaching the courses Theoretical Electrical Engineering and Circuit Theory
- Laboratory for teaching the courses Electromagnetism and Applied Electromagnetism
- Laboratory for teaching the courses Measurement in Electrical Engineering and Electrical and Electronic Measurement
- Research laboratory for modelling and optimisation of fields in electromechanical systems
- Research laboratory for magnetic measurements and nondestructive testing by electromagnetic methods

II.2. Special Instrumentation and Computers

- Electromagnetic field strength meter (from 27 to 1000 MHz).
- Optical measuring set OPTEL PROFI.
- Program MEP and MMAP v. 5.1 for modelling of electrostatic, magnetic and quasi-stationary fields by the Finite Element Method (FEM).
- Program ANSYS v. 5.1 based on FEM – Unlimited version for Microsoft NT Windows OS.
- Program ANSYS v. 5.3 based on FEM – University version for Microsoft NT Windows OS.
- Program MATLAB v. 5.3
- Program MEP 6.0 for modelling of harmonic electric fields in lossy media for Microsoft NT Windows
- Electronic fluxmeter capable of measuring and graphical presentation of both magnetisation curves and static hysteresis characteristics of ferromagnetic samples.
- Computer-controlled measuring site for hysteresis characteristics of ferromagnetic materials
- Semiautomatic computer-controlled set for precision checking of analog and digital multimeters.
- Semiautomatic computer-controlled set for precise DC measurement of very low resistances.
- Laboratory electromagnet for NMR spectrometer at 80 MHz.
- Coercive Force Meter FOERSTER.
- Hall probe magnetometer FOERSTER.
- Milliteslameter with a ferromagnetic probe.

- Standards of inductances and capacitances.
- Standard magnets.
- Gauss/Teslameter F.W. BELL Series 9950 (0.001μT – 300T)

III. TEACHING

III.1. Bachelor´s Programme (Bc)

Applied Electromagnetism	Y2, summer	2/3	Jarmila Dědková
Electrical Insulation	Y3, winter	3/2	Pavel Kaláb
Electrical Engineering I	Y1, winter	2/2	Lubomír Brančík
Seminary of Electrical Engineering	Y1, winter	0/2	Jarmila Dědková

III.2. Master´s Programme (Ing)

Theoretical Electrical Engineering I	Y1 L1, summer	3/2	Jiří Sedláček
Theoretical Electrical Engineering II	Y2 L1, winter	3/2	Juraj Valsa
Circuit Theory	Y1 L1, summer	3/3	Milan Murina
Measurement in Electrical Engineering	Y2 L1, summer winter	2/1	Jiří Rez
Electromagnetism	Y2 L1, summer	3/3	Libor Dědek
Circuit Theory (in English)	Y2 L1, winter	2/0	Juraj Valsa
Experimental Practice	Y1 L1, summer Y2 L1, winter Y2 L1, summer	0/2	Jiří Rez
Electrical Installations	Recom., summer	2/2	Pavel Kaláb

III.3. Doctoral Programme (PhD)

Algorithms for Computer Simulation of Linear and Non-linear Electronic Networks	Winter	42 hrs.	Juraj Valsa
Finite Element Method in Power Electrical Engineering	Winter	42 hrs.	Libor Dědek

III.4 Study in English Language (International Students)

Circuit Theory	Y1 L1, summer	3/3	Juraj Valsa
Electromagnetism	Y2 L1, summer	4/2	Libor Dědek
Fundamentals of Electrical Engineering	Y1 L1, winter	0/1	Jiří Sedláček
Electrical Measurement	Y2 L1, summer	2/3	Eva Gescheidtová

IV RESEARCH PROJECTS

Symbolic, Semisymbolic and Numerical Methods of Analysis, Design and Optimization of Electrical Circuits
Grant project GAČR No. 102/01/0432, principal investigator: Juraj Valsa

Electronic Circuits in Non-Conventional Modes and Their Applications
Grant project GAČR No. 102/01/0228, principal investigator: Juraj Valsa, participants: Jiří Sedláček, Milan Murina

Non-Conventional Realization of Frequency Filters, Their Design and Optimization
Grant project GAČR No. 102/00/097, principal investigator: Jiří Sedláček

Methods of Solution of Selected Nonstandard Tasks with Dominancy of Electromagnetic Field
Grant project GAČR No. 102/00/0933, principal investigator: Libor Dědek, participants: Jarmila Dědková, Pavel Fiala

Participation in the Faculty Research Intentions
Research programme No. MSM 262200011, principal investigator: Jiří Svačina, UREL, participants: Juraj Valsa, Jiří Sedláček, Lubomír Brančík, Miloslav Steinbauer
Research programme No. MSM 262200022, principal investigator: Radimír Vrba, UMEL, participants Juraj Valsa, Lubomír Brančík

V Cooperations

V.1 Cooperations in the Czech Republic

- Department of Theoretical Electrical Engineering, FEL, University of Western Bohemia, Plzeň
- Department of Circuit Theory, FEL, Czech Technical University, Prague
- Department of Optics, Palacky University Olomouc
- Military Academy Brno
- ABB EJF Comp., Brno, ABB EJF Comp., Prague
- Prototypa Comp., Brno
- ELIS Comp., Brno
- Department of Electrical Drives and Power Electronics, FEEC BUT Brno
- Department of Radioelectronics, FEEC BUT Brno
- Department of Physical Engineering, FME BUT Brno

