

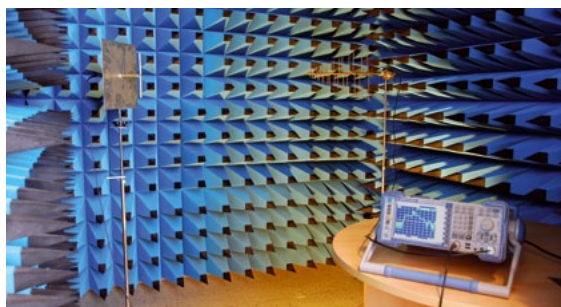
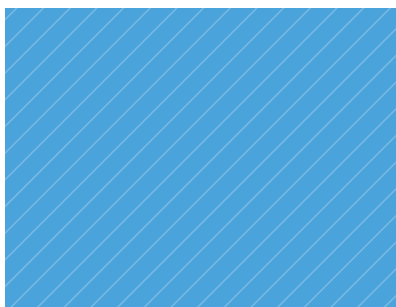
## INSTITUTE CONTACT



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## THEMATIC RESEARCH FOCUS

### RESEARCH AREA

Electronic circuits and systems, application of electronic circuits in communication systems, signal processing, electromagnetic waves

### MISSION

Excellent institute, which is a part of the wider world leaders in basic and applied research.

### EXCELLENCE

Applied electromagnetics, satellite and mobile communication, free space optical communication, advanced analogue electronic circuits

## DEVELOPED TECHNOLOGIES

### CONTENT OF RESEARCH

- » Theory of electronic circuits and systems
- » Application of electronic circuits in communication systems, control and industrial applications
- » Signal processing and its impact on speech processing and digital wireless communication
- » Electromagnetic waves, antennas, microwaves, optoelectronics and electromagnetic compatibility
- » Special electronic communications (mobile, satellite, optical wireless communication)

## MAIN CAPABILITIES

### Basic research

Our department participates in publishing the Radioengineering Journal (included in the Thomson ISI), confirming the high international level of the institute

### Application research + protection forms

- National patent for multi-band antenna.  
In the last few years more than 10 technical arrangements and programmes have been realized. The most considerable projects are as follows:
- » Atmospheric laser optical link with self-adapting control
  - » Contactless optoelectronic instrument for measuring dimensions with CCD elements and microprocessor control,
  - » Onboard low noise receiver in L band for the experimental PHASE 3D satellite of the international organization AMSAT
  - » SNAP – computer programme for symbolic analysis of electronic circuits
  - » Digital quadrature detector for SDR (software defined radio) systems
  - » Frequency synthesizer and detectors with post-processing DSP for the receiver of the transponder of the Phase 3E satellite of the organization AMSAT
  - » Testing and measuring the EDGE system for fast data transmission in GSM networks (in cooperation with T-Mobile CZ) in the mobile communications laboratory

## FIELDS OF RESEARCH RESULTS APPLICATION

- » Communication, control and industrial engineering

## ALUMNI PROFILE

The graduate is able to develop a completely new electronic device, improve the methods for signal processing, etc. on the basis gained by deep theoretic knowledge. Graduates find their place in experimental,



research and development (R & D) centres, in academia and science institutions. Doctoral study programme graduates are also very successful abroad.

#### Knowledge and skills in:

Electronic analogue, pulse and digital circuits and systems, TV and video applications, HF and microwave applications, antennae and theory of electromagnetic field, signal processing, wireless communications and electromagnetic compatibility.

### NUMBER OF RESEARCH POSITIONS ↘

#### SENIOR RESEARCH STAFF

10

#### JUNIOR RESEARCH POSITIONS (INCL. PH.D. STUDENTS)

30

### KEY RESEARCH EQUIPMENT ↘

#### LIST OF DEVICES

- » Fully equipped EMC chamber for measurements in the range of kHz to GHz
- » Vector network analyzer for measurements up to 40 GHz
- » Optoelectronic laboratory for characterizing free-space optical systems
- » Mobile communication laboratory fully connected to T-Mobile network

### BUDGET ↘

#### TOTAL (MIL. CZK/ MIL. EUR)

50 / 2

#### PART OF THE TOTAL BUDGET FROM PRIVATE RESOURCES (%)

4

#### PART OF THE TOTAL BUDGET FROM FOREIGN RESOURCES (%)

20

### MAIN PROJECTS ↘

**2010–2013:** Agile RF transceivers and front-ends for future smart multi-standard communications applications (FP7 project; ENIAC. Coordinator: Infineon)

**2008–2012:** High intensity radiated fields – synthetic environment (FP7 project; COOPERATION. Coordinator: Alenia Aeronautica)

**2008–2010:** Antennas for Car2Car communication (research contract; Contractor: Volkswagen A.G.)

### ACHIEVEMENTS ↘

- » Free space optical link for gigabit wireless communication
- » Transponders for AMSAT satellites
- » Measurement campaign of data transfer rate in commercial mobile networks
- » Antenna system for Car2Car communication

### MAIN COLLABORATING PARTNERS ↘

#### COLLABORATION WITH ACADEMIC PARTNERS

- » Faculty of Electrical Engineering, Czech Technical University (Prague, CZ)
- » Institute of Scientific Instruments, Academy of Sciences of the Czech Republic (Brno, CZ)
- » Institute of Photonics and Electronics, Academy of Sciences of the Czech Republic (Prague, CZ)
- » Institute of Atmospheric Physics, Academy of Sciences of the Czech Republic (Prague, CZ)

#### COLLABORATION WITH COMPANIES

- » Barco (Uherské Hradiště, CZ)
- » Ccom (Pardubice, CZ)
- » Dcom (Brno, CZ)
- » ERA (Pardubice, CZ)
- » Evektor (Kunovice, CZ)
- » Omikron (Praha, CZ)
- » První brněnská strojírna (Velká Bíteš, CZ)
- » Škoda Auto (Mladá Boleslav, CZ)
- » T-Mobile (Prague, CZ)
- » Tesla Holding (Prague, CZ)

### EXPECTATIONS ↘

#### REQUIREMENTS

- » Foreign high-quality postdocs
- » Demand after innovation

#### OFFERS

- » Competitive applied research