V.2 International Cooperation

- Institute of Physics, Slovak Academy of Sciences, Bratislava, Slovak Republic
- Department of Theoretical Electrical Engineering and Electrical Measurement, Technical University of Warszawa, Poland
- Department of Theoretical Electrical Engineering, Technical University of Gliwice, Poland (network theory, simulation, FEM)
- Department of Engineering, University of Waterloo, Ontario, Canada (sensitivity of switching networks)
- ISEP Paris, France

V.3 Membership in International Organizations and Societies

- Juraj Valsa, IEEE Power Engineering Society, Member (USA), Member of program committee of international conference SPETO (Poland)
- Libor Dědek, IEEE Magnetics Society, Member (USA)
- Jiří Rez, IEEE Instrumentation and Measurement Society, Member (USA)
- Lubomír Brančík, IEEE Circuits and Systems Society, Member (USA), IEICE Engineering Sciences Society, Member (Japan)
- Milan Murina, Member of program committee of international conference SPETO (Poland)
- Jiří Sedláček, Member of program committee of international conference SPETO (Poland)

VI Publications

VI.1 Journals and Parts of Books

- HÁJEK, K., SEDLÁČEK, J. Kmitočtové filtry (Frequency filters). 1. ed. BEN-technická literatura Praha: BEN-technická literatura, Luboš Kubica, 2002. ISBN 80-7300-023-7
- DĚDEK, L., DĚDKOVÁ, J., VALSA, J. Optimization of Perfectly Matched Layer for Laplace's Equation. *IEEE Transaction on Magnetics*, ISSN 0018-9464, 2002, Vol. 2002, No. 2, p. 501 - 504.
- BARTUŠEK, K., GESCHEIDTOVÁ, E. Měření vlastností gradientních magnetických polí v tomografii magnetické rezonance metodou okamžitého kmitočtu (Gradient magnetic field measurementin MR tomography by IF method). *Elektrorevue - Internetový časopis (http://www.elektrorevue.cz)*, ISSN 1213-1539, 2002, Vol. 2002, No. 26, p. 1 - 10.
- GESCHEIDTOVÁ, E., BARTUŠEK, K. Application of digital signal processors in a gradient controller for MR tomography. *ElectronicsLetters.com - http://www.electronicsletters.com*, ISSN 1213-161X, 2002, Vol. 2002, No. 9, p. 1 - 8.
- BARTUŠEK, K., GESCHEIDTOVÁ, E. Měření indukce magnetického pole metodou okamžitého kmitočtu spinového echa (Measurement of the magnetic field induction by IFSE method). *Elektrorevue - Internetový časopis (http://www.elektrorevue.cz)*, ISSN 1213-1539, 2002, Vol. 2002, No. 35, p. 35 - 42.
- BARTUŠEK, K., GESCHEIDTOVÁ, E. Instantaneus freguency of spin echo method for gradient magnetic fields measurement on MR systems.. *Journal of Electrical Engineering*, ISSN 0013-578X, 2002, Vol. 53, No. 10/s (2002), p. 49 - 52.

- KALÁB, P., STEINBAUER, M., VESELÝ, M. Novel educational program of electrical devices safety at Faculty electrical engineering and comunication, Technical university of Brno. *Journal of Electrical Engineering*, ISSN 1335-3632, 2002, Vol. 53, No. 11-12, p. 354 – 356.

VI.2 Conferences

- BRANČÍK, L. *Improved Method of Numerical Inversion of Two-Dimensional Laplace Transforms for Dynamical Systems Simulation* In Proceedings of The 9th IEEE International Conference on Electronics, Circuits and Systems. Dubrovnik, Croatia: Zagreb University of Technology, 2002, p. 385 - 388, ISBN 0-7803-7597-1.
- BRANČÍK, L. *Numerical Inversion of Two-Dimensional Laplace Transforms Based on FFT and Quotient-Difference Algorithm*. In Proceedings of The International Conference on Fundamentals of Electronics, Communications and Computer Sciences ICFS'2002. Waseda University, Tokyo, Japan, 2002, p. 15 – 20.
- BRANČÍK, L. *Matlab Oriented Matrix Laplace Transforms Inversion for Distributed Systems Simulation*. In Proceedings of 12th International Scientific Conference Radioelektronika2002. Department of Radio and Electronics, FEI STU Bratislava, Slovakia, 2002, p. 114 - 117, ISBN 80-227-1700-2.
- BRANČÍK, L. *Novel FFT-Based Method for Numerical Inversion of Two-Dimensional Laplace Transforms*. In Proceedings of 25th International Conference on Fundamentals of Electrotechnics and Circuit Theory IC–SPETO 2002. Gliwice-Ustroň, Poland, 2002, p. 199 - 202, ISBN 83-85940-24-3.
- DĚDEK, L., DĚDKOVÁ, J. *Perfectly matched layers for stationary magnetic field* In 25th International Conference on Fundamentals of Electrotechnics and Circuit Theory IC-SPETO 2002. Gliwice, Poland, 2002, p. 41 - 44, ISBN 83-85940-24-3.
- DĚDEK, L., DĚDKOVÁ, J., VALSA, J. *Optimization of Perfectly Matched Layer for 2D Poisson's equation with Antisymmetrical or Symmetrical Boundary Conditions* In The 10th International IGTE Symposium on Numerical Field Calculation in Electrical Engineering. Graz, Austria , 2002, p. 55 - 60, ISBN 3-901351-65-5.
- GESCHEIDTOVÁ, E., STEINBAUER, M. *Educational multimedia program for cicuit theory course* In International Conference Research in Telecommunication Technology. Research in Telecommunication Technology. Žilina, Slovakia, 2002, p. 149 - 151, ISBN 80-7100-991-1.
- BARTUŠEK, K., GESCHEIDTOVÁ, E. *Adaptive digital filter for gradient magnetic field measurement in MR tomography* In APCCAS 2002. 2002 Asia-Pacific Conference on Circuits and Systems APCCAS´02. Bandung, Indonesia: IEEE, 2002, p. 79 - 82, ISBN 0-7803-7690-0.
- REZ, J., GESCHEIDTOVÁ, E. *Effect of specimen shape on information yield in non-dstructivemagnetic testing*. In Electromagnetic Fields and Materials & Magnetic Measurement´02. MM'02. Bratislava, Slovakia, 2002, p. 114 – 117.
- KALÁB, P. *Insulating properties of the epoxy resin exposed to surface discharges* In 14thInternational conference of dialectric and insulating systems in electrical engineering - DISEE 2002. Bratislava: FEI STU, Slovakia, 2002, p. 40 - 41, ISBN 80-227-1758-4.
- HÁJEK, K., SEDLÁČEK, J., SVIEZENY, B. *New Circuits for Realization of the 1st and 2nd order All-Pass Filters with a Better Technological Feasibility* In ISCAS 2002. The International Conference ISCAS 2002. Phoenix, USA: Phoenix University, USA, 2002, p. 523 - 526, ISBN 0-7803-7449-5.
- HÁJEK, K., SEDLÁČEK, J. *General Multiple LC Prototype Filter Solutions and Optimization* In The 9th IEEE International Conference on Electronics, Circuits and Systems. Dubrovnik, Croatia: Faculty of Electrical Engineering and Computing, University of Zagreb, 2002, p. 165 - 168, ISBN 0-7803-7597-1.
- HÁJEK, K., SEDLÁČEK, J. *Active RC filters for very low frequencies* In 12th International Czech-Slovak Scientific Conference. RADIOELEKTRONIKA 2002. Bratislava, Slovakia, 2002, p. 44 - 47, ISBN 80-227-1700-2.
- SEDLÁČEK, J. An *Optimization of High Order Low-Pass Filters* In 25th International Conference of fundamentals of electrotechnics and circuit theory XXV SPETO 2002. Gliwice-Ustron, Poland, 2002, p. 389 - 392, ISBN 83-85940-24-3.

VI.3 Textbooks, Lecture Notes

- BRANČÍK, L., VESELÝ, Z., ZAPLETAL, Z.: *Teoretická elektrotechnika I - Sbírka příkladů. (Theoretical Electrical Engineering I - Practices)*. ISBN 80-214-2077-4.
- BRANČÍK, L., SEDLÁČEK, J., VALSA, J. *Elektrotechnika I (Electrical engineering I)*. FEEC BUT Brno, 2002 (TEE001).

- GESCHEIDTOVÁ, E., REZ, J., STEINBAUER, M. *Měření v elektrotechnice (Electrical measurement)* Brno, VUTIM, 2002. ISBN 80-214-1990-3.
- MURINA, M. *Teorie obvodů (Circuit Theory)*. Brno, 2002. ISBN 80-214-2081-2.
- MURINA, M., SEDLÁČEK, J., BRANČÍK, L., STEINBAUER, M., VESELÝ, M. *Elektrotechnika II - cvičení (Electrical engineering II - practise).* Brno, 2002 (TEE006).
- RAIDA, Z., FIALA, P. *Počítače a programování 2 (Computers and programming 2).* FEEC BUT Brno, 2002 (REL021).
- SEDLÁČEK, J., VALSA, J. *Elektrotechnika II přednášky (Electrical engineerign II - lessons).* Brno, 2002 (TEE005).

VI.4 PhD and Habilitation Theses

- DĚDEK, J.: Computational Electromagnetism. Up to Date State, Future Development and Education. Inauguration Lecture. Scientific Papers BUT Brno, 2002, Vol. 72.

VII OTHER **A**CTIVITIES

- DTEEE FEEC was together with Military Academy of Brno coorganizer of the conference Seminary of Circuit Theory, Brno, September 2002.
- FIALA, P.: HS 410017, Prototypa Comp., Brno
- Analysis of Coupled Electromagnetic Model of Pulse Voltage or Current Source.
- FIALA, P.: HS 420015, Prototypa Comp., Brno
- Conception Design and Model Analysis of Power Microwave Generator of Electromagnetic Impulse.

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Alena Šmídková

II. FACILITIES

II.1 Teaching and Research Laboratories

- Laboratory of electrical machines
- Laboratory of fractional horse power electrical machines
- Laboratory of electrical apparatus
- Laboratory of electric arc and plasma
- High - voltage laboratory
- Laboratory of holographic interferometry
- Laboratory of special diagnostics
- Laboratory of electrical drives
- Laboratory of power electronics
- Laboratory of microprocessor – technics
- Laboratory of control –technics
- Laboratory of testing and verification of quality
- The quality assurance and non-destructive testing laboratory
- Research laboratory
- PC classrooms

II.2 Special Instrumentation and Computers

- Dynamometer with tenzometric torque measurement including diagnostics up-to 1 kW
- Measurement setup for automation measuring of electrical machines including evaluation facilities
- TorqueMaster dynamometer including diagnostics and data handling processing
- Digital multimeters Keithley, type 2000
- Programmable wattmeter Hioki 3188
- Programmable source of DC 300 A / 24 V
- Automatic measurement of electrical machines including diagnostics
- Holographic stand for vibration and small deformations measurement
- Workplace for electric arc measurement
- High-speed camera NAC (up to 10 000 frames/s)
- Digital oscilloscope TEKTRONIX TDS 754C, 500 MHz, 4 channels, 2Gb/s
- Voltage probes TEKTRONIX P6015A (20kV)
- Three-channels set for pressure measurements KISTLER (0-20 MPa)
- Automatic system of digital data acquisition and evaluation
- Dynamometric stations for electrical drives up to 50 Nm
- Storage oscilloscopes, digital multimeters, counters, logical analysers
- Development system for microprocessor Motorola M 56001
- 6 sets of development systems for microprocessors Intel MCS 48
- 6 sets of development systems for microprocessors Intel MCS 96
- Controlled measurement station PC - Advantech - Lab View
- Measurement and control station PC - MATLAB - Real Time Toolbox
- Development system for controllers PC - MATLAB - SIMULINK - Real Time Workshop
- Electronical contactless measurement of speed, acceleration and path Chauvin - Arnoux
- Equipment for power transistors switching phenomena measure
- Modular control systems set Dominoputer
- Programmable 3-phase current source for motor testing, 3 kW, 0-460 V
- TORQUEMASTER - Torque sensor, up to 200 Nm
- Digital multimeters KEITHLEY 2700 (2 pcs)
- Contactless digital thermometer SEFRAM (up to 500 °C)
- High-Voltage construction kit 0,5/5 Trg, MWB (AC and DC voltage up to 200 kV)
- Gaussmeter/Teslameter TECTRA – measurement of magnetic fields with heavy duty probe included
- 2 channel digital oscilloscope 100 MHz, 54622 A
- Combined power source analyser BK 550
- Software: Autodesk Inventor, Autodesk Charakter Studio, 3ds max 4, MATLAB, TestPoint, LabView

III. TEACHING

III.1 Bachelor´s Programme (Bc)

Computers and Programming I	Y1, winter	2/2	Aubrecht
Information technology in high-power Engineering	Y1, summer	0/2	Aubrecht
El. drives and power electronic	Y2, winter	3/2	Feiler
Power and control electronics	Y2, winter	3/2	Patočka
Logic circuits and microprocessors	Y2, summer	3/2	Klíma
Electrical machines and apparatus	Y2, summer	3/2	Horná
Operation of electrical drives	Y3, summer	3/3	Koláčný
Operation and protection of electrical machines	Y3, summer	3/3	Horná
Technology and production of electrical machines and apparatus	Y3, winter	3/2	Veselka
Computers in power engineering	Y3, winter	3/2	Kuchyňková
Computer control of electric drives	Y3, winter	3/2	Klíma
Quality and metrology management	Y3, winter	3/2	Hruška
Electrical equipment in motor vehicles	Y3, summer	3/2	Hájek
Inspection and control activity	Y3, summer	3/2	Veselka
Technical project	Y3, summer	0/6	Veselka

III.2 Master´s Programme (Ing)

Electrical machines I	Y1 L2, winter	3/2	Ondrůšek
Materials for construction	Y1 L2, winter	3/2	Kutnohorský
Electrical apparatus	Y1 L2, summer	3/3	Vávra
Power electronics I	Y1 L2, summer	3/2	Vrba
Electrical machines II	Y1 L2, summer	2/3	Ondrůšek
Computers in power engineering	Y1 L2, summer	3/2	Kuchyňková
High-voltage phenomena	Y1 L2, summer	3/2	Aubrecht
Control Theory I	Y1 L2, summer	3/2	Skalický
Measurement in power engineering	Y2 L2, winter	2/3	Hájek
Electrical drives I	Y2 L2, winter	3/2	Koláčný
Power electronics II	Y2 L2, winter	3/2	Patočka
Electrical stations	Y2 L2, summer	3/2	Vávra
Computer aided design	Y2 L2, summer	3/2	Kuchyňková
Electrical machines for motor vehicles	Y2 L2, summer	3/2	Hájek
Laboratory measurements on el. drives	Y2 L2, summer	0/5	Koláčný
Electrical drives II	Y2 L2, summer	3/2	Skalický
Semester project 1	Y2 L2, summer		Skalický, Ondrůšek
Protection in power engineering	Y3 L2, winter	3/2	Vaněk
Micro-machines	Y3 L2, winter	3/2	Hájek
Construction of electrical machines and apparatus	Y3 L2, winter	6/0	Vávra
Production of electrical machines and apparatus	Y3 L2, winter	3/2	Kutnohorský
Design of electrical drives	Y3 L2, winter	3/2	Skalický
AC controlled drives	Y3 L2, winter	3/3	Feiler
Regulators of electrical drives	Y3 L2, winter	2/2	Feiler
Microprocessor control of drives	Y3 L2, winter	3/3	Skalický
Electrical equipment of motor vehicles	Y3 L2, summer	3/2	Hájek
Solving of innovation problems (TIPS)	Y3 L2, summer	3/2	Bušov
Economy and management	Y3 L2, summer	3/2	Kutnohorský
Special tests of electrical instruments	Y3 L2, summer	3/2	Horná
Protection and installation in LV switchgear	Y3 L2, summer	3/2	Vaněk
Electromechanical systems	Y3 L2, summer	3/2	Ondrůšek
Simulation and optimisation	Y3 L2, summer	2/2	Ondrůšek
Inspection and control activity	Y3 L2, summer	2/2	Lapčík, Veselka
Power electronics III	Y3 L2, summer	3/2	Patočka
Electrical micro-drives	Y3 L2, summer	2/2	Koláčný
Semester project 2	Y3 L2, summer		Skalický, Ondrůšek
Diploma work	Y3 L2, summer		Skalický, Ondrůšek

III.3 Doctoral Programme (PhD)

Advanced control of electrical drives	Winter	42 hrs.	Skalický
State control of electrical drives	Winter	42 hrs	Skalický
Plasma physics	Winter	42 hrs	Peška
Methodology and practise of establish of quality system control by internat. agreements (ISO9000)	Winter	42 hrs	Hruška
Electrical machines for motor vehicles	Winter	42 hrs	Hájek
Electromechanical energy conversion	Winter	42 hrs	Ondrůšek
Solving of innovation problems (TIPS)	Winter	42 hrs	Bušov, Veselka
Optical diagnostics of plasma	Summer	42 hrs	Peška
Automation measurement of electrical machines	Summer	42 hrs	Hájek
Electrical microdrives	Summer	42 hrs.	Koláčný
Topical conditions of testing and certification in CR and EU	Summer	42 hrs	Hruška

III.4 Study in English Language (International Students)

Electrical Machines I	Y1 L2, summer	3/2	Lapčík
Materials for Construction	Y1 L2, winter	3/2	Lapčík
Power Electronics I	Y1 L2, winter	3/0	Skalický
Electrical Apparatus	Y1 L2, summer	3/2	Aubrecht
Electrical Machines II	Y1 L2, summer	2/3	Ondrůšek
Computers in Power Engineering	Y1 L2, summer	3/2	Kuchyňková
High-Voltage Phenomena	Y1 L2, summer	3/2	Aubrecht
Measurement in Power Engineering	Y2 L2, winter	2/3	Ondrůšek
Control Theory II	Y2 L2, winter	3/0	Skalický
Electrical Drives I	Y2 L2, winter	3/0	Koláčný
Electrical Traction	Y2 L2, summer	3/2	Ondrůšek
Computer Aided Design	Y2 L2, summer	3/2	Kuchyňková
Electrical Machines for Motor Vehicles	Y2 L2, summer	3/2	Hájek
Micromachines	Y3 L2, winter	3/2	Hájek
Design of Electrical Machines and Apparatus	Y3 L2, winter	3/2	Lapčík
Production of Electrical Machines and Apparatus	Y3 L2, winter	3/2	Lapčík
Electrical Equipment of Motor Vehicles	Y3 L2, summer	3/2	Hájek
Plasma Technology	Y3 L2, summer	3/2	Aubrecht
Electromechanical Systems	Y3 L2, summer	3/2	Ondrůšek
Simulation and Optimalization	Y3 L2, summer	2/2	Ondrůšek
Inspection and Control Activity	Y3 L2, summer	2/2	Lapčík
Technical Project I	Y2 L2, winter		
Technical Project II	Y3 L2, winter		
Diploma Project	Y3 L2, summer		

IV. RESEARCH PROJECTS

Research of power electrical commutatorless drives of low voltage for automobile industry
 Grant project GAČR No. 102/00/DO13/B, principal investigator: P. Vorel

Research of resources, accumulation and optimisation of electrical energy in ecological applications,
 Research programme No. MSM 262200010, principal investigator: Jiří Kazelle, Čestmír Ondrůšek, A. Matoušek

Special pump for liquid salts in transmutation devices
 Grant project GAČR No. 101/00/0478, principal investigator: Oldřich Matal – Energovýzkum, s. r. o., participant: Čestmír Ondrůšek

Complex dynamic systems with parameters variations in high power engineering
 Grant project GAČR No. 102/00/1586, principal investigator: Čestmír Ondrůšek, Josef Koláčný, Jiří Skalický, František Veselka, Vladimír Aubrecht, Josef Bartl

Innovation methods of electrical machines design and testing
 Grant project FRVŠ No. 1525, principal investigator: Vítězslav Hájek

Measurement, analysis and identification of asynchronous machines parameters
 Czech-Poland grant project, No.21 (79), principal investigator: Vítězslav Hájek

Integrated starting device
 Grant project MPO No. FD-C3/84, co-investigator: Vítězslav Hájek

Axial starter actuated by permanent magnet
 Grant project MPO No. FD-K/123, co-investigator: Vítězslav Hájek

Project Contact – Development of invention potential of students, teachers and designers by TIPS methodology
 Grant project MŠMT No. ME 400349, principal investigator: Bohuslav Bušov

Induction motors with external rotor
 Grant project MPO No. FD-K/123, co-investigator: Vítězslav Hájek

Project Contact – Laboratory of quality diagnostics and testing
 Grant project MŠMT No. ME 400350, principal investigator: Karel Hruška

Radiation of switching arc in high power circuit breakers
 Grant project KONTAKT ME499, principal investigator: Vladimír Aubrecht

Research of power low voltage brushless drives used in vehicles
   Grant project GAČR No. 102/00/D013, principal investigator: Pavel Vorel
Innovation of Laboratory of electrical dynamics and protection
   Grant project MSMT H-0072, principal investigator: Zdeněk Vávra
Diagnostics of electromagnetic properties of electric machines using vibration acoustic fields
   Grant project GAČR No. 102/01/1291, co-investigator: Čestmír Ondrůšek
Development of universal breech of ballistic measurement devices according to NATO and C.I.P. standards
   Grant project MPO, No. FD-K/044, co-investigator: Čestmír Ondrůšek
Research of city bus and its components
   Grant project MPO, FD-K/111, co-investigator: Čestmír Ondrůšek
Novel methods of spatial computer modeling
   Grant project MSMT, FRVS 1952/2002, principal investigator: H. Kuchyňková
Training laboratory for measurement of high-speed engines
   Grant project MSMT FRVS, principal investigator: J. Pozdník
Electrical pumping device for NC working machines
   Grant project MPO FF-P/094, principal investigator: V. Hájek
High speed motors with high efficiency for vacuum cleaners
   Grant project MPO, principal investigator: F. Veselka

V. COOPERATIONS

V.1 Cooperations in the Czech Republic

- Magneton Kroměříž
- ABB-EJF Brno
- ABB-ENERGO Trutnov
- JULI MOTORENWERKE Brno
- OEZ Letohrad
- Prošek elektrosystémy a. s., Brno
- Škoda Auto Mladá Boleslav
- VUES, a. s., Brno
- Siemens AG, Praha
- Siemens AG, Michalovce
- Siemens Elektromotory s.r.o, závod Drásov
- Siemens, Mohelnice
- JE Dukovany
- KPB Intra Bučovice
- TG Drives, s. r. o., Brno
- UZIMEX, s. r. o., Praha
- Motorola CZ, Rožnov p. Radhoštěm
- Control Technics VUES, s. r. o., Brno
- SEW Eurodrive s. r. o., Praha
- DEL, s. r. o., Žďár nad Sázavou
- HBM Centrum, s. r. o., Brno
- MICROSYS, s. r. o., Brno
- ČEZ Vodní elektrárny Štěchovice, Slapy
- PROTOTYPA, a. s., Brno
- ETA, Hlinsko
- Transformátory Jevišovice
- APS, Světlá nad Sázavou
- EMP Slavkov

V.2 International Cooperation

- TU Gliwice, Poland
- TU Lodz, Poland
- TU Warsaw , Poland
- TU Poznan, Poland
- TU St. Peterburg, Russia
- HEDRC Moscow, Russia
- IMAPH Minsk, Belarus
- TU Gdansk
- Univ. P. Sabatier, Toulouse, Francie
- RWTH Aachen, Germany
- E. M. Arndt University of Greifswald, Germany
- University of Liverpool, UK
- IEA Lund Institute of Technology, Lund, Sweden
- Polytechnical Institute Kiev, Ukrajine
- T. Shevchenko Kiev Nat. University, Ukraine
- FEL, Slovak Technical University, Bratislava, Slovakia
- TU Košice, Slovakia
- TU Žilina, Slovakia
- HUNELEC, Ltd., Budapest, Hungary
- MNPO Spektr Moscow, Russia

V.2.1 Visitors to the Department

- J. Kudla, IMUE TU Gliwice, Poland, 5 days
- C. Zywiec, IMUE TU Gliwice, Poland, 5 days
- A. Bobon, IMUE TU Gliwice, Poland, 5 days
- J. Kapinka, IMUE TU Gliwice, Poland, 5 days
- R. Miksiewicz, IMUE TU Gliwice, Poland, 5 days
- H. Weiss, MU Leoben, Austria, 2 days
- A. Schmidhofer, MU Leoben, Austria, 2 days
- B. Davat, INPL Nancy, France, 2 days
- I. Nagy, BME, Budapest, Hungary, 2 days
- P. Korondi, BME, Budapest, Hungary, 2 days
- P. Bauer, DUT, Delft, Holland, 2 days
- P. DFuisen, SR, Alphen, Holland, 2days
- Mužickij, Sosnin, MNPO Spektr, Moscow, Russia 5 days

V.2.2 Visits of Staff Members to Foreign Institutions

- V. Aubrecht, RWTH Aachen, 9 days
- J. Bartl, V. Hájek, IMUE, TU Gliwice, Poland, 3 days
- Z. Vávra, Cigre, Paris, France, 5 days
- M. Maňa, KPI Kiiev, Ukraine, 1 month
- Č. Ondrůšek, TU Warsaw, Poland, 5 days

V.3 Contracts

- JULI MOTORENWERKE Brno, Measurement of revolution sensors in motors JULI, Analysis of electrical motors for high-lift trucks, Dynamic testing of asynchronous motors for manufacturing lines, Hájek, Ondrůšek
- JME, a. s., E. ON Bohemia, s.r.o, Cooperation Memorandum, Ondrůšek
- VUES Brno, Cooperation Agreement, Hájek, Ondrůšek
- Siemens Elektromotory, s. r. o., závod Drásov, Kutnohorský
- OEZ Letohrad, Cooperation Agreement, Vaněk

- Magneton Kroměříž, Analysis of prospect development in the field of alternators and starters for motor vehicles, Hájek
- Auto-Škoda Mladá Boleslav, Integrated starting system, Hájek
- Siemens Michalovce, Veselka
- KPB INTRA, Cooperation Agreement, Vaněk
- ČEZ Hydro-power-stations Štěchovice, Slapy
- PROTOTYPA, a. s., Cooperation Agreement,

V.4 Membership in International Organizations and Societies

- Vávra Z., CIGRE
- Skalický J., member IEEE, The Institute of Electrical and Electronics Engineers
- Patočka, M., member IEEE, The Institute of Electrical and Electronics Engineers

VI. PUBLICATIONS

VI.1 Journals and Parts of Books

- AUBRECHT, V., BARTLOVÁ, M. Net Emission Coefficients in Argon Arc Plasmas. *Czechoslovak Journal of Physics*, ISSN 0011-4626, 2002, Vol. 52, n. 6, p. 522 - 527.
- BRADÍK, J. Metodika vyjadřování nejistoty měření (Methodology of expressing of uncertainty in measurement). *Elektrorevue - Internetový časopis (http://www.elektrorevue.cz)*, ISSN 1213-1539, 2002, Vol. 2002, n. 11, p. 1 - 6.
- BŘEZINA, T., KRATOCHVÍL, C., ONDRŮŠEK, Č. Mechatronics Handbook. Chapter: *Design Optimization of Mechatronic System*. Florida, USA: CRC Press LLC, 2002. p. 34-1 - 47. ISBN 0-8493-0066-5
- BUŠOV, B. Znalostně založené inovace (knowledge based innovation). , 2002, Vol. , n. ,
- KUTNOHORSKÝ, V. Ložiskové proudy (The Bearing Current). *Elektrotechnika v praxi*, ISSN 0862-9730, 2002, Vol. 2002, n. ,
- ONDRŮŠEK, Č., KRATOCHVÍL, C. Mechatronics Handbook. Chapter: *Mechatronics Handbook*. Florida, USA: CRC Press LLC, 2002. p. 34-1 - 47. ISBN 0-8493-0066-5
- VOREL, P., ČERVINKA, D. Jednostopé elektromobily s asynchronním pohonem (Electric vehicles with an induction motor). *Technik*, ISSN 2100-616X, 2002, Vol. , n. 3,

VI.2 Conferences

- AUBRECHT, V., BARTLOVÁ, M. *Radiation in SF6+PTFE Arc Plasmas* In Proceedings of the XIV International Conference on Gas Discharges and their Applications. XIV International Conference on Gas Discharges and their Applications. Liverpool: The University of Liverpool, 2002, p. 47 - 50, ISBN 0-9539105-1-2
- AZIZIAN, M., HUTÁK, P., VOREL, P. *Sensorless Brushless DC Motor Drive Using a Frequency Independent Phase Shifter* In EPVE 2002 Elektrické pohony a výkonová elektronika. EPVE 2002, celostátní konference elektrických pohonů a výkonové elektroniky. Brno: VUT FEKT v Brně, ÚVEE, 2002, p. 164 - 169, ISBN 80-214-2246-7
- AZIZIAN, M., SKALICKÝ, J., HUTÁK, P., VOREL, P. *Sensorless control of brushless DC motor drives using a frequency independent phase shifter* In X. international symposium on electric machinery in Prague. International Workshop on Robot-Multi-Agent-Systems R-MAS 2001. Praha: abc, 2002, p. 82 - 89, ISBN 80-000 000
- BRADÍK, J. *Expression of Uncertainty in Practical Measurement* In Electronic Devices and Systems. EDS 2002 Electronic Devices and Systems Conference. Brno: Ing. Zdeněk Novotný, CSc., 2002, p. 395 - 400, ISBN 80-214-2180-0
- BRADÍK, J. *Nejistota stanovení indukčnosti magnetizační cívky* (Uncertainty in measurement of magnetizing coil inductance) In EPVE Elektrické pohony a výkonová elektrotechnika. EPVE 2002, celostátní konference elektrických pohonů a výkonové elektroniky. Brno: Vysoké učení technické v Brně, 2002, p. 194 - 199, ISBN 80-214-2246-7
- BRADÍK, J. *Nejistoty měření v NDT* (Uncertainties of measurement in NDT) In Technická diagnostika strojů a výrobních zařízení – DIAGO 2002. Technická diagnostika strojů a výrobních zařízení DIAGO 2002. Ostrava: Ediční středisko VŠB - TU Ostrava, 2002, p. 9 - 14, ISBN 80-248-0045-4

- BRADÍK, J. Vyjadřování nejistot v elektromagnetické nedestruktivní diagnostice jakosti. (Expression of uncertainty in electromagnetic non-destructive diagnostic of quality). 2002. ISBN 80-214-2164-9.

- BUŠOV, B. *InOVACE systémově* (InnOVATION systematically) In SYSTEM ENGINEERING (SYSTE 02). System Engineering, SYSTE02. Praha: Mikota, 2002, p. 17 - 28, ISBN 80-86596-06-0

- BUŠOV, B. *Technická tvůrčí práce se SW podporou* (Technical crativity supported by SW) In Pedagogický software 2002. Pedagogický software. České Budějovice: Scientific Padagogical Publishing, 2002, p. 23 - 23, ISBN 80-85645-46-7

- BUŠOV, B., BARTLOVÁ, M. *From Problem to its Stones and Kernels* In ETRIA WORLD CONFERENCE, TRIZ FUTURE 2002. ETRIA WORLD CONFERENCE. ENSAIS, Strasbourg: ENSAIS, 2002, p. 347 - 358, ISBN 2-86820-227-6

- BUŠOV, B., BARTLOVÁ, M. *Knowledge Mining - Myth or Fact ?* In Proceedings 3rd Conference Physics Teaching in Engineering Education. Physics Teaching in Engineering Education PTEE 2002. Leuven: Universitry of Leuven, 2002, ISBN 90-5682-359-0

- BUŠOV, B., PROCHÁZKA, J. *Tvorba a řešení inovačních zadání - TRIZ a její SW podpora Invention Machine* (TIPS and its SW support IM) In Konferencia katedier častí a mechanizmov strojov. XLIII. medzinárodná vedecká konferencia. Zvolen: TU Zvolen, 2002, p. 282 - 285, ISBN 80-228-1174-2

- BUŠOV, B., SAMEK, R., LASÁK, P. *Informace, znalosti, inovace* (Information, knowledge, innovation) In Moderní management (MOMAN02). 32nd Spring International Conference MOSIS'98. Praha: Ing. Petr MIKOTA, 2002, p. 37 - 45, ISBN 80-65596-03-6

- BUŠOV, B., SAMEK, R., LASÁK, P. *Inovace s metodikou TRIZ s podporou expertního systému IM* (Innovation with TRIZ methodology and IM expert system) In XX.mezinárodní kíolokvium o řízení osvojovacího procesu. Acoustic Emission '99. Vyškov: VVŠ pozemního vojska Vyškov, 2002, p. 65 - 69, ISBN 80-7231-090-9

- BUŠOV, B., VESELKA, F. *InOVACE založené na znalostech* (Knowledge based innOVATION) In GENERAL MANAGEMENT (GEMAN 02). Genaral management. Mariánské lázně: Mikota, 2002, p. 211 - 222, ISBN 80-86596-10-9

- ČERVINKA, D. *Startérgenerátory v osobních automobilech* (Starter-generators in cars) In National Conference with International Participation ENGENEERING MECHANICS 2002. Inženýrská mechanika 2001. Svratka Czech Republic: ÚMT FS VUT Brno, 2002, ISBN 80-214-2109-6

- ČERVINKA, D., VOREL, P. *Electric scooter with an asynchronous motor* In Advanced batteries and accumulators - 3rd International conference. Advanced Batteries and Accumulators, ABA - 3. Brno: VUT, 2002, p. 27-1 - 30, ISBN 80-214-2082-0

- ČERVINKA, D., VOREL, P. *Elekrický skútr s asynchronním motorem* (Electric scooter with an induction motor) In Inženýrská mechanika´02. Národní konference s mezinárodní účastí - Inženýrská mechanika 2002. Svratka: XYZ, 2002, p. 21 - 22, ISBN 80-214-2109-6

- ČERVINKA, D., VOREL, P. *Elektrický skútr s asynchronním pohonem* (Electric scooter with an induction machine) In National Conference with International Participation ENGENEERING MECHANICS 2002. Inženýrská mechanika 2001. Svratka: ÚMT FS VUT Brno, 2002, ISBN 80-214-2109-6

- DOHNAL, P. *High Frequency Plasma Pencil* In Sborník konference Student EEICT. Student EEICT 2002. VUT FEKT Brno: , 2002, p. 241 - 245,

- FLÉGR, Z., KOLÁČNÝ, J. *Rezonanční pásma 3-fázového krokového motoru.* (Resonance frequency of 3-phase stepping motors.) In STUDENT EEICT 2002. Student EEICT 2002. VUT Brno: , 2002, p. 139 - 141, ISBN 80-214-2114-2

- HÁJEK, V., KUCHYŇKOVÁ, H. *Automobile Electrical Machines of this Century* In ISEM 2002. ISEM 2002. Praha: ČVUT Praha, 2002, p. 140 - 145, ISBN 80-01-02617

- HÁJEK, V., KUCHYŇKOVÁ, H. *Electric Starter Motors - Contemporary Problems and Questions* In ZKwE´2002. ZKwE´2002 - Zastosovania Komputerov w Elektrotechnice. Poznaň, Polsko: , 2002, p. 519 - 521, ISBN 83-912306-2-7

- HÁJEK, V., KUCHYŇKOVÁ, H. *Perspective Types of Automobile Electric Machines* In SME´2002. XXXVIII International Symposium on Electrical Machines. Kielce, Polsko: Wydawnictwo Politechniki Swietokrzyskiej, Kielce, Polsko, 2002, p. 519 - 528, ISBN 86-88906-02-X

- HORNÁ, M. *Ověření prototypu střídavého zdroje s nezávisle proměnným napětím a frekvencí* (Verification of 3 phases control source) In EPVE 2002. EPVE 2002, celostátní konference elektrických pohonů a výkonové elektroniky. Brno: VUT Brno, 2002, p. 259 - 262, ISBN 80-214-2246-7

- HORNÁ, M. *Performance tests of a three-phase alternating-current asynchronnous motor with independently variable voltage and frequency* In ISEM 2002. ISEM 2002. Praha: Praha, ČVUT, 2002, p. 53 - 58, ISBN 80-01-02617-5
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VII. OTHER ACTIVITIES

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ANNUAL REPORT 2